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**SCHOOL OF POSTGRADUATE STUDIES**

**A STUDY OF DETERMINANTS OF CAPITAL MARKET LIQUIDITY IN ZAMBIA.**

**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE  
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**BY**

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## DECLARATION

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## **DEDICATION**

Firstly, I dedicate this work to the almighty God, Jehovah because its completion is a testimony that faith overcomes boundaries. Secondly, I dedicate this work to my mother, brother, and sisters for the support throughout my life beyond academic gates. Lastly, but not the least, this work is also dedicated to Dr. Chibwe Chisala for the calm and enlightening guidance throughout the research process. I thank you all.

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## LIST OF ACRONYMS

<b>8NDP</b>	8 <sup>th</sup> National Development Plan
<b>ARDL</b>	Autoregressive distribution lag
<b>CMMP</b>	Capital Markets Master Plan
<b>COVID-19</b>	Corona virus disease 2019
<b>CPI</b>	Consumer price index
<b>GDP</b>	Gross Domestic Product
<b>H<sub>0</sub></b>	Null hypothesis
<b>H<sub>1</sub></b>	Alternative hypothesis
<b>LuSE</b>	Lusaka Stock Exchange
<b>M3</b>	Broad money supply
<b>MoFNP</b>	Ministry of finance and national planning
<b>Obs</b>	Observations
<b>OLS</b>	Ordinary Least Square
<b>Stata</b>	Statistical software analysis
<b>SEC</b>	Securities & Exchange Commission
<b>US</b>	United States of America

## **ABSTRACT**

The study aimed at establishing economic determinants of capital market liquidity in Zambia, to contribute to efforts towards increasing liquidity in the market. Capital markets are financial avenues through which long-term investment is secured for purposes of enhancing economic activity either in debt and or equity markets (SEC bulletin, 2017: 21). In this regard, capital (LuSE) market turnover is the liquidity of the market measured by the value of trade volume of equity against total equity issued (Ibid).

It therefore follows that the study examined the relationship between capital market liquidity (LuSE turnover as a proxy) as the response variable and GDP growth rate, inflation, money supply (broad money) growth rate, average annual crude oil price per barrel and exchange rate against the US dollar as regressors. The research data sample was for 21 years from 2000 to 2021 for both the response and regressor variables. The research utilised the autoregressive distribution lag model (ARDL) to establish the state of the relationships between capital market liquidity and regressor variables because the data was differenced at order 0 and 1. Before running the ARDL model, the data was subjected to statistical tests of normal distribution, stationarity, multicollinearity, and heteroscedasticity.

The bounds test was performed on the data to determine if the relationship between the regressors and the response variable were either short or long run. The outcomes of the statistical tests show that only a short-run relationship exists among the variables. The short run relationship ARDL statistical results interestingly show that only crude oil price per barrel and the exchange rate are statistically significant at 95% confidence interval to influence capital market liquidity outcomes. The results show that crude oil price per barrel is positively related to capital market liquidity by a coefficient of 34100000 whereas the exchange rate is negatively related to capital market liquidity by a coefficient of 1350000000. In this regard, a unit increase in crude oil price per barrel increases capital market liquidity by K34,100,000 whereas a unit depreciation of the Kwacha against the US dollar reduces capital market liquidity by K1,350,000,000.

To increase liquidity or turnover in the Zambian capital market for purposes of increasing economic activity for job creation and population welfare improvement, the study recommends adoption of macroeconomic policies that would strengthen the

Kwacha against the US dollar in the short run to prevent or reduce liquidity or turnover losses. It further recommends that the country establish and utilise regression models based on significant macroeconomic variables for forecasting capital market liquidity as a better means of forecasting and managing risks that may affect capital market turnover, and thereby securing investment and job creation to attain economic growth.

## CHAPTER 1: INTRODUCTION

The end of World War 2 in 1945 provided impetus towards a new global war of development ideologies between capitalism and socialism. The central argument of the two ideologies was largely centered on either individual or state resource ownership and allocation as the best model for improving people's welfare through economic growth, entailing attainment of development. Nonetheless, by the end of the cold war, it was evident that private sector participation in economic activities accelerates economic growth. During this period, the financial intermediary sector, namely capital markets started gaining momentum around the globe as an efficient and effective means of providing long-term affordable capital for economic development.

With the dawn of democracy and economic liberalization in Zambia in the 1990s, it became apparent for the country to enhance capital markets by establishing a stock exchange, in addition to its already existing government bond market to provide a means for both private companies and government to raise long-term capital through stock and corporate bonds for growth and job creation. This was fuelled by privatization in most public company dominated sectors such as the mines and manufacturing.

It therefore follows that in the 1990s, the country transformed its economic practice to accelerate economic development. To date, it's evident that Zambia needs capital to accelerate its economic development agenda through diversification. In this regard, capital markets are essential for the country to efficiently allocate resources through long term capital for economic development. Capital markets are avenues through which companies raise financial capital for investment using bonds, stocks, and other long-term capital (SEC Annual Report, 2018:17). Capital markets are therefore complementary financial markets to banks and other financial institutions in resource mobilization and allocation for investment purposes. Therefore, capital markets provide additional investment resources to those provided by banks and other financial institutions at affordable rates with easy access for both the corporate sector and central government. The affordability and easy access of capital through capital markets is an accelerator of economic growth because investor market players prefer such capital to drive investment activities and thereby create jobs, unlike sourcing from banks through loans because of huge cost. Absence or limited capital (liquidity) in

capital markets limits economic growth and therefore this results in slow to no jobs being created due to low appetite for loans by the private economic players to invest in production increase. In this regard, illiquidity of capital markets limits economic growth and job creation, because investors avoid sourcing for funds from banks.

With such importance of providing long term affordable capital to both government and corporate investment needs, it is Zambia's' desire to reduce the dominance of the banking sector in providing capital by establishing a market that meets capital demand. Therefore, it is in government plans for capital markets to become liquid and contribute to economic development, as part of extensive financial sector reforms aimed at enhancing the role of capital markets towards bolstering the economy. In this regard, the Government of the Republic of Zambia, developed the Capital Market Master Plan (CMMP), a comprehensive ten (10) year long-term strategy for capital markets development in Zambia. The CMMP is envisaged to give a unified and clear roadmap to reposition the capital market in Zambia as an important conduit for domestic and foreign investments and that will allow it to achieve its function of bolstering Zambia's economy (SEC,2022:3).

The objective of the Capital Market Master Plan is to layout a framework or path for Zambia's capital market development over a period of 10 years (2022-2032) that will enable it to fulfil its function of backing up economic development and achieve the objectives of the 8<sup>th</sup> National Development Plan, to create jobs and wealth through economic transformation, and Vision 2030, to make Zambia a prosperous middle-income country. This work is timely because the development of capital markets is one of the underlying pillars of Zambia's development goals over the next decade (MoFNP & SEC, 2022: 3). Thus, development of the Zambian capital market through CMMP is meant to increase liquidity in the market for affordable long-term capital for central government and corporate sector for the country to achieve sustainable economic development.

## **1.1 STATEMENT OF THE PROBLEM**

Zambia needs capital to implement its economic transformation agenda to create jobs through economic growth (SEC, 2023: 2). With a financial sector dominated by banks, capital is expensive for the corporate sector to acquire loans and invest in their business ventures. This has contributed to slow economic development in the country due to inadequate investment activities to accelerate economic growth because of

high cost of capital. Despite the existence of the capital market in Zambia, as a source of affordable and easily accessible capital, the nations development agenda through economic transformation has been faced with financing problems. This is partly attributed to the problem of an illiquid capital market (MoFNP & SEC,2022:5). An illiquid capital market for Zambia means insufficient available funds for investment demands to achieve economic transformation.

The Zambian capital market is characterized by low liquidity due to low investment in capital products such as stocks by private and public investors (Ibid). The Zambian capital market has remained underdeveloped and has been characterized by several weaknesses that inhibit it from efficiently mobilizing the country's public and private financing needs. For example, Lusaka Stock Exchange (LuSE) is a highly illiquid market with the value of shares traded (market turnover) equal to four percent against twelve percent market capitalisation of GDP. In 2022, LuSE domestic share turnover ratio (shares traded against total issued) was 3.3% represented by \$4 billion (MoFNP & SEC,2022:5), a jump from less than \$2 billion in 2021 (PWC, 2021:4). The market needs more participants if it's to meet the desired trading levels to increase liquidity (Ibid). Nonetheless, CMMP envisions to increase LuSE market turnover from \$4 billion in 2022 to \$ 23 billion in ten years. This is all aimed at ensuring that the capital market becomes liquid to meet capital investment need demands (MoFNP & SEC,2022:5). Hence, the study aims to establish factors underlying capital market liquidity in Zambia.

## **1.2 RESEARCH OBJECTIVES**

The following were the proposed research or study objectives.

### **General objective:**

- To establish determinants of capital market liquidity in Zambia.

### **Specific objectives:**

- To establish the relationship between inflation rate and capital market liquidity.
- To establish the relationship between gross domestic product (GDP) growth rate and capital market liquidity.
- To establish the relationship between money supply (M3) growth rate and capital market liquidity.

- To establish the relationship between crude oil price per barrel and capital market liquidity.
- To establish the relationship between exchange rate and capital market liquidity.

### **1.3 RESEARCH HYPOTHESES**

The following were the proposed research hypotheses as per study objectives above.

#### **Inflation**

**H<sub>0</sub>.** Inflation rate has no influence on capital market liquidity.

**H<sub>1</sub>.** Inflation rate has influence on capital market liquidity.

#### **Gross Domestic Product (GDP)**

**H<sub>0</sub>.** GDP growth rate has no influence on capital market liquidity.

**H<sub>1</sub>.** GDP growth rate has influence on capital market liquidity.

#### **Money supply (M3)**

**H<sub>0</sub>.** Money supply growth rate has no influence on capital market liquidity.

**H<sub>1</sub>.** Money supply growth rate has influence on capital market liquidity.

#### **Crude oil price**

**H<sub>0</sub>.** Crude oil price has no influence on capital market liquidity.

**H<sub>1</sub>.** Crude oil price has influence on capital market liquidity.

#### **Exchange rate**

**H<sub>0</sub>.** Exchange rate has no influence on capital market liquidity.

**H<sub>1</sub>.** Exchange rate has influence on capital market liquidity.

### **1.4 SIGNIFICANCE OF THE STUDY**

With a 3.3% LuSE market turnover against 12% capital market capitalization of GDP, it is evident that capital market liquidity is below desired levels for the market to significantly contribute to economic growth in Zambia. The illiquid market is because of many factors which largely include low investment appetite from private and corporate sectors in capital market products. And this means insufficient capital for the corporate sector to meaningfully engage in investment activities for job creation. Therefore, understanding economic variable determinants of capital market liquidity resulting from capital market product investment funds from both public and private investors is vital for the Zambia Capital Markets Master Plan to respond to relevant market conditions needing attention for it to be a success. The study therefore aimed



at establishing a baseline for more insightful research around understanding capital market liquidity beyond the economic variable findings in this study. Further, the findings of the study were aimed at informing government policy governing capital market structure, regulation, and capacity building for policy to adequately address identified economic factors of influence on capital market liquidity. It was envisaged that this would assist in solidifying efforts aimed at increasing liquidity in capital markets to drive the economic development agenda as per the 8NDP goal of economic transformation for job creation and Vision 2030, to make Zambia a prosperous middle-income country.

### **1.5 STUDY LIMITATIONS**

- Lusaka Stock Exchange (LuSE) turnover data was a proxy of the entire capital market trades data. The dependent variable was only represented by securities data. The securities market data represented money market, bonds, and other capital market asset data. Data availability is extremely limited.
- The study was limited by a sample size of less than 30 years due to unavailability of data for the years before 2000.
- Serial correlation among regressors limited the choice of macroeconomic variables to include in the study.

### **1.6 STUDY SCOPE**

The study sample size was 21 years of historical data pertaining to Zambia from 2000 to 2021 for the response and explanatory variables. The study used end year inflation rate, annual GDP growth rate, end year exchange rate against the US dollar, annual growth rate of money supply-M3 (broad money) and international annual average price of crude oil per barrel as explanatory variables to establish the state of existence of relationships with the response variable of capital market liquidity, proxied by LuSE turnover.

### **1.7 DEFINITION OF KEY CONCEPTS**

- Capital markets-Financial avenues through which long-term investment is secured for purposes of enhancing economic activity either in debt and or equity markets (SEC bulletin, 2017: 21)
- Capital market capitalization-Size of the capital market measured by the quantity of issued equity and bonds against their respective prices (Ibid).

- Capital (LuSE) market turnover-The value of equity traded or bought.
- Liquidity-The ability to buy or sell large quantities of an asset fast and at low cost (Husnain et al, 2021:737). In this study, it will be used synonymously with definition of LuSE market turnover.
- Inflation- The rise in general price level of goods and service measured at a point in time (Oshaibat cited by Igbinosa and Uhunmwangho, 2020:22).
- Broad money supply-The total financial instruments held by money holding sectors that are a medium of exchange and widely used in an economy or close substitutes for the medium of exchange that are reliable store of value e.g. currency in circulation as medium of exchange and short-term debt securities, savings, term deposits etc., as close substitutes for medium of exchange (IMF, 2009:4).
- Gross domestic product-The market value of goods and services produced within a defined geographical area (country) at a specific point in time (Leamer, 2009:19).
- Crude oil-Also known as petroleum and is used as an energy source in vehicles and planes etc.
- Exchange rate-The rate at which one currency is exchanged for another (Suvendu, 2021:1)

## **1.8 THE ORGANIZATION OF THE REPORT**

The structure of this report starts with chapter 1 which is an introduction and includes background, statement of the problem, objectives, significance of the study, scope of the study and definition of key concepts. Chapter 1 is followed by chapter 2 which covers literature review including theoretical and conceptual frameworks. This is followed by chapter 3 which is the methodology of the study and covers study design, approach, population, sample size and methods of data collection including analysis. This is followed by chapter 4 which is data presentation and analysis and covers results of all statistical tests performed on the data including their interpretation. This is followed by chapter 5 which is discussion of results and findings and covers discussion of findings and results, and their relationship to theory including applicability in the real world. This is followed by chapter 6 which is conclusions and recommendations, and this entails a summary of findings and their impact in the real world including suggested means of better managing subject under research.

## **CHAPTER 2: LITERATURE REVIEW**

This chapter provides details about the study topic in line with already existing literature. Its significance was presentation of information relevant for shaping the study to contribute to the building of capital market liquidity knowledge in the context of Zambia. It guided the study by focusing on key terms, existing findings, themes, research gaps (weaknesses), methodology and applicable theory to determine and explain macroeconomic variables of influence on capital market liquidity in Zambia as a topic of research interest. Thus, literature review helped focus the study by informing the process of establishing both general and specific objectives for findings to be sufficient and relevant to would be users such as government, corporate players, and researchers in knowledge building, policy formulation and general management of capital markets to enhance liquidity. And thereby contribute to economic development.

### **2.1 EMPIRICAL REVIEW**

In every economy, capital markets are vital in contributing to economic growth because of their unique status as complementary financing mechanisms to banks. Apart from banks, capital markets also play a key role in transferring finances from surplus sectors to sectors with a deficit to finance investment activities. The surplus sector is mainly dominated by the corporations, banks, pension, and insurance funds including other types of institutions. Nonetheless, individuals or households are also key players in capital markets. The markets provide easily accessible and affordable financing for investment activities needed by government and corporate entities. It therefore follows that sustained growth and stability of capital markets is also key in achieving economic growth for job creation and improved general welfare among citizens. In this regard, it's imperative for Zambia to sustainably grow its capital market by implementing favourable policies if it is to achieve desired positive economic outcomes in both the short-run and long term.

The development of capital markets can sustainably be achieved by increasing participation of both asset issuers and buyers. In this case, issuance is a representation of capitalization and buying is a representation of turnover (cash or liquidity). It's therefore a need to determine and understand variables that influence Zambia's capital market growth if policy and general management practice of the market is to lead to meaningful achievements in any period. The Zambian capital market is made up of equity, money, and bond assets etc. In this regard, due to limited

literature on capital markets, this chapter reviewed information from an equity or stock market perspective as a proxy for the entire capital market in terms of liquidity.

The liquidity of a stock can be measured by the number of times it is traded, the number of transactions it creates, and the value of transactions it produces (Husnain, Hashmi and Ahmad, 2021:738). Thus, market illiquidity indicates poor market functioning, which can result into a financial crisis, translating into reduced economic activities in terms of investment (Ibid). Four dimensions matter in liquidity measurement, and these are trading time (the capacity to transact at the current price), tightness (simultaneous purchase and sale of an asset), depth (the ability to acquire and sell an asset without affecting the listed price), and resiliency (the ability to acquire and sell an item with least impact on the quoted price) (Op. cit).

Generally, a liquid market can be defined as a market in which assets in their huge quantity are traded easily and fast at lower transaction costs with minimal price impact (Amihud cited by Priyanka N and Yeddy:1). A liquid capital market can therefore be referred to as a market in which a huge quantity of available financial assets including stock can be exchanged easily and faster at lower transaction costs with minimal price impact. Considering these definitions, reviewed literature has shown that measure of capital market liquidity using the stock market liquidity uses different measures that can fairly bring out the key liquidity market characteristics, and that is, quantity or volume (depth measure), time or speed (immediacy measure), price impact (breadth measure), and spread (transaction cost measure) (Ibid).

Using liquidity definition of depth as defined above, this specifically shows that stock market liquidity is an indication of the presence of an agreement to exchange a particular quantity of stock at a given price without delay on time between willing sellers and buyers (Op. cit). In other words, stock liquidity can be referred to as the capacity to buy and sell stock in large amounts without affecting prices or increasing exchange costs (Zheng and Su cited by Husnain, Hashmi and Ahmad, 2021: 738). In the same vein, a liquid market is one in which a huge volume of transactions is occurring within a space of time but the movement in price is marginal. Thus, if the market is not liquid, only insignificant investment activities will lead to an increase in returns (Igbiosa and Uhunmwangho, 2020:18).

The above definitions all point to the need for trading activities in capital markets to be frequent for the market to meet investment demands. And this represents market turnover (value of trade as a product of volume multiplied by price). The higher the value of capital market turnover, the higher the investment activities because of available resources to finance investment. This gives impetus to the need for capital markets through increased turnover to spur economic growth in a country like Zambia, through improved sophistication and risk management of products (investment) (Capital markets Association of Zambia, 2021:6). In 2021, it was reported that on average, countries' scores around the world, including Zambia, fell by one unit when compared to the scores in 2020 (Ibid). Low stock turnover significantly contributed to this poor performance. This was attributed to the slow pace of economic recovery which negatively affected turnover levels and market confidence as well as the impact of the Covid-19 pandemic, and thereby affecting economic activity (Capital markets Association of Zambia, 2021:7).

Therefore, despite the disagreement in relation to causality direction between economic growth and capital market growth, evidence has shown that economic growth and development in general are influenced by capital market development (Chandavarkar, 1992 cited by Acquah & Salami, 2013: 6). For instance, findings in wealth countries have shown that growth of capital markets, helps to control inflation, reduce unemployment, and provide a foundation for employment creation through the growth of economic activities financed by the capital market (Ibid). This relationship between growth of an economy and capital market liquidity is the basis of calls for policy reforms to encourage more participation in capital markets by both corporates and households. Nonetheless, capital market liquidity in Zambia has been insufficient to meet financial investment needs due to a variety of reasons which include low participation in the market by private and public entities (MoFNP & SEC,2022:5). Thus, it's vital to understand capital market liquidity in the context of Zambia for policy and market management practice to be geographically aligned and applicable to influence favourable liquidity outcomes in the country.

Capital market liquidity is affected by both micro and macro economic variables such as national debt and returns respectively. The economic determinants include variables such as interest rate, national debt, inflation, exchange rate, money supply, international oil price per barrel, taxation, government expenditure and savings etc...

Hence the need for literature review to ease process of shaping the study by narrowing it down to the most pronounced variables in the review.

In 2008, with a global financial crisis, monetary policy interventions of central banks with the intention to stabilize financial markets and the real sector did not yield intended results because the situation was unprecedented. There was a need for quick fixes of the crisis around the world through monetary policy, but it was done with limited knowledge. Thus, a study in Europe was conducted to understand the actual impact of monetary policy on stock liquidity and thereby address its role as a determinant of commonality in liquidity. Countries whose stock exchanges were under study were Germany, France and Italy covering the period of 132 months from January 1999-December 2009. The considered stock universe included all German stocks traded at the Xetra trading system, all French stocks traded at the Euronext Paris and all Italian stocks traded at the Milan stock exchange (Fernandez-Amador, Martin, Larch and Peter, 2011: 1-3).

In this study, stock liquidity was defined as ease of trading equity (Ibid). The study was influenced by the lack of sufficient knowledge about the relationship between monetary policy and liquidity of stock markets because central banks globally tried to ease financial markets during the crisis era by means of massive monetary policy interventions (Op. cit). To establish effects both at the micro and macro level of stock markets, the study applied panel estimations and vector auto regressive models. The findings of the study found that the European Central Bank expansionary monetary policy (higher base money growth) leads to an increase in liquidity of the stock market in the French, German and Italian markets (Fernandez-Amador, Martin, Larch and Peter, 2011: 14).

In the Middle Eastern and North African (MENA) region countries, research focused on analysis of the impact of selected macroeconomic variables on development of the stock market (the stock exchange share value on GDP) was conducted. The findings of the study, retrieved from panel data analysis, showed that share of domestic credit to private sector, saving rate, stock market liquidity and inflation rate were significant determinants of development of the stock market (stock market capitalization) while investment and income level did not statistically have any significant impact (Naceur, Samy, Ghazouani and Omran, 2007:227).

In the global south, another study aimed at examining stock market liquidity and macroeconomic aggregates (variables) in African markets was conducted and the target countries were South Africa, Nigeria, Mauritius, Egypt, and Morocco. These countries were selected because of the size of their exchanges compared to others on the continent, and this also meant an expanded scope of the study (Igbinosa and Uhunmwangho, 2020:20). The research was cross-sectional in design, and data utilised was for a period of 10 years from 2006 to 2016 sourced from World Bank data base. To account for tolerance of unbalanced panel data, time constant unobserved heterogeneity as well as serial correlation, fixed effect panel least squares regression technique was used in the analysis (Ibid).

The statistical outcomes of the study showed that selected macroeconomic variables significantly explain variations in the liquidity of stock markets in Africa. The variables that were found to have influence on stock market liquidity are inflation, money supply, exchange rate and private sector credit. Though the positive sign for economic growth was there, at 0.05 level, it was not statistically significant. The researcher noted that, money supply determines stock market liquidity because purchasing power and investment activities are greatly enhanced if there is an improvement in money supply in an economy. With inflation, it was noted that it determines stock market liquidity because higher returns are associated with sustained increase in price levels (Op. cit).

It was also concluded in the study that a stronger domestic currency is associated with higher investment activities from abroad and that credit to private sector determines stock market liquidity because its increase results into improved investment activities in capital markets. Based on these findings, the study recommended that foreign portfolio investors, pay careful attention to national economic macroeconomic forces because of the great probability they hold in influencing returns on the stock market (Igbinosa and Uhunmwangho, 2020:21). The study further concluded that macroeconomic variables affect stock market liquidity through their impact on trading volume and investors' expectations such as inflation expectations which has a bearing on investment decision (Ibid).

For example, for financial institutions such as the deposit money banks, a rise in inflation is synonymous with decrease in deposits (less savings) and ultimately reduction in its ability to create loans (Oshaibat cited by Igbinosa and Uhunmwangho,

2020:22). This suggests that inflation may produce a negative effect on the financial market liquidity or turnover. Thus, when an economy grows and becomes stable, it causes investor confidence to rise and this therefore attracts both local and foreign investors into the market, stimulating trading activities, and in the long run increasing stock market liquidity (Ibid).

Money supply is often referred to as stock of money or currency in circulation plus demand deposits at a point in time (Iyoha cited by Igbinosa and Uzunmwangho, 2020:23). A rise in the quantity of money in circulation increases the purchasing power of the citizens, stimulates savings and investment, whereas a reduction in money supply may have the opposite effect, thereby influencing the liquidity of financial assets. Governments usually regulate their money supply through the Central banks. Thus, the liquidity of the stock market is influenced by government actions through monetary policy (Wang, Tsai and Lee cited by Igbinosa and Uzunmwangho, 2020:23).

In Türkiye, a study was conducted to establish macroeconomic factors with impact on the Turkish Stock Market index. The study used the autoregressive distribution lag using data from 2003 to 2017 to establish findings. The findings showed that economic growth, portfolio investments, foreign direct investments, and the relative value of the domestic currency increase the stock market index while crude oil prices and interest rate negatively affect it. The results also show that stronger domestic currency, higher international capital inflows, and lower energy and investment costs improve the performance of the Istanbul Stock Exchange Market (Demir, 2019:89).

In Nepal, research was conducted to empirically examine the economic variables of influence on the performance of the stock market using periodic monthly data ending mid-July 2014 from mid-August 2000. The response variable used was gross domestic product as a real measure of stock performance because stock market liquidity is associated with growth in a nation's gross domestic product. The explanatory variables were political risk, monetary policy (lending interest rate), inflation, and money supply. The changes in Nepal Rastra Bank's policy and politics were assessed in terms of their impact on lending against share collateral. The empirical results retrieved from ordinary least squares estimations of behavioural equations revealed that the stock market performance responds positively to broad money growth and inflation, and negatively to the rate of interest. This postulates that, in the country of Nepal, stock



investors seem to take shareholding as a hedge against inflation and consider equity as an alternative financial instrument. Further, liquidity availability and the low interest rates were found to be stimulants of the performance of the Nepalese stock market. More importantly, the equity market was found to react significantly to adjustments in political environment and the policy of Nepal Rastra Bank (Prakash and Subedi, 2014:1). The findings were aimed at assisting to design policies to stabilize or stimulate the share market (liquidity) in Nepal if accepted and used (Ibid).

In addition, in another study, focused on the stock market in Nepal, it was discovered that liquidity of the equity market responds positively to alterations in broad money growth and inflation rates, but negatively influenced by the interest rate (Shrestha and Subedi, 2015). Therefore, in Nepal, economic conditions seem to have massive influence on the growth of the capital markets via acceleration of liquidity in equity exchanges.

In the country of Sri Lanka, a study was conducted to investigate the relationship between macroeconomic variables and development of the stock market. Stock market turnover in the study was used as a proxy for stock market development. The selected macroeconomic variables used as regressors were the exchange rate volatility, inflation rate, lending interest rate, deposit interest rate and gross domestic product. The study statistical results showed that all the macroeconomic variables used in the study influence the development of the stock market. The findings were that inflation rate and exchange rate were associated with higher deposit rates and therefore hindered development of the stock market in Sri Lanka (Khulatunga, 2015: 31).

In Japan, empirical assessments were conducted to determine the link between macroeconomic factors and stock market liquidity in terms of returns from 1995 to 2001 using the VAR (Value at risk) method. The assessment results showed that macroeconomic factors influence stock market liquidity. Interestingly, interest rate was found to be robustly associated with liquidity of the stock market (Cook and Choi cited by Igbinosa and Uhumwangho, 2020:25). Further, a study that focused on the effect of inflation on liquidity of the stock market in Kenya under the period 2002 to 2011, using least squares, reported that inflation negatively influences stock market liquidity (Jepkemei cited by Igbinosa and Uhumwangho, 2020:25).

In a study conducted on emerging economies to identify variables of influence of capital market liquidity using the proxy of stock market turnover. It was found that rate of interest, rate of inflation, and foreign exchange price were not statistically significant determinants of capital market liquidity (Agiyeva cited by Tajul et. Al, 2017: 307). In contrast, in Nigeria, it was discovered that the Stock Exchange liquidity is statistically influenced significantly by macroeconomic factors, namely, rate of inflation, size of money supply in the economy, and output in real terms. In addition, these variables were found to have critical impact on the stimulation of performance of the capital market in terms of liquidity in the long run (Ibid). Further, market liquidity was found to be significantly determined by key factors, namely, expenditure by government, supply of money, private borrowing, short-term interest rate, bank rate and government borrowing across a variety of sectors of the stock market in Asia (Chowdhury, Uddin and Anderson, 2018: 6)

A study conducted in Ghana attempted to investigate the macroeconomic variables of influence on development of the capital market in the country. The basis of the study was multiple linear regression analysis using secondary quarterly data starting from 1991 to 2011. The data analysis approached used was exploratory and involved confirming and resolving basic assumptions of multivariate analysis. Research tools such as Structural Equation Modelling (SEM) through Path Analysis (i.e., Layered Regression technique), Principal Component Analysis (PCA) and tests of interactions among variables were used to test for the linear relationships between key variables of interest in the equations estimated. The study was carried out to examine the macroeconomic variables of influence on capital market development in Ghana to help resolve the challenge of insufficient financial capital for pro-poor economic growth in the country. Market capitalization was used as the response variable. The explanatory variables in the model were gross domestic product growth rate (GDP), development of financial intermediaries (DFI), gross capital formation (GFI), capital market liquidity (CML), foreign direct investment (FDI), macroeconomic stability (with the rate of inflation as the proxy), and interest rates (with the 91-Day government Treasury bill rates as the proxy) (Acquah-Sam, 2016:251-257).

The empirical findings of the study were that the development of the capital market in Ghana is influenced positively by gross capital formation (GFI) and gross domestic product growth rate but influenced negatively by Treasury bill rates (T-BILLS). Foreign

direct investments (FDI) and Inflation rate were proven not be significant in the estimated equation (Ibid). These findings implied that policymakers should promote real income or output growth, and physical infrastructural development to improve development of the capital market in the country of Ghana (Acquah-Sam, 2016:251-257). The study recommended that the rate of interest and Ghana's government treasury bill rates must be fixed at reasonable amounts to enhance investment activity in capital market assets. It was concluded that the use of the study is that the findings including the forecasted model is in predicting long run paths of growth of capital markets in low-income countries when country specific problems are well addressed (Ibid).

In Nigeria, a study was conducted to examine stock market liquidity predictors using the autoregressive distribution lag (ARDL) testing approach on monthly data pertaining to the Nigerian stock market from January 2013 to December 2021. Data relating to the stock market was accessed from the website of Nigerian Exchange Group (NGX), while macroeconomic regressor data was sourced from the Central Bank of Nigeria website. The response variable adopted was stock market turnover (volume of stocks traded multiplied by price against each stock, and therefore in other words cash). The explanatory variables were stock return, inflation, money supply (broad money), monetary policy rate (lending rate), foreign exchange rate, and COVID-19. The research found evidence that liquidity of the stock market increases with enhanced market performance and government monetary interventions. The study also found that while liquidity persistence features in the market, higher levels of price prevent market liquidity translating into low volumes of equity trades. (Abdulkadira, Olatinwob, Afolabi, 2022:2).

The study findings showed proof of liquidity persistence as the then present level of liquidity was influenced positively by the liquidity levels in the past. However, this evidence was only established in the short run as the estimates in the long-run estimates could not be confirmed. There was further revelation in the results that performance of the market (measured by returns on stock) and supply of money have positive impact on liquidity of stock market both in the short and the long runs. stock return findings showed that liquidity of the stock market increases with market performance improvement (Ibid). These findings confirmed earlier results by Goyenko and Ukhov (2009), Chordia et al. (2005), and Miralles-Marcelo et al. (2015). Findings

on supply of money also indicated that credit limitations are loosened when money supply improves. This obviously boosts trading activities and consequently enhances liquidity of the stock market (Op. cit). This finding is the same with prior results by Fernandez-Amador et al. (2011) and Miralles-Marcelo et al. (2015). However, it differs from the finding by Siddiqi et al. (2021), where supply of money was found to be insignificant in influencing liquidity (Abdulkadira, Olatinwob, Afolabi, 2022:10).

Furthermore, findings revealed that inflation rate negatively impacts liquidity of stock market both in the short and the long runs. This further implies that liquidity increases (reduces) when inflation level reduces (increases). This finding is the same as the earlier discovery by Jepkemei (2017). It was also found that the pandemic of COVID-19 negatively affects liquidity of stock market in the short term. This is as expected because units of data matching the time of COVID-19 are relatively less in comparison to the entire data units in the research. This finding is the same with the belief that liquidity of the stock market is contingent on time (Ibid). The results of the study showed that rate of interest has no influence on market liquidity either in the short or long terms. In addition, the exchange rate was also discovered to be statistically insignificant in the short term. It, however, becomes marginally significant in the long term at 10% significance level (Op. cit).

In a study conducted in Kenya with Nairobi Stock Exchange as the subject of interest. Research was conducted to determine underlying macroeconomic factors behind the development of the stock market. In this case, being the Nairobi Stock Exchange. In this research, the response variable (Nairobi Stock Exchange) was represented by the market's capitalization value. And the explanatory variables were stock market liquidity, domestic savings, investment, bank development, political risk, and institutional quality. The study was secondary in nature and utilized data from 2005 to 2009 spanning a period of 5 years. The study used regression to establish macroeconomic factors influencing stock market capitalization as a proxy for development of the stock market.

The findings of the research revealed that coefficients of institutional quality, political risk, domestic savings, and income per capita, bank development and stock market liquidity are statistically significant. This indicates that the variables have influence on development of the stock market. However, the variables private capital inflows and

macroeconomic stability were found to have no influence on development of the stock market (Aduda, Masila and Onsongo, 2012:226).

The study further showed existence of a negative influence of institutional quality on development of the stock market. The study concluded that a 1% rise in political risk leads to a 1.4% decline in the development of the stock market. This is because when there is unrest politically, investors tend to hold out investing in stock markets (Aduda, Masila and Onsongo, 2012:226). Nonetheless, domestic saving statistically proved to be significant. The results indicated that domestic savings influences positively development of the stock market at 1% level. An increase by one Kenya shillings in domestic savings leads to stock market growth by 4.209 Kenya. Savings are related directly to investment. This has a direct connection to the amount of investment in the economy because investors add more investment in stocks to increase their production to satisfy the increased demand. As the economy expands and there is increase in investment, people invest using their earlier savings. The private sector commercial bank credit to gross domestic product ratio (proxy of banking sector development) was also found to be significant at the 1% level. In this regard, stock market development savings grow by 0.02% when there is an increase of 1% in commercial bank credit to private sector (Ibid).

Consequently, the study suggested that financial liberalization experiments and restructuring plotted to improve the efficiency of financial intermediaries lead to improvement of real savings if credit to private sector enterprises increase. This in turn culminates into development of the stock market as people invest in stocks from savings in the banking sector (Aduda, Masila and Onsongo, 2012:227). Further, the per capita income was also statistically found to be significant in determining stock market development. It was found that an increase of one percent in income per capita leads to 1.3% development of the stock market. These findings indicate that growth in disposable national income leads to more stock market product investment by the population. The liquidity of the stock market was statistically significant as well at the level of 1%. Therefore, a growth of 1% in liquidity of the stock market, promotes development of the market savings by 1.8%. This depicts an increased investment level in the economy as the investors add more investment due to liquidity increase as share value appreciates with time (Ibid).

Research in South Africa aimed at examining the connection between liquidity and monetary policy on the South African equity market was conducted. The research was carried out to examine the deterministic relations between variables using ordinary least squares methodology. The sample size used was from 2002 to 2019 for a period of 17 years. The adjusted illiquidity (stock return forecasting measure) measure and trade volume were used in the study to determine impact of monetary policy on stock liquidity on the South African stock market as response variables. In the study, stock market liquidity was defined as the ease by which a stock can be converted into cash. The explanatory variable used was monetary policy using the South African Benchmark Overnight Rate (SABOR) (Marozva Godfrey, 2020: 265-275).

The results of the research were that monetary policy is negatively related to adjusted illiquidity measure but positively related to trade volume. This implies that a contractionary monetary policy contributes to illiquid stock markets were as a monetary policy, expansionary in nature, contributes to improved liquidity conditions in stock markets. Thus, the study concluded that the nature of the relation between monetary policy and liquidity of the stock market is dependent on the explicit definition of stock liquidity used in a study (Ibid).

In another study, the relationship between the equity market (market capitalization) and variables of macroeconomic policy in South Africa were examined. The research findings revealed that there is long-run relationship between the selected variables of macroeconomics and the South African stock market. The results findings showed that changes in rate of inflation, supply of money, expenditure by government, exchange rate and rate of interest are transferred into the stock market, entailing explanatory variables being determinants of performance of the stock market in terms of capitalization (Kapingura, Makhetha and Ntshangase, 2020: 23).

It can therefore be deduced from the above literature that influence of macroeconomic factors on liquidity of capital markets is varying but evident and strong. The varying aspects of economic variables in determining capital market liquidity stem from the definition of liquidity, wealth status of a population, methodology of studies and selected macroeconomic variables in these studies. This shows the need for capital market liquidity to be understood from a Zambian economic variable perspective if its development is to be reliably influenced by any form of policy impetus, because study

findings are different from country to country based on several factors that include economic conditions.

In addition, as earlier highlighted, capital market liquidity in the studies reviewed is defined differently. Market liquidity definitions in various studies are by key terms such as trade volume, turnover ratio, gross domestic product, and capitalization. But all these definitions are based on one common understanding which is conversion of financial assets into cash with ease. Different liquidity definitions are attributed to the fact that there is no agreed upon universal definition of capital market liquidity. In this case, literature review helped focus the study in terms of an explicit market liquidity definition. In this regard, the definition of transaction or trade value (stocks traded multiplied by the price) which is simply market turnover was used as the response variable in measuring capital market liquidity using liquidity of stock market (proxy).

The study utilized market turnover because market capitalization is not an accurate measure of liquidity since it's an indicator of demand for investment funds as per value of issued shares and or government paper against the price. Whereas market turnover is an indicator of actual cash or money invested in issued stock (in other words realized monetary gains on issued stock by corporates and government). Therefore, capital market liquidity represented by stock market liquidity (LuSE) and defined as actual investment by buyers in market issued equity was used as a measure of liquidity. This is because it accurately measures conversion of the equity into needed cash for investment use.

Further, studies reviewed hardly addressed the state of relationships, whether positive or negative between response and explanatory variables. In this regard, this study will state the relationship direction between capital market liquidity using LuSE and macroeconomic explanatory variables. Based on reviewed literature on macroeconomic explanatory variables, the study adopted the use of money supply rate (broad money (M3)), end year inflation (CPI) rate, end year exchange rate, annual average international crude oil price per barrel and GDP growth rate as explanatory factors of capital market liquidity (LuSE turnover).

It thus follows that this study used capital market liquidity, in this case, LuSE turnover as a proxy to measure capital market liquidity in Zambia. In addition, the study also aimed to establish the direction of the relationships between the dependent and

explanatory variables, whether negative or positive to adequately inform policy direction. The study considered factors in the Zambian context to account for geographical and economic status for findings to be relevant to the country, and thereby effectively influence policy aimed at increasing liquidity in the capital market to meet investment demand.

## **2.2 CRITIQUE OF THE LITERATURE REVIEW**

In the literature reviewed above, it's clear that the globe lacks a universal definition of capital market liquidity. In this regard, the measure of capital market liquidity (stock market liquidity) uses different measures that can fairly bring out the key liquidity market characteristics, and that is, quantity or volume (depth measure), time or speed (immediacy measure), price impact (breadth measure), and spread (transaction cost measure) (Amihud cited by Priyanka N and Yeddy:1). In this vein, different studies reviewed, adopted different definitions as per researcher preference. This obviously would be the reason for differences in findings in studies reviewed from country to country.

However, it is worth noting that liquidity in simple terms is the ease of converting an asset into cash. Therefore, the most appropriate measure of liquidity in capital markets to measure financing needs is turnover unlike capitalization and returns. This is because capitalization is the actual size of demand for investment capital, and turnover is the supply of investment capital to government and corporate entities through purchase of capital market assets. Therefore, this study used capital market turnover as the dependent variable to represent actual size of liquidity problems for findings to be relevant and reliable for use, and comparable to other studies.

## **2.3 THEORETICAL FRAMEWORK**

This section provides details of theories upon which the study was anchored to report findings and draw conclusions.

### **Financial market theory of development**

The theory states that developing countries can attain economic development through domestic resource mobilisation and international capital flight using stock markets. The theory recognises the need for capital mobilisation in developing countries if economic development is to be achieved (Malmberg, Gupta, Grootaert, Kanbur, Kwakwa, Lustig and Nora, 2000:76-85). The theory stresses the need for market



participation by households and corporates for liquidity (turnover) to be adequate to propel investment for job creation and economic growth. The theory further states that market liquidity is determined by macroeconomic factors, regulation, and market structure (Malmberg et al, 2000:76-85). Thus, the study is shaped by the theory in the sense that it recognizes the influence of economic determinants of capital market liquidity.

### **Monetarist theory**

Based on the quantity theory of money, this theory postulates that growth in supply of money influences economic activity but increases prices and inflation, and the opposite is also true. In addition, money supply also has influence on GDP growth and employment but only temporarily (Jahan and Papageorgiou, 2014:38). The theory frames the basis upon which growth rate in money supply, inflation and employment would influence capital market liquidity. Therefore, since a rise in money supply increases demand for various services and goods, it is expected for demand for capital market products to increase and thereby enhance market liquidity. The opposite that comes with decrease in money supply also holds. Therefore, the study will also focus on money supply including its influence on other variables to assess its relationship with capital market liquidity.

### **Demand and supply theory**

The theory refers to people and institutional behaviour as they interact with one another as sellers and in the marketplace. Demand and Supply are the forces behind the mechanics of markets working. They determine the quantity demanded and produced of each good/service at an exchange price (Mankiw, 2018:66). Quantity demanded refers to the amount of a good/service that buyers are able and willing to purchase while quantity supplied is the amount of a good/service that producers are able and willing sell at a determined price. It thus follows that, the law of demand states that price increase of a service/good is associated with reduced quantity demand and vice versa, whereas the law of supply states that price increase of a good/service is associated with increased supply and vice versa (Ibid). Economic policy therefore must consider income and inflationary consequences on supply and demand of capital market products because the latter don't exist in isolation. The change in these variables may lead to a change in either supply or demand, and this affects the liquidity

of capital markets. Hence, the focus of the study on explanatory variables, namely inflation and income (GDP).

### **The Dow theory**

Dow theory is based on 6 principles which are 1. Averages discount everything and that means every unit factor, and detail that is likely to determine both demand and supply is reflected in market price 2, Any market has 3 trends and these are primary trends (lasts for more than a year were prices are either rising (bullish) or falling (bearish)), secondary trends (lasts from 3 weeks to 3 months and represent corrective market activities of the primary trend) and minor trends which lasts less than 3 weeks and these follow-on trends to the secondary trends of market corrective adjustments, 3. Market trend phases-these phases are three starting with information about market opportunities, rising prices and finally enhanced public participation in the market, 4. Market averages confirming each other were they have to be higher or lower compared to previously observed averages if they are to be reliable in predicting market price rise or fall, 5. Market volume confirming market trends-trade volume must be used in confirming rise or fall in market prices, and 6. Market trends are continuous until a definite reversal (Rhea, 2012:15-398).

The theory suggests trade volume confirms market trends (market direction, either rising or falling). Therefore, it postulates that, trade volume goes up with price increase (stock price) in an ascending trend due to increase in value (Ibid). In reverse, trade volume drops with a reduction in stock prices when there is a descending market trend. Since market trade volume is considered as a good assessor of liquidity in this paper, this research will postulate that liquidity (as measured by volume of stock trading) will increase when there is an ascending trend in the market and will reduce when there is a descending trend in the market, if economic variables of the capital market are influencing the market positively or negatively respectively (Rhea, 2012:15-398).

### **2.4 CONCEPTUAL FRAMEWORK**

Below was the conceptual framework upon which the research was built and conducted to determine economic elements with ability to change capital market liquidity in Zambia.

**Figure 1: Capital market liquidity conceptual framework**

Independent variable	Status of influence if relationship is present	Dependent variable
Inflation	→ Reduces or increases liquidity	Capital market liquidity
GDP growth rate	→ Reduces or increases liquidity	
Money supply growth rate	→ Reduces or increases liquidity	
Crude oil price	→ Reduces or increases liquidity	
Exchange rate	→ Reduces or increases liquidity	

From the above framework, if the independent variables are increased or reduced, this either reduces or increases liquidity in capital markets. This therefore entails that the regressor variables influence the performance of capital market liquidity. This influence on liquidity can either reduce or increase the availability of investment funds for the government and or corporate sector. An increase in liquidity in this case, increases the pool of funds available for investment activities and the opposite is true if liquidity reduces, entailing low investment activities from market players. With an increase in capital market liquidity, it is expected that this would lead to economic growth, job creation and overall improvement in human population welfare. For example, as earlier alluded, despite the disagreement in relation to causality direction between economic growth and capital market growth, evidence has shown that economic growth and development in general are also influenced by capital market development (Chandavarkar, 1992 cited by Acquah & Salami, 2013: 6). Study findings in wealth countries have shown that growth of capital markets, helps to control inflation, reduce unemployment, and provide a foundation for employment creation through the growth of economic activities financed by the capital market (Ibid). In this regard, the regressor variables were regressed against the response variable to determine their influence. The existence and state of regressor variable influence is vital to understand for purposes of enhancing economic growth through economic practice that is informed by variables of influence on the response variable, in this case, capital market liquidity.

## **CHAPTER 3: METHODOLOGY**

This chapter provides an outline of the research purpose, design and approach which was used to answer the study objectives.

### **3.1 Research purpose**

The aim of the research was to explore the status of existence and direction of relationships between capital market liquidity (value of trade) as the response variable and economic determinants as explanatory variables, which are growth rate of gross domestic product, rate of inflation, growth rate of money supply (broad money), annual average crude oil price per barrel and exchange rate.

### **3.2 Research design**

The study was descriptive and experimental in design. The study used descriptions to show data characteristics such as averages and total sample size. The experimental aspect of the study was used to depict and explain relationship findings pertaining to the dependent and explanatory variables. Statistical tests on the data were done to establish existence of the state of influence of regressor variables on the response variable. The statistical tests made use of the OLS (Ordinary Least Squares) estimation model in form of the bounds test to determine state of relationships (short or long run) and autoregressive distribution lag model (ARDL) to determine if economic variables of interest determine capital market liquidity in Zambia. The ARDL test can be adopted for applying cointegration analysis to empirically determine the relationship among the economic variables that is regardless of the regressors being stationary at level, integrated of order one, or a mixture of both (Pesaran and Shin (1999) and Pesaran et al. (2001) cited by Abonazel and Elnabawy 2020:25). The study therefore used the ARDL bounds test because variables were both stationary at level and integrated of order one. In this regard, the ARDL model was applicable because its flexibility to analyse the stationarity of data at level or order I, including a mixture of both.

### **3.3 Research approach**

The research was quantitative and therefore secondary in nature. It utilised historical time series data pertaining to capital market liquidity using the LuSE turnover as a proxy, and as the response variable. Thus, rate of inflation (consumer price index), growth rate of gross domestic product, exchange rate, money supply growth rate and

annual average crude oil price per barrel were used as the explanatory variables to explain variations in capital market liquidity (LuSE turnover).

### **3.4 Study population and sample size**

The population under study was the capital market of Zambia, using Lusaka stock exchange as the proxy. The sample size of the study was 21 years from 2000 to 2021 for both response and explanatory variables.

### 3.5 Measurement

As earlier alluded, the study made use of capital market liquidity as the response variable, and where LuSE annual turnover data was a proxy of the market. The LuSE annual turnover data was therefore used to assess its relationship with economic regressor variables. The following were the operational definitions of the response and explanatory variables.

**Table 1: Variable operational definitions**

Variable	Category	Definition	Measure	Scale
Capital market liquidity (LuSE turnover)	Response	Annual value of stock trades on the Lusaka Stock Exchange (LuSE turnover)	Continuous	Interval
Inflation rate	Regressor	Rate of inflation rate at end year for Zambia	Continuous	Interval
Gross domestic product growth rate (GDP)	Regressor	Annual growth rate of gross domestic product for Zambia (GDP)	Continuous	Interval
Exchange rate	Regressor	End year exchange rate between US dollar and Zambian Kwacha	Continuous	Interval
growth rate of Money supply	Regressor	Annual broad money (money supply) growth rate for Zambia	Continuous	Interval
Crude oil price per barrel	Regressor	Annual international average crude oil price per barrel	Continuous	Interval

### 3.6 Methods of data collection

The data which was used in the research was collected from different public internet sources namely World Bank data bank, Bank of Zambia annual statistical reports, International Monetary Fund statistical reports, Zambia Statistics Agency reports, Zambia Ministry of finance and national planning and others. The data collected was entered into an excel database and later exported to Stata after completion of the data collection and cleaning exercise for storage and use in the analysis process to generate study statistical results regarding linearity conditions and relationships.

### 3.7 Data analysis technique & Model specification

The study used Stata 17 standard version, for data analysis. Before determining the regression model specification and its application, tests for normality of data, multicollinearity among explanatory variables, stationarity of the data including heteroskedasticity were performed to assess if the data meets linearity conditions for the estimation regression model to hold, and therefore make it reliable for generating predictions regarding capital market liquidity. The first test done was a normality test of the data distribution using the Shapiro-Wilk test and histograms to depict data plots. Secondly, Stationarity test using the Breusch-pagan test statistic was done to rule out presence of unit roots in the data and thereby ascertain reliability of the would be established estimation model of capital market performance in terms of liquidity.

Thereafter, the data was subject to multicollinearity tests in the process of modelling the regression equation using the Pearson correlation coefficient, including an autocorrelation assessment. This was done to ensure regressors independently influence the response variable. A bounds test followed to ascertain the state of the relationship among variables of interest in terms of being either short-run or long-run, after which the ARDL was performed to establish if regressors determine capital market liquidity. Upon establishing that the data was stationary and without serial correlation, the model was estimated by following the criteria below after running the ARDL model in Stata.

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + e_t \quad (1),$$

Y standing for capital market liquidity using the Lusaka Stock Exchange turnover as a proxy, and therefore the dependent variable,  $b_0$  standing for the constant,  $b_{1-4}$  standing

for independent variable coefficients,  $X_{1-4}$  standing for independent variables and  $e_t$  standing for the error term or residuals.

For the above model to meet all linearity conditions and for it to be reliably used for estimating capital market liquidity, the dataset was also subjected to statistical tests of heteroskedasticity. The study made use of the Breusch-Pagan test to establish if there was presence of homoscedastic characteristic in the data, and that is constant mean. Presence of a constant mean in the dataset made the model to be reliable in estimating the response variable. The model was concluded to be linear and reliable in estimating capital market liquidity (with LuSE turnover as a proxy) upon the dataset meeting all conditions as per statistical tests conducted and as explained above.



## CHAPTER 4: PRESENTATION AND ANALYSIS OF RESULTS

The study utilised economic data pertaining to Zambia to investigate the relationship between capital market liquidity represented by LuSE turnover and independent variables namely inflation, growth rate of money supply, growth rate of GDP, crude oil price and exchange rate. The study utilised autoregressive distribution lag model (ARDL) to investigate the topic under study. This was necessitated by presence of unit roots in selected variables. Data analysis in this study was done using statistical analysis software, version 17 (Stata17). The results of the analysis process are presented in this chapter under specific chapter thematic areas.

### 4.1 DESCRIPTIVE STATISTICS

Presented below is the statistical descriptive distribution summary of the data under study.

**Table 2: Descriptive statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
LuSE turnover	21	104300000	3073000000	-10910000000	6916000000	-1.696618	10.05464
Inflation rate	22	1.098	4.533	0.064	0.26	4.36308	20.04055
Money supply growth rate	21	-3.324	26.475	-65.1	40.75	-0.441008	2.870531
GDP growth rate	21	-0.014	2.382	-4.7	6.4	0.323321	4.273674
Crude oil price	22	437.919	271.008	93.008	1136.394	0.811826	3.194315
Exchange rate	22	7.435	4.837	3.58	21.09	1.458298	4.195317

*Source: Analysis results extracted from Stata 17*

The total sample size of the research activity was 22 annual data points (observations) for six variables which includes the response variable from the year 2000 to 2021. The sample size for LuSE turnover, growth rate of GDP and growth rate of money supply is 21 because they were characterised by stationarity at level and therefore, differentiation of the variables at first level resulted into loss of data by a unit for these variables. From the results above, the interaction among variables is both negative and positive and

volatility for all the variables is high based on standard deviation values. The expected changes as per their means in the variables of interest annually for the period under study namely LuSE turnover, inflation, growth rate of money supply, growth rate of gross domestic product, crude oil average price per barrel and exchange rate at year end were K104,300,000, 1.098%, -3.324%, -0.014%, K437.919 and 7.435%.

**Table 3: Autocorrelation statistical test**

Autocorrelation of the error terms violates the ordinary least squares assumption that the error terms are uncorrelated, and the consequence is that the estimates of coefficients and their standard errors will be wrong if it is ignored (Uyanto, 2020:119). The study used the Durbin-Watson and Breusch–Godfrey tests to test for autocorrelation. The Durbin-Watson statistic ranges between 0 to 4. A value near 2 and above 1.5 indicates non-autocorrelation. For Breusch–Godfrey test, a P-value above 0.05 validates the null hypothesis that there is no serial autocorrelation in the data set (Uyanto, 2020:120).

Durbin–Watson d-statistic (6, 21) = 1.858023

Breusch–Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	0.099	1	0.7535

H<sub>0</sub>: no serial correlation

From the above test statistic results, both Breusch–Godfrey and Durbin-Watson test statistic of 0.75 (p-value) and 1.85 validate the assumption of no autocorrelation in the data set.

**Table 4: Normal data distribution statistical test**

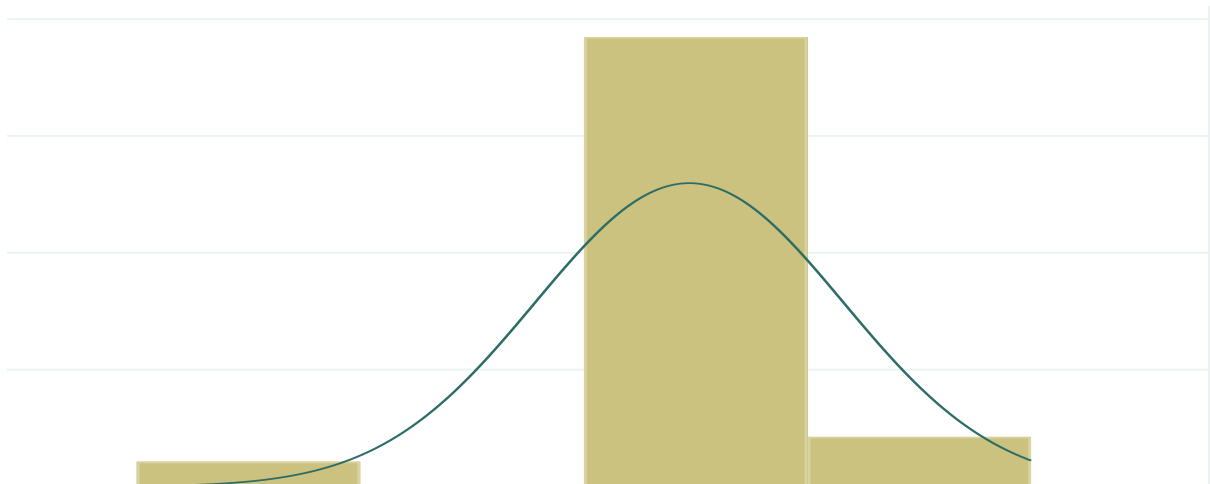
Variable	Obs	W	V	Z	Prob>z
LuSE turnover	21	0.65423	8.473	4.320	0.00001
Inflation rate	22	0.22996	19.508	6.024	0.00000
Money supply growth rate	21	0.96568	0.841	-0.350	0.63688
GDP growth rate	21	0.94307	1.395	0.673	0.25042
Crude oil price	22	0.93285	1.701	1.077	0.14063
Exchange rate	22	0.76823	5.872	3.589	0.00017

*Source: Analysis results extracted from Stata 17*

The study utilised the Shapiro-Wilk test to test normality of data distribution. The test compares the statistics in the sample against the collective normally distributed scores with the same standard deviation and mean (Ghasemi and Zahediasl, 2012: 487). The  $H_0$  (null hypothesis) is that the sample is normally distributed, and if the probability test is significant, the sample is not normally distributed (Ibid). Under table 2 above, all variables in the study, and that is both response and explanatory variables were subjected to the normality test using the Shapiro-Wilk

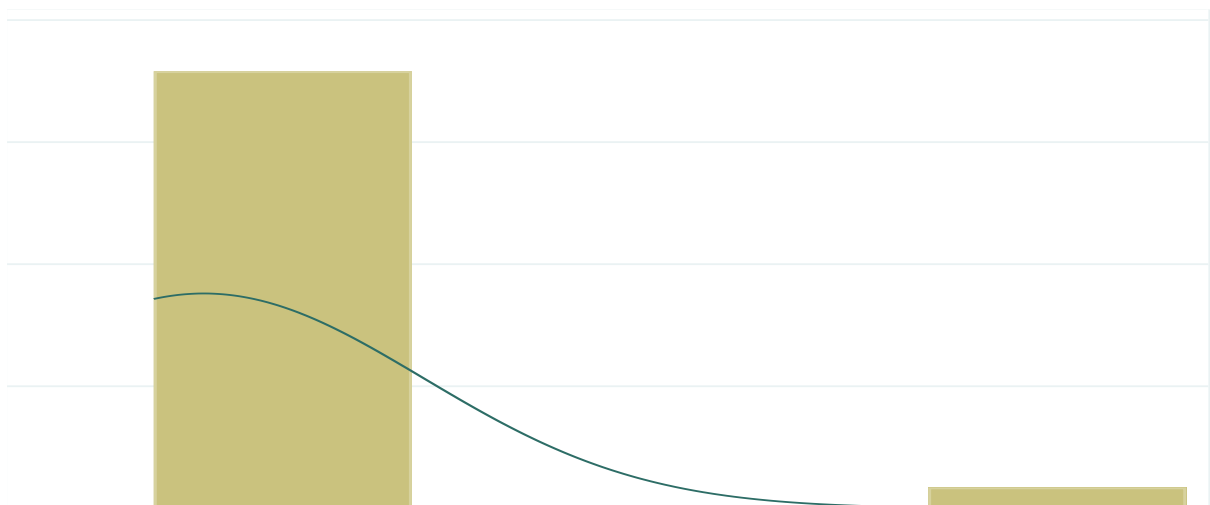
assessment to determine whether their data are normally distributed or not. As per the results in the table, growth rate of money supply, growth rate of gross domestic product (GDP) and crude oil price data are normally distributed at 5% significance level as per probability of the z-score ( $\text{Prob}>z$ ), whereas LuSE turnover, inflation rate and exchange rate data are not normally distributed. To further ascertain, if the data is normally distributed or not, it was subjected to graphical analysis using histograms. The results show normal distribution of all variables as per bell shape of the plots depicted below.

**Figure 2: LuSE turnover data graphical presentation**



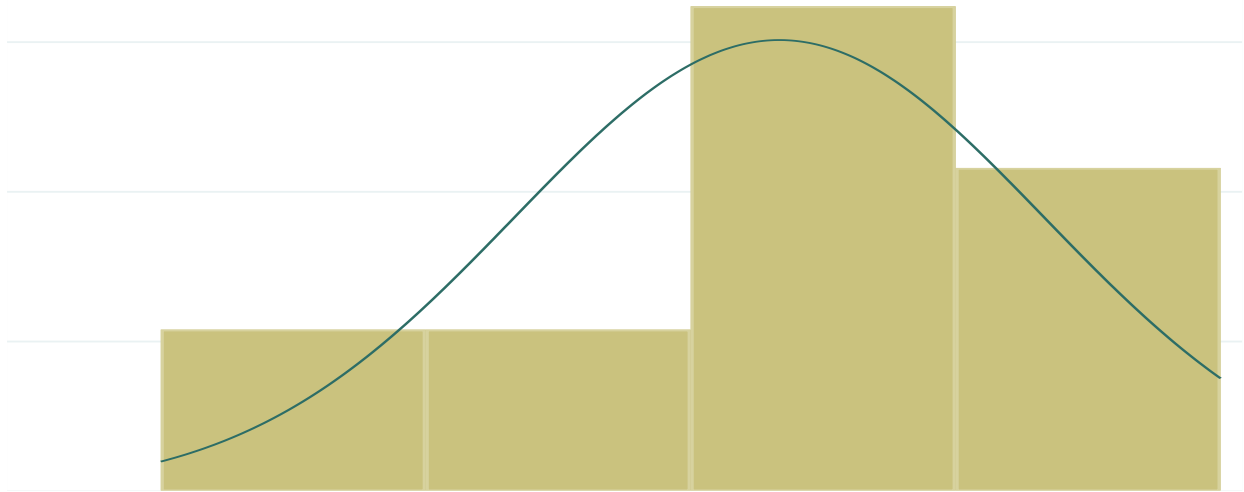
Source: Analysis results extracted from Stata 17

**Figure 3: Inflation data graphical presentation**



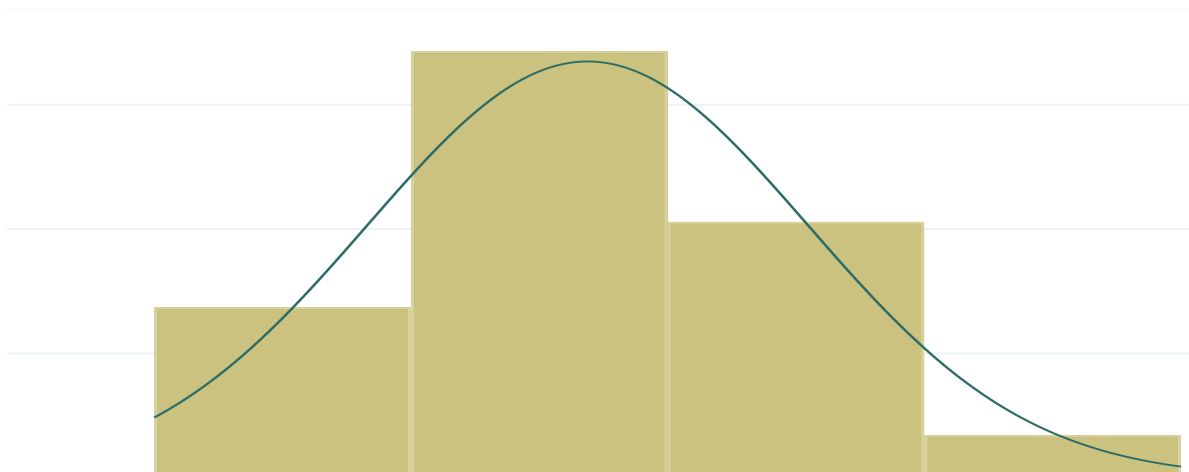
Source: Analysis results extracted from Stata 17

**Figure 4: Money supply growth rate data graphical presentation**



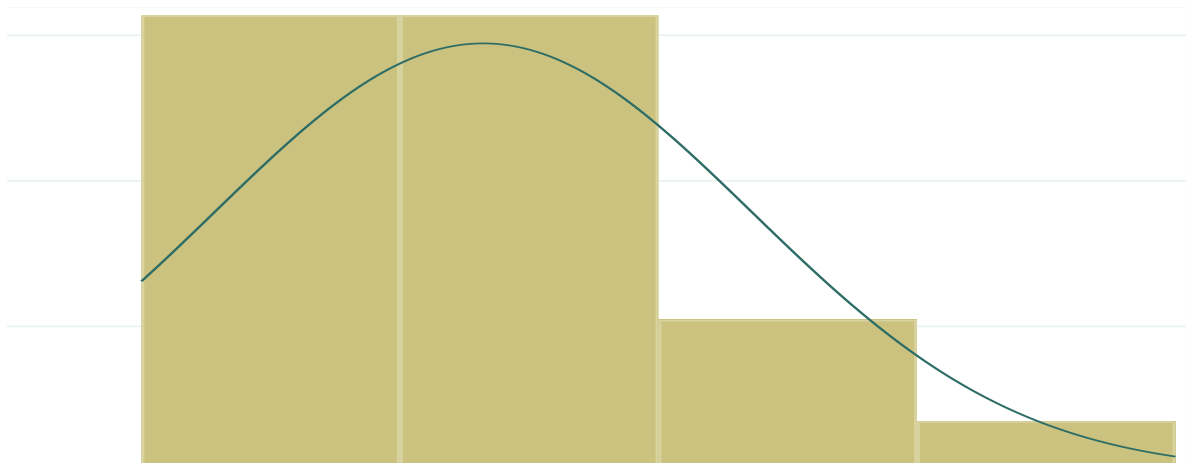
Source: Analysis results extracted from Stata 17

**Figure 5: GDP growth rate data graphical presentation**



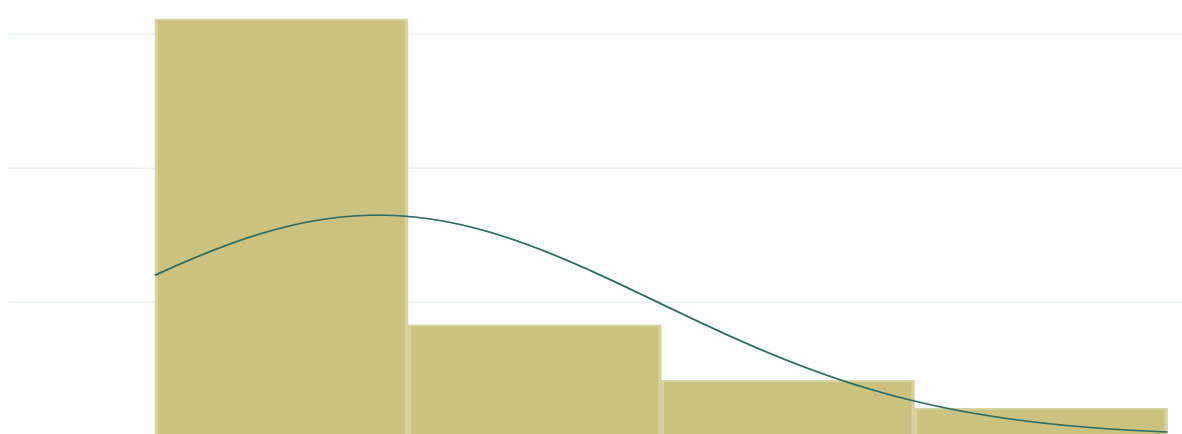
Source: Analysis results extracted from Stata 17

**Figure 6: Crude oil price data graphical presentation**



Source: Analysis results extracted from Stata 17

**Figure 7: Exchange rate data graphical presentation**



Source: Analysis results extracted from Stata 17

#### 4.2 UNIT ROOT (STATIONARITY) TEST

The statistical basis of estimation or forecasting being reliable is dependent on time series data being stationary. Therefore, to know if data is stationary at order 0 or 1, the Augmented Dicky-Fuller t-statistic is used (Mushtaq, 2011:13). In this regard, the study utilized the Augmented Dicky-Fuller t-statistic to determine stationarity (absence of unit roots) of the variables under study.

**Table 5: Stationarity test at level, LuSE turnover**

Number of obs = 20

Number of lags = 1

H<sub>0</sub>: LuSE turnover data is non-stationary at level.

Test statistic	Dickey Fuller critical-value		
	1%	5%	10%
Z(t)	-1.788	-2.660	-1.950

Source: Analysis results extracted from Stata 17

**Table 6: Stationarity test at first difference, LuSE turnover**

Number of obs = 19

Number of lags = 1

H<sub>0</sub>: LuSE turnover data is non-stationary at first level.

Test statistic	Dickey Fuller critical-value		
	1%	5%	10%
Z(t)	-3.070	-2.660	-1.950

Source: Analysis results extracted from Stata 17

The above Augmented Dicky-Fuller t-statistic test results show that LuSE turnover is not stationary at order 0 or level, based on the t-statistic value of -1.788 being less than the critical value of -1.950 in absolute expression at 5% significance level. Therefore, we fail to reject the  $H_0$  (null hypothesis) at a significance level of 5% and conclude that LuSE turnover data is not stationary at level. However, at first level, LuSE turnover is stationary based on the t-statistic value of -3.070 being above the critical value of -1.950 in absolute form at a significance level of 5%. Therefore, the  $H_0$  (null hypothesis) is rejected at 5% level of significance and conclude that LuSE turnover data is stationary at first level.

**Table 7: Stationarity test at level, Exchange rate**

Number of obs = 20

Number of lags = 1

$H_0$ : Exchange rate is non-stationary at level.

Test statistic	Dickey Fuller ----- critical-value -----		
	1%	5%	10%
Z(t)	2.296	-2.660	-1.950

Source: Analysis results extracted from Stata 17

The above Augmented Dicky-Fuller t-statistic test results show that Exchange rate is stationary at order 0 or level, based on the t-statistic value of 2.296 being above the critical value of -1.950 in absolute form at 5% level of significance. Therefore, the null  $H_0$  (hypothesis) is rejected at 5% level of significance and conclude that exchange rate data is stationary at level.

**Table 8: Stationarity test at level, Inflation rate**

Number of obs = 20

Number of lags = 1

$H_0$ : Inflation rate is non-stationary at level.

Test statistic	Dickey Fuller ----- critical-value -----		
	1%	5%	10%
Z(t)	-123.000	-2.660	-1.950

Source: Analysis results extracted from Stata 17

The above Augmented Dicky-Fuller t statistic test results show that rate of inflation is stationary at order 0 or level, based on the t statistic value of -123 being above the critical value of -1.950 in absolute form at 5% level of significance. Therefore, the null

H<sub>0</sub> hypothesis is rejected at 5% level of significance and conclude that inflation rate data is stationary at level.

**Table 9: Stationarity test at level, Crude oil price**

Number of obs = 20

Number of lags = 1

H<sub>0</sub>: Crude oil price is non-stationary at level.

Test statistic	Dickey Fuller critical-value			
	1%	5%	10%	
Z(t)	2.349	-2.660	-1.950	-1.600

Source: Analysis results extracted from Stata 17

The above Augmented Dicky-Fuller t statistic test results show that crude oil price is stationary at order 0 or level, based on the t statistic value of 2.349 being above the critical value of -1.950 in absolute form at 5% level of significance. Therefore, the H<sub>0</sub> (null hypothesis) is rejected at 5% level of significance and conclude that crude oil price data is stationary at level.

**Table 10: Stationarity test at level, GDP growth rate**

Number of obs = 20

Number of lags = 1

H<sub>0</sub>: GDP growth rate is non-stationary at level.

Test statistic	Dickey Fuller critical-value			
	1%	5%	10%	
Z(t)	-0.750	-2.660	-1.950	-1.600

Source: Analysis results extracted from Stata 17

**Table 11: Stationarity test at first difference, GDP growth rate**

Number of obs=19  
Number of lags=1

H<sub>0</sub>: GDP growth rate is non-stationary at first level.

Test statistic	Dickey Fuller critical-value			
	1%	5%	10%	
Z(t)	-3.675	-2.660	-1.950	-1.600

Source: Analysis results extracted from Stata 17

The above Augmented Dicky-Fuller t statistic test results show that growth rate of GDP is not stationary at order 0 or level, based on the t statistic value of -3.675 being lower



than the critical value of -1.950 in absolute form at 5% level of significance. Therefore, we fail to reject the  $H_0$  (null hypothesis) at 5% level of significance and conclude that growth rate of GDP data is not stationary at level. However, at first level, growth rate of GDP is stationary based on the t statistic value of -3.675 being above the critical value of -1.950 in absolute form at 5% level of significance. Therefore, the  $H_0$  (null hypothesis) is rejected at 5% level of significance and conclude that growth rate of GDP data is stationary at first level.

**Table 12: Stationarity test at level, Money supply growth rate** Number of obs=20

Number of lags=1

$H_0$ : Money supply growth rate is non-stationary at level.

Test statistic	Dickey Fuller			
	----- critical-value -----	----- critical-value -----	----- critical-value -----	
	1%	5%	10%	
Z(t)	-1.312	-2.660	-1.950	-1.600

Source: Analysis results extracted from Stata 17

**Table 13: Stationarity test at first difference, Money supply** Number of obs = 19

Number of lags = 1

$H_0$ : Money supply growth rate is non-stationary at first level.

Test statistic	Dickey Fuller			
	----- critical-value -----	----- critical-value -----	----- critical-value -----	
	1%	5%	10%	
Z(t)	-7.002	-2.660	-1.950	-1.600

Source: Analysis results extracted from Stata 17

The above Augmented Dicky-Fuller t statistic test results show that growth rate of money supply is not stationary at order 0 or level, based on the t statistic value of -1.312 being lower than the critical value of -1.950 in absolute form at 5% level of significance. Therefore, we fail to reject the  $H_0$  (null hypothesis) at 5% level of significance and conclude that growth rate of money supply data is not stationary at level. However, at first level, growth rate of money supply is stationary based on the t-statistic value of -7.002 being above the critical value of -1.950 in absolute form at 5% level of significance. Therefore, the  $H_0$  (null hypothesis) is rejected at 5% level of significance and conclude that growth rate of money supply data is stationary at first level.

### 4.3 DETERMINATION OF STATE OF RELATIONSHIP (LONG or SHORT RUN)

$H_0$ : no levels relationship       $F = 1.360$

$t = -3.903$

**Table 14: Short or long run relationship determination using F-Statistic**

	[I-0] L-1	[I-1] L-1	[I-0] L-05	[I-1] L-05	[I-0] L-025	[I-1] L-025	[I-0] L-01	[I-1] L-01
k_5	2.26	3.35	2.62	3.79	2.96	4.18	3.41	4.68

Source: Analysis results extracted from Stata 17

**Table 15: Short or long run relationship determination using t-Statistic**

	[I-0] L-1	[I-1] L-1	[I-0] L-05	[I-1] L-05	[I-0] L-025	[I-1] L-025	[I-0] L-01	[I-1] L-01
k_5	-2.57	-3.86	-2.86	-4.19	-3.13	-4.46	-3.43	-4.79

Source: Analysis results extracted from Stata 17

It is required that before running the relationship statistical test between the response and explanatory variables, the relationship form is determined, whether long-run or short-run. This is for purposes of running the appropriate ARDL statistical test. In this case, F-values of the bound test are compared to the critical values at the lower and upper bounds (Husnain et al, 2021:742-745). The  $H_0$  for the test is that there is no long-run association between variables or no cointegration (Ibid). Therefore, if the F statistic is below the value of lower bound scores, there is no long-run relationship or no cointegration and if it is above the value of the upper bound scores, then there is a long-run relationship or cointegration (Op. cit).

Hence, in the case of the study, since the F-statistic is lower than the lower bound value of -2.86 at a significance level of 5%, then its conclusive that there is no long run relationship or cointegration among the variables. In this regard, there exists only a short run association between the response and explanatory factors and therefore we run the short-run ARDL model to establish relationship between variables of order 0 and 1. Below are the results of the short-run ARDL model between the LuSE and all explanatory variables.

ARDL (1,0,0,0,1,1) regression

Sample: 2002 thru 2021 Number of obs = 20  
 F(8, 11) = 1.90  
 Prob > F = 0.1595  
 R-squared = 0.5805  
 Adj R-squared = 0.2755 Log likelihood = -456.61143 Root MSE = 2.684e+09

**Table 16: Short-run ARDL results**

LuSE turnover	Coefficient.	Std. err	t	P>t	[95%	Conf. interval]
LuSE turnover	0.1838444	0.2091158	0.88	0.398	-0.2764164	0.6441051
L1.						
Inflation	4.10e+10	2.15e+10	1.91	0.083	-6.35e+09	8.83e+10
Money supply growth	3.24e+07	3.83e+07	0.85	0.415	-5.19e+07	1.17e+08
GDP growth	-3.93e+08	4.01e+08	-0.98	0.348	-1.28e+09	4.89e+08
Crude oil price	-1.36e+07	9111168	-1.49	0.163	-3.37e+07	6438970
--.						
L1.	3.41e+07	9664790	3.53	0.005	1.28e+07	5.54e+07
Exchange rate	-1.35e+09	5.18e+08	-2.61	0.024	-2.50e+09	-2.14e+08
--.						
L1.	6.21e+08	5.37e+08	1.16	0.272	-5.61e+08	1.80e+09
_cons	-6.80e+09	3.58e+09	-1.90	0.084	-1.47e+10	1.09e+09

Source: Analysis results extracted from Stata 17

Based on the short-run results above under table 5, crude oil price and exchange rate are statistically significant in determining change in the response variable, namely LuSE turnover (capital market turnover). The levels of significance for crude oil price and exchange rate are 0.005 and 0.024 respectively. We therefore reject the null hypotheses for these two variables, which states that crude oil price and exchange rate don't influence LuSE turnover at 95% confidence interval, and therefore conclude that crude oil price and exchange rate determine LuSE turnover (capital market turnover). In the same vein, we fail to reject the null hypotheses for rate of inflation, growth rate of GDP and growth rate of money supply that there is no relationship between these variables and LuSE turnover at 95% confidence interval.

#### 4.4 REGRESSION MODEL OF ESTIMATION

Based on the findings above under the immediate previous section, below is the format to be used for establishing the regression model for estimating capital market liquidity in Zambia.

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + e_t \quad (2),$$

were Y=LuSE turnover as a proxy for capital market liquidity,  $b_0$ =constant,  $X_1$ =rate of inflation,  $X_2$ =growth rate of money supply,  $X_3$ =growth rate of GDP,  $X_4$ =price of crude oil,  $X_5$ =Exchange rate and  $e_t$ =Error term. Therefore, it follows that because only the crude oil price and the exchange rate are statistically significant in determining capital market liquidity in Zambia, the LuSE turnover estimation equation is,

$$Y = -6,800,000,000 + 34,100,000x_4 - 1,350,000,000x_5 \quad (3)$$

In this regard, the international price of crude oil per barrel is positively related to capital market liquidity in terms of turnover whereas the exchange rate is negatively related. Therefore, a 1-unit increase in the international price of crude oil per barrel increases capital market liquidity (turnover) by K34,100,000 whereas a 1-unit depreciation of the Zambian Kwacha currency, reduces capital market liquidity by K1,350,000,000.

However, for the established regression equation to be reliable in estimating capital market liquidity, there is need to ensure linearity conditions hold. In this regard, the data set was subjected to multicollinearity and heteroskedasticity statistical tests to reliably inform and establish its use. Hence, if the tests results meet homoscedastic

and collinearity conditions, then the model is reliable for use in estimating or forecasting capital market liquidity variations in Zambia.

#### 4.5 MULTICOLLINEARITY TEST

Correlation assessment using the Pearson test was used to examine the relationship among variables, and the matrix of correlation (value of less than 0.85) is a vital indicator that tests the linearity of relationships, among the variables (Aduda, Masila and Onsongo,2012:224). The matrix also assists to establish the strength of the factors in a model, that is, which variable explains best the relationship between LuSE turnover and its influencers (Ibid). This is vital and assists in making decisions in terms of which variable(s) to eliminate from the equation of regression.

**Table 17: Correlation matrix**

Variables	(1)	(2)	(3)	(4)	(5)
(1) Inflation	1.000				
(2) Money supply growth	-0.538	1.000			
(3) GDP growth rate	0.143	-0.443	1.000		
(4) Crude oil price	-0.309	0.006	-0.002	1.000	
(5) Exchange rate	-0.187	0.103	-0.106	0.844	1.000

*Source: Analysis results extracted from Stata 17*

Correlation was checked on the independent variables to ensure there is no statistically significant relationships among the explanatory factors. Presence of serious correlation among independent variables would affect reliability of forecasts or estimations based on the established regression model. In this case, all the independent variables have correlation coefficients below 0.85 and therefore are reliable for use in forecasting response variable outcomes depending on changes in the explanatory variables. In other words, there is no serial correlation and therefore making changes in the response variable accounted to individual explanatory variables.

#### 4.6 HETEROSKEDASTICITY TEST

With a null hypothesis of constant variance, for linearity to hold, Breusch-Pagan statistical assessment was used to examine for heteroskedasticity or normal distribution of the residuals. The Breusch–Godfrey serial correlation test is used to establish if there is autocorrelation in the errors of a regression model or not (Husnain et al, 2021:745). It uses residuals from a regression model that is being analyzed to complete the calculation. The null hypothesis is that serial correlation between two

variables is not present. The null hypothesis of heteroscedasticity states that there is absence of proof of heteroscedasticity in a dataset. If the P-value is not statistically significant, therefore there is failure to reject the null hypothesis because the model residuals stay stable across the sample period (Ibid). Below are the test statistics that were generated.

H<sub>0</sub>=Homoskedasticity

**chi2(20) = 21**

**Prob > chi2 = 0.3971**

*Source: Analysis results extracted from Stata 17*

With a P-value of 0.3971 greater than 0.05 significance level, it is concluded that the regression model is homoscedastic and therefore reliable for estimating Zambian capital market liquidity outcomes.

## CHAPTER 5: DISCUSSION OF FINDINGS

Capital markets are one of the main pillars of economic development across the globe. Their importance in promoting economic growth cannot be overlooked because they are a source of cheap and easily accessible capital for government and corporate entities to sustain growth in production, and the economy at large. Further, findings in wealth countries have shown that growth of capital markets, helps to control inflation, reduce unemployment, and provide a foundation for employment creation through the growth of economic activities financed by the capital market (Chandavarkar, 1992 cited by Acquah & Salami, 2013: 6). This association of causality between economic growth and liquidity of the capital market is the basis of calls for policy reforms to encourage more participation of capital market players, and that is both corporates and households. Nonetheless, capital market liquidity in Zambia has been insufficient to meet investment needs due to a variety of reasons which include low participation in the market by private and public entities (MoFNP & SEC,2022:5).

It is therefore, the aim of the Capital Markets Master Plan (CMMP) to layout a framework for capital market development in Zambia over a period of ten years (2022-2032) that will facilitate it to achieve its role of supporting economic development to attain the aims of the 8<sup>th</sup> National Development Plan, which are to create jobs and wealth through economic transformation, and Vision 2030, to make Zambia a prosperous middle-income country (MoFNP & SEC,2022:5). The Zambian capital market has remained underdeveloped and has been characterized by several weaknesses that inhibit it from efficiently mobilizing the country's public and private financing needs (Ibid). The illiquidity problem in the Zambian capital market is so huge that the number of shares traded (market turnover) on the Lusaka Stock Exchange (LuSE) is 4% against 12% market capitalisation measured against the gross domestic product (Op. cit). The 8% difference between the capital market capitalization and turnover rates is the magnitude of the problem and shows the need for the country to implement well informed measures for liquidity to improve and thereby meet government and private capital needs for economic activity to improve.

Hence, this study's main interest was to establish economic variables that determine performance of the capital market in terms of liquidity in Zambia using Lusaka Stock Exchange (LuSE) turnover as a proxy for the entire market. The aim is to contribute to effective policy reform and thereby help guide efforts aimed at improving capital market

liquidity for the market to contribute to Zambia's economic development agenda, efficiently and effectively. The explanatory variables or regressors are inflation (using consumer price index, CPI), exchange rate at end year, annual growth rate of money supply, annual growth rate of gross domestic product and international annual average crude oil price per barrel.

In this regard, in this study, as earlier specified in chapter 1 and 2, capital market liquidity (LuSE turnover) is defined as the the value of trade volume of equity against total equity issued (SEC bulletin, 2017: 21). In other words, it's simply the cash value of equity traded or purchased in stock markets. The core argument of using market turnover unlike capitalization in other studies is that the latter is a representation of the demand for cash for investments by corporate entities and government whereas turnover is the representation of investment in capital market issued assets by corporate and government entities to raise capital for investment in production. It can therefore be deduced that capital market turnover as a representation of investment by the public and corporate entities in issued assets such as equity reflects actual monetary transactions. In this case, using it as a response variable in determining variables of its influence is actual representation of the problem at hand of an illiquid capital market as defined in the Capital market master plan for Zambia. The study utilised 21 years data from 2000 to 2021 for all variables, and autoregressive distribution lag model (ARDL) to determine relationship status between the response and regressor factors.

As per the findings in chapter 4 using the bounds test, there is only a short-run relationship between the liquidity of the capital market and the regressors, namely, inflation, annual growth rate of money supply, annual growth rate of gross domestic product, crude oil price per barrel and exchange rate. In this regard and as per the findings in chapter 4, only the price of crude oil per barrel and the exchange rate are statistically significant to independently influence change in the capital market liquidity in Zambia at 95% confidence interval. Therefore, inflation, growth rate of money supply and growth rate of GDP are not statistically significant to independently influence change in capital market liquidity in Zambia. There is simply no influence between these factors and liquidity of the capital market.



In comparison of the above findings to other studies, it appears that there are both contrasting and similar results. For example, a study aimed at examining economic aggregate (variables) and liquidity of stock markets in markets of Africa conducted in Nigeria, South Africa, Egypt, Mauritius, and Morocco found that aggregate macroeconomic factors significantly explain variations in stock market liquidity in Africa. The factors that were found to have influence on stock market liquidity are supply of money, exchange rate, inflation, and credit to private sector (Igbinosa and Uhunmwangho, 2020:20). Though economic growth had the positive sign, at 0.05 confidence level, it was not statistically significant. In this study, the researcher noted that, money supply determines stock market liquidity because purchasing power and investment activities are greatly enhanced if there is an improvement in supply of money in an economy whereas with inflation, it was noted that it determines stock market liquidity because higher returns are associated with sustained increase in price levels (Ibid).

It was further concluded in the study that a stronger domestic currency is associated with higher investment activities from abroad (Igbinosa and Uhunmwangho, 2020:21). The study further concluded that economic variables affect stock market liquidity through their impact on trading volume and investors' expectations such as inflation expectations which has a bearing on investment decision (Ibid).

These findings vary to this study's findings in terms of differences and similarities. For example, the findings that exchange rate determines liquidity of the stock market is the same. In this regard, an appreciated currency against foreign currencies is a significant determinant of liquidity in capital markets. However, the finding that inflation and money supply are also determinants of liquidity in capital markets is not the same with findings in this paper because inflation and supply of money are not statistically significant.

In the country of Sri Lanka, a study was conducted to investigate the effect of economic factors on development of the stock market. The research utilised turnover of the stock market as a proxy for development of the stock market and the selected economic factors adopted in the research were rate of inflation, exchange rate volatility, lending interest rate, deposit interest rate and gross domestic product. The research discovered that all macroeconomic factors used influence the development of the

stock market. To be precise, rate of inflation and exchange rate were associated with higher deposit rates and therefore hindered development of the stock market in Sri Lanka (Khulitunga, 2015: 31). In another study focused on the capital market in the country of Nepal, it was discovered that liquidity of the stock market responds positively to variations in rate of inflation and broad money growth, though negatively influenced by the interest rate (Shrestha and Subedi, 2015).

In addition, in a study conducted on emerging economies to identify variables that determine capital market liquidity using the proxy of stock market turnover. It was found that rate of interest, inflation, and foreign exchange rate do not determine capital market liquidity (Agiyeva cited by Tajul et. Al, 2017: 307). In contrast to these results, in Nigeria, it was found that liquidity of the Stock Exchange is significantly determined by economic factors, namely, rate of inflation, amount of money supply in the economy, and output in real terms. In addition, these variables were found to have critical influence on the stimulation of performance of the capital market in terms of liquidity in the long run (Agiyeva cited by Tajul et. Al, 2017: 307).

It can therefore be deducted from the above literature that influence of economic factors on capital market liquidity is varying but evident and strong from country to country. The varying aspects of economic factors in determining liquidity of capital markets stem from the definition of liquidity, wealth status of a population, methodology of studies and selected economic variable determinants in the studies. This generated interest and the need for capital market liquidity to be understood from a Zambian economic variable perspective if its development is to be reliably influenced by any form of policy impetus. This is because as highlighted above, study findings are different from country to country based on several factors that include economic conditions, study methodology and variable definitions.

It therefore follows that the significance of a variable in determining capital market liquidity is dependent on several factors that include definition of capital market liquidity, size of an economy, variables of interest as regressors etc... The definition of capital market liquidity seems to be a major reason for variations in findings in different research activities focused on different economic landscapes in countries of focus. This is because there is no universally acceptable single definition of capital market liquidity. The definitions vary but all centre on capitalization, returns, turnover

and cost of transactions. Therefore, the definition of capital market liquidity is dependent on a researchers' views and most appropriate for the adopted study. Hence the varying results from across studies because statistical interactions are obviously different due to differences in absolute values for the defined dependent liquidity term.

Nonetheless, with localisation of the findings, it's also important to state that majority of the economic variables in Zambia are serially correlated, as evidenced during the statistical analysis and modelling processes. This could be because of the size of the economy making variables interact in a web of heavily influencing outcomes of each other. The variable selection process used the regression modelling procedure and variables such as government revenue, gross domestic product, government expenditure, broad money, copper price and foreign direct investments were serially correlated. This made them to be dropped from the regression model to uphold the independence characteristic of regressor variables influencing the response variable as a necessary condition to be met for results to be reliable in making capital market liquidity forecasts or estimations.

In line with the findings in this study in chapter 4, on one hand, it is found that crude oil price per barrel is positively related to capital market liquidity by a coefficient of 34100000, expressed in Kwacha terms, K34,100,000. Therefore, a unit increase in the price of crude oil per barrel in the global market, in Kwacha terms, increases capital market liquidity by K34,100,000 in Zambia. This entails an increase in investments by the public and corporate entities including foreign individuals by K34,100,000 whenever there is a one unit increase in crude oil price in the global market. This sets an interesting topic of study to understand the transmission mechanism between the price of crude oil and investment in capital market assets in Zambia. Meanwhile, on the other hand, it is established that exchange rate relates negatively to the Zambian capital market liquidity by a coefficient of 1350000000, expressed in Kwacha terms, K1,350,000,000. Therefore, a unit depreciation of the exchange rate in Zambia, in Kwacha terms, reduces capital market liquidity by K1,350,000,000. This entails a decrease in investments by the public and corporate entities including foreign individuals by K1,350,000,000 whenever there is a one-unit depreciation in the exchange rate against the United States of America dollar currency (US dollar).

The exchange rate statistical significance in determining capital market liquidity shows that for foreign inflow of capital via investment in capital market assets to be sustained incrementally, requires a strong domestic currency against the US dollar. This is in line with boosting investor confidence in the Zambian economy in terms of return earning as expected at a future cash out or pay date. This is evidenced by the findings in a study on economic aggregates and the liquidity of stock markets in Africa. The findings depicted that a stronger domestic currency is associated with higher investment activities from abroad (Igbinosa and Uhunmwangho, 2020:21).

In line with the suggested theories for use in interpreting the findings, it therefore follows that firstly, the financial market theory of development is useful in this study to interpret the findings. The theory postulates that developing countries can attain economic development through domestic resource mobilisation and international capital flight using stock markets (in this case, capital markets) (Malmberg, Gupta, Grootaert, Kanbur, Kwakwa, Lustig and Nora, 2000:76-85). Further, the theory recognises the need for capital mobilisation in developing countries such as Zambia if economic development is to be achieved (Ibid). It stresses need for market participation by households and corporates for liquidity (turnover) to be adequate to propel investment for job creation and economic growth. The theory further states that market liquidity is determined by economic factors, regulation, and market structure (Op. cit). Thus, true to the theories postulations about economic variables determining capital market liquidity, the theory can be used to explain capital market liquidity development using the exchange rate and crude oil price to explain market variations. It is therefore imperative for a country like Zambia to consider crude oil price and exchange rate interactions with capital market liquidity as per findings in this paper in any efforts aimed at enhancing domestic investment and foreign capital flight in capital markets if the country is to attain economic development.

Secondly, the demand and supply theory is also useful in taking into account findings in this paper to inform efforts aimed at enhancing liquidity in capital markets. The theory refers to the people's behaviour including institutions as they interact as buyers and sellers with one another in markets. Demand and supply are the elements that make market economies to work (Mankiw, 2018:66). They determine the quantity of each good produced and the price at which it is sold (Ibid). Quantity demanded is the number of a good/service that buyers are able and willing to purchase while quantity

supplied is the number of a good/service that sellers able and are willing to sell (Op. cit). Therefore, in line with this study conducted under the fact that supply of capital market assets represented by capitalization is stable and growing, the focus is on the demand for these products. The price of crude oil and the exchange rate as significant determinants of capital market liquidity may thus be used to estimate the demand for capital market assets in the short run to determine liquidity (turnover), and thereby also use the law of supply and demand theory to determine capital market equilibrium points between market capitalization (as asset supply) and market turnover (as asset demand).

Lastly, the Dow theory can also be used to interpret changes in capital market liquidity using the crude oil price and exchange rate variability in Zambia. The theory suggests that trade volume or trade turnover confirms market trends (market direction, either rising or falling) (Rhea, 2012:15-398). Therefore, as per the theory, trade volume (turnover) ascends with price increase (stock price) in an incremental trend due to increase in value (Ibid). In reverse, trade volume descends with a fall in stock prices when there is a decremental trend in the market. Therefore, with an upward trend, rise in the price of crude oil and appreciation of the Kwacha against foreign currencies will increase trade volume which is in this case the capital market liquidity measured by total turnover within a specified period. The increase in trade volume because of a rise in crude oil price per barrel internationally and appreciation of the Kwacha against the US dollar would be a product of increased value of capital market assets (price). In turn, with a downward trend, decrease in the price of crude oil and depreciation of the Kwacha against foreign currencies would reduce trade volume, which is in this case the capital market liquidity measured by total turnover within a specified period. The reduced trade volume would be because of the reduced value of capital market assets.

Considering the above, if the capital market master plan for Zambia (CMMP) is to be effective in increasing liquidity in the capital market for liquidity investment demands to be met for production purposes by both the corporate and government, then there is need to address the exchange rate between the Kwacha and US dollar, and crude oil price factors in the plan using relevant theories including those used in this study. This would help in better managing efforts aimed at increasing capital market liquidity while considering variables of influence and their variations. Further, to better manage efforts in enhancing liquidity, government has a central role to play through both fiscal

and monetary policies using Bank of Zambia and Ministry of finance and national planning to influence the exchange rate and ensure local price paid for crude oil products is reflective of international prices. This is because crude oil price increase may enhance liquidity in capital markets by making households re-channel resources from consumption to investment.

Hence, for Zambia to achieve desired results of increasing liquidity in the capital market through the capital market master plan. It needs to address the problem of low household and corporate participation in the capital market through various investments in available assets. The capital market master plan should therefore account for findings in this study to comprehensively address the low liquidity problem in the market. These findings being that liquidity in the capital market is influenced in the short run only, by the exchange rate negatively and international crude oil price per barrel positively.

Therefore, depreciation of the Kwacha against the US dollar is associated with a reduction in liquidity whereas, an upward movement of crude oil price is associated with an increase in capital market liquidity. As such, the SEC in collaboration with Ministry of finance and national planning including other aligned government ministries and departments need to work towards making the Kwacha appreciate against the US dollar to reduce on liquidity losses because of a depreciating currency and implement cost reflective crude oil prices locally as a means of increasing liquidity in capital markets. A strong and stable currency against the US dollar improves investor confidence and thereby making capital flight into the capital market improve as result of foreign individuals or entities including Zambians living abroad investing in capital market assets. Nonetheless, increase in the crude oil price per barrel internationally improves capital market liquidity maybe because increasing crude oil prices increase input costs of production leading to companies capitalizing and thereby attracting investments as turnover from households and corporate entities. Increase in crude oil prices may also lead to increased capital market turnover (liquidity) by forcing households to reallocate resources from consumption to investments functions in the capital market for increased income streams to match increased cost of living resulting from crude oil price increase.

## **CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Conclusions**

Capital markets have a huge role to play in growing economies around the globe because they support not only government and corporate entities but also entrepreneurs with easily accessible and cheap capital for both kickstarting and growing production. Increase in production entails economic growth and this comes with employment creation and improved welfare. In advanced countries, billions in value of capital market assets are traded daily to enhance economic activity for job creation and welfare improvement for the citizens.

However, in Zambia, capital markets are characterised by low liquidity. This means the capital market is unable to meet liquidity demands from the corporate and government sector for investment purposes. This therefore means that economic growth is slow including job creation and thereby affecting welfare improvement. Therefore, to improve liquidity in this market for Zambia, the country developed the capital market master plan (CMMP) which runs from 2022 to 2032. Its aim is to improve the liquidity in the market to meet liquidity demand from firms and government as represented by capitalization. This study therefore was conducted to contribute to informing the capital market master plan on economic variables of significance in determining the capital market liquidity. The aim of the research was to determine variables of economic influence on capital market liquidity using LuSE turnover as a proxy of the response variable. The explanatory variables were inflation, annual growth rate of money supply, annual growth rate of gross domestic product, crude oil price per barrel and exchange rate.

The study used the autoregressive distribution lag model to establish results. However, use of the model was dependent on the statistical stationarity tests conducted to determine presence or not of unit roots in the data. Upon successful tests of stationarity after differencing some variables at first level, only the autoregressive distribution lag model could be used due to differences in stationarity levels of the data (order 0 and 1).

The bounds test results depicted that there only existed a short-run relationship between the response and regressor factors. The short-run relationship results showed that among the regressor variables, only the crude oil price and exchange rate

are statistically significant in determining capital market liquidity in Zambia at 95% confidence interval. Therefore, as Zambia continues with efforts aimed at improving liquidity in capital markets to meet demand through the capital market master plan (CMMP). It is imperative that the management of the master plan considers the crude oil price per barrel in the global market and exchange rate against the US dollar.

In this vein, as per results in this research, it is vital to note that crude oil price per barrel is positively related to capital market liquidity by a coefficient of 34100000, and this therefore means that a unit increase in the crude oil price per barrel on the international market, in Kwacha terms, increases capital market liquidity by K34,100,000 in Zambia. In addition, the exchange rate negatively relates to the Zambian capital market liquidity by a coefficient of 1350000000, and this means that a unit depreciation of the exchange rate in Zambia, in Kwacha terms, reduces capital market liquidity by K1,350,000,000. It is therefore imperative for the management of the capital market master plan to consider these findings in the implementation process if the plan is to achieve its intended purpose of increasing capital market liquidity to meet investment financial needs of both government and the corporate sector by increasing household and corporate participation.

## **6.2 Recommendations**

The following are the recommendations in general in line with the study results in this document.

- The Zambian government policy makers should adopt economic policies that are going to strengthen the Kwacha against the US dollar to prevent capital market liquidity losses because of low investor confidence in the short run.
- The Securities and Exchange Commission and ministry of finance and national planning should establish a representative technical working team that will drive policy reforms towards ensuring economic stability to prevent loss of liquidity in the capital market because of Kwacha depreciation against the US dollar in the short run.
- The Zambian government policy makers should continue to adopt and implement cost reflective crude oil prices especially among corporate entities as a means of encouraging capitalization in capital markets to meet costs of



inputs such as transport and thereby improve capital market liquidity in the short run.

- The Securities and Exchange Commission as the chief implementor of the capital market master plan should establish a monitoring and evaluation team to establish indicators informed by the exchange rate and crude oil price per barrel and assess achievement of results of the plan periodically using the established regression equation.
- The securities and exchange commission should use the regression equation model established in this study to make capital market forecasts or estimations based on prevailing and or forecasted crude oil price per barrel and exchange rate to counter economic risks that may reduce capital market liquidity or turnover.

### **6.3 Recommendations for future studies**

- Future studies should seek to understand how exchange rate and crude oil price per barrel affect capital market liquidity negatively and positively respectively.
- Future studies should seek to understand if there is correlation between capital market capitalization and turnover, including the direction of the correlation if it exists.

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## APPENDICES

### Data

Year	LuSE turnover (ZMW)	Annual GDP growth rate (%)	Annual inflation_end year (%)	Annual growth rate of money supply (M3) (%)	Exchange rate_end period (ZMW)	Crude oil average price "ZMW
2000	25273500	3.9	26.03	73.80	4.08	123.92002
2001	189837225	5.32	21.391	8.70	3.58	93.0084
2002	10891650	4.51	22.23	28.20	4.27	111.88368
2003	49448750	6.95	21.4	25.00	4.70	146.01384
2004	32712000	7.03	17.97	32.00	4.50	186.795
2005	54215000	7.2	18.00	3.30	4.50	254.88
2006	102377000	7.9	9.00	44.05	3.60	237.78
2007	282927600	8.4	11.00	25.27	4.00	289.36
2008	836682400	7.8	12.00	23.23	3.70	368.779
2009	207079400	9.2	13.00	7.66	5.00	309.75
2010	960495600	10.3	9.00	29.86	4.80	381.504
2011	775320000	5.6	6.43	21.70	5.10	483.888
2012	362788800	7.6	6.58	18.00	5.16	485.298
2013	211288500	5.1	6.98	21.00	5.51	539.8698
2014	7126963800	4.7	7.81	12.00	6.39	595.3563
2015	8161174000	2.9	10.11	35.00	10.98	534.2868
2016	12007968000	3.8	17.87	-6.00	9.92	429.4368
2017	12007968000	3.5	6.58	21.00	9.99	507.492
2018	1097000000	3.7	7.49	16.00	11.92	777.5416
2019	260000000	1.4	9.15	13.00	14.11	804.1289
2020	191000000	-2.8	15.73	46.00	21.09	836.8512
2021	2214691562	3.6	22.02	4.00	16.67	1136.3939

