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The Impact of external public debt on stock market performance in Kenya.

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THE IMPACT OF EXTERNAL PUBLIC DEBT ON STOCK MARKET PERFORMANCE IN KENYA

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Declaration

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

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ABSTRACT

In recent years, the level of external debt in Kenya has been increasing rapidly with the stock market also experiencing a bear run over the same period. The study therefore aimed to investigate the impact of external public debt as disaggregated into its various categories on stock market performance in Kenya for the period 2015 to 2021. The study used the Nairobi Securities Exchange (NSE) All-Share Index as the dependent variable, with multilateral debt, bilateral debt, commercial debt and guaranteed external debt classified as the independent variables. Based on an assessment of past research undertaken on stock market performance, exchange rates, interest rates and domestic public debt were included as control variables. In accordance with the methods used by previous studies and the fact that the variables used in the present study were both stationary and non-stationary at level form, the research used a descriptive correlational research design and the Autoregressive Distributed Lag (ARDL) model to assess this relationship using monthly secondary data. The analysis of the time series data revealed that given multilateral debt, bilateral debt, commercial debt and guaranteed external debt, none of the variables had an impact on the stock market in the short run. In the long run, only bilateral and multilateral debt had an impact on the market with both variables recording a significant positive effect. As a result, the study recommends the continued need for the government to utilize external debt instruments within the approved limits and to employ the funds in long term, productive economic activities that positively influence the stock market. In addition, given that few studies have been conducted on external public debt when divided into its components, further studies could be carried out on other jurisdictions for comparison.

Keywords*: Stock market, Multilateral debt, Bilateral debt, Commercial debt, Guaranteed external debt, Autoregressive Distributed Lag Model*

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DEFINITION OF TERMS

All Share Index – This is a measurement index weighted based on the market capitalization of all the companies listed at the NSE (Osoro & Ambrose, 2013).

ARDL model – An autoregressive distributed lag (ARDL) model is a model that allows different optimal lags to be used for different variables and is applicable for time series data with mixed order of integration (Mbah, Agu , & Umunna , 2016)

Bilateral debt – A form of external debt which a country obtains when accorded foreign aid by another country (Amoa, 2020).

Commercial debt – A type of external debt that mainly involves issuing sovereign bonds in the international debt market (Dittmar & Yuan, 2008).

Fiscal policy - The use of revenue collected by the government from taxes and payments to induce the economy (Murungi & Okiro, 2018).

Guaranteed external debt – This is debt which is not held by the public sector, but the government is obligated to cover (Hakura, 2020).

Multilateral debt - External debt achieved through funding from International Financial Institutions such as the IMF (Nemlioglu & Mallick, 2020).

Stock market - A public market where securities such as corporate bonds, equities, commercial paper and derivatives are traded.

ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey Fuller
AIC	Akaike information criterion
APT	Arbitrage Pricing Theory
ARDL	Autoregressive Distributed Lag
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
CPI	Consumer Price Index
EAC	East African Community
ECM	Error correction model
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HQC	Hannan-Quinn Information Criterion
IMF	International Monetary Foundation
I-REIT	Income Real Estate Investment Trust
NACOSTI	National Commission for Science, Technology & Innovation
NASI	NSE All Share Index
NSE	Nairobi Securities Exchange
PPG	Public and Publicly Guaranteed
SIC	Schwartz Information Criterion

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Globally, very few studies have been conducted on the impact of external public debt on stock market performance with evidence mainly from the South Asian market. This also holds true for the African market where stock exchanges are less developed than those in emerging economies. Extant literature reveals several studies on public debt in Kenya but specifically on its effects on economic growth. These include studies by (Murungi & Okiro, 2018), (Mose, 2020), (Mwaniki, 2016) and (Matiti, 2013). However, within the Kenyan capital markets, few to no studies have examined the impact of external public debt on stock market performance hence the need for this research.

1.1.1. Public Debt

Fiscal policy is the use of revenue collected by the government from taxes and payments to induce the economy (Murungi & Okiro, 2018). Through the adjustment of taxation levels and expenditure, the government affects combined demand and economic activity levels. Governments the world over borrow in order to reduce the gap between investments and savings. According to Murungi and Okiro (2018), governments employ debt financing by attaining funds from the domestic or the external market.

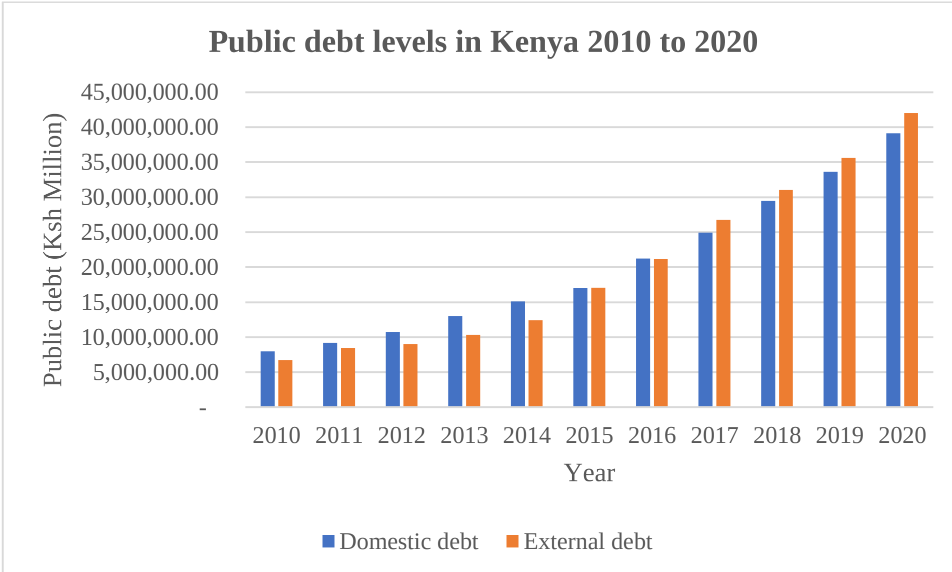
Internal borrowing is a form of fiscal policy where the government raises funds through floating loans within its own country (Murungi & Okiro, 2018). Here, Domestic Public Debt is owed to holders of Government securities such as Treasury Bonds and Bills (Babu, Kiprop, Kalio, & Gisore, 2015). Babu et. al (2015) affirm that governments borrow for two main reasons; to pay off maturing loans and when the projected revenue goals fall short of the projected expenditure. The former is typical with domestic debt. One of the key advantages of internal borrowing is the lower risk of default by the government as the debt is payable in local currency (Awan & Qasim, 2020).

As a developing country, Kenya depends mostly on external financing to cater for its development (Murungi & Okiro, 2018). This is evidenced by the increase in external debt values as shown in Figure 1. Before 2015, domestic public debt levels in the country always exceeded the external debt composition. This meant a higher percentage of the government's borrowing was through products such as treasury bills and bonds. In 2015, Kenya experienced the first instance of where external debt exceeded domestic debt. According to IMF (2021), as a result of more spending on infrastructure projects, the country's gross public debt increased from 48.6% of GDP at the end of 2015 to an estimated 69% of GDP at the end of 2020.

As opposed to domestic borrowing, external debt does not only provide access to foreign capital for development and improved technical expertise (Awan & Qasim, 2020) but it also allows the country to explore longer term projects (Murungi & Okiro, 2018). Most developing and emerging countries approach the international debt market due to lack of savings and investments. This is in addition to low government revenue and budget deficits (Sami & Mbah , 2018).

The external debt exists in various forms including multilateral, bilateral, commercial or guaranteed debt. Multilateral external debt is achieved through funds from multilateral organizations such as the IMF (Nemlioglu & Mallick, 2020) while a country obtains bilateral debt when accorded foreign aid by another country (Amoa, 2020). Multilateral organizations are more prone to debt relief initiatives with data from the IMF showing Kenya received Fund emergency support in 2020, and arrangements for an extended credit facility and an extended fund facility in 2021. On the other hand, a country's publicly guaranteed debt is that which is not held by the public sector but the government is obligated to cover (Hakura, 2020) while external commercial funding mainly involves issuing sovereign bonds in the international debt market (Dittmar & Yuan, 2008). An example of this is the Eurobond.

Over the past 15 years Kenya's debt composition has evolved, with a lower exposure to bilateral and multilateral development institutions and a much more commercial funding structure comprising of Eurobonds and syndicated loans. As at March 2020, data from the Central Bank of Kenya showed the country's total public debt stood at KES 6.3 trillion, with the debt ceiling having been raised to KES 9.0 trillion from the initial 50% of GDP in October 2019. According to the IMF debt sustainability report for 2021 about half of Kenya's public debt is owed to external creditors, specifically 52% of the total public debt. As of December 2020, the monthly bulletins by the National Treasury gave the external debt composition as; 27.8% commercial debt, 39.4% multilateral debt, 28.3% bilateral debt and 4.5% publicly guaranteed debt.



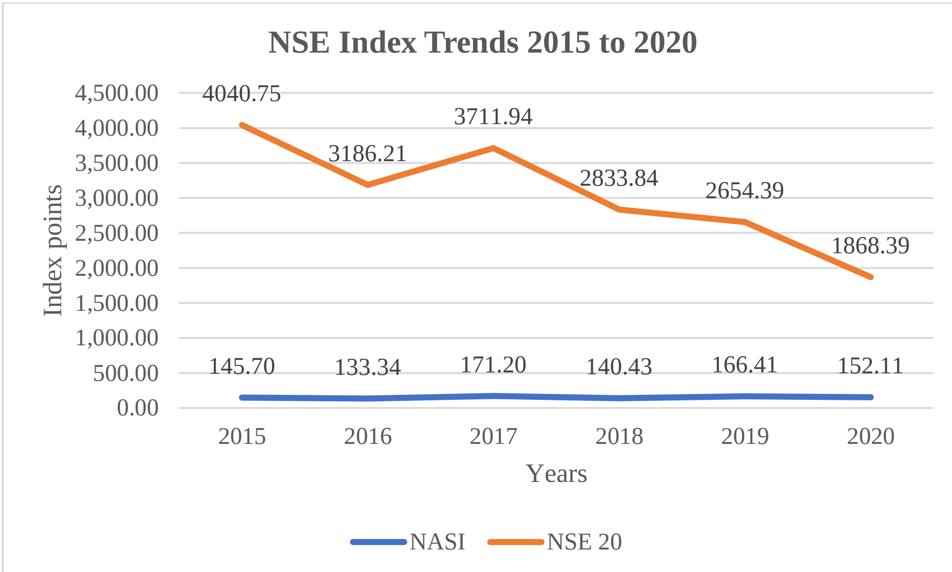
Source: CBK Website

Figure 1: Public debt levels in Kenya 2010 to 2020

1.1.2 Stock Market Performance in Kenya

A stock market is a public market where securities such as corporate bonds, equities, commercial paper and derivatives are traded. Since the mid-1980s, capital market development has continued to be a strategic development goal in Kenya with an aim to promote positive economic growth (Ayako, Kungu, & Githui, 2015). Since its formation in 1954 (Kemboi & Tarus, 2012), the Nairobi Securities Exchange (NSE) has grown to be one of the largest bourses in East Africa with over 60 listed companies, a market capitalization of $22.92 million and about 137 billion in equity turnover according to data from the NSE as of December 2021.

Over the years, the NSE has experienced modernization reforms through various initiatives including automation of trading and the development of supervisory and regulatory frameworks (Ayako, Kungu, & Githui, 2015). This has contributed to its improved performance which is measured by variables such as its market capitalization and turnover ratio (Kemboi & Tarus, 2012) or the NSE All-Share Index (NASI) and the NSE 20 share indices (Osoro & Ambrose, 2013). The NSE 20 share index tracks the average performance of the 20 best performing counters drawn from different sectors listed at the NSE while NASI is weighted based on the market capitalization of all the companies listed at the NSE (Osoro & Ambrose, 2013).



Source: CMA/NSE (2020)

Figure 2: NSE Index Trends 2015 to 2020

As per the data from the NSE and CMA presented in Figure 2, the NSE 20 index stood at 1,868.39 points as at the end of 2020 compared to the 4,040.75 points recorded in 2015. The low performance in 2020 was because of the pandemic-induced slump by Covid-19 and its impact on businesses globally. NASI managed to remain steady with the highest annual index recorded in 2017 which was partially attributed to the increase in volumes of trade at the NSE. However, over the same period, the market experienced a bear run with the last initial public offer recorded in 2015 when the Stanlib Fahari I-REIT was listed. This meant regular instances of depressed stock market performance with reduced share prices and erosion of shareholder value at the Exchange. In addition, this affected the earnings by stock market participants such as stockbrokers and investment banks.

1.3.1 Public Debt and Stock Market Performance

'Reasonable' debt levels in an emerging economy are likely to contribute towards economic growth as long as the borrowed funds are aimed at productive initiatives (Babu, Kiprop, Kalio, & Gisore, 2015). Muhammad, Jawad, Muhammad, & Ijaz (2020) employed panel least square regression analysis to test and determine a negative relationship between external debt and stock market performance. They attributed this to the fact that the funds from the external sources were being used to service debt and other non-productive activities as opposed to economic activities that would boost stock market performance. Another reason was political destabilization during the period under review. However, the authors noted that the study was limited to Pakistan, Sri Lanka, India and Bangladesh and could not be generalized to other parts of the world.

In their study, Meme and Muturi (2016) investigated how the different categories of government domestic debt affect stock market performance in Kenya. The study revealed that treasury bonds and treasury bills have negative but insignificant influence on stock market performance while the central bank overdraft to the government and commercial bank advance to the government have positive and significant influence on stock market performance. The paper also called for further research to determine the reliability of its findings as well as research on the relationship between external debt and stock market performance. Thus, this study intends to contribute in a significant way by examining the impact of external public debt on stock market performance in Kenya.

1.2. Statement of the problem

According to Meme and Muturi (2016), a country's economic performance can be measured by variables such as inflation, exchange rate, GDP and the debt position. The authors also specify that given that the stock market reflects economic fundamentals, stock prices should be used as leading indicators of economic activity. This is in line with Olweny & Kimani (2011), who posit that the level of performance at the NSE is a good predictor of economic growth. As such, investors are encouraged to analyse macroeconomic indicators that affect stock prices such as government debt (Meme & Muturi, 2016).

In Kenya public debt began to grow at a startling rate from 2013 due to an increase in government expenditure which resulted in the advancement of loans by the government to support the budget (Sami & Mbah , 2018). The high debt levels in the country have created a source of concern with both the debt to GDP ratio as well as the debt service to revenue ratio having surpassed the recommended threshold. This has in turn led to the reevaluation of Kenya's Sovereign Credit Outlook by several rating agencies including Moody's and Fitch which both gave Kenya a B+ rating in 2021, an indication of a negative outlook.

Risks posed by high debt levels to the economy include higher tax rates due to a higher cost of servicing debt, local currency depreciation, crowding out of private investments and increased cost of additional borrowing (Sami & Mbah, 2018). To the degree that government debt has an impact on the state of the economy, it will also have an indirect impact on the stock market. This is because where other financial markets question the debt sustainability of a country, these nations will demand higher interest rates from government securities to compensate for the high default risk. This will increase the yield of government securities and in line with Meme and Muturi (2016), lower their prices, eventually leading to a reduction in stock prices and poor stock market performance such as the bear run experienced at the NSE.

This area of research has barely been explored in the Kenyan market especially where both domestic and external debt have been disaggregated into their various categories. Given this fact, the implications of rising public debt and the growing percentage of external public debt in the country, this study aims to establish the impact of multilateral debt, bilateral debt, guaranteed external debt and commercial debt on stock market performance in Kenya.

1.3. Research objectives

1.3.1 General objective

The study aims to establish the impact of external public debt on stock market performance in Kenya.

1.3.2 Specific objectives

In order to address the general objective, the study will:

1. Investigate the impact of multilateral debt on stock market performance in Kenya.
2. Determine the influence of guaranteed external debt on stock market performance in Kenya.
3. Examine the extent to which bilateral debt influences stock market performance in Kenya.
4. Establish the effect of external commercial debt on stock market performance in Kenya.

1.4 Research Questions

1. Does multilateral debt have an impact on stock market performance in Kenya?

2. Does guaranteed external debt influence stock market performance in Kenya?
3. To what extent does bilateral debt influence stock market performance in Kenya?
4. Does external commercial debt have an effect on stock market performance in Kenya?

1.5 Scope of the study

The aim of this study is to examine the relationship between external public debt and stock market performance in Kenya. The study utilized secondary time series data covering a 7-year period from 2015 to 2021. Consideration for this specific time period was made on the basis that it covers more recent developments at the NSE such as the launch of the Derivatives Market and a new trading system. It is also in line with similar studies. The study will also include all listed companies at the NSE over the entire period.

1.6 Significance of the study

The findings and recommendations of this study will be of importance to various groups of people as shown below.

1.6.1 Policy makers

In a bid to generate more capital flows from the capital market towards the country's infrastructural needs as envisaged in both the "Big 4 Agenda" and Vision 2030, government policy makers can incorporate some of the findings in creating future policies geared towards overall economic growth. This will in turn create a conducive environment for the operations of the stock market.

1.6.2 Capital market participants

The findings and recommendations from this study will act as a reference base for capital market stakeholders such as intermediaries, investors and listed firms when contemplating investment choices and strategies.

1.6.3 Research scholars

This study aims to contribute to the body of knowledge on the nexus between external public debt and stock market performance. To the research scholars, this study will provide both literature and areas of further research in this field.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter evaluates past research conducted on the various categories of external public debt. It is a review of both theoretical and empirical literature guiding the study's conceptual framework with an in depth look at the significance of public debt in various stock markets globally.

2.2 Theoretical review

In this section, the research examines two main theories in support of the study's objectives. Both theories have been used to model the behavior of stock market returns given the importance it poses to various stakeholders. Thus, this section offers an in-depth look at the Arbitrage Pricing Theory and the Efficient Market Hypothesis.

2.2.1 The Arbitrage Pricing Theory

The Arbitrage Theory of Capital Asset Pricing (Ross, 1976) is an alternative theory to the Capital Asset Pricing Model (CAPM) used to decipher the phenomena observed in stock markets (Ruhani, Islam, & Ahmad , 2018). While CAPM advocates that market returns are a linear function of a single common factor (systematic risk), the Arbitrage Pricing Theory (APT) specifies that they are a function of multiple factors and their sensitivity to these factors (Gatuhi, Gekara, & Muturi, 2015).

APT capitalizes on the principle of "arbitrage pricing" and is illustrated by two versions: macro variable model and factor loading model. As its name suggests, the macro variable model is based on economic interplays while the factor loading model uses artificial factors in its analysis. Both adaptations of the APT were determined to surpass CAPM, but neither version was clearly predominant to the other as regards both within and out-of-sample explanatory power (Ruhani, Islam, & Ahmad , 2018).

This theory is important to the research on public debt and stock market performance as it describes the debt burden to an economy, particularly on stock market returns. Given the nature of this study, it also provides an important link to the specific objectives of this research as the analysis is pegged on the macroeconomic APT model in order to establish the effect of the various forms of external public debt on stock market performance in Kenya.

2.2.2 *Efficient Market Hypothesis*

The Efficient Market Hypothesis by Fama (1970) stems from the idea that an "efficient" capital market fully reflects all available information for firms and investors to make productive investment decisions. The theory assumes that security prices follow a random walk and investors cannot earn abnormal returns as information is readily available (Sharma, 2014). The efficient market hypothesis exists in the weak form where security prices reflect all historical information, semi-strong form where prices adjust to publicly available information and strong form where prices reflect past, present and future information (Fama, 1970).

Proponents of the theory such as Malkiel (2005) show that equity prices depend on factors such as current earnings, performance prospects and the economic health of a country. In fact, investment managers do not surpass their index benchmarks as prices appear to reflect all available information. On the other hand, the increased popularity of behavioral finance theories has been as a result of the inability of EMH to explain certain financial phenomena (Baker & Wurgler, 2000).

According to Gatuhi, Gekara, & Muturi (2015) due to market inefficiencies and information asymmetry, the Kenyan equity market exists in the semi strong form EMH. Therefore, to evaluate this, the study intends to investigate the long run and short run effects of bilateral debt, commercial debt, publicly guaranteed debt and multilateral debt on stock market performance in Kenya.

2.3 Empirical review

This section provides an analysis of previous literature that guide the framework of this study. It evaluates previous research that has been conducted on the various categories of public debt and their relationship with stock market performance. Eventually, it provides the research gaps identified that will form the basis of this study's conceptual framework.

2.3.1 *Multilateral debt and stock market performance*

Lora and Olivera (2007) established that funding from multilateral organizations do not seem to improve the advance effects of debt. This is also in line with the debt overhang argument where profitable private investment opportunities in the funded countries are forgone due to the taxation costs imposed on their returns by past debt obligations (Raddatz, 2011). In a study on multilateral debt, Raddatz (2011) employed an OLS estimation and found a positive relationship between the effect of announcements on multilateral debt relief initiatives and the stock prices of South African companies with affiliates in the receiving countries. The author attributed this occurrence to the perception that future taxes will decrease because of the debt relief. Ezeaku , Egbo , Nwakoby, & Onwumere (2020) used dynamic panel autoregressive distributed lag models to determine that multilateral concessional loans have a positive impact on economic growth both in the short and long run. To the degree that government debt affects the state of the economy, it will also have an indirect effect on stock prices (Meme & Muturi, 2016).

Nemlioglu and Mallick (2020) categorized IMF loans as short-term when compared to funding from the World Bank which is more long-term in nature and targeted towards longer term development goals with an aim to enhance productive capital. In determining whether multilateral lending aids capital accumulation, their paper used the GMM estimation technique to examine data from 175 economies over the period 1970 to 2017. They uncovered that countries with better innovation and institutional quality derive greater benefit in generating a higher level of capital stock from multilateral lending, especially where those funds are used in funding innovative activities. Where there is increased capital accumulation in an economy, individuals are better placed to invest more (Irfan , Akbar, Rao, & Younis, 2020).

2.3.2 Guaranteed external debt and stock market performance

Hakura (2020) defines publicly guaranteed debt as the portion of debt which the public sector does not hold but has a duty to cover. Several studies in literature have examined guaranteed external debt but specifically its effect on economic growth. Kharunda and Tinyinondi (2018) examined the impact of public and publicly guaranteed (PPG) debt on the economic growth of the East African Community (EAC) member countries using an Autoregressive Distributed Lag Model. The results exhibited crowding out and debt overhang effects over the period of study spanning 1971 to 2014 by establishing a non-linear relationship between PPG debt and economic growth in Kenya, Burundi, Rwanda, Tanzania and Uganda.

It was also evident that where these countries received a debt relief, the contribution of PPG external debt to GDP per capita growth was positive and significant. These findings are consistent with those of (Ali & Mustafa, 2012) and (Cai & Zhang, 2011) who show that a high level of indebtedness hinders the level of future investments thus leading to a reduction in value. In addition, Joo and Mir (2014) find that foreign capital increases the level of domestic capital formation leading to an increase in job opportunities, market size and volatility in the stock market.

2.3.3 Bilateral debt and stock market performance

Amoa (2020) defines bilateral debt as foreign development aid granted by one country to another. Before the 1990s, the debt raised by African countries was predominantly from bilateral or multilateral institutions (Greene, 1989). These loans were concessional in nature with low interest rates and long maturity durations. Past research conducted on bilateral debt has also mainly focused on its effects on economic growth. However, both Tachiwou (2010) and Nyanaro and Elly (2017) establish a positive relationship between economic growth and stock market performance variables.

The studies on bilateral debt have had varying results. Research by Nwakoby and Ezeaku, (2021) exhibited a positive relationship between bilateral concessional debt and the standard of living in the West African Monetary Zone and according to Maqbool, Hameed, and Habib, (2018), improved standards of living also have an impact on stock market returns. Contrastingly, Dey and Tareque, (2020), Amoa, (2020) and Hussain, et al. (2017) find a negative long run correlation between net bilateral foreign aid and economic growth. Dey and Tareque (2020) postulate that external debt negatively impacts growth and based on the composition of external debt, it is the bilateral component of the total external debt that delays growth. Hussain, et al. (2017) attribute this to the employment of the funds in nonproductive and corrupt activities which do not enhance the living standards of the general public but instead crowds out private investments. Where loanable funds are out of reach of the private sector, economic activities and stock prices are negatively affected (Ali , Zaman, Ziaei , & Anuar , 2014).

2.3.4 Commercial debt and stock market performance

Sovereign bonds refer to debt issued by governments in international markets whose payment is guaranteed by the respective governments (Dittmar & Yuan, 2008). The international bond market plays an important role in the internalization of capital markets by attracting different types of investors. In the Eurobond market, sovereign borrowers rank as the top participating category to either finance specific projects, fund balance-of-payments deficits or to enhance foreign exchange reserves important to countries' transfer risk assessment (Amira, 2004). In addition, Eurobonds eliminate the conditional compliance associated with foreign aid (Mensah, Yiadom, & Dziwornu, 2021) and where the cost of servicing debt is positively correlated with the strength of the government's budgetary position, foreign currency debt could be used as a hedging tool (Amira, 2004).

Dittmar and Yuan (2008) examined whether sovereign bonds benefit corporate bond markets in emerging economies. Their methodology involved the use of variance decompositions from a vector autoregression representation of the yield spreads on corporate and sovereign bonds to examine the contribution of each asset to price discovery. The findings revealed that sovereign bonds improve the corporate bond market through allowing corporate investors to better understand systemic pricing risks and promoting price discovery by providing more market information. This in turn led to lower adverse selection costs and improved market liquidity. However, Roy and Kappagoda (2016) advocate for developing countries to be prudent in their borrowing strategies in both domestic and international markets due to the consequences of financial market volatility.

2.4 Research Gap

The relationship between external public debt and economic growth has been widely studied to reveal effects such as availability of funds for specific government projects (Amira, 2004) or crowding out of private investments where the debt exceeds optimal levels (Sami & Mbah , 2018). However, when it comes to the stock market, research is quite scant. According to Lim (2020), while the empirical relationship between public debt and economic growth has been well-researched, there is a gap in terms of understanding the nexus between equity market performance and public debt. This statement also holds for the Kenyan market.

In Kenya, several studies have been conducted on the variables that affect stock market performance, specifically the macroeconomic factors. Research by (Gatuhi, Gekara, & Muturi, 2015) and (Kiboi & Katuse, 2015) established that exchange rates and interest rates significantly influenced stock market returns for the firms listed at the Nairobi Securities Exchange (NSE). In a separate study Ouma and Muriu, (2014) determined money supply to be positively correlated with stock market returns at the NSE and while exchange rates exhibited negative correlation, interest rates had no significant impact in the long run. However, what remained evident in most of the studies was the lack of inclusion of public debt as a variable.

Meme and Muturi (2016) attempted to fill this gap by exploring the relationship between the various classes of government domestic debt and the NSE 20 Share Index through a multiple regression model. The study showed that stock market performance was positively and significantly influenced by the central bank overdraft to the government and commercial bank advance variables while treasury bonds and bills had a negative but insignificant influence on stock market performance. Still, there are limited to no studies examining the influence of external public debt on stock market performance in Kenya. Therefore, this research aims to fill this gap by determining the impact of the various classes of external public debt on stock market performance in Kenya.

2.5 Conceptual Framework

The dependent variable for this study will be a performance indicator specifically, the NSE All Share Index (Osoro & Ambrose, 2013).This is measured by a weighted average of all the counters at the Nairobi Securities Exchange. The independent variables for this study will be the various categories of external public debt since the goal is to determine the impact that external government debt has on the Kenyan stock market. These have been highlighted in such as (Amoa, 2020), (Nwakoby & Ezeaku, 2021), (Raddatz, 2011) and (Dittmar & Yuan, 2008). The other independent variables include domestic public debt, interest rates and exchange rates (Gatuhi, Gekara, & Muturi, 2015; Kiboi & Katuse, 2015; Meme & Muturi, 2016). Figure 3 illustrates the interrelationships among the identified dependent and predictor variables.

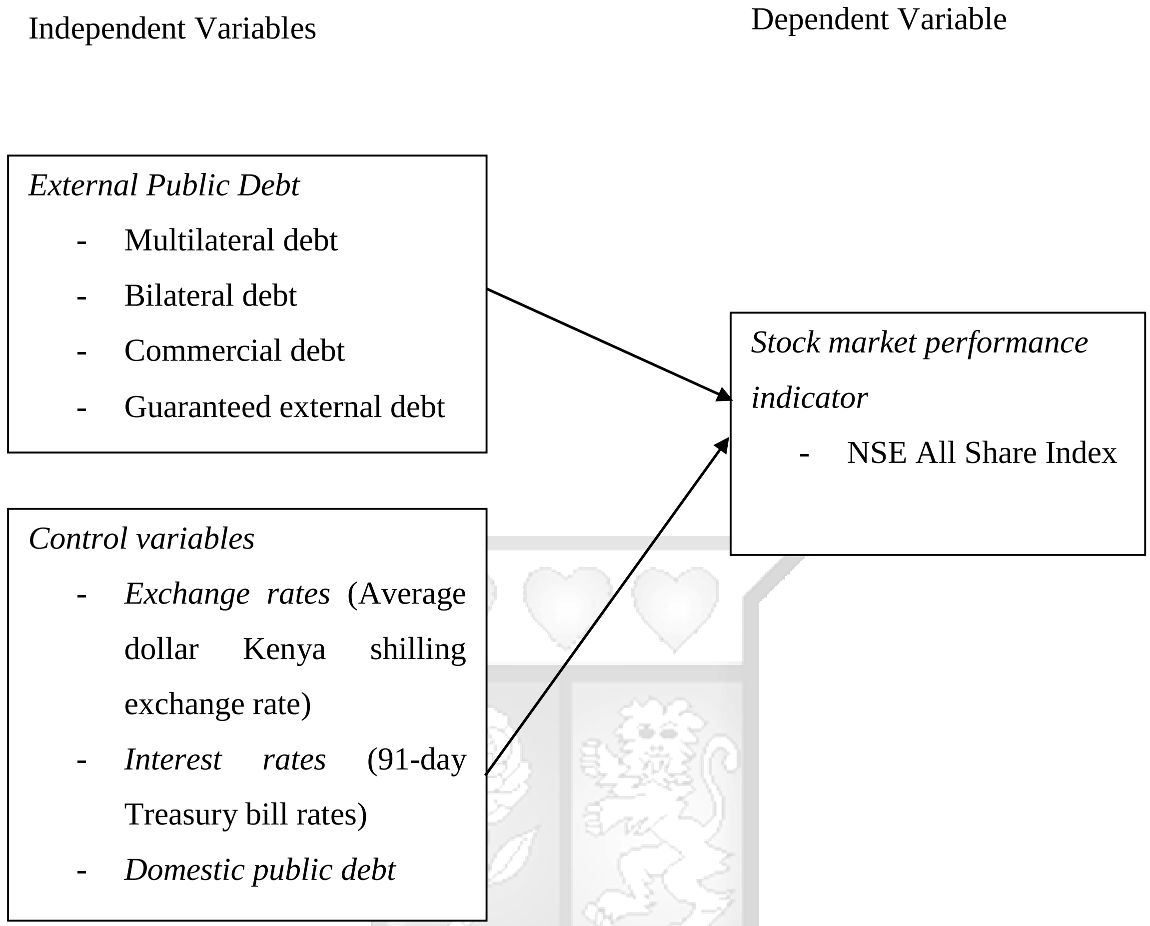


Figure 3: Conceptual framework

2.6 Discussion of the variables

Stock market performance has been measured using various variables in different studies including stock market turnover, market capitalization and the NSE 20 index. This research uses the NSE All Share index. Based on past research, the expected relationship between stock market performance and external debt is negative as highlighted in (Muhammad , Jawad, Muhammad , & Ijaz, 2020). As established in (Gatuhi, Gekara, & Muturi, 2015), (Kiboi & Katuse, 2015) and (Meme & Muturi, 2016) the study also expects interest rates, exchange rates and domestic public debt to negatively influence stock market performance.

2.7 Operationalisation of the study's variables

Based on the variables presented in Figure 3, Table 1 presents the variable definitions.

Table 1: Variable operationalization

Variable	***Type***	***Measurement***	***Supporting literature***	***Supporting theory***
Dependent variable				
NSE All Share Index	Continuous	Weighted based on the market capitalization of all the companies listed at the NSE	(Osoro & Ambrose, 2013).	Arbitrage Pricing Theory (APT)
Independent variables				
Multilateral debt	Continuous	Value of external funding from multilateral organizations such as IMF and World Bank	(Murungi & Okiro, 2018; Raddatz, 2011); (Lora & Olivera, 2007) (Nemlioglu & Mallick, 2020)	Macro-model APT
Guaranteed external debt	Continuous	The portion of debt which the public sector does not hold but has a duty to cover.	(Kharunda & Tinyinondi, 2018)	Macro-model APT
Bilateral debt	Continuous	The value of foreign development aid granted by other countries to the Kenyan government	(Nwakoby & Ezeaku, 2021)	Macro-model APT
Commercial debt	Continuous	Value of debt from external commercial banks, sovereign	(Dittmar & Yuan, 2008)	Macro-model APT

		bond issuances and suppliers’ credit		
Control variables				
Interest rates	Continuous	91-day Treasury bill rates	(Kiboi & Katuse, 2015)	Macro-model APT
Exchange rates	Continuous	Average dollar Kenya shilling exchange rate	(Gatuhi, Gekara, & Muturi, 2015)	Macro-model APT
Domestic public debt	Continuous	Value of domestic government debt	(Meme & Muturi, 2016)	Macro-model APT

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Following the outlined research objectives and questions, this chapter contains information on the research design, research philosophy, population, sampling technique, data collection and analysis. The chapter determines secondary data collection methods and specifies an autoregressive distributed lag (ARDL) model employed in analyzing the data to evaluate the impact of external public debt on stock market performance in Kenya. This is in line with the techniques used by studies such as (Sami & Mbah , 2018) and (Sothan, 2018).

3.2 Research philosophy

The study exploited an ontological research philosophy with a positivist epistemological criterion. Tuli (2010) relates ontology to the nature of reality and describes it in two forms, objectivism and constructionism. The author defines objectivism as the position that things exist as a purposeful reality notwithstanding the social actors affected by their existence while constructionism presumes that reality is a consequence of social processes.

The study embraced a positivist approach. According to Tuli (2010), a positivist researcher is more likely to lean towards quantifiable observations that loan themselves to statistical analysis. This entails gathering data on an observable reality from which you determine consistencies and causal relationships to establish law-like generalisations. Therefore, the study utilized a positivist – deductive inference to draw conclusions from the analysis.

3.3 Research design

Gatuhi et al. (2015) define a research design as the framework used to decipher research questions. The study employed a descriptive correlational research design to determine the impact of external public debt on stock market performance in Kenya. According to Williams (2007), the goal of the descriptive research approach is to examine a situation based on an observational basis or research the correlation between two or more phenomena hence exploring the predictability of one variable based on information available on a different one. This is consistent with the present study which sought to investigate the relationship between bilateral debt, multilateral debt, external commercial debt, guaranteed external debt and the NSE All Share Index. Meme and Muturi (2016) successfully adopted this design in their research on the relationship between government domestic debt and stock performance in Kenya.

3.4 Population of the Study

The unit of observation for the study was the Nairobi Securities Exchange as valued by the NSE All Share Index as of 31 December 2021. Given that the unit of observation for the study was the entire stock market, no sampling process was conducted.

3.6 Data collection methods

The study used monthly, secondary time series data in its analysis to meet the specific objectives previously highlighted. Data on the NSE All Share Index (NASI) was obtained from the Capital Markets Authority (CMA), public debt data was acquired from the National Treasury while information on interest rates and exchange rates was obtained from the Central Bank of Kenya (CBK) website. The period covered was from 2015 to 2021 which was consistent with studies such as Meme and Muturi (2016) and Irfan et al. (2020) who exploited time periods of more than five years.

3.7 Data analysis

According to Gatuhi et al. (2015), data analysis is the process of understanding the data that has been collected with the aim of identifying patterns and appropriate details uncovered during the investigation.

3.7.1 Descriptive statistics

For this study, the quantitative data collected was sorted, cleaned and input into a statistical analysis tool to provide both descriptive and inferential statistics that guided the study's univariate and multivariate analyses. Descriptive statistics provide information on the central tendency (mean, mode and median) and dispersion of the data (Saunders, Lewis, & Thornhill, 2012). This was especially significant in tests for normality.

3.7.2 Econometric model

The equation below shows the econometric model that was used to regress the dependent variable on the independent variables.

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 \sum_{j=1}^{n} Controls_{it} + \varphi_t + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where Y = The dependent variable (NASI) at time t.

β_0 = Constant

β_i = Corresponding coefficients for the independent variables; multilateral debt at time t (X_{1t}), guaranteed external debt at time t (X_{2t}), bilateral debt at time t (X_{3t}) and external commercial debt at time t (X_{4t}).

φ_t = control for time to capture the difference in periods.

ε_{it} = Error term at time t.

The controls include: *Interest Rate, Exchange Rate and Domestic Public Debt*

Following Mbah et al. (2016) this study adopted the ARDL bound testing model to measure the long-run equilibrium relationship and determine the direction of causality between the variables.

3.7.3 Unit root test

Unit root tests are used to address the null hypothesis of the existence of a unit root and an alternative hypothesis of a stationary time series, where a unit root involves a trend in the time series data (Herranz, 2017). According to Sami and Mbah (2018), as compared to the standard Johansen cointegration approach, the ARDL framework uses a single reduced form equation with variables identified to be integrated of both order zero I(0) and order one I(1). As such, the Augmented Dickey Fuller (ADF) test was used to determine the stationarity of the variables. For the ADF test, the null hypothesis on non-stationarity is rejected when the test statistic value is higher than the critical value at the desired level of significance (Emeka & Aham, 2016).

3.7.4 Autoregressive Distributed Lag (ARDL) model

The use of the ARDL model is in line with similar studies in this area of research. This includes studies such as (Sothan, 2018) and (Sami & Mbah , 2018). The ARDL model is a model that has both lagged values of the dependent variables (autoregressive) and lagged values of the independent variables (distributed lag) as one of the explanatory variables (Mbah, Agu , & Umunna , 2016). It allows different optimal lags to be used for different variables which is not the case for the conventional cointegration test. The steps below are used in the ARDL approach.

3.7.4.1 Lag length estimation

As in Mbah et al. (2016) a lag length test was performed using a single equation VAR and lag length criteria to obtain the optimal number of lags for each variable. It was necessary to determine the appropriate lag length for each of the underlying variables in the model in order to have Gaussian error terms that are not autocorrelated or suffer from heteroskedasticity (Emeka & Aham, 2016). The study used the Akaike information criterion (AIC) to determine the optimal lag length of the variables. The model with the smallest standard errors, information criteria estimates and high coefficient of determination performs relatively better (Emeka & Aham, 2016).

3.7.4.2 Investigation of a long run relationship

Wald tests were conducted to achieve F-statistics which were used to test for the existence of a long-run relationship between the variables. This is the bound test for cointegration which entailed the specification of upper and lower bound critical values from the I(1) and I(0) series, respectively. At a 5% level of significance, where an F-statistic is below the lower bound value, we fail to reject the null hypothesis of no cointegration among the variables and therefore conclude that there is no evidence of a long-run relationship among the variables irrespective of the order of integration of the variables.

3.7.4.3 Error correction mechanism

From the bound test result, where it is determined that the variables are co-integrated, it is necessary to specify both a short run ARDL model and a long run Error Correction Model (ECM). This is because there may exist disequilibrium in the short run which can be corrected by an error correction mechanism (Sami & Mbah, 2018). Where the variables are not co-integrated, only the short run ARDL model is specified. Where a long run ARDL model is specified, a granger causality test is important to establish the direction of the causal link between the variables.

3.7.5 Additional tests

The model was tested on the basis of test hypotheses to deduce its fitness on the data. To determine the significance of each of the predictor variables, the p-values were evaluated at a 95% confidence level. We failed to reject the null hypothesis where the p-value happened to be greater than the 5% level of significance. The goodness-of-fit for the model was also determined using the r-squared and adjusted r-squared statistics to determine how well variations in the dependent variables can be explained by the independent variables. In addition, the variables were also be tested for normality, autocorrelation and homoscedasticity.

3.8 Research quality

This speaks to whether the findings and conclusions from a study can withstand even the closest investigation. To gauge this, we test for reliability, internal and external validity as well as construct validity (Saunders, Lewis, & Thornhill, 2012).

3.8.1 Reliability and objectivity of the research

Reliability refers to whether your data collection methods and analytic techniques would provide similar findings if they were replicated by another researcher on a different instance (Saunders, Lewis, & Thornhill, 2012). It is a test of consistency that is threatened by errors either from the researcher or participants or bias from either party. For the current study reliability was addressed by ensuring secondary data was derived from credible sources such as the Capital Markets Authority, Central Bank of Kenya website and the National Treasury. The analytic procedure was also in line with previous studies such as Mbah, Agu, and Umunna (2016) and Sami & Mbah (2018), but was customized to address the objectives of the study.

3.8.2 Validity

This is expressed in three different forms: construct, internal and external validity. Construct validity refers to the degree to which your research measures actually meet your objectives, internal validity is met when your research establishes causality between two variables while external validity is determined when the study's findings can be deduced by other relevant settings or groups (Saunders, Lewis, & Thornhill, 2012). For the present study, validity concerns were addressed through cleaning and sorting data before use as well as adequate model diagnostic tests to reveal any form of inadequacy, hence accurately controlling the possibility of making a Type I error. These tests include test for normality, autocorrelation and homoscedasticity.

3.9 Ethical considerations

Ethics are the researcher's standards of behavioral conduct as concerns all those who are impacted by the research (Saunders, Lewis, & Thornhill, 2012). In order to address the ethical concerns, the study utilized publicly available data from the CMA, CBK and National Treasury therefore protecting against any form of breach of confidentiality associated with private information. To prevent plagiarism, all information obtained from other studies was properly cited. The study also sought a research permit from the National Commission for Science, Technology & Innovation (NACOSTI) which spoke to the quality of research.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter provides the analysis of data and interpretation of research findings. It first presents descriptive statistics and diagnostic tests conducted in line with the study's objectives. This is followed by the application of the ARDL model to determine the impact of external public debt on stock market performance in Kenya.

4.2 Descriptive statistics

In this section, the mean, standard deviation, minimum and maximum values were determined.

Table 2: Summary of descriptive statistics

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
NASI	84	154.26	15.75	122.23	191.23
Bdebt (million)	84	764,488.30	240,031.10	346,506.30	1,094,899.00
Mdebt (million)	84	997,431.00	326,497.80	601,980.90	1,782,085.00
Cdebt (million)	84	738,530.50	300,343.20	272,464.00	1,135,655.00
Gdebt (million)	84	114,620.90	51,026.59	41,261.33	171,725.60
Ddebt (million)	84	2,508,571.00	786,260.80	1,334,643.00	4,032,368.00
Er	84	103.38	4.18	91.42	113.14
Ir	84	8.04	2.04	6.11	19.47

(KEY: NASI = NSE All Share Index; Bdebt = Bilateral debt; Mdebt = Multilateral debt; Cdebt= Commercial debt; Gdebt = Guaranteed debt; Ddebt = Domestic debt; Er = Exchange rate; Ir = Interest rate)

The results in Table 2 indicate the mean value of NASI as 154.26 with a standard deviation of 15.75, a minimum value of 122.23 and a maximum of 191.23. This implies that on average the stock market recorded a monthly All-Share Index of 154.26 during the period under study.

Bilateral debt posted an average monthly value of Kshs. 764,488.30 million with a minimum value of Kshs. 346,506.30 million against a maximum value of Kshs. 1,094,899 million. This indicates that bilateral public debt experienced a lot of fluctuation over the period as evidenced by the standard deviation of 240,031.10 million.

The results on multilateral debt similarly depicted significant variation in the values with a maximum of Kshs. 1,782,085 million, minimum of Kshs. 601,980.90 million, mean of Kshs. 997,431 million and a standard deviation of Kshs. 326,497.80. This shows that on average, the government had a monthly multilateral debt of Kshs. 997,431 million.

The descriptive analysis findings on external commercial debt showed the values ranged between Kshs. 272,464 million and Kshs. 1,135,655 million with an average value of Kshs. 738,530.50 and standard deviation of Kshs. 300,343.20 million. This implies that over the period under study, the country's average commercial debt was Kshs. 738,530.50 million per month.

Data on guaranteed external debt recorded an average of Kshs. 114,620.90 million with a standard deviation of Kshs. 51,026.59, and values ranging between Kshs. 41,261.33 million and Kshs. 171,725.60 million. These values showed lower variation as compared to domestic public debt which posted a maximum value of Kshs. 4,032,368 million, a minimum value of Kshs. 1,334,643 million and a mean of Kshs. 2,508,571 million. The standard deviation of Kshs. 786,260.80 million also evidenced the large deviation from the mean.

The exchange rate measured by the average dollar Kenya shilling rate had a mean of 103.38 with a standard deviation of 4.18 and values ranging between 91.42 and 113.14. For the interest rate measured by the 91-day Treasury bill rates, the minimum value was 6.11% and the maximum value was 19.47%. The average rate for the period was 8.04% with a standard deviation of 2.04%.

4.3 Diagnostic test results

Diagnostic tests were conducted to ensure the assumptions of the classical linear regression model were not violated. The tests include tests for normality, heteroscedasticity, autocorrelation and stationarity.

4.3.1 Normality test

The Jarque Bera test statistic was used to test for normality based on the hypothesis below:

H_o: The sample data is normally distributed

H_a: The sample data is not normally distributed

The summary results are shown in table 3.

Table 3: Normality test result

Statistic	**Chi2**	**Prob > chi2**
Jarque Bera	2.152	0.3409

As per the results in table 3, the resultant p-value is 0.3409 with a Chi-Square statistic of 2.152. Given that the value is greater than a significance level of 0.05, the null hypothesis cannot be rejected hence the sample data is normally distributed.

4.3.2 Test for heteroscedasticity

The Breusch-Pagan test was used to test for heteroscedasticity based on the following hypothesis:

H_o: Residuals are homoscedastic

H_a: Residuals are not homoscedastic (heteroscedastic)

The results are as given in table 4.

Table 4: Heteroscedasticity test result

Test	**Chi2**	**Prob > chi2**
Breusch-Pagan test	0.08	0.7789

From the results, the p-value of 0.7789 is greater than 0.05 and therefore the null hypothesis in not rejected. This concludes that the residuals are homoscedastic.

4.3.3 Test for autocorrelation

Based on a null hypothesis of no autocorrelation, the Breusch – Godfrey LM test was used to test whether the error terms were uncorrelated. The findings in table 5 indicate absence of serial correlation as the p-value of 0.7866 is greater than a significance level of 0.05 hence the null hypothesis is not rejected.

Table 5: Autocorrelation test result

Test	**Chi2**	**Prob > chi2**
Breusch – Godfrey LM test	0.073	0.7866

Similarly, the Durbin Watson test statistic recorded a value of 2.015 which is well within the acceptable range of 1.80 to 2.20. This also implies the lack of autocorrelation between the error terms.

Table 6: Durbin Watson test result

Durbin-Watson test statistic	2.01596

4.3.4 Stationarity test

The study used the Augmented Dickey Fuller test to examine the presence of a unit root in the variables. The test was based on a null hypothesis of non-stationarity and was critical to justify the use of the ARDL model which is used when variables are determined to be of mixed stationarity. The results are as shown below.

Table 7: Unit root test

Variable	Level			First difference		
	t-stat	p-value	Status	t-stat	p-value	status
NASI	-2.296	0.1733	Non-stationary	-5.235	0.000	Stationary
LNbDEBT	-2.487	0.1186	Non-stationary	-7.716	0.000	Stationary
LNmDEBT	1.072	0.9950	Non-stationary	-5.590	0.000	Stationary
LNcDEBT	-1.607	0.4800	Non-stationary	-5.184	0.000	Stationary
LNgDEBT	-1.449	0.5587	Non-stationary	-8.288	0.000	Stationary
LNdDEBT	-0.907	0.7855	Non-stationary	-7.073	0.000	Stationary
ER	-2.329	0.1628	Non-stationary	-5.006	0.000	Stationary
IR	-3.484	0.0084	Stationary			

(KEY: NASI = NSE All Share Index; LNbDebt = Natural log of Bilateral debt; LNmDebt = Natural log of Multilateral debt; LNcDebt = Natural log of Commercial debt; LNgDebt = Natural log of Guaranteed debt; LNdDebt = Natural log of Domestic debt; ER = Exchange rate; IR = Interest rate)

The results in Table 7 strengthen the case for the application of the ARDL model since at level form all variables apart from interest rates are non-stationary. This is because the p-values of the ADF test statistics for the variables were greater than 0.05 hence not statistically significant and the null hypothesis of non-stationarity is not rejected. At first difference, all variables are stationary.

4.3.5 CUSUM test

The Cumulative Sum of Recursive Residuals (CUSUM) test was used to determine the stability of the model under the null hypothesis that all coefficients were stable. As in figure 4, the CUSUM graph lies within the critical bounds at a 95 percent confidence level hence the study failed to reject the null hypothesis.

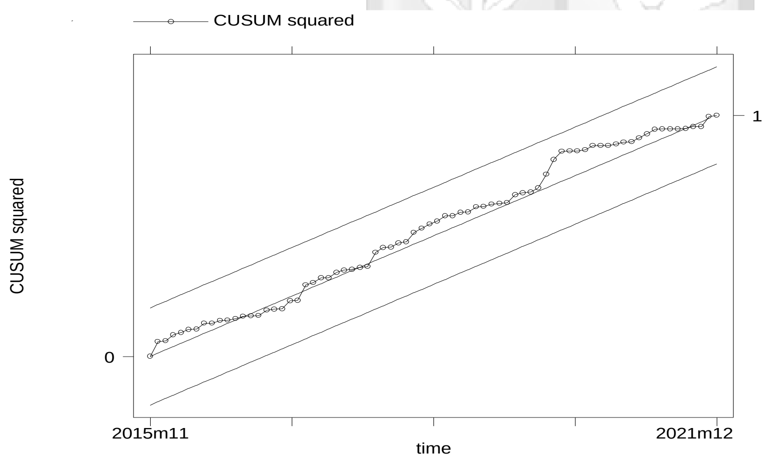


Figure 4: Model Stability test

4.4 Lag length estimation

Optimal lag lengths are determined using minimum values of either AIC, SIC or HQC estimates in order to estimate the correct ARDL F-statistic. In this case, the study used the AIC technique, and the results are as given in table 8 with asterisks (*) for the optimal lag selected

Table 8: Optimal lags

	NASI	**LNbDebt**	**LNmDebt**	**LNcDebt**	**LNgDebt**	**LNdDebt**	**ER**	**IR**
Lags	**Akaike information criterion**							
0	8.34002	0.572444	0.34401	1.21883	1.52519	0.492323	5.33842	4.22435
1	6.73554	-3.6948	-3.8554	**-2.15073***	-1.1545	-5.68396	3.0286	2.57197
2	6.75482	-3.73769	-3.8838	-2.12674	**-1.2436***	-5.67592	**2.95134***	3.59118
3	**6.72016***	**-3.74427***	**-3.8943***	-2.14322	-1.23733	**-5.68678***	2.97053	3.52043
4	6.72578	-3.71931	-3.87743	-2.12483	-1.23072	-5.66304	2.97257	**3.53223***

From the table, the lags length selected for NASI, LNbDebt, LNmDebt, LNcDebt, LNgDEBT, LNdDebt, ER and IR are 3, 3, 3, 1, 2, 3, 2 and 4 respectively. Therefore, the generalized ARDL model is specified as follows:

$$Y_t = \beta_{0i} + \sum_{i=1}^{p} \delta_i Y_{t-1} + \sum_{i=0}^{q} \beta_1 lnX_{1_{t-1}} + \sum_{i=0}^{q} \beta_2 lnX_{2_{t-1}} + \sum_{i=0}^{q} \beta_3 lnX_{3_{t-1}} + \sum_{i=0}^{q} \beta_4 lnX_{4_{t-1}} + \sum_{i=0}^{q} \beta_5 X_{5_{t-1}} + \sum_{i=0}^{q} \beta_6 X_{6_{t-1}} + \sum_{i=0}^{q} \beta_7 lnX_{7_{t-1}} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots (2)$$

Where:

β_0 and δ are Constants

i = 1…. k which represents the number of variables in the model

P and q represent optimal lag orders for dependent and independent variables respectively

Y_t= The dependent variable (NASI) at time t.

β_i = Corresponding coefficients for the independent variables; multilateral debt at time t (X_{1t}), guaranteed external debt at time t (X_{2t}), bilateral debt at time t (X_{3t}) and external commercial debt at time t (X_{4t}).

ε_{it} = Error term at time t.

The controls include *Interest Rate, Exchange Rate and Domestic Public Debt* where (X_{5t}) is interest rate at time t, (X_{6t}) is exchange rate at time t and (X_{7t}) is domestic public debt at time t.

4.5 Bounds test for Cointegration

To determine the presence of cointegration between the variables, the study used the Pesaran, Shin and Smith bound test for cointegration.

H_o: Variables are not cointegrated

H_a: Variables are cointegrated

The cointegration test results are presented in table 9.

Table 9: Cointegration test results

Statistic	Obtained value	Critical value at 10%		Critical value at 5%	
		I (0)	**I (1)**	**I (0)**	**I (1)**
f-stat	4.064	2.021	3.373	2.369	3.865
t-stat	-4.445	-2.423	-4.025	-2.766	-4.437

The F-stat of 4.064 is higher than critical values at both 10% and 5%. Similarly, the t-stat value of -4.445 is lower than critical values at 10% and 5%. Both t-stat and f-stat values show the existence of cointegration among the variables hence the null hypothesis of no cointegration is rejected. This confirms a long run relationship exists between the variables. Given that the variables are cointegrated, the below combined short run and long run Error Correction Model (ECM) is specified.

$$\Delta lnY_t = \rho_0 + \sum_{i=1}^{p} \rho_{1i} \, \Delta lnY_{t-1} + \sum_{i=0}^{q} \rho_{2i} \, \Delta lnX_{1_{t-1}} + \sum_{i=0}^{q} \rho_{3i} \, \Delta lnX_{2_{t-1}} + \sum_{i=0}^{q} \rho_{4i} \, \Delta lnX_{3_{t-1}} + \sum_{i=0}^{q} \rho_{5i} \, \Delta lnX_{4_{t-1}} + \sum_{i=0}^{q} \rho_{6i} \, \Delta X_{5_{t-1}} + \sum_{i=0}^{q} \rho_{7i} \, \Delta X_{6_{t-1}} + \sum_{i=0}^{q} \rho_{8i} \, ln\Delta X_{7_{t-1}} + \rho_9 lnY_{t-1} + \rho_{10} lnX_{1_{t-1}} + \rho_{11} lnX_{2_{t-1}} + \rho_{12} lnX_{3_{t-1}} + \rho_{13} lnX_{4_{t-1}} + \rho_{14} X_{5_{t-1}} + \rho_{15} X_{6_{t-1}} + \rho_{16} lnX_{7_{t-1}} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots \quad (3)$$

Where the coefficients of first differenced variables $\rho 2i$, $\rho 3i$, $\rho 4i$, $\rho 5i$, $\rho 6i$, $\rho 7i$, $\rho 8i$ the short run effects of the external debt categories and the control variables on the stock market performance in Kenya. The long run effects are presented by the coefficients of lagged external debt categories and control variables, $\rho 10$, $\rho 11$, $\rho 12$, $\rho 13$, $\rho 14$, $\rho 15$, $\rho 16$ normalized on $\rho 9$.

4.6 ARDL Model

The ARDL framework was used because the variables in the model were identified to be integrated of both order zero I(0) and order one I(1). Given that the variables are cointegrated, both long run and short run coefficients are estimated by an ARDL Error Correction Model. For the model to be convergent, the Error Correction Term is required to be significantly negative.

Table 10: ARDL Results

D.NASI		Coef.	t-stat	p-value
	ECT	**-1.199**	**-4.45**	**0.000*** **
Long Run				
	LNbDebt	**63.005**	**3.25**	**0.002*** **
	LNmDebt	**33.878**	**1.94**	**0.058***
	LNcDebt	5.289	0.75	0.459
	LNgDebt	-2.600	-0.42	0.675
	LNdDebt	**-101.510**	**-3.01**	**0.004*** **
	ER	0.123	0.16	0.875
	IR	**-1.456**	**-1.82**	**0.074***
Short Run				
NASI	LD	-.0424	-0.20	0.844
	L2D	-.0206	-0.14	0.887
LNbDebt	D1	-54.378	-1.53	0.131
	LD	-50.688	-1.56	0.125
	L2D	-13.337	-0.54	0.589
LNmDebt	D1	-35.578	-1.05	0.297
	LD	-19.185	-0.61	0.546
	L2D	-40.513	-1.52	0.135
LNcDebt	D1	-11.777	-1.01	0.318

LNgDebt	D1	1.846	0.23	0.817
	LD	-.357	-0.05	0.958
LNdDebt	D1	110.620	1.52	0.126
	LD	108.743	1.54	0.130
	L2D	-13.028	-0.18	0.857
ER	D1	**-2.758**	**-2.69**	**0.010****
	LD	1.279	1.15	0.255
IR	D1	1.012	1.12	0.268
	LD	-0.608	-0.69	0.495
	L2D	0.894	1.26	0.212
	L3D	-0.572	-0.77	0.442
C		158.647	1.19	0.238
Observations		80		
r-squared		**0.7573**		
Adj. r-square		**0.6241**		

**** Statistically Significant at 1%; ** Statistically Significant at 5%; * Statistically Significant at 10%*

The ARDL output is shown in Table 10. The ECT value of -4.45 shows the model converges to the equilibrium.

For the long run coefficients, multilateral debt (LNmDebt), bilateral debt (LNbDebt), domestic debt (LNdDebt) and interest rates (IR) are determined to be significant. At 1% level of significance, bilateral debt (LNbDebt) has a positive long-term effect on NASI. The corresponding coefficient of 63.005 shows that a 1% increase in the country's bilateral debt increases, increases NASI on average by 63% signifying better performance of the stock market in the long run. Similarly, multilateral debt (LNmDebt) is significantly positive at 10% with a coefficient value of 33.878. This shows that holding all else constant a 1% increase in multilateral debt leads to a 34% increase in NASI.

The effect of domestic debt (LNdDebt) on NASI is significantly negative at less than 1% level of significance. With the negative coefficient of -101.510, a percentage increase in domestic debt in the country would lead to a corresponding decrease in the All-Share index. Similarly, interest rate (IR) has a negative long-term effect on the NSE All Share Index (NASI) at less than 10%. This is supported by the negative coefficient of -1.456 which shows that a 1% increase in interest rates will lead to a 1% decrease in the value of NASI. In the long run, commercial debt (LNcDebt), guaranteed external debt (LNgDebt) and exchange rate (ER) have no significant impact on NASI at 1%, 5% or 10% level of significance.

For the short run coefficients, no variable is found to have a significant effect on NASI except exchange rate (ER) that is significantly negative at 5%. Exchange rate posts a coefficient of -2.758 which means that a percentage increase in exchange rates in the short run causes a subsequent decrease in NASI.

The r-squared and adjusted r-squared are found to be 75.7% and 62.4% percent respectively. This shows that the model has good explanatory power as 76% of the variation in NASI can be explained by the independent variables in the model.

4.7 Granger Causality

The existence of cointegration in the model proved the presence of granger causality in at least one direction. The Granger causality test was used to determine the causal link between external public categories and the NSE All Share Index in Kenya.

Table 11: Granger causality test results

Equation	Chi2	df	Prob>chi2
Causality from LNbDebt to NASI	**11.401**	**2**	**0.003*** **
Causality from NASI to LNbDebt	0.7707	2	0.680
Causality from LNmDebt to NASI	**5.8698**	**2**	**0.053** **
Causality from NASI to LNmDebt	3.5093	2	0.173
Causality from LNcDebt to NASI	0.02435	2	0.988
Causality from NASI to LNcDebt	0.19043	2	0.909
Causality from LNgDebt to NASI	0.39564	2	0.821
Causality from NASI to LNgDebt	6.7369	2	0.034
Causality from LNdDebt to NASI	9.2484	2	0.010

Causality from NASI to LNdDebt	0.4617	2	0.794
Causality from ER to NASI	0.11069	2	0.946
Causality from NASI to ER	**7.0979**	**2**	**0.029****
Causality from IR to NASI	4.4547	2	0.108
Causality from NASI to IR	**6.8964**	**2**	**0.032****

**** Statistically Significant at 1%; ** Statistically Significant at 5%; * Statistically Significant at 10%*

The results in table 11 show the presence of a unidirectional relationship from bilateral debt (LNbDebt) and (multilateral debt) LNmDebt granger to (NSE All-Share Index) NASI. This means that values of multilateral and bilateral debt can be used to predict the stock market performance measured by NASI. This is because, when forecasting the values of NASI, in addition to using the past values of NASI, the past values of bilateral and multilateral also contain information that can be used to predict future values of NASI. A further unidirectional relationship also exists from NASI to (exchange rate) ER and (interest rates) IR.

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The aim of this research was to evaluate the impact of external public debt on stock market performance in Kenya. This chapter provides the discussions, conclusions, recommendations, areas for further study and limitations of the research. The discussion links the findings of the study to past literature and to theory.

5.2 Discussion of findings

5.2.1 Multilateral debt and stock market performance

One of the study's specific objectives was to investigate the relationship between multilateral debt and stock market performance in Kenya which was measured by NASI. The findings revealed that multilateral debt had no significant effect on NASI in the short run but had a positive significant effect in the long run.

The findings are in line with previous literature which support the use of multilateral lending for capital formulation. Raddatz (2011) determined that announcements on multilateral debt relief initiatives postively affected the stock prices of South African companies due to increased investor confidence in the market. Similarly, Ezeaku et. al (2020) also found multilateral concessional loans to positively affect economic growth. In these instances, efforts by the multinationals to reduce debt vulnerabilities by the affected countries promote the accumulation of capital and increased investments (Irfan , Akbar, Rao, & Younis, 2020). During the period under review, Kenya received debt relief initiatives from the IMF and World Bank which further support the findings of the study. In addition, the findings are in line with both the macroeconomic APT model and the efficient market hypothesis given that better prospects of market performance contribute to improved stock market performance.

5.2.2 Guaranteed external debt and stock market performance

The second objective was to determine the nexus between guaranteed external debt and stock market performance. The findings showed that in both the short and long run guaranteed external debt had no effect on NASI. As such, guaranteed external debt would not be considered a factor that affects stock market returns in the macroeconomic APT model. The results differ from past research conducted by Kharunda and Tinyinondi (2018) who used an ARDL model to establish a positive relationship between the economic growth of EAC member countries and the public and publicly guaranteed debt. As determined by previous research, to the effect that public debt has an effect on economic growth, it will also impact the performance of the stock market (Meme & Muturi, 2016).

5.2.3 Bilateral debt and stock market performance

The study also explored the extent to which bilateral debt influences stock market performance in Kenya. Similar to multilateral debt, bilateral debt had no effect on NASI in the short run but had a significant positive effect in the long run. Given that (Nyanaro & Elly, 2017) and (Tachiwou , 2010) determined a positive relationship between stock market performance and economic growth, the findings conflict with those of Dey and Tareque (2020) who established that bilateral debt impedes economic growth. However, where bilateral debt is concessional in nature and funds are employed in productive activities, this promotes economic growth as standards of living are improved, eventually having a positive effect on stock market returns (Maqbool, Hameed, & Habib, 2018). Additionally, the granger causality test provided a unidirectional relationship from bilateral debt to NASI showing that past variables of bilateral debt can be used to predict stock market performance, further supporting the efficient market hypothesis and the macroeconomic APT.

5.2.4 Commercial debt and stock market performance

The final specific objective examined the effect of external commercial debt on stock market performance in Kenya. The results show that commercial debt has no impact on NASI in both the short run and long run and would therefore not be a considered a factor in the macroeconomic APT model. The findings differ from those of Dittmar and Yuan (2008) who used vector autoregression to establish that sovereign bonds positively affect the corporate bond market by enhancing market liquidity in emerging economies.

5.2.5 Impact of control variables

To support the general objective, the study incorporated domestic public debt, interest rates and exchange rates as control variables. The findings revealed that only exchange rates influenced the stock market in the short run with a negative impact on NASI. This is in line with the findings of Ouma and Muriu, (2014) who established a negative relationship between exchange rates and stock market returns at the NSE. In the long run, both domestic public debt and interest rates influenced stock market performance by posting a significant negative effect on NASI. This contradicts with Ouma and Muriu, (2014) who found that interest rates had no significant impact on the stock market in the long run but is in line with (Kiboi & Katuse, 2015) who determined that interest rates significantly affect stock market returns for firms at the NSE.

5.3 Conclusion

The Kenyan capital markets play a crucial role in promoting the growth of the economy. Based on the findings of the study, of the various categories of external debt, only the multilateral and bilateral debt components have a significant effect on stock market performance in the country. As such, it is important for key capital market stakeholders, particularly the government, to drive initiatives and implement policies that will promote the local capital markets as an avenue for long term finance.

5.4 Recommendations

The findings of the study provide implications on the fiscal policy formulation and implementation by the government. The current amount of public debt composition has a higher percentage of external public debt which the government raises from multilateral, bilateral, commercial and publicly guaranteed sources. From the results of the study, both multilateral and bilateral debt have a significant and positive impact on stock market performance. In line with this, the study recommends that as the government continues to increase the country's level of bilateral and multilateral debt, it should do so within the set ceiling and the funds should be used in productive economic activities such as long-term infrastructural projects. This would promote the country's economic health in the long run, eventually fostering improved stock market performance.

The study also concluded that publicly guaranteed debt and external commercial debt had no significant impact on stock market performance in both the short and long run. Despite this result, the study recommends that the government maintains the set limit to avoid any inflationary effects that may be due to overextending these instruments.

5.5 Limitations of the study

The results of the study are applicable to the Kenyan economy and applicability to other economies should be done in consideration of the size and performance of the stock markets. In addition, part of the period under review was characterized by the Covid-19 pandemic which might have adversely affected the level of external public debt therefore increasing or decreasing its effect on the stock market during the period.

5.6 Areas of further research

The present study aimed to investigate the impact of various classes of external public debt on stock market performance in Kenya from 2015 to 2021. The study used monthly data and employed the ARDL technique to determine that the Kenyan stock market is only affected by multilateral and bilateral debt. Further studies can be performed across longer periods to determine if the findings will still hold. In addition, different measures of stock market performance such as turnover and market capitalization could also be incorporated across different samples to establish whether the relationship holds in the long run.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

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Strathmore UNIVERSITY BUSINESS SCHOOL

Wednesday, 25 May 2022

To Whom It May Concern,

RE: FACILITATION OF RESEARCH - OCHIENG' SANDRA ACHIENG'

This is to introduce **Ochieng', Sandra Achieng'**, admission number **MDF/78984/2019** who is an MSc. in Development Finance (MDF) student at Strathmore University Business School (SUBS). As part of our SBS MDF Master's Program, Sandra is expected to do applied research and to undertake a project. This is in partial fulfilment of the requirements of the Master of Development Finance. She would like to request for appropriate data from your organization to help her finalize her research.

Sandra is undertaking a research project on "**The Impact of External Public Debt on Stock Market Performance in Kenya.**" The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

The MDF program seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

Any assistance you can provide to her will be greatly appreciated and we shall be willing to provide any further information required.

Yours sincerely,

Njoki Kiagiri,
Manager-Graduate Programmes,
Strathmore University Business School

APPENDIX 2: RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 752299

Date of Issue: 22/June/2022

RESEARCH LICENSE

This is to Certify that Ms.. Sandra Ochieng of Strathmore University, has been licensed to conduct research in Nairobi on the topic: The impact of external public debt on stock market performance in Kenya for the period ending : 22/June/2023.

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APPENDIX 3: ETHICAL APPROVAL

Strathmore
UNIVERSITY

14th July 2022

Ms Achieng Ochieng Sandra,
sandra.oachieng@gmail.com

Dear Ms Achieng,

RE: The impact of external public debt on stock market performance in Kenya

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU Masters'** research proposal. Your application reference number is **SU-ISERC1401/22.** The approval period is **14th July 2022 to 13th July 2023.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-ISERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

for: **Dr Ben Ngoye,**
Secretary; SU-ISERC

Cc: Prof Fred Were,
Chairperson; SU-ISERC

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14 Jul 2022
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