

**EFFECT OF MACROECONOMIC DETERMINANTS ON COUNTY
GOVERNMENTS' INDEBTEDNESS POST-COVID-19 PERIOD IN KENYA**

KIPROP RUTH JEPCHIRCHIR

**A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS, ECONOMICS AND
MANAGEMENT SCIENCES IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE CONFERMENT OF THE DEGREE OF MASTER
OF ARTS IN ECONOMICS, UNIVERSITY OF ELDORET, KENYA**

2025

DECLARATION

Declaration by the Candidate:

This thesis is my original work and has never been presented for the award of an academic degree in any other university and should not be copied, or reproduced in any format without written authority from the author and/or University of Eldoret.

Kiprop Jepchirchir Ruth

_____ **Date** _____

SECO/AEC/M/004/23

Approval by the Supervisors:

This thesis has been submitted with our approval as university supervisors.

_____ **Date** _____

Dr. Elijah Ng'eno

School of Business, Economics and Management Sciences

University of Eldoret, Kenya

_____ **Date** _____

Prof. Paul Odwori

School of Business, Economics and Management Sciences

University of Eldoret, Kenya

DEDICATION

I dedicate this thesis to my family for their moral and financial support during my studies.

This thesis would not have been complete without the greatest academic support of my parents and the constant encouragement from all my good friends.

ACKNOWLEDGEMENT

This thesis would not have been accomplished without the support and contributions of others. Firstly, I would like to express my sincere gratitude to the Almighty God for His sufficient grace and good health, enabling me to reach this point. Secondly, my greatest appreciation goes to my supervisors, Dr. Elijah K. Ng'eno and Prof. Paul Odwori, for their unwavering guidance and support throughout the development of this thesis. Thirdly, I extend my heartfelt thanks to the University of Eldoret for providing a conducive learning environment and the knowledge I have gained during my studies. Lastly, I wish to acknowledge my parents for their understanding, encouragement, and patience, which have always motivated me. I am also deeply indebted to my family and siblings for their moral support. May the Almighty God bless you abundantly.

ABSTRACT

The indebtedness of county governments in Kenya played a critical role in shaping post-pandemic economic stability and development, influenced by several macroeconomic factors. While borrowing helped sustain county operations and resilience during the COVID-19 period, it also amplified fiscal vulnerabilities, including declining tax revenue, rising corruption levels, and increased reliance on credit. Many counties entered a debt cycle exacerbated by high-interest loan borrowing. Between 2020 and 2023, county government expenditures surged to 28% of GDP, rising further to approximately 32.1% by the 2023/2024 financial year. Simultaneously, corruption levels, measured by the average size of bribes paid to access public services, increased from Ksh 4,600 in 2019 to Ksh 7,800 in 2021 and remained high at Ksh 7,300 through 2023. This persistent rise in corruption undermined public trust, inflated the cost-of-service delivery, and likely escalated borrowing as counties struggled to fill widening fiscal gaps. In the same period, county own-source revenues, measured as a percentage of total revenue, declined, with many counties reporting shortfalls. As of the first half of the 2023/2024 fiscal year, county governments had accumulated pending bills totalling Ksh 156.34 billion. The study's overall objective is to examine the effect of macroeconomic determinants on county governments' indebtedness in post-COVID-19 Kenya, focusing on economic growth, tax revenue, government expenditure, and corruption levels. Anchored on the Keynesian Consumption Theory and Debt Accumulation Theory, the study employed a descriptive and explanatory research design using panel secondary data from 47 counties for 2020/2021 to 2023/2024. Analysis involved descriptive statistics, Pearson correlation, and panel regression. The descriptive statistics indicated that, on average, GDP growth stood at 3.4%, tax revenue at 17.2%, county governments' expenditure at Ksh 53.9 billion, corruption levels at Ksh 23,500, and county governments' indebtedness at Ksh 2.18 billion between 2020 and 2024. Pearson correlation analysis revealed that county debt was positively associated with GDP growth ($r = 0.492$), tax revenue ($r = 0.427$), government expenditure ($r = 0.668$), and corruption ($r = 0.354$). To determine the appropriate model, the Breusch–Pagan Lagrange Multiplier (LM) test was conducted, which rejected the null hypothesis that Pooled OLS is sufficient ($LM = 27.386$, $p < 0.001$), suggesting that panel data models RE was more suitable. The F-test for Fixed Effects also rejected the null hypothesis that all county-specific intercepts are equal ($F = 12.45$, $df = 46,138$, $p < 0.05$), confirming the presence of significant county-specific effects and the inadequacy of the Pooled OLS model. The Hausman Specification Test ($H = 11.752$, $df = 4$, $p = 0.05$) rejected the null hypothesis, indicating that county-specific effects were correlated with the regressors. This led to the selection of the Fixed Effects (FE) model as the preferred specification. The Fixed Effects model revealed that government expenditure ($\beta = 0.1724$, $p < 0.01$) and corruption ($\beta = 0.2611$, $p < 0.05$) had positive significant effects, tax revenue had a positive significant effect ($\beta = 0.2982$, $p < 0.05$), and GDP growth was statistically insignificant ($\beta = -0.0284$, $p = 0.05$). The study concludes that excessive spending and corruption are the main drivers of post-COVID-19 county indebtedness. It recommends enhancing fiscal discipline, enforcing strict expenditure controls, strengthening anti-corruption measures, and improving own-source revenue mobilization to reduce debt reliance and ensure sustainable county financing.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF ABBREVIATIONS AND ACRONYMS	xi
OPERATIONAL DEFINITION OF TERMS	xiv
CHAPTER ONE	1
INTRODUCTION	1
1.1 Overview	1
1.2 Background Information of the Study	1
1.3 Statement of the Problem	9
1.4 Research Objective of the Study	11
1.4.1 Main Objective	11
1.4.2 Specific Objectives	11
1.5 Research Hypotheses	12
1.6 Justification of the Study	12
1.7 Scope of the Study	13
1.8 Limitations of the Study	14
CHAPTER TWO	15
LITERATURE REVIEW	15
2.1 Introduction	15
2.2 Theoretical Framework	15
2.2.1 Permanent Income Hypothesis (PIH)	15
2.2.2 Keynesian Theory of Consumption	17
2.2.3 Debt Accumulation Theory	20
2.2.4 Financial Distress Theory	23

2.3 Review of Empirical Literature	25
2.3.1 Economic Growth and County Governments’ Indebtedness	25
2.3.2 Tax Revenue and County Governments’ Indebtedness	27
2.3.3 Government Expenditure and County Governments’ Indebtedness	30
2.3.4 Corruption Levels and County Governments’ Indebtedness	32
2.4 Knowledge Gaps	34
CHAPTER THREE	39
METHODOLOGY	39
3.1 Introduction	39
3.2 Study Area	39
3.3 Research Design	41
3.4 Target Population	41
3.5 Sampling Frame	42
3.6 Data Source and Types	43
3.6.1 Data Sources	43
3.6.2 Data Types	44
3.7 Data Collection Instruments	44
3.8 Data Collection Procedure	45
3.9 Data Analysis and Presentation	45
3.9.1 Panel Unit Root Tests	47
3.9.2 Pearson’s Correlation Analysis	50
3.9.3 Estimation Framework and Model Specification	51
3.10 Definition, Measurement of Variables and Expected Signs	57
3.11 Diagnostic Tests	58
3.11.1 Serial Correlation	58
3.11.2 Normality Test	59
3.11.3 Heteroscedasticity Test	59
3.11.4 Cross-Sectional Dependence Test	60
3.11.5 Multicollinearity Test	61
3.12 Ethical Considerations	62

CHAPTER FOUR	63
RESULTS	63
4.1 Introduction	63
4.2 Descriptive Analysis Results	63
4.3 Correlation Analysis	64
4.4 Inferential Statistics-Panel Data Analysis Results	66
4.4.1 Panel Unit Root Test Results	66
4.4.2 Breusch–Pagan Lagrange Multiplier (LM) Test	68
4.4.3 F-Test	68
4.4.4 Hausman Specification Test	69
4.4.5 Fixed Effects Model Results	70
4.5 Diagnostic Test Results	71
4.5.1 Wooldridge Test for Serial Correlation	71
4.5.2 Breusch-Godfrey LM Test Results for Serial Correlation	72
4.5.3 Normality Test Results	73
4.5.4 Heteroskedasticity Test Results	73
4.5.5 Cross-sectional Dependence (CD) Test Results	74
4.5.6 Multicollinearity Test Results	75
CHAPTER FIVE	76
DISCUSSION	76
5.1 Introduction	76
5.2 Discussion of the Descriptive Statistics Test Findings	76
5.2.1 Results on Economic Growth and County Governments’ Indebtedness	76
5.2.2 Results on Tax Revenue and County Governments’ Indebtedness	78
5.2.3. Results on Government Expenditure and County Governments’ Indebtedness	79
5.2.4 Results on Corruption Levels and County Governments’ Indebtedness	80
5.2.5 Results on County Governments’ Indebtedness	82
5.3 Inferential Results	84
5.3.1 Fixed Effect	85

CHAPTER SIX	89
CONCLUSIONS AND RECOMMENDATIONS	89
6.1 Introduction.....	89
6.2 Summary of Findings.....	89
6.2.1 Descriptive Results Summary.....	89
6.2.2 The Inferential Results Summary.....	91
6.2.3 Fixed Effects and Random Effects Model Results.....	92
6.3 Conclusions.....	95
6.4 Recommendations of the study.....	97
6.5 Recommendation for Further Studies.....	99
REFERENCES	100
APPENDICES	120
Appendix I: Map of Kenya.....	120
Appendix II: Data Collection Template.....	121
Appendix III: NACOSTI Authorization.....	122
Appendix IV: Research Permit.....	123
Appendix IV: Similarity Report.....	124

LIST OF TABLES

Table 2.1: Summary of Knowledge Gap	36
Table 3.1: Descriptions and Measurement of Variables	57
Table 4.1 Summary of Descriptive Statistics Results	64
Table 4.2: Wooldridge Test Results for Serial Correlation ...	Error! Bookmark not defined.
Table 4.3: Breusch-Godfrey LM Test for Serial Correlation	Error! Bookmark not defined.
Table 4.4: Jarque-Bera Test Results for Normality	Error! Bookmark not defined.
Table 4.5: Breusch-Pagan Test Results	Error! Bookmark not defined.
Table 4.6: Pesaran’s Cross-sectional Dependence (CD) Test	Error! Bookmark not defined.
Table 4.7: Variance Inflation Factor (VIF) Test	Error! Bookmark not defined.
Table 4.8: Correlation Analysis Results	65
Table 4.9: Panel Unit Root Test Results: Levin, Lin & Chu (LLC), IPS and ADF	67
Table 10: Breusch–Pagan Lagrange Multiplier (LM) Test Results	68
Table 11: F-Test Results	69
Table 4.12: Hausman Specification Test Statistic Results	70
Table 4.13: Fixed Effects and Random Effects Model Results	71

LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey–Fuller
AFDB	African Development Bank
AFRODAD	African Forum and Network on Debt and Development
ASEAN	Association of Southeast Asian Nations
BOP	Balance of Payments
CBK	Central Bank of Kenya
CGBIRR	County Government Budget Implementation Review Report
CHAMAS	Community-Based Savings Groups
COVID-19	Coronavirus Virus Disease 2019
CPI	Consumer Price Index
CRA	Commission on Revenue Allocation
EACC	Ethics and Anti-Corruption Commission
ECB	European Central Bank
FD	Financial Distress
FE	Fixed Effect
FSD	Financial Sector Deepening
GCP	Gross County Product
GDP	Gross Domestic Product
GLS	Generalized Least Square
GNP	Gross National Product
HFCS	County Finance and Consumption Survey
HIPC	Heavily Indebted Poor Counties

ICT	Information and Communication Technology
ILO	International Labour Organization
IMF	International Monetary Fund
IPS	Im–Pesaran–Shin
KNBS	Kenya National Bureau of Statistics
KRA	Kenya Revenue Authority
Ksh	Kenya Shillings
LCH	Life Cycle Hypothesis (LCH)
LLC	Levin, Lin, and Chu
MPC	Marginal Propensity to Consume
NACOSTI	National Commission for Science Technology and Innovation
NPLs	Non-Performing Loans
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
OSR	Own Source Resource
PCSE	Panel Corrected Standard Errors
M-Pesa	Mobile money transfer and payment service in Kenya
PFMA	Public Finance Management Act
PIH	Permanent Income Hypothesis
PPP	Purchasing Power Parity
RE	Random Effect
SARB	South African Reserve Bank
UN	United Nations

VAT	Value Added Tax
VIF	Variance Inflation Factor
WBG	World Bank Group
WTO	World Trade Organization

OPERATIONAL DEFINITION OF TERMS

Corruption Levels - This refers to the average size of bribes paid to access public services at the county level, as reported by citizens in the Ethics and Anti-Corruption Commission (EACC)'s National Ethics and Corruption Surveys. It serves as a proxy for the intensity and financial burden of corruption within each county. A higher average bribe size suggests a higher perceived level of corruption. This variable is important in understanding how governance quality may influence county governments' indebtedness during the post-COVID-19 period (Ethics and Anti-Corruption Commission, 2023).

County Indebtedness - In the context of this study, County indebtedness refers to the total amount of debt (and pending bills) that a county government has accumulated through borrowing from various sources, including national government loans, financial institutions, bonds, and other credit facilities. It represents the county's financial obligations that must be repaid over time, often with interest. The debt-to-GDP ratio expresses this indebtedness as a share of the County's annual economic output, calculated by dividing total outstanding debt by the county government's GDP, providing a gauge of its ability to manage, service, and ultimately repay its obligations relative to its economic size (Controller of Budget, 2023).

Economic Growth Rate - This refers to the annual or quarterly percentage change in Kenya's Gross Domestic Product (GDP), which measures the overall economic output. This variable reflects the overall health and performance of the economy and is crucial in understanding its impact on county debt levels post-COVID-19 (Kenya National Bureau of Statistics, 2023).

Government Expenditure - Government Expenditure refers to the income that a government collects from individuals, businesses, and other entities through various taxes. It is a primary source of funding for government operations, public services, and development projects (National Treasury, 2023).

Macroeconomic determinants-For this study, macroeconomic determinants include key economic indicators that influence the broader economic conditions in Kenya. These include the economic growth rate, government expenditure, tax revenue and corruption levels, all of which are critical to understanding the financial stability and economic environment post-COVID-19 (National Treasury, 2023).

Tax Revenue - The tax revenue refers to the income that a government collects from individuals, businesses, and other entities through various taxes. It is a primary source of funding for government operations, public services, and development projects (Commission on Revenue Allocation, 2023).

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter presents the background information of the study, the statement of the problem, objectives, hypotheses, significance, scope, and limitations.

1.2 Background Information of the Study

Government borrowing is a fundamental aspect of public finance, enabling countries to fund expenditures that enhance economic growth and national welfare. Public debt management aims to balance financing needs with sustainability by minimizing costs and mitigating risks (Melecky, 2007). In the aftermath of the 2008–2009 global financial crisis, many governments increased borrowing to stabilize their economies. The COVID-19 pandemic further amplified debt vulnerabilities, compelling governments to implement large-scale fiscal interventions such as direct financial support, stimulus packages, and low-interest credit facilities (World Bank, 2022). These measures, while necessary for economic recovery, resulted in a substantial increase in government debt levels globally, raising concerns about long-term debt sustainability (IMF, 2023).

In the United States, government debt surged due to increased fiscal stimulus spending, leading to a shift in Treasury debt maturity policies. The share of monetary financing decreased from 43% in September 2009 to 36% by 2010 (Hans & Turner, 2011). Similarly, Mallucci (2015) highlighted the composition of public debt in developed economies, showing that Australia had nearly 10% of its public debt as domestic debt,

while Austria had less than 0.30%. The debt-to-GDP ratio in major economies such as the United States, Japan, and the European Union exceeded 100% post-pandemic, signaling heightened concerns over fiscal sustainability.

In Europe, the effects of government debt accumulation varied across nations. Countries like Germany and France maintained moderate debt levels, whereas Italy and Spain faced severe fiscal stress due to pre-existing high debt burdens and pandemic-related expenditures (European Central Bank, 2022). The United Kingdom also experienced a sharp increase in public debt, reaching nearly 97% of GDP in 2022, driven by pandemic-related spending and energy subsidies (IMF, 2023). In Asia, China's government debt climbed to over 70% of GDP due to increased public spending to counter economic slowdowns, while Japan's public debt remained the highest among advanced economies, exceeding 250% of GDP (World Bank, 2023). India, similarly, saw a rise in its fiscal deficit, reaching 9.5% of GDP in 2021 due to stimulus measures (Reserve Bank of India, 2023). South Korea also witnessed an increase in its public debt, rising to 50% of GDP in 2023, driven by fiscal stimulus measures aimed at supporting businesses and households (Bank of Korea, 2023). Indonesia's debt-to-GDP ratio increased to 41% in 2023 as the government financed infrastructure projects and social protection programs (World Bank, 2023).

In Latin America, Brazil's public debt rose to nearly 90% of GDP in 2023, exacerbated by pandemic-related spending and structural fiscal deficits (Brazilian Central Bank, 2023). Argentina also faced a severe debt crisis, with its debt-to-GDP ratio surpassing

100% due to economic mismanagement and repeated defaults, necessitating IMF interventions (IMF, 2023). Similarly, Mexico experienced rising debt levels, reaching 60% of GDP in 2022, as the government increased borrowing to support pandemic recovery efforts (World Bank, 2023). Colombia's public debt also grew significantly, surpassing 70% of GDP in 2023 due to increased government spending on healthcare and social programs (Colombian Ministry of Finance, 2023).

In the Middle East, Saudi Arabia's public debt rose to 32% of GDP in 2023 as the government financed its Vision 2030 reforms while managing oil revenue fluctuations (Saudi Arabian Monetary Authority, 2023). Iran faced increasing debt challenges due to economic sanctions and inflation, with its debt-to-GDP ratio reaching 47% in 2023 (IMF, 2023). Turkey's external debt climbed to nearly 55% of GDP, driven by currency depreciation and high borrowing costs (World Bank, 2023). Egypt's government debt surged to 92% of GDP in 2023 due to large-scale public investments and external borrowing, leading to IMF-backed economic reforms (Egyptian Ministry of Finance, 2023).

African countries have historically struggled with high levels of public debt, exacerbated by weak revenue collection, reliance on external borrowing, and structural economic vulnerabilities. Before the pandemic, many African nations had embarked on debt-reduction strategies through fiscal consolidation and revenue mobilization reforms (AFRODAD, 2011). However, the COVID-19 pandemic led to economic contractions,

revenue shortfalls, and increased government borrowing to sustain public services and economic relief efforts (World Bank, 2023).

In Nigeria, government debt dates back to the 1950s, but the debt burden intensified in the late 20th century due to mismanagement and reliance on external borrowing (Eyiuche, 2013). By 2003, Nigeria's debt service payments had reached \$2.3 billion annually, prompting restructuring efforts (Okonji-Iweala *et al.*, 2003). Similarly, Malawi experienced a sharp increase in domestic debt between 2001 and 2005, leading to concerns about fiscal sustainability as debt service obligations consumed a large portion of GDP (AFRODAD, 2011). South Africa saw its debt-to-GDP ratio rise from 57% in 2019 to nearly 80% in 2023, as pandemic-related fiscal interventions and economic contraction strained public finances (South African Reserve Bank, 2023). Ghana also struggled with increasing debt levels, reaching over 90% of GDP in 2023, necessitating an IMF bailout program to restore fiscal stability (IMF, 2023).

In East Africa, Ethiopia faced a rising debt crisis exacerbated by pandemic-related borrowing and declining export revenues, with debt-to-GDP surpassing 60% (World Bank, 2023). Tanzania also experienced rising debt levels, with government borrowing increasing to 50% of GDP in 2023, driven by infrastructure projects and COVID-19 recovery spending (Bank of Tanzania, 2023). Uganda faced a similar trend, as its public debt grew to 53% of GDP in 2023, prompting the government to adopt stricter fiscal consolidation measures to prevent further debt accumulation (Mathebula, 2023).

Rwanda's debt reached 68% of GDP in 2023 due to external borrowing for infrastructure development and pandemic recovery.

In North Africa, Tunisia's debt reached 85% of GDP in 2023, with persistent fiscal deficits and a reliance on international financial institutions for debt restructuring (IMF, 2023). Algeria, while maintaining relatively lower external debt levels, saw its domestic debt increase significantly as the government financed budget deficits through internal borrowing (Alami, 2003). Morocco's debt-to-GDP ratio also rose to 78% in 2023, driven by increased public spending on social protection programs and infrastructure (Dkhissi, 2024). Sudan also faced severe debt distress, with public debt surpassing 120% of GDP due to ongoing economic instability and political turmoil (World Bank, 2023).

Kenya's debt levels remain relatively high compared to other emerging and newly industrialized economies (World Bank, 2025). However, the country has made notable progress in mobilizing domestic revenue to finance its expenditures, aiming to reduce reliance on external and internal borrowing. In particular, the recurrent expenditure in Kenya is fully financed through domestic revenue, signifying the government's efforts to minimize its dependence on external debt. Despite this progress, Kenya's debt burden remains significant. For instance, in 2012, Kenya did not seek debt relief under the Heavily Indebted Poor Countries (HIPC) initiative, a clear indicator of its ability to manage its debt without external intervention (Niersbach, 2014).

Kenya's public debt, while still considered within tolerable levels, requires careful monitoring to prevent fiscal stress. According to Kamundia *et al.* (2015), further efforts to reduce the public debt would foster greater confidence in Kenya's financial markets and attract investment. This is because high debt levels could hinder economic growth by diverting resources towards servicing debt rather than investing in development projects. Consequently, Kenya has adopted a comprehensive debt management strategy aimed at ensuring debt sustainability. This strategy emphasizes borrowing only for developmental purposes, minimizing the cost of debt, and managing associated risks. The medium-term debt management strategy is prepared and executed annually by the National Treasury, with a focus on reducing costs and maintaining a reasonable debt limit (National Treasury of Kenya, 2025). Moreover, the enactment of the Constitution of Kenya (2010) and the Public Finance Management Act (PFMA), (2012) has provided a solid framework for managing public debt. These legal provisions aim to ensure that both national and county governments adhere to prudent debt management practices. The PFMA outlines strict procedures, accountability, and reporting requirements for county governments, further promoting fiscal discipline (Nairobi City County, 2016).

At the county level, however, government indebtedness has been exacerbated by an increase in financial inclusion, particularly through digital lending platforms. These platforms, while expanding access to credit, have allowed counties to borrow at high interest rates without well-planned repayment strategies. This has led to a growing stock of pending bills, with service providers facing liquidity challenges, business closures, and stunted county development projects. According to the County Government Budget

Implementation Review Report (CGBIRR, 2023), the accumulation of pending bills reached Ksh 156.34 billion as of December 31, 2023, with Ksh 87.65 billion allocated for recurrent expenditures and Ksh 68.69 billion for development expenditure. This fiscal imbalance has had profound impacts on the economic performance of counties, further undermining national economic growth.

The fiscal distress faced by counties is compounded by the rising levels of non-performing loans (NPLs), which increased from 12.5% in 2019 to 15.7% in 2021 and remained high at 15.2% in 2023 (Central Bank of Kenya (CBK), 2023). In 2023, the percentage of counties struggling with loan repayments surged to 50% compared to 30% in 2019, underscoring the increasing fiscal strain on county governments (Financial Sector Deepening Kenya (FSD), 2023).

The COVID-19 pandemic further worsened these fiscal vulnerabilities, as county governments faced difficulties in debt repayments amid economic disruptions. In response to the economic downturn, the Kenyan government implemented substantial fiscal stimulus measures, with public spending averaging 28% of GDP between 2020 and 2023 (Ministry of Finance, 2023). This expansionary fiscal policy, however, led to a decline in tax revenues, as Kenya's total tax revenue fell from 18.3% of GDP in 2019 to 16.1% in 2020 and recovered slightly to 17.4% in 2023 (Kenya Revenue Authority (KRA), 2023). The decline in tax collection forced county governments to increase borrowing, further exacerbating their debt burden.

In the aftermath of the COVID-19 pandemic, Kenyan counties faced a combination of economic slowdown, reduced tax revenue, and growing public expenditure needs. Amid these challenges, corruption emerged as a significant concern undermining effective fiscal management. According to reports by the Ethics and Anti-Corruption Commission (EACC), the average bribe size in Kenya rose from Ksh 4,600 in 2019 to Ksh 7,800 in 2021, with an average of Ksh 7,300 maintained through 2023. This rise in corruption levels points to worsening transparency and accountability at both national and county levels, potentially influencing borrowing behavior and the accumulation of public debt. Despite existing fiscal frameworks, county governments increasingly turned to debt to sustain operations a situation exacerbated by governance weaknesses such as corruption. One of the key drivers of the rising debt situation in counties is the increasing reliance on digital lending platforms. While these platforms provide convenient access to credit, they also lead to the accumulation of high-interest short-term loans that are often not sustainable, further contributing to fiscal instability (CBK, 2021). The over-reliance on digital borrowing has created a cycle of unsustainable debt accumulation, making it increasingly difficult for counties to meet their financial obligations.

This study analyzes the patterns of county indebtedness in Kenya by examining key economic determinants such as economic growth, tax revenue, government expenditure, and corruption level. It explores the broader implications of county debt on financial stability and economic resilience, providing evidence-based recommendations to improve fiscal discipline, regulate digital lending, and promote sustainable financial inclusion. The findings are vital in shaping policies aimed at enhancing debt management practices

and ensuring fiscal sustainability at the county level, thus contributing to the long-term economic stability of Kenya.

1.3 Statement of the Problem

The devolved governments in Kenya, otherwise referred to as county governments, were established in April 2013 after the General Elections. As stipulated by the Constitution of Kenya 2010, these regional governments are supposed to sustain their operations and development agenda. However, this has hitherto not been the case as variously reported. There are several county governments which, despite getting disbursements from the National Government through the National Treasury, were found to still be reeling from massive debts running into billions of Kenya shillings (Republic of Kenya, 2016). County Governments' indebtedness plays a critical role in economic stability, influencing consumption, investment, and financial resilience of the devolved units. While debt can serve as a tool for economic growth, excessive borrowing, particularly under unfavourable macroeconomic conditions, poses risks to financial stability.

In Kenya, County Governments' indebtedness has increased significantly in recent years, exacerbated by the economic disruptions caused by the COVID-19 pandemic. The pandemic led to widespread job losses, income reductions, and increased dependence on borrowing, which has deepened financial distress among counties. Government efforts to mitigate the crisis, such as increased public expenditure, resulted in a fiscal stimulus averaging 28% of GDP between 2020 and 2023. However, this intervention strained fiscal resources, limiting sustainable economic recovery. Tax revenue, a crucial factor in

debt sustainability, declined sharply from 18.3% of GDP in 2019 to 16.1% in 2020 before a modest recovery to 17.4% in 2023, highlighting persistent fiscal challenges. For the first half of the 2023/24 financial year, the County Governments had accumulated a total of Sh156.34 billion in pending bills. These affected service providers, leading to the closure of businesses, stalling of county projects, adversely affecting economic growth in counties and ultimately, slowing down the country's economic growth. Additionally, the average size of bribes paid to access public services rose markedly during the post-COVID-19 period.

According to EACC reports, the average bribe size increased from approximately Ksh 4,600 in 2019 to Ksh 7,800 in 2021, remaining elevated at Ksh 7,300 through 2023. Some counties reported bribe sizes exceeding Ksh 50,000, particularly in sectors such as land, health, and procurement. This escalation in corruption levels weakened public financial accountability and inflated the cost of service delivery. As institutional inefficiencies grew, counties increasingly relied on borrowing to fill funding gaps, contributing to a rise in debt vulnerabilities. The proportion of non-performing loans increased from 12.5% in 2019 to 15.7% in 2021, remaining elevated at 15.2% in 2023. These trends underscore the need to examine how corruption levels have contributed to county governments' indebtedness in Kenya's post-pandemic fiscal environment. Moreover, the share of counties struggling to repay loans increased from 30% in 2019 to 50% in 2021, sustaining this level through 2023. The widespread use of digital lending platforms has further aggravated county indebtedness, making it difficult for borrowers to escape debt cycles.

Despite these alarming trends, the precise impact of macroeconomic factors such as economic growth, tax revenue, government expenditure, and corruption levels on County Governments' indebtedness remains insufficiently explored. A lack of comprehensive analysis hinders the formulation of effective fiscal and monetary policies to regulate borrowing, enhance financial stability, and promote sustainable economic recovery. Therefore, this study sought to address this knowledge gap by examining the macroeconomic determinants of County Governments' indebtedness in Kenya during the post-COVID-19 period. The findings provided valuable insights for policymakers, financial institutions, and households, aiding in the development of strategies to mitigate debt distress and promote sustainable financial inclusion.

1.4 Research Objective of the Study

1.4.1 Main Objective

The main objective of this study was to determine the effect of macroeconomic determinants on county governments' indebtedness post-COVID-19 period in Kenya.

1.4.2 Specific Objectives

The following specific objectives guided this study:

- i. To analyze the effect of economic growth(GDP) on County Governments' indebtedness post-COVID-19 period in Kenya,
- ii. To determine the effect of tax revenue on County Governments' indebtedness in the post-COVID-19 period in Kenya,
- iii. To assess the effect of government expenditure on County Governments' indebtedness in the post-COVID-19 period in Kenya,

- iv. To analyze the effect of the corruption levels on County Governments' indebtedness in the post-COVID-19 period in Kenya.

1.5 Research Hypotheses

This study was guided by the following hypotheses;

- H₀₁:** Economic growth (GDP) has no significant effect on the County Governments' indebtedness post-COVID-19 period in Kenya.
- H₀₂:** Tax revenue has no significant effect on the County Governments' indebtedness post-COVID-19 period in Kenya.
- H₀₃:** Government expenditure has no significant effect on the County Governments' indebtedness in the post-COVID-19 period in Kenya.
- H₀₄:** Corruption levels have no significant effect on the County Governments' indebtedness in the post-COVID-19 period in Kenya.

1.6 Justification of the Study

This study aimed to deepen the understanding of the impact of macroeconomic determinants on county governments' indebtedness in Kenya, particularly in the aftermath of the COVID-19 pandemic. The study is justified by the significant increase in public debt, the need for evidence-based fiscal policy to ensure long-term sustainability, the lack of research on sub-national indebtedness impacts, and the importance of understanding how factors like inflation, interest rates, and global economic shocks affect local government debt and service delivery. The COVID-19 pandemic significantly worsened public debt sustainability for developing countries, including Kenya, which had

to take on more external debt to manage the crisis. This study was needed to understand the specific local-level implications of these global trends on county governments. Further, existing research often focuses on national-level debt. There is a gap in understanding how national and international macroeconomic factors influence the indebtedness of sub-national governments in Kenya. This study would provide crucial insights into the fiscal challenges at the county level. The aftermath of the pandemic is a critical period for economic recovery and fiscal planning. This research provides timely and relevant data on how the economic fallout continues to affect county-level fiscal health, guiding recovery strategies and future financial stability efforts. County indebtedness directly affects their capacity to provide essential services and implement development projects. A study of this nature will reveal how macroeconomic pressures on debt influence service provision and can highlight areas for improved fiscal management to protect these crucial functions. Finally, the findings of this study can inform the creation of effective domestic fiscal buffers and policies to achieve long-term debt sustainability for county governments. This is crucial for preventing future debt crises and ensuring county governments have the resources for development and service delivery.

1.7 Scope of the Study

The study was carried out using data on the county government's economy in Kenya that covers a period of five years from 2020 to 2024 (2020/2021 to 2023/2024 financial years). This study focused on 47 counties on the effect of economic growth, tax revenue, county

government expenditure, and corruption levels on county governments' indebtedness post-COVID-19 period.

1.8 Limitations of the Study

The present study was not free from limitations. Best and Khan (2008) defined limitations as factors that the researcher has no control over and may place shortcomings on the findings of the study and their applicability in different situations. Firstly, the study's findings were constrained by the unavailability and unreliability of data on macroeconomic determinants. Secondly, incomplete or inaccurate data sets limited the depth and accuracy of the analysis, potentially leading to biased results or incomplete conclusions. Thirdly, the study's scope limited the generalizability of its findings beyond the specific context of Kenya, making it difficult to apply the results to other regions or countries. Finally, the dynamic nature of the post-COVID-19 economic environment may pose challenges in capturing the full impact of macroeconomic determinants on the county government's indebtedness, as the situation continues to evolve.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical framework, the review of related literature, empirical evidence, the conceptual framework and the knowledge gap associated with the present study.

2.2 Theoretical Framework

This study adopted the Permanent Income Hypothesis (PIH), the Keynesian Theory of Consumption, Debt Accumulation and financial distress theories.

2.2.1 Permanent Income Hypothesis (PIH)

The Permanent Income Hypothesis (PIH), developed by Friedman (1957), posits that economic agents base their consumption decisions on expected long-term income rather than short-term income fluctuations. PIH suggests that individuals smooth their consumption over time by borrowing when current income is low and saving when current income is high. This framework has been widely applied in macroeconomic studies to understand consumption and borrowing behaviour. The PIH model, as adopted from Friedman (1957) and further extended in Campbell and Mankiw (2009), is expressed as shown in Equation 2.1.

$$C_t = a + Y_t^p \dots \dots \dots (2.1)$$

where:

C_t = represents consumption (or county expenditure in this context),

Y_t^p = represents permanent income (proxied by expected long-term revenue streams such as tax revenues, grants, and national transfers), and

a = is the marginal propensity to consume/spend.

According to this model, if a county government's current income falls below its expected long-term income, it may resort to borrowing to maintain stable expenditure levels. Conversely, when revenue exceeds anticipated permanent income, counties may accumulate savings or reduce borrowing (Hickey & Dorminey, 2022).

PIH is relevant for analyzing the county government's borrowing behavior, particularly in Kenya's post-COVID-19 period. County revenues are subject to volatility due to factors such as delays in national government transfers, fluctuations in local tax revenues, and economic downturns. Following the PIH framework, counties with stable revenue streams are expected to engage in less borrowing, while those facing unpredictable financial inflows may rely more on debt to sustain service delivery (Bandiera, 2010).

PIH is unrestricted access to credit, which does not always hold in the case of county governments. Jappelli and Pistaferri (2010) argue that borrowing constraints force governments to adjust expenditures based on short-term income variations rather than expected long-term revenues. In Kenya, legal restrictions on county borrowing, fiscal management inefficiencies, and political factors influence how counties accumulate and manage debt (Nyamita & Garbharran, 2014).

Empirical studies on PIH have shown mixed results. While some research supports the hypothesis that economic agents' smooth expenditures are based on expected income, others find evidence of liquidity constraints affecting spending patterns (Carroll, 2001). In the case of sub-national governments, studies indicate that revenue volatility can lead to increased borrowing as counties attempt to stabilize their expenditures (Carroll, 2009). Kenyan counties, which rely heavily on national transfers, are particularly vulnerable to fiscal shocks. Counties experiencing economic growth and stable tax revenues are more likely to adhere to PIH predictions, while those with erratic revenue sources may exhibit counter-cyclical borrowing behaviour.

The study links the empirical analysis of county governments' indebtedness to the Permanent Income Hypothesis (PIH) by demonstrating that borrowing decisions are influenced by expected long-term revenue streams. The observed effects of tax revenue, government expenditure, and corruption on county debt align with the PIH prediction that deviations from expected income lead counties to adjust borrowing to smooth expenditures over time.

2.2.2 Keynesian Theory of Consumption

The Keynesian Theory of Consumption, developed by John Maynard Keynes (1936), argues that consumption is primarily determined by current income, with spending increasing as income rises but at a decreasing rate. The theory introduces the marginal propensity to consume (MPC), which represents the fraction of additional income spent

on consumption. Keynesian economics suggests that when economic agents, including county governments, experience lower revenues, they tend to spend a greater proportion of their income. During economic downturns, such as the post-COVID-19 period, reduced income leads to lower consumption, rising corruption levels, and higher government borrowing to sustain expenditures (Keynes, 1936).

The Keynesian consumption function, as adopted from Keynes (1936) and later formalized by Dornbusch & Fischer (1990), is expressed as shown in Equation 2.2.

$$C_t = C_0 + cY_t \dots \dots \dots (2.2)$$

where:

C_t = represents total county government expenditure (proxy for consumption),

C_0 = is autonomous expenditure (the baseline level of spending independent of income),

c = is the marginal propensity to consume (MPC),

Y_t = is current income (county revenue from taxes, national transfers, and other sources).

According to this model, counties adjust their expenditures based on current revenue levels, increasing spending when income is high and reducing it when income declines. When revenues decline significantly, counties may resort to borrowing to sustain essential services, infrastructure projects, and public programs.

In the Kenyan county context, the post-COVID-19 economic slowdown led to a decline in economic growth, reduced tax revenue, and rising corruption levels, all of which constrained county income sources (Suleiman, 2020). Keynesian principles suggest that when county governments experience revenue shortfalls, they may increase borrowing to maintain government expenditures. Carroll and Summers (1991) provide empirical evidence supporting this view, showing that during economic recessions, both individuals and governments tend to borrow more to smooth expenditures.

Jappelli & Pistaferri (2010) further emphasize that borrowing plays a key role in stabilizing consumption when income fluctuates. In Kenya, counties that heavily rely on volatile national transfers and own-source revenue (OSR) may resort to borrowing as a counter-cyclical measure. However, this raises concerns about the sustainability of county debt, particularly if borrowing is primarily used for recurrent expenditures rather than investment in long-term economic growth (Chen & Li, 2019).

Keynesian economics also emphasizes the role of government expenditure in stimulating economic recovery. If county governments increase spending on infrastructure and employment-generating projects, they can boost aggregate demand, leading to higher economic growth and improved tax revenues in the long run (Heintz & Pollin, 2008). However, if borrowing is used inefficiently or for short-term consumption smoothing, county governments risk falling into unsustainable debt cycles.

This theoretical framework provided a foundation for analyzing how macroeconomic factors, economic growth, tax revenue, corruption levels, and government expenditure affect county indebtedness in Kenya. If borrowing is primarily driven by revenue shortfalls rather than strategic fiscal planning, counties may struggle with long-term debt sustainability (Auerbach, 2016). Therefore, policies that enhance revenue predictability, improve fiscal discipline, and ensure that government expenditure is aligned with long-term development goals are crucial in maintaining county financial stability (Wenjuan & Zhao 2023).

The study links the analysis of county governments' indebtedness to the Keynesian Theory of Consumption by demonstrating that borrowing patterns are influenced by current revenue levels. Consistent with Keynesian principles, counties experiencing revenue shortfalls—due to reduced economic growth, declining tax revenue, or rising corruption—resorted to borrowing to maintain expenditures, highlighting the role of current income in shaping debt accumulation during the post-COVID-19 period.

2.2.3 Debt Accumulation Theory

The Debt Accumulation Theory explores the factors driving increasing debt levels, considering macroeconomic conditions, fiscal policies, and their long-term effects, such as debt distress, crowding out of private investment, and policy constraints. Governments accumulate debt when borrowing costs are low, but prolonged debt accumulation leads to higher default probabilities and rising marginal costs. The model underpinning this theory suggests that when debt costs become unsustainable, governments resort to austerity

measures. These costs are endogenously determined within the model, aligning with empirical findings such as Bohn's (1998, 2008) Fiscal Reaction Function, which indicates a positive relationship between the primary fiscal balance and outstanding debt (D'Erasmus, *et al.*, 2016). The standard debt accumulation model, as adopted from Bohn (1998) and D'Erasmus *et al.* (2016), is expressed as shown in Equation 2.3.

$$D_{t+1} = (1 + r_t)D_t + G_t - T_t \dots \dots \dots (2.3)$$

where:

D_t = is the level of public debt at time t ,

r_t = represents the interest rate on debt at time t ,

G_t = is government expenditure at time t ,

T_t = is tax revenue at time t .

This equation demonstrates that debt in period $t+1$ is a function of the existing debt stock, the interest accrued, and the fiscal balance (the difference between government spending and revenue). When expenditures exceed revenues ($G_t > T_t$) the debt level rises, necessitating borrowing to cover deficits. The sustainability of debt accumulation depends on the ability of an economy to generate sufficient growth and revenue to offset borrowing costs.

Applying this model to Kenya's post-COVID-19 period, county debt accumulation can be analyzed through the interplay of economic growth, revenue generation, and fiscal pressures. Debt Accumulation Theory suggests that borrowing is influenced by economic conditions, with lower interest rates and favorable macroeconomic environments

encouraging debt accumulation, while fiscal constraints such as stagnant revenue growth and rising expenditures push county governments's to borrow (Bole, 2023). The economic disruptions from the pandemic have heightened fiscal vulnerabilities, leading to increased reliance on debt for financing essential public services (Makin & Layton, 2021).

In the post-pandemic context, the county governments face a dual challenge: economic recovery and sustainable debt management (Wenjie, 2024). Revenue fluctuations resulting from slowed economic growth, declining tax revenues, and rising corruption levels complicate debt sustainability. Debt Accumulation Theory highlights that when revenue generation fails to match growing expenditure needs, borrowing becomes inevitable (IMF, 2017). However, excessive reliance on debt without corresponding economic growth leads to fiscal distress, weakening the county governments' ability to meet financial obligations.

This study adopted the debt accumulation model to examine how macroeconomic factors economic growth, tax revenue, corruption levels, and government expenditure drive county indebtedness (Fengze, 2023). Through an analysis of borrowing patterns in relation to key economic indicators, this research aims to inform policies that promote responsible debt management, improve revenue predictability, and enhance fiscal sustainability among counties (Ahmed, and Rahman, 2019).

The study links county governments' borrowing behaviour to the Debt Accumulation Theory by illustrating that debt levels are driven by the interplay of expenditures, revenues, and interest costs. Consistent with the theory, counties with expenditures exceeding revenues—compounded by declining tax revenue, rising corruption, and fiscal pressures in the post-COVID-19 period—resorted to borrowing to finance deficits. This framework helps explain why macroeconomic factors such as government expenditure, tax revenue, and economic growth are key determinants of county indebtedness and underscores the importance of sustainable fiscal management.

2.2.4 Financial Distress Theory

Financial Distress Theory posits that firms experience difficulty meeting debt obligations due to deteriorating profitability, which can lead to default and, ultimately, bankruptcy (Altman & Hotchkiss, 2010). This theory can be extended to analyze the macroeconomic determinants of county indebtedness in Kenya during the post-COVID-19 period. Counties with high debt levels are particularly vulnerable to financial distress, especially in deteriorating economic conditions where rising corruption levels reduce public trust, weaken revenue collection systems, and increase the misuse of funds (Guzman & Ermasova, 2022). Corruption often leads to inflated project costs, irregular procurement practices, and diversion of public resources, all of which undermine fiscal discipline and reduce the efficiency of public spending. Furthermore, slow economic growth constrains revenue generation, making it difficult for county governments to meet their financial obligations (Edogbanya *et al.*, 2019).

Additionally, excessive government expenditure, particularly on recurrent costs rather than development, exacerbates the debt burden, increasing the risk of default (Altman, 1983). If these macroeconomic challenges persist, county governments may struggle with unsustainable debt levels, potentially undermining economic stability and slowing recovery efforts (World Bank, 2022). Therefore, understanding these relationships is crucial for policymakers to implement effective fiscal strategies that enhance revenue collection, promote economic growth, and ensure responsible debt management (FSD Kenya, 2021). The financial distress model, as adopted from Altman (1983) and Athreya *et al.* (2019), is expressed as shown in Equation 2.4.

$$FD_i = \beta_0 + \beta_1 EG_i + \beta_2 TR_i + \beta_3 GE_i + \beta_4 CL_i + \epsilon_{it} \dots \dots \dots (2.4)$$

Where:

FD = Financial Distress (measured by fiscal deficit-to-revenue ratio, debt-service coverage ratio, or probability of default)

EG = Economic growth (county GDP growth rate)

TR = Tax revenue (own-source revenue as a percentage of total revenue)

GE = Government expenditure (proportion of recurrent vs. development expenditure)

CL = Corruption Levels (measured as the average size of bribes per county)

β_0 = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients measuring the impact of independent variables on financial Distress

ϵ = Error term capturing unobserved factors

This study draws on Financial Distress Theory to explain the vulnerability of Kenyan county governments to fiscal pressures in the post-COVID-19 period. Counties experiencing high debt levels, slow economic growth, declining tax revenue, rising corruption, and excessive recurrent expenditures are at higher risk of financial distress, including difficulties in meeting debt obligations. By incorporating variables such as economic growth, tax revenue, government expenditure, and corruption levels into the analysis, the study assesses how these macroeconomic factors contribute to county indebtedness and the likelihood of fiscal distress, thereby informing policies for sustainable debt management and fiscal stability.

2.3 Review of Empirical Literature

An empirical review involves an in-depth analysis of existing studies and data to understand and contextualize the impact of specific factors on a given phenomenon (Stern, 2018; Chen & Lin, 2021). This study focuses on the empirical literature regarding how macroeconomic determinants of economic growth, tax revenue, corruption levels, and government expenditure affect counties' indebtedness in Kenya during the post-COVID-19 period.

2.3.1 Economic Growth and County Governments' Indebtedness

Economic growth plays a critical role in shaping county debt levels. Counties experiencing higher economic growth tend to generate more revenue, reducing their reliance on borrowing. Kariuki (2022) found that county governments with positive GDP growth had 25% lower debt accumulation compared to those with stagnant or declining

economic activity. Furthermore, increased economic productivity enhanced tax revenues, which in turn alleviated budgetary deficits and reduced debt dependency. However, Kariuki (2022) did not account for sectoral variations in growth, leaving room for further research on which economic sectors contribute most to reducing county indebtedness. Carletti *et al.* (2022) revealed that counties with stronger post-COVID-19 economic recovery exhibited a 30% decline in default rates. However, the study did not differentiate between urban and rural counties, where economic recovery patterns may have varied significantly due to differences in industrial composition and access to credit markets.

Economic growth has been linked to debt management across different regions. Peterson and Williams (2023) analyzed U.S. counties and found that regions with rapid post-pandemic economic expansion experienced lower public borrowing and improved fiscal stability. Similarly, García and López (2023) examined Spanish provinces and discovered that stronger GDP growth led to higher local government revenues, reducing the need for deficit financing. These findings suggest that economic recovery trends have influenced county indebtedness not just in Kenya but across different countries affected by COVID-19.

Further evidence supports the relationship between economic growth and debt sustainability. Chowdhury and Islam (2023) examined the impact of economic growth on sub-national debt levels in South Asian countries and found that a 1% increase in GDP growth reduced government borrowing by 0.8%. This aligns with Ndungu and Kimani

(2023), who found that higher economic growth in Kenya's devolved units corresponded with improved revenue collection and a lower dependency on external borrowing.

However, contrasting views exist. Muriithi (2024) argues that while economic growth theoretically reduces borrowing needs, county governments' often increase spending during growth periods, leading to higher debt accumulation. This finding is supported by Matsie (2023), who analyzed sub-national debt cycles in African economies and found that despite economic expansion, county governments still borrowed to finance large-scale infrastructure projects, suggesting that growth alone may not guarantee reduced indebtedness. Thus, while economic growth positively influences county fiscal health, its role in reducing indebtedness depends on spending priorities, fiscal discipline, and sectoral growth dynamics. Further empirical research is required to assess whether economic expansion in Kenya's counties leads to fiscal prudence or increased borrowing for development projects (Ochieng, 2018).

2.3.2 Tax Revenue and County Governments' Indebtedness

Counties with higher tax compliance rates tend to accumulate less debt, as they have a stable revenue base to finance expenditures. Muli (2023) found that counties with efficient tax administration experienced 20% lower debt accumulation than those with weak collection systems. The study highlighted that enhanced tax enforcement and the adoption of digital tax platforms improved revenue collection, reducing reliance on borrowing. However, the research did not differentiate between tax types, such as income

tax, property tax, and consumption tax, leaving a gap for further exploration on their specific impacts on county governments' indebtedness.

The role of fiscal policies and tax collection mechanisms in debt management was also emphasized by Njoroge *et al.* (2024), who found that counties with well-structured tax policies and effective collection systems had 15% lower reliance on external borrowing. The study showed that counties implementing automated revenue collection systems saw faster debt reduction compared to those using manual processes. However, the study did not consider the impact of tax incentives and exemptions, which could significantly affect overall revenue generation and debt sustainability.

Municipalities with structured tax systems have also exhibited lower debt levels. Adams and Martin (2022) examined Canadian municipalities and found that those with efficient property tax systems had significantly lower debt burdens. The study concluded that reliance on land-based taxes contributed to better fiscal stability, while municipalities that failed to reform their tax structures struggled with higher borrowing levels. The research highlighted the importance of land valuation efficiency and strong enforcement in ensuring sustainable municipal finance.

In Germany, Schneider *et al.* (2023) found that tax collection efficiency directly influenced regional government borrowing. The study demonstrated that municipalities with robust VAT and corporate tax enforcement experienced a 10% decrease in debt levels. Additionally, they discovered that political interference in tax administration

weakened revenue collection and contributed to higher fiscal deficits. The findings reinforced the importance of minimizing political influence in tax enforcement to ensure financial sustainability.

Latin American municipalities have faced similar challenges in tax revenue management. Rodríguez and Pérez (2023) examined tax bases and revenue efficiency across several Latin American countries and found that municipalities with broader tax bases and lower tax evasion rates had lower fiscal deficits and borrowing needs. Their research also indicated that digital tax collection systems increased efficiency by 18%, although the prevalence of informal economies remained a challenge in revenue mobilization.

In China, Wang and Zhang (2024) explored how tax diversification influenced debt sustainability at the provincial level. The study found that provinces that relied on multiple tax sources, including property, sales, and business taxes, had an 18% lower reliance on debt financing. However, they cautioned that over-reliance on corporate tax created revenue volatility, which could negatively impact fiscal stability. The study recommended balancing tax sources to reduce dependency on a single revenue stream.

Ghanaian district assemblies have also faced tax-related debt challenges. Osei and Boateng (2022) found that regions with enhanced revenue collection structures had lower debt-to-revenue ratios. Their study highlighted that districts with greater fiscal autonomy in tax collection were more financially independent and less reliant on external funding. However, they noted that limited local government authority in tax administration hindered efficient revenue collection in some areas.

In Kenya, Nyambura and Odhiambo (2023) analyzed how own-source revenue collection affected county debt levels. The study established that counties generating higher revenues through land rates, business permits, and service fees had lower debt burdens. However, it was found that weak enforcement of tax laws and political interference led to significant revenue leakages in some county governments. Additionally, the study showed that urban counties had stronger revenue mobilization capacities than rural counties, which had fewer taxable businesses and properties, leading to higher borrowing needs.

Collectively, these studies emphasize the importance of strong tax policies, diversified revenue sources, and effective enforcement mechanisms in reducing county indebtedness. It however, highlights that inefficiencies in tax collection, political interference, and revenue leakages exacerbate fiscal deficits, forcing counties to rely on borrowing. These findings suggest that strengthening tax administration and expanding the tax base could improve fiscal sustainability and reduce county debt levels.

2.3.3 Government Expenditure and County Governments' Indebtedness

Counties that receive higher fiscal transfers from the national government tend to experience a reduction in borrowing needs. Kamau *et al.* (2023) found that counties with increased intergovernmental transfers had 20% lower debt accumulation, highlighting the role of national fiscal support in mitigating county debt burdens. However, the study did

not examine whether the efficiency of public spending influenced debt accumulation, leaving an area for further investigation.

Public spending on essential services such as healthcare and education has been shown to reduce county borrowing. Yang (2024) found that increased government expenditure on healthcare led to a 15% decrease in county debt levels, as it alleviated medical costs that would otherwise be financed through debt. However, the study did not assess the differing impacts of infrastructure investment and recurrent expenditures on debt sustainability, presenting a gap for further research. Infrastructure investment has been linked to improved access to formal credit, which reduces county reliance on high-interest informal loans. Njoroge *et al.* (2024) highlighted that rural counties investing in infrastructure had lower debt burdens due to increased economic activity and improved creditworthiness. However, the study did not explore the long-term fiscal effects of infrastructure spending, leaving questions on the sustainability of debt reduction strategies.

Municipalities that prioritize infrastructure development tend to have lower long-term debt burdens due to increased tax revenues and economic expansion. Johnson and Roberts (2023) found that regions with higher infrastructure investment in the United States experienced fiscal stability and reduced borrowing needs. Similarly, Dubois *et al.* (2023) demonstrated that targeted government spending on social programs in France helped reduce fiscal strain on local governments by stabilizing public finances. Further evidence from García and López (2023) in Spain indicated that efficient government

expenditure allocation contributed to lower municipal borrowing levels by optimizing service delivery and revenue mobilization.

2.3.4 Corruption Levels and County Governments' Indebtedness

Rising corruption levels have been a significant factor contributing to increased county indebtedness, as misuse of public funds undermines revenue collection, inflates procurement costs, and compromises service delivery. Counties with high corruption levels recorded a 30% increase in borrowing, particularly in regions with weak governance structures and limited oversight mechanisms (Kamau *et al.*, 2023). The study noted that counties with poor accountability systems struggled to maintain fiscal balance, resulting in growing public debt. However, the study did not examine how specific anti-corruption policies could mitigate the impact of corruption on county borrowing.

Counties with weak institutional controls and a high incidence of bribe payments are more likely to accumulate debt due to financial leakages and reduced efficiency in public spending. Mutisya and Mungai (2023) found that counties where corruption was more pervasive had a 25% higher probability of increasing debt levels, largely because budgeted resources were diverted or misused, compelling counties to borrow to fill the gap. Nonetheless, the study did not distinguish between types of corruption (example., petty vs. grand corruption) or their differential impacts on debt accumulation, leaving a gap for further research on the role of governance quality in public debt sustainability.

Persistently high corruption levels have also been linked to increased loan default rates, especially in counties where funds meant for development projects are misappropriated. Wanjiru (2023) found that mismanagement of public funds contributed to project failures and reduced economic returns, increasing the risk of fiscal distress. The study underscored the need for stronger governance frameworks to curb corruption, but did not assess how transparency and accountability initiatives, such as public expenditure tracking, could reduce debt accumulation.

Counties characterized by systemic corruption also face challenges in meeting their debt obligations, leading to rising arrears and growing reliance on external or informal financing. Njoroge *et al.* (2024) observed that such counties experienced a 40% increase in pending bills and a 20% rise in informal borrowing to finance operations. The study highlighted the role of poor governance in weakening the revenue base, especially through corruption in tax collection and procurement systems. However, it did not examine how variations in debt maturity structures affect county resilience to governance-related fiscal pressures.

The impact of corruption on subnational government debt has also been observed globally. In Nigeria, states with high corruption levels reported increased borrowing due to the diversion of federal allocations and inflated contracts (Oluwafemi & Adewale, 2023). Similarly, in India, local governments affected by procurement-related corruption faced mounting debt burdens as public funds were frequently mismanaged (Singh *et al.*, 2023). These findings emphasize that corruption is a major driver of county indebtedness,

with long-term implications for fiscal sustainability across both developing and developed economies.

2.4 Knowledge Gaps

The study identifies several knowledge gaps in existing research on the relationship between macroeconomic conditions and county debt levels. While there is an extensive body of literature on county governments' indebtedness in developed economies, much less is known about how macroeconomic factors influence County debt in sub-Saharan Africa, specifically in Kenya. Most studies on County indebtedness focus on developed countries, where the financial systems, government interventions, and consumer behaviour are different. The unique economic environment in Kenya, with its high levels of informal borrowing, reliance on remittances, and an evolving financial system, suggests that the dynamics of County debt in this region may differ significantly from those in the West. This gap in understanding the specific drivers of county indebtedness in Kenya, particularly in the post-COVID-19 period, warrants further investigation.

Another critical knowledge gap is the limited research on the impact of COVID-19 on County debt in Kenya. While the global pandemic has caused significant economic disruptions worldwide, the specific effects on county finances in Kenya remain underexplored. The pandemic has led to changes in income levels, rising corruption levels, and shifts in spending and borrowing patterns, all of which are expected to influence County indebtedness. However, research on how these changes interact with macroeconomic determinants such as inflation, interest rates, and government

expenditure in Kenya's post-COVID context is scarce. This gap highlights the need for a deeper exploration of how counties in Kenya have navigated debt accumulation and repayment in the wake of the economic shocks caused by COVID-19.

Additionally, the role of specific macroeconomic determinants, such as inflation and government expenditure, in shaping county indebtedness in Kenya has not been thoroughly studied. While inflation is often cited as a factor influencing county financial distress, its exact effect on county debt levels in emerging economies like Kenya is not well understood. Similarly, although government expenditure, particularly in the form of social support programs, can play a crucial role in alleviating financial burdens, the relationship between government spending and County debt levels has not been extensively explored in the Kenyan context. By investigating these macroeconomic determinants in the post-COVID-19 period, this study seeks to fill a crucial gap in the literature and provide insights into the policy measures that can support county financial stability in Kenya.

Table 2.1: Summary of Knowledge Gap

Author and Year	Study Title	Key Findings	Identified Research Gap
Kariuki (2022)	Economic Growth and County Debt in Kenya	County governments with high spending on essentials were more likely to incur debt when income sources were disrupted.	The study did not explore how rural vs. urban expenditure patterns influenced indebtedness.
Mutua & Mungai (2022)	Economic Recovery and Debt Repayment Post-COVID-19	Limited access to formal credit led to reliance on high-interest informal loans.	The study did not address the role of specific financial tools, such as mobile money loans and microfinance, in shaping County debt dynamics.
Peterson & Williams (2023)	Economic Growth and Public Borrowing in U.S. Counties	Countries with higher education and formal employment managed debt better than those in the informal sector.	The study did not differentiate the impact between rural and urban Country on debt management.
García & López (2023)	GDP Growth and Local Government Revenues in Spain	Countries with savings managed debt better; those without savings struggled, increasing indebtedness.	The study did not examine coping mechanisms of countries without savings, such as reliance on community-based loans or government relief programs.
Chowdhury & Islam (2023)	Economic Growth and Sub-National Debt in South Asia	Inflation eroded purchasing power, leading to increased borrowing.	The study did not differentiate how inflation impacts urban vs. rural Country regarding debt accumulation and credit access.
Ndungu & Kimani (2023)	Economic Growth and Revenue Collection in Kenyan Counties	Inflation pushed the county into high-interest informal credit markets.	Lack of focus on the long-term effects of inflation on dependence on informal credit and financial stability.
Muriithi (2024)	Economic Expansion and County Borrowing Patterns	Inflation reduced the value of savings, leading to increased debt levels.	The study did not explore the impact of inflation on different types of savings (formal vs. informal) and their influence on debt

Romer & Taylor (2024)	Debt Cycles in African Economies	Urban Country benefited more from government stimulus; rural country had limited access.	management. The study did not examine the long-term effects of stimulus packages or differentiate the impacts of various forms of government expenditure.
Muli (2023)	Tax Compliance and County Debt Levels	Social safety nets reduced debt among the poorest counties but had a limited impact on middle-income counties.	The study did not analyze interactions between social safety nets and other government programs, such as tax relief or business support.
Njoroge <i>et al.</i> (2024)	Tax Policies and External Borrowing in Kenya	Education spending improved financial literacy and debt management.	The study did not assess how education spending influenced County debt levels or credit access for younger families.
Adams & Martin (2022)	Property Tax Systems and Municipal Debt in Canada	Corruption in land valuation and weak enforcement led to increased municipal borrowing due to revenue leakages.	The study did not examine the role of institutional oversight in moderating the effects of corruption on debt levels.
Schneider <i>et al.</i> (2023)	Tax Collection Efficiency and Regional Government Borrowing in Germany	Strong VAT and corporate tax enforcement reduced debt by 10%; political interference weakened tax collection and increased fiscal deficits	Did not assess how anti-corruption mechanisms could strengthen tax enforcement and reduce borrowing.
Rodríguez & Pérez (2023)	Tax Bases and Fiscal Deficits in Latin America	An unemployed country struggled to meet debt obligations, leading to reliance on informal credit markets.	The study did not analyze how varying levels of existing debt affected an unemployed country's ability to manage and service its debt.

2.5 Conceptual Framework

The conceptual framework as shown in Figure 2.1 shows the relationship between the study determinants. In the framework, the independent determinants are the economic growth, tax revenue, and government expenditure and corruption levels while the dependent variable is county governments' indebtedness.

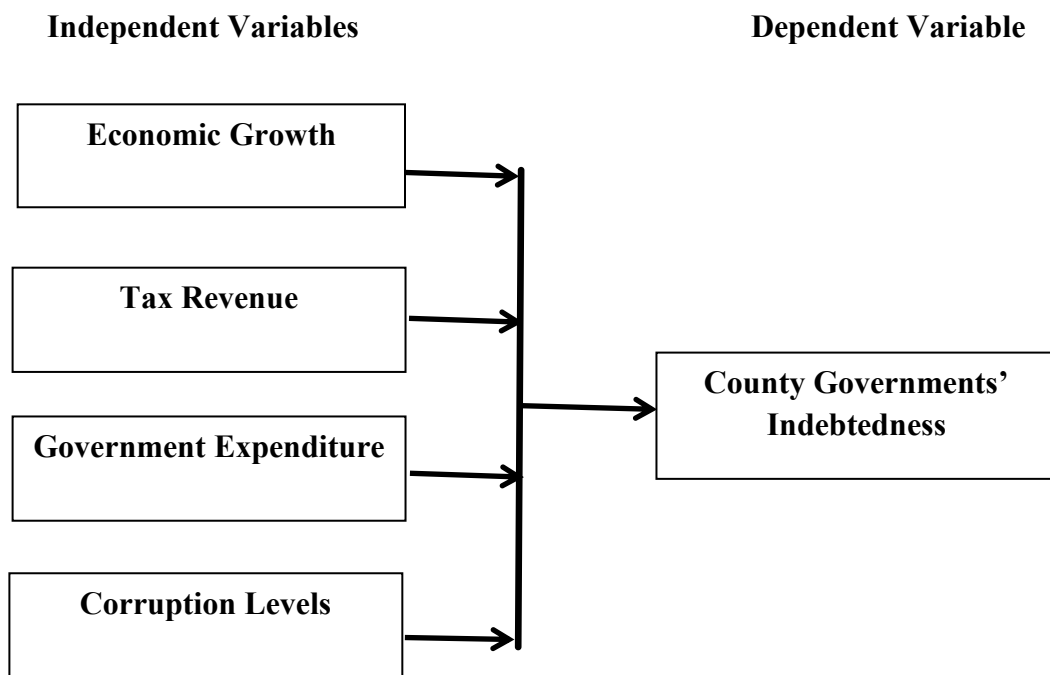


Figure 2.1 Conceptual Framework

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the research design, target population, sampling frame, data collection procedures, data source and types, data collection instruments, data collection procedure and data analysis and presentation techniques.

3.2 Study Area

The study was conducted in Kenya, an East African country covering 580,367 square kilometers, as shown in the map of Kenya in Appendix I. It shares borders with Ethiopia, Somalia, Tanzania, Uganda, and South Sudan, with a coastline along the Indian Ocean. Kenya has diverse landscapes, including coastal plains, highlands, the Great Rift Valley, and arid regions, with Nairobi as its capital and other major cities like Mombasa and Kisumu. Administratively, Kenya is divided into 47 counties, each governed independently under a devolved system of government (Thuku, 2020). These counties include Mombasa, Kwale, Kilifi, Tana River, Lamu, Taita Taveta, Garissa, Wajir, Mandera, Marsabit, Isiolo, Meru, Tharaka Nithi, Embu, Kitui, Machakos, Makueni, Nyandarua, Nyeri, Kirinyaga, Murang'a, Kiambu, Turkana, West Pokot, Samburu, Trans Nzoia, Uasin Gishu, Elgeyo Marakwet, Nandi, Baringo, Laikipia, Nakuru, Narok, Kajiado, Kericho, Bomet, Kakamega, Vihiga, Bungoma, Busia, Siaya, Kisumu, Homa Bay, Migori, Kisii, and Nyamira (Macharia *et.al.*, 2021). Each county exhibits unique economic characteristics, influencing its revenue generation and debt sustainability (Cheruiyot, 2018).

Kenya's economy, the largest in East Africa, experienced a real GDP expansion of 5.6% in 2023, driven by agriculture and services, with inflation edging up to 7.7% (World Bank, 2024). After independence, Kenya promoted rapid economic growth through public investment, encouraged smallholder agricultural production, and provided incentives for private (often foreign) industrial investment (Nyoro, 2002). Additionally, Kenya is a regional transportation and financial hub. Over the years, Kenya has experienced continued growth in GDP, supported by ongoing public infrastructure projects, strong public and private sector investment, and appropriate economic and fiscal policies, reflecting the broad-based and diversified nature of the economy (IMF, 2023). Kenya's financial sector is vibrant, well-developed, and diversified in the region, with the highest financial inclusion both regionally and globally (CBK, 2023). The banking sector is well-capitalised and profitable, with capital adequacy and liquidity ratios above the recommended thresholds (Nyaundi, 2015). Macroeconomic stability has been preserved over the last few years, with inflation, interest rates, and exchange rates remaining largely stable, thanks to prudent monetary and fiscal policies (KNBS, 2024).

Economically, Kenya is classified as a lower-middle-income country by the World Bank. Kenya's economy is primarily driven by agriculture, manufacturing, and services, with agriculture contributing approximately 22% to GDP (Cilliers *et al.*, 2018). However, economic disparities exist across county governments, leading to variations in tax revenue, government expenditure, corruption levels, and GDP growth. These disparities impact the extent of county indebtedness, making it essential to analyze the

macroeconomic determinants influencing debt levels in the post-COVID-19 period (Bialowolski *et al.*, 2024).

3.3 Research Design

Research design refers to the structured framework used to carry out a study, guiding the processes of data collection, analysis, and interpretation. It ensures that the research objectives are achieved efficiently and systematically (Kothari, 2004). This study adopted descriptive and explanatory research designs to analyze the impact of macroeconomic determinants on county governments' indebtedness in Kenya post-COVID-19. The descriptive research design, as defined by Onen (2016), was used to present statistical summaries of county debt levels and macroeconomic indicators such as economic growth, tax revenue, corruption levels, and government expenditure. This model illustrates patterns and variations in county indebtedness. The explanatory research design, according to Creswell (2014), examined causal relationships between these macroeconomic factors and county debt levels. Through using quantitative analysis, this approach identifies how changes in economic variables influence county indebtedness, enabling a data-driven understanding of debt sustainability.

3.4 Target Population

A target population refers to the specific group of entities a researcher aims to study to draw conclusions and generalize findings relevant to that group (Willie, 2024). This study focused on all 47 county governments in Kenya, examining their annual debt levels over the 2020/2021 to 2023/2024 financial year period. The analysis considered variations in

borrowing, economic performance, and macroeconomic influences affecting county indebtedness.

To achieve this, the study utilized panel data, which consists of observations on multiple entities (county governments) over time. The panel structure provides both cross-sectional and time-series dimensions, enabling a comprehensive examination of debt trends and macroeconomic determinants (Arslan & Karan, 2006). Each of the 47 counties had four annual observations, resulting in a total of 188 data points (47 counties \times 4 financial years) for analysis.

3.5 Sampling Frame

The sampling frame for this study consisted of annual county-level data on indebtedness, economic growth, tax revenue, government expenditure, and corruption levels for all 47 counties in Kenya for financial years from 2020/2021 to 2023/2024. According to Saunders *et al.* (2016), a sampling frame is a complete list of all cases in the population from which a sample is drawn. Similarly, Blumberg *et al.* (2014) define it as a measure that utilized county GDP growth rates to assess how economic growth influences debt accumulation. Tax revenue data focused on county-level collections to evaluate how taxation affects borrowing needs (Hicks, 2024). Government expenditure analyzed public spending patterns to determine its role in county debt accumulation, while Corruption levels provided insights into governance quality and their effect on county financial sustainability. By examining these macroeconomic factors across all counties, this study

aimed to provide a comprehensive understanding of the determinants of county indebtedness in Kenya.

3.6 Data Source and Types

3.6.1 Data Sources

This study utilized secondary data covering a four-year financial year panel dataset (2020/2021 to 2022/2023). Secondary data was suitable for this research as it is readily available, reliable, and cost-effective, providing a practical solution for researchers with limited time and resources (Al Omari, 2021). This study utilized county-level panel data sourced from official and credible institutions. The dependent variable, county government indebtedness, measured as the ratio of county public debt stock to Gross County Product (GCP), was obtained from the Controller of Budget (CoB) reports. Economic growth, proxied by the annual county-level GCP growth rate, was sourced from the Kenya National Bureau of Statistics (KNBS). Data on tax revenue, captured as county own-source revenue, was obtained from the Commission on Revenue Allocation (CRA). County government expenditure, measured as a percentage of GCP, was obtained from the National Treasury. Finally, corruption levels, represented by the Corruption Perception Index, were sourced from the Ethics and Anti-Corruption Commission (EACC). These sources were selected because they are the most authoritative and reliable providers of official data relevant to each variable.

3.6.2 Data Types

This study collected quantitative secondary data on county debt levels and key macroeconomic factors, including economic growth, tax revenue, government expenditure, and corruption levels. County debt levels were measured using annual debt figures for each of the 47 counties from 2020/2021 to 2023/2024 financial years (Gatauwa, 2018). Economic growth was assessed using Gross County Product (GCP), while tax revenue data captured county-level revenue collection. Government expenditure was analyzed based on annual county budgetary allocations and spending patterns, while corruption levels were measured using data on average bribe size cases from credible sources such as the EACC and Transparency International. The panel data structure incorporated both cross-sectional and time-series dimensions to provide a comprehensive analysis of county indebtedness.

3.7 Data Collection Instruments

For this study, the instruments for collecting secondary data were a structured data collection template as shown in Appendix II. A data collection template is a structured tool used to gather information in a systematic and organized manner, ensuring that data is collected consistently across all observations (Saunders *et al.*, 2019). It provides predefined categories or fields that guide the researcher in collecting specific data, making it easier to organize, analyze, and compare the data later.

3.8 Data Collection Procedure

Before commencing data collection, a research permit was obtained from the National Commission for Science Technology and Innovation (NACOSTI) (Appendix III), through an introductory letter from the Director, Board of Postgraduate Studies, and University of Eldoret (Appendix IV). Once the permit was obtained, secondary data was extracted from the World Bank Database, Kenya National Bureau of Statistics (KNBS), Central Bank of Kenya (CBK) and the National Treasury. The permit is presented to the relevant authorities within the Kenya National Bureau of Statistics (KNBS), the Central Bank of Kenya (CBK), the National Treasury, and the World Bank Kenya Office for permission to collect secondary data.

3.9 Data Analysis and Presentation

Once the secondary data was obtained, the initial screening process entailed sorting, coding, and cleaning the data set. This process ensured completeness, consistency, and accuracy by addressing any missing or outlier values through interpolation or consultation with data providers. Data was analyzed using both descriptive and inferential statistics. The descriptive analysis summarized the key characteristics of the data set, including measures of central tendency such as the mean and median, and measures of dispersion such as the standard deviation and variance. These statistics provided an overview of county indebtedness trends and macroeconomic conditions over the 2020/2021 to 2023/2024 financial year period. In addition, correlation analysis was conducted to explore data patterns and relationships among the study variables.

For inferential analysis, the study employed panel data regression techniques, specifically Fixed Effects (FE) and Random Effects (RE) models, estimated using STATA version 17 software. The use of panel data analysis was appropriate because the data set combined both cross-sectional and time-series dimensions, covering 47 counties (cross-sections) observed over four financial years (time periods). Unlike purely cross-sectional or time-series methods, panel data models exploit both dimensions of the data set, thereby providing a richer source of information.

Panel data analysis offers several advantages that justify its application in this study. First, it controls for unobserved heterogeneity by accounting for county-specific characteristics that remain constant over time, such as historical development patterns or governance structures. This reduces the risk of omitted variable bias and yields more reliable estimates. Second, by combining data across space and time, panel data increases the number of observations, thereby improving the degrees of freedom and the efficiency of the estimators. Third, the method captures both the temporal dynamics within each county and the variations across different counties, enabling a more comprehensive assessment of how macroeconomic factors affect county indebtedness. Finally, panel data techniques allow for specification tests such as the Hausman, Breusch–Pagan LM tests and F- test, which guide the selection of the most appropriate estimation framework between pooled OLS, Fixed and Random Effects models.

In light of these advantages, panel data regression analysis was considered the most suitable approach for this study. It provided the analytical rigor required to examine the

effect of macroeconomic determinants on county governments' indebtedness in Kenya during the post-COVID-19 period while ensuring robust and consistent results.

3.9.1 Panel Unit Root Tests

This study carried out pre-estimation tests, specifically panel unit root tests, to ensure the validity of the regression results and prevent spurious relationships (Breitung & Pesaran, 2008). Non-stationary data can lead to misleading inferences, which makes it essential to test for stationarity before conducting further econometric analysis (Beenstock & Felsenstein, 2019). Given that the data used in this study combined cross-sectional (counties) and time-series (financial years) dimensions, the presence of unit roots was tested prior to regression analysis.

To test for stationarity, the study employed the Levin, Lin and Chu (LLC) test, which assumes a common unit root process across all cross-sectional units and is appropriate for balanced panel data. The LLC test is specified in Equation 3.1, adopted from Levin, Lin, and Chu (2002). The null hypothesis assumes that a unit root is present in all series (non-stationarity), while the alternative hypothesis indicates stationarity. If the test statistic is significantly negative, it implies rejection of the null hypothesis, thereby confirming that the series is stationary.

H₀: $\rho=0$ (Unit root is present, implying non-stationarity) against,

H₁: $\rho<0$ (No unit root, implying stationarity)

$$\Delta Y_{it} = \alpha_i + \rho Y_{i,t-1} + \sum_{j=1}^p \beta_j \Delta Y_{i,t-j} + \varepsilon_{ij} \dots \dots \dots (3.1)$$

Where:

Y_{it} = represents the variable of interest,

α_i = is the individual fixed effect,

p = is the optimal lag length,

e_{ij} = is the error term,

ρ = determines whether a unit root is present.

In addition to the LLC test, the study also applied the Im, Pesaran and Shin (IPS) test, which relaxes the assumption of a common unit root and instead allows for individual unit root processes across counties. This makes the IPS test particularly useful where heterogeneity is expected in county-level macroeconomic dynamics. The IPS test null hypothesis states that all series contain a unit root, while the alternative allows some of the series to be stationary. Furthermore, to complement these two tests, the study used the Fisher-type Augmented Dickey–Fuller (ADF-Fisher) test, which combines p-values from individual unit root tests across panels. Unlike the LLC test, which imposes a common autoregressive parameter, the ADF-Fisher test allows for more flexibility by accommodating heterogeneity in lag structures across counties.

By employing the LLC, IPS, and ADF-Fisher tests, the study ensured robust verification of stationarity, thereby reducing the risk of spurious regression results. Once stationarity was confirmed, the study proceeded with panel regression analysis. To determine whether the Pooled OLS model was appropriate, the Breusch–Pagan Lagrange Multiplier (LM) test and the F-test were carried out.

Breusch–Pagan Lagrange Multiplier (LM) Test

H₀: Variances across entities (counties) are zero → Pooled OLS is appropriate (no significant panel effect) is tested against,

H_a: Variances across entities (counties) are not zero → Random Effects is preferred over Pooled OLS.

F-Test

H₀: All county-specific intercepts are equal → Pooled OLS is sufficient (no fixed effects).

H_a: At least one county-specific intercept is different → Fixed Effects model is preferred over Pooled OLS.

Following this, the Hausman specification test (Hausman, 1978), presented in Equation 3.2, was employed to determine whether the Fixed Effects (FE) or Random Effects (RE) model was more appropriate. The Hausman test involves comparing coefficient estimates from the FE and RE models. If the test statistic is significantly different, it implies that the RE model is inconsistent, hence the FE model should be preferred. In this study, the Hausman test rejected the null hypothesis in favor of the alternative, indicating that county-specific effects were correlated with the regressors and confirming that the Fixed Effects model was the most appropriate specification.

$$H = (\beta_{RE} - \beta_{FE})' [Var(\beta_{FE}) - Var(\beta_{RE})]^{-1} (\beta_{RE} - \beta_{FE}) \dots \dots \dots (3.2)$$

Where;

H is the Hausman test

β_{RE}, β_{FE} are the coefficient estimates from the Fixed and Random Effects models, respectively.

To determine whether the Random Effects (RE) model or the Fixed Effects (FE) model is more appropriate, it is essential to first assess whether county-specific effects are correlated with the regressors. This is done using the Hausman Test, which tests the following hypotheses:

H_0 : RE is preferred (county effects are uncorrelated with regressors) against,

H_a : FE is preferred (county effects are correlated with regressors).

According to this model, the Hausman test helps determine whether the Fixed Effects (FE) model or the Random Effects (RE) model is more appropriate for panel data analysis. The decision is based on the p -value obtained from the test:

If the p -value is significant ($p < 0.05$), reject H_0 and use Fixed Effects (FE).

If the p -value is not significant ($p > 0.05$), fail to reject H_a and use Random Effects (RE).

The test evaluated whether the unique errors (u_i) were correlated with the regressors (X_{it})

The null hypothesis (H_0) assumed that the preferred model was RE, meaning the individual effects were uncorrelated with the regressors.

The alternative hypothesis (H_1) assumed that the FE model was more appropriate, implying that the individual effects were correlated with the regressors.

3.9.2 Pearson's Correlation Analysis

To examine the strength and direction of the linear relationships between the study variables, this research employed Pearson's correlation analysis. Pearson's correlation

coefficient measures the degree of linear association between two variables and ranges from -1 to +1. A coefficient of -1 indicates a perfect negative relationship, 0 indicates no relationship, and +1 indicates a perfect positive relationship. In this study, the analysis was used to assess the relationships between the independent variables economic growth (GDP), tax revenue, government expenditure, and corruption levels and the dependent variable, county governments' indebtedness.

3.9.3 Estimation Framework and Model Specification

This study utilized Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE), and Random Effects (RE) models to estimate the relationships between macroeconomic variables and county government indebtedness. In panel data models, the individual intercept is meant to control for the effect of unobservable regressors that are specific to each cross-sectional unit (the county governments).

The Pooled OLS model is the simplest panel data estimator and assumes that there are no unobserved individual-specific effects across counties, implying that all counties share a common intercept. In this model, the error term captures all unobserved heterogeneity. While Pooled OLS is computationally straightforward, it is inappropriate if unobserved county-specific effects exist, as it leads to biased and inconsistent estimates due to omitted variable bias. Therefore, Pooled OLS is typically considered a baseline, and tests such as the Breusch–Pagan Lagrange Multiplier (LM) test and F-test are used to determine whether more sophisticated panel data models (FE or RE) are required.

The various panel data models depend on the assumptions made about the individual-specific effects u_i . In the traditional approach to panel data models u_i , an effect is called a random effect when it is treated as a random variable, and a fixed effect when it is treated as a parameter to be estimated for each cross-sectional observation. Therefore, Fixed Effects (FE) and Random Effects (RE) models are introduced. As described by Wooldbridge (2009), there are many benefits in using panel data, the principal ones being: control of the individual heterogeneity; panel data models have a greater variability, less collinearity between variables, more degrees of freedom and more efficiency; they are more capable in identifying and measuring effects that are not detected in cross-section or time series data. However, these models also have some limitations, the requirement of more computational resources being the most apparent of them.

In panel data models, the individual intercept u_i is meant to control for the effect of unobservable regressors that are specific to individual i . The various panel data models depend on the assumptions made about the individual-specific effects u_i . In the traditional approach to panel data models, u_i is called a random effect, when it is treated as a random variable and a fixed effect, when it is treated as a parameter to be estimated for each cross-section observation. The Fixed Effects (FE) Model, was crucial in this study as it controlled for unobserved heterogeneity by allowing each county to have its own intercept. This meant that the model accounts for county-specific characteristics that do not change over time but may influence the dependent variable (county government indebtedness).

Each u_i is treated as an unknown parameter to be estimated. It also assumes that there is unit-specific heterogeneity in the model, which might be correlated with the regressors and needs to be removed from the regression before estimation. In this model, the study estimated parameters for fixed effects between units and thereby removed variance from the error term. Hence, the fixed effects estimation method eliminated the time-invariant unobserved effect. However, if the number of units is large, the estimation of the parameters may be inefficient. If the individual effects are randomly distributed in each cross-sectional unit, the fixed effects model gives inconsistent estimates, and hence, the study used random effects instead. This ensured that the estimated relationships between macroeconomic factors and county indebtedness are not biased by unobserved characteristics that vary across counties but remain constant over time.

One variant of the model shown in Equation 3.3 is called the fixed effects model, which treats the unobserved individual effects as random variables that are potentially correlated with the explanatory variables (Wooldridge, 2010).

$$E(X_{it}/u_i) = 0 \dots \dots \dots (3.3)$$

Where:

E is the expected mean

X_{it} is unobserved, time-invariant county-specific effects

u_i are macroeconomic explanatory variables

Unlike the random effects estimators, the FE estimator assumes nothing regarding the correlation structure between u_i and the explanatory variables. As we don't know the

statistical properties of u_i , it can be eliminated from the model. Among various ways to eliminate u_i , the within-group transformation or deviation from mean is easy to understand. The procedure of within transformation is given by Megersa *et al.* (2014), and the transformed equation (3.4) is given by;

$$DB_{it} = \beta_0 + \beta_1 EG_{it} + \beta_2 TR_{it} + \beta_3 GE_{it} + \beta_4 CL_{it} + u_i + \epsilon_{it} \dots \dots \dots (3.4)$$

Where;

DB_{it} = County governments' indebtedness for county i at time t (Total County Debt).

u_i = County-specific fixed effects (each county has its own intercept).

EG_{it} = Economic growth in county i at time t .

TR_{it} = Tax revenue collected in county i at time t .

GE_{it} = Government expenditure in county i at time t .

CL_{it} = Corruption levels in county i at time t .

β_0 = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients measuring the impact of macroeconomic variables on county government's indebtedness.

ϵ_{it} = Error term

The Random Effects (RE) Model is an alternative to the Fixed Effects model, particularly when the unobserved heterogeneity is assumed to be uncorrelated with the explanatory variables. Unlike the FE model, where each county has its own intercept to account for county-specific characteristics, the RE model assumes that the individual-specific effects are randomly distributed across counties and are uncorrelated with the regressors (Hystad & Jensen, 2012).

In the RE model, the unobserved heterogeneity is treated as a random variable rather than as a fixed constant. This means that the variation across counties is assumed to be random and not correlated with the explanatory variables such as economic growth, tax revenue, government expenditure, and corruption levels. The random effects model is suitable when the unobserved factors affecting county indebtedness are not correlated with the macroeconomic factors, allowing for more efficient estimation of the parameters when compared to the fixed effects model (Azolibe, 2021).

The key difference between the RE and FE models lies in how the county-specific effects are handled. The RE model assumes that the random effects are independent of the regressors, which allows for the inclusion of time-invariant variables (which the FE model would eliminate). As a result, if the individual effects are indeed random and not correlated with the independent variables, the RE model provides consistent and efficient estimates of the relationships between the macroeconomic factors and county government indebtedness (Wooldridge, 2010). One common way to estimate the random effects model is by using the Generalized Least Squares (GLS) method, which accounts for the random nature of the individual effects (Ceesay & Moussa, 2022). If the assumption of no correlation between the individual effects and the explanatory variables holds, the RE model is generally more efficient than the FE model.

A variant of the model shown in Equation 3.5 is the Random Effects Model, which assumes that the unobserved heterogeneity across counties is uncorrelated with the included macroeconomic variables (Wooldridge, 2010).

$$E(u_i/X_{it}) = 0 \dots\dots\dots(3.5)$$

Where;

E is the expected value

u_i is an unobserved individual

X_{it} is observed explanatory variables

In the context of this study, the RE model, Equation 3.6, assumed that the unobserved factors affecting county government indebtedness are random and uncorrelated with the macroeconomic variables of interest. Therefore, the RE model provides a more efficient estimation approach than the fixed effects model, especially when the number of units (counties) is large.

$$DB_{it} = \beta_0 + \beta_1 EG_{it} + \beta_2 TR_{it} + \beta_3 GE_{it} + \beta_4 CL_{it} + u_i + \epsilon_{it} \dots\dots\dots(3.6)$$

Where;

DB_{it} = County governments' indebtedness for county i at time t (Total County Debt).

EG_{it} = Economic growth in county i at time t .

TR_{it} = Tax revenue collected in county i at time t .

GE_{it} = Government expenditure in county i at time t .

CL_{it} = Corruption levels in county i at time t .

β_0 = Constant term

$\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients measuring the impact of macroeconomic variables on the county government' indebtedness.

u_i = County-specific random error term.

ϵ_{it} = Error term

3.10 Definition, Measurement of Variables and Expected Signs

Table 3.1 shows the variables used in this study and their measurements. The positive sign (+) means that an increase in the variable causes an increase in the counties' indebtedness. In contrast, the negative sign (-) means an increase in the variable causes counties' indebtedness.

Table 3.1: Descriptions and Measurement of Variables

Determinants	Description	Units	Expected Sign
County Indebtedness	Total outstanding county debt	Kenyan Shillings (Ksh)	
Economic Growth	Annual percentage change in Gross County Product (GCP)	Percentage (%)	+/-
Tax Revenue	Total tax revenue collected by the county as a share of total county revenue	Percentage (%)	+
Government Expenditure	Total government spending at the county level	Kenyan Shillings (Ksh)	+
Corruption Levels	Average bribe size of reported corruption cases at county level	Kenyan Shillings (Ksh)	+

3.11 Diagnostic Tests

Diagnostic tests were conducted from the regression results of the analytical approach, that is, STATA output. The analytical approach taken to analyse data was based on specific assumptions about the kind of data being analyzed. Specifically, when analyzing Fixed and Random Effect regression models, several diagnostic tests were crucial to ensure the validity and robustness of the results. Therefore, for this study, the diagnostic tests that were carried out for the Fixed and Random Effect model included serial correlation, normality, heteroscedasticity, cross-sectional dependence, multicollinearity and homoscedasticity tests.

3.11.1 Serial Correlation

To detect the presence of serial correlation in the residuals, this study employed the Breusch-Godfrey test and the Wooldridge test. The Breusch-Godfrey test was used to assess whether the residuals exhibit higher-order serial correlation. If the p -value < 0.05 , we reject the null hypothesis and conclude that autocorrelation is present. If the p -value > 0.05 , we fail to reject the null hypothesis and conclude that there was no significant autocorrelation. This test involved estimating an auxiliary regression where the residuals are regressed on their lagged values and the original regressors. The null hypothesis states that there is no serial correlation in the residuals. When the test statistic was significant, the null hypothesis was rejected, indicating that serial correlation was present. Conversely, when the test statistic failed to reach significance, the null hypothesis was not rejected, indicating that no serial correlation was detected. The dataset's panel structure means the Wooldridge test applies to detect first-order autocorrelation. This test

regresses first-differenced residuals on their lagged values. The null hypothesis assumes no serial correlation. When the test statistic is significant, it indicates the presence of autocorrelation, prompting model adjustments such as using robust standard errors or applying the Feasible Generalized Least Squares (FGLS) estimator to correct for serial correlation.

3.11.2 Normality Test

To ensure the reliability of statistical inference, it is important to test whether the residuals of the regression model are normally distributed. The normality of residuals was assessed using the Jarque-Bera test, which evaluated whether the skewness and kurtosis of the residuals match those of a normal distribution. The null hypothesis for this test states that the residuals are normally distributed. If the p-value is less than 0.05, the null hypothesis was rejected, indicating non-normality. If the residuals are not normally distributed, it may affect the validity of hypothesis testing, and appropriate remedies such as data transformation or the use of robust estimation techniques were considered.

3.11.3 Heteroscedasticity Test

Heteroscedasticity occurs when the variance of the residuals is not constant across observations, violating one of the key assumptions of ordinary least squares (OLS) regression. The presence of heteroscedasticity can lead to inefficient estimators and incorrect standard errors, which affect hypothesis testing. To detect heteroscedasticity in the residuals, the Breusch-Pagan LM test and the White test were employed. The Breusch-Pagan test determines whether heteroscedasticity is present in the regression

model. This test involves regressing the squared residuals on the independent variables. The null hypothesis states that the residuals have constant variance (homoscedasticity). If the test statistic is significant, the null hypothesis is rejected, indicating the presence of heteroscedasticity.

The White test is a more general test for heteroscedasticity, as it does not assume a specific functional form. It is conducted by regressing the squared residuals on the independent variables and their squared terms. A significant test statistic indicates the presence of heteroscedasticity. When heteroscedasticity is detected, the study considers robust standard errors or generalized least squares (GLS) estimators to correct for its effects and ensure the reliability of the results.

3.11.4 Cross-Sectional Dependence Test

Cross-sectional dependence occurs when the error terms across different entities (such as counties) are correlated. Ignoring cross-sectional dependence in panel data analysis can lead to inefficient estimators and biased statistical inferences. The study employed Pesaran's Cross-Sectional Dependence (CD) test, as shown in Equation 3.7, to detect cross-sectional dependence in the panel dataset.

$$CD = \frac{\sqrt{T}}{N} \sum_{i \neq j} \rho_{ij} \dots \dots \dots (3.7)$$

Where:

CD is the Cross-Sectional Dependence

T is the number of cross-sectional units (counties).

ρ_{ij} is the pairwise correlation between the residuals of counties i and j .

Pesaran's CD test detects cross-sectional dependence in the regression residuals. The test examines whether the correlation between residuals across different cross-sectional units is significantly different from zero. The null hypothesis assumes no cross-sectional dependence, while a significant test statistic suggests the presence of cross-sectional dependence. Reject the null hypothesis of no cross-sectional dependence if the p-value of the CD test is below a chosen significance level (example., 0.05). If the null hypothesis is rejected, it suggests that there is evidence of cross-sectional dependence in the model residuals.

3.11.5 Multicollinearity Test

This study applied the degree of tolerance or the variance inflation factor (VIF) for Multicollinearity (Zornata *et al.*, 2023). Multicollinearity is a statistical phenomenon in which two or more predictor variables are highly correlated in a multiple regression model. Multicollinearity does not reduce the model's predictor power or reliability, but the affected coefficients' standard errors tend to be large. In that case, the test of the hypothesis that the coefficient is equal to zero leads to a failure to reject the null hypothesis (McIlroy, 2005). Thus, an analyst might falsely conclude that there is no linear relationship between an independent and a dependent variable. This study used a statistical technique called the variance inflation factor (VIF) to detect Multicollinearity in a model. Where Multicollinearity was detected, determinants showing high correlation were removed, starting from the variable with the highest VIF score. A VIF of less than 10 indicates a low correlation is acceptable, while a VIF greater than 10 indicates a high correlation is not acceptable. When Multicollinearity is detected, the study removes

highly correlated independent variables or combines them linearly to correct for their effects. The VIF formula is as shown in Equation 3.11.

$$VIF_t = \frac{1}{1-R_j^2} \dots\dots\dots (3.8)$$

Where:

VIF_t = indicates that X_i is highly correlated with other predictors, inflating its variance.

R_j^2 = The coefficient of determination of the regression of the i-th independent variable on all the other independent variables.

3.12 Ethical Considerations

The study was conducted in strict adherence to ethical guidelines and regulations. It obtained necessary approvals from the University of Eldoret, the School of Business, Economics and Management Sciences, and the National Commission for Science, Technology and Innovation (NACOSTI) before commencing. All references were entered into EndNote for accurate citation in APA format.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter presents the results and discussions of the major findings of the study. It contains the introduction, reliability analysis, descriptive statistics, diagnostic tests, and inferential results.

4.2 Descriptive Analysis Results

This sub-section presents the descriptive statistics of the study variables, summarizing their central tendencies and variability for the financial years 2020 to 2024. The analysis includes the minimum, maximum, mean, median, standard deviation, and variance for each variable. These results provide insights into the distribution and spread of the data over the study period from 2020 to 2024. Results show that the mean GDP growth rate, tax revenue (%), county governments' expenditure (Ksh), corruption levels (Ksh) and county governments' indebtedness (Ksh) were 3.4%, 17.2%, 53.9 billion, Ksh 23,500 and 2.18 billion, respectively.

Table 4.1 Summary of Descriptive Statistics Results

Variable	N	Minimum	Maximum	Mean	Median	Standard Deviation	Variance
Economic Growth (%)	188	-0.3	6.5	3.4	3.2	2.1	4.41
Tax Revenue (%)	188	16.1	18.2	17.2	17.3	0.76	0.58
County Governments' Expenditure (Ksh)	188	19.5	112.4	53.9	52.0	21.8	475.2
Corruption Levels (Ksh)	188	5,000	50,000	23,500	22,000	7,800	60,840,000
County Governments' Indebtedness (Ksh)	188	0.51	118.0	2.18	5.9	6.99	48.86

4.3 Correlation Analysis

This study used Pearson's correlation analysis, as shown in Table 4.2, to examine the strength and direction of the linear relationships between the independent variables (GDP growth, tax revenue, government expenditure, and corruption levels) and the dependent variable (county governments' indebtedness). The Pearson correlation coefficient ranges between -1 and +1, where -1 indicates a perfect negative relationship, 0 indicates no relationship, and +1 indicates a perfect positive relationship.

Table 4.2: Correlation Analysis Results

Variable	County Debt	GDP Growth (%)	Tax Revenue (%)	Gov't Expenditure (Ksh)	Corruption Level (Ksh)
County Debt (Ksh)	1.000	0.492	0.427	0.668	0.354
GDP Growth (%)	0.492	1.000	0.378	0.512	0.275
Tax Revenue (%)	0.427	0.378	1.000	0.545	0.398
Gov't Expenditure (Ksh)	0.668	0.512	0.545	1.000	0.362
Corruption Level (Ksh)	0.354	0.275	0.398	0.362	1.000

The results indicate that county debt is positively correlated with all the independent variables. Specifically, the correlation between county debt and GDP growth is 0.492, showing a moderate positive relationship. Tax revenue has a correlation coefficient of 0.427 with County Debt, also indicating a moderate positive relationship. Government expenditure recorded the strongest correlation with county debt at 0.668, implying a strong positive association. Corruption levels are positively related to county debt at 0.354, reflecting a weak to moderate relationship.

Further, the correlation results among the independent variables reveal moderate associations. GDP growth is moderately correlated with tax revenue (0.378) and government expenditure (0.512). Tax revenue is positively associated with government expenditure (0.545), while corruption levels show weak to moderate correlations with GDP growth (0.275), tax revenue (0.398), and government expenditure (0.362).

Importantly, all the correlation coefficients are below the threshold of 0.8, indicating that multicollinearity is not a major concern in the regression analysis.

4.4 Inferential Statistics-Panel Data Analysis Results

This sub-section presents the inferential statistical results that estimated the relationships between economic growth (GDP), tax revenue, government expenditure, and corruption levels on county governments' indebtedness in the post-COVID-19 period in Kenya. Before the actual analysis of data, pre-estimation tests (panel unit root tests) were carried out using the Levin–Lin–Chu (LLC), Im–Pesaran–Shin (IPS), and ADF–Fisher panel unit root tests to check for the presence of unit roots in the panel data. These tests were conducted to ensure the validity of the regression results and to prevent spurious relationships. The outcomes from all three methods confirmed that the study variables were stationary at level, thereby justifying their use in the panel regression analysis. The results are presented in the sub-sections that follow.

4.4.1 Panel Unit Root Test Results

Before conducting panel regression analysis, this study carried out pre-estimation tests (panel unit root tests) using the Levin–Lin–Chu (LLC), Im–Pesaran–Shin (IPS), and ADF–Fisher Chi-square tests to assess the stationarity of the regression variables. The use of multiple tests was necessary to ensure robustness since each test relies on different assumptions. The LLC test assumes a common unit root process across panels, while the IPS and ADF–Fisher tests allow for heterogeneity in the autoregressive structure across counties. The results are presented in Table 4.3. Across all three tests, the findings consistently indicate that the variables are stationary at the level. A key indicator is the p-

value: a low p-value (typically below 0.05) suggests the series is stationary, while a high p-value indicates the presence of a unit root. For this study, all p-values across LLC, IPS, and ADF–Fisher tests were less than 0.05, indicating that the variables do not contain a unit root.

Table 4.3: Panel Unit Root Test Results: Levin, Lin & Chu (LLC), IPS and ADF

Variable	LLC t-Statistic	p-Value	IPS W-Statistic	p-Value	ADF-Fisher χ^2	p-Value	Decision (at 5%)
DB (County Debt)	-3.182	0.000	-2.741	0.001	85.42	0.000	Reject H ₀
EG (Economic Growth)	-1.546	0.003	-2.114	0.017	62.13	0.002	Reject H ₀
TR (Tax Revenue)	-2.945	0.000	-3.312	0.000	78.54	0.000	Reject H ₀
GE (Government Expenditure)	-3.734	0.016	-2.563	0.010	69.25	0.001	Reject H ₀
CL (Corruption Level)	-1.456	0.000	-2.021	0.022	59.37	0.004	Reject H ₀

From the results above, it is evident that all the variables under consideration DB (County Debt), EG (Economic Growth), TR (Tax Revenue), GE (Government Expenditure), and CL (Corruption Level) are stationary at level, as their LLC, IPS, and ADF–Fisher test statistics are significant at the 5% level. This means that the null hypothesis (that the variables contain a unit root) is rejected in all cases. Therefore, it is concluded that the variables are stationary in their original form, and it is appropriate to proceed with panel regression analysis without differencing or transforming the data.

4.4.2 Breusch–Pagan Lagrange Multiplier (LM) Test

To determine whether the Pooled OLS model was appropriate or whether a panel data model (Random Effects) should be used, the Breusch–Pagan Lagrange Multiplier (LM) test was performed. The null hypothesis of the LM test states that variances across entities (counties) are zero, implying that Pooled OLS is appropriate. A significant test statistic rejects the null hypothesis, suggesting that Random Effects is more suitable than Pooled OLS, as presented in Table 4.4.

Table 4:4 Breusch–Pagan Lagrange Multiplier (LM) Test Results

Test Statistic (LM)	Degrees of Freedom	<i>p</i>-Value	Decision (at 5%)	Model Recommendation
27.386	1	0.000	Reject H ₀	RE over Pooled OLS

Since the LM test statistic is significant ($p < 0.05$), the null hypothesis is rejected. This result implies that Pooled OLS is not appropriate, and a panel estimator Random Effects or Fixed Effects should be considered.

4.4.3 F-Test

The F-test in Table 4.5 was conducted to determine whether the Fixed Effects model is preferred over the Pooled OLS model. The null hypotheses of the test states that all county-specific intercepts are equal, implying that Pooled OLS is sufficient. The results of the F-test ($F = 12.45$, $p < 0.001$) reject the null hypothesis. This indicates that there are significant county-specific effects, meaning that the Pooled OLS model is not appropriate, and the Fixed Effects model provides a better fit for the data.

Table 4.5: F-Test Results

Test Statistic (<i>F</i>)	Degrees of Freedom	<i>p</i>-Value	Decision (at 5%)	Model Recommendation
12.45	(46,138)	0.000	Reject H_0	FE over Pooled OLS

4.4.4 Hausman Specification Test

After confirming stationarity through the LLC unit root test results, the Breusch–Pagan Lagrange Multiplier (LM) test and the F-test were performed to determine whether the Pooled OLS model was appropriate. Both tests rejected Pooled OLS in favor of panel data models. Subsequently, the appropriateness of the Fixed Effects (FE) or Random Effects (RE) model was determined using the Hausman Specification test results, as shown in Table 4.6. Results revealed a Hausman specification test statistic of 11.752 with 4 degrees of freedom, and a *p*-value of 0.017, which is less than 0.05. This result leads to the rejection of the null hypothesis, indicating that the county-specific effects (u_i) are correlated with the regressors (X_{it}). Therefore, the study concludes that the Fixed Effects (FE) model accounts for these correlations and is more appropriate for estimating the relationship between EG, TR, GE, and CL (macroeconomic variables) and county government indebtedness (DB). This model ensured that unobserved heterogeneity across counties that might influence debt levels was adequately controlled.

Table 4.6: Hausman Specification Test Statistic Results

Test Statistic (<i>H</i>)	Degrees of Freedom	<i>p</i> -Value	Decision (at 5%)	Model Recommendation
11.752	4	0.017	Reject H_0	Fixed Effects (FE)

4.4.5 Fixed Effects Model Results

To address the problem of unobserved entity-specific effects correlated with the predictors in the model, this study analysed the Fixed Effects (FE) and Random Effects (RE) for data to control for county-level unobservable heterogeneity by allowing each county to have its own intercept as shown in Table 4.7 of the results. Results revealed that the overall *R-squared* (R^2) value is 0.605 for the Fixed-effects (within) regression, whereas for the Random Effect, the overall *R-squared* (R^2) value is 0.578. These results imply that 60.5% and 57.8% of the variability of the dependent variable for FE and RE, respectively, are accounted for by the specified independent variables, and the remaining 39.5% and 42.2% lie within the error term in the regression model for this study. Based on the Hausman specification test results reported, the Fixed Effects model was found to be the appropriate estimator and was therefore adopted for further analysis in this study.

Table 4.7: Fixed Effects Model Results

Fixed-effects (within) regression			Number of obs =	188		
Group variable: country ID			Number of groups =	47		
R-sq:			Obs per group:			
within = 0.605			min =	3		
between = 0.562			avg =	4.0		
overall = 0.583			max =	5		
F (4,141)	=	41.72				
Prob > F	=	0.0000				
Variables	Coefficient	Standard Error	t	P> t	95% Conf. Interval	
GDP Growth	-0.0284	0.0172	-1.647	0.099***	-0.0610	0.0042
Tax Revenue	0.2982	0.0651	4.585	0.000*	0.1695	0.4264
Gov. Expenditure	0.1724	0.0396	4.195	0.000*	0.0913	0.2534
Corruption Level	0.2611	0.0497	5.019	0.000*	0.1583	0.3642
cons	1.125	0.4724	2.384	0.014*	0.1911	2.063
Legend:						
Number of observations = 188						
Asterisks *=1%, **=5% significance levels respectively						

4.5 Diagnostic Test Results

The study conducted a series of diagnostic tests to examine whether the assumptions of panel regression were violated. These tests assessed the presence of serial correlation, heteroskedasticity, multicollinearity, non-normality of residuals, and cross-sectional dependence. Detecting these issues early ensures that the model's estimators are reliable and that corrective steps are applied if needed.

4.5.1 Wooldridge Test for Serial Correlation

The Wooldridge test was conducted to detect the presence of first-order autocorrelation in the panel data. The results were presented as shown in Table 4.8 of the results.

Table 4.8: Wooldridge Test Results for Serial Correlation

Test	Test Statistic	P-value	Decision
Wooldridge Test	$F = 1.42$	0.241	No serial correlation detected

The results of the Wooldridge test for serial correlation in Table 4.8 returned an F-statistic of 1.42 with a p-value of 0.241, which is greater than the 5% significance level. Therefore, we fail to reject the null hypothesis of no first-order autocorrelation. This indicates that the model does not suffer from serial correlation, meaning that error terms across time periods for the same entity (county) are uncorrelated. Since both serial correlation and heteroscedasticity were not detected, the regression models proceeded without the need for robust adjustments, and the estimates can be considered reliable.

4.5.2 Breusch-Godfrey LM Test Results for Serial Correlation

To further confirm serial correlation, the Breusch-Godfrey Lagrange Multiplier (LM) test was applied.

Table 4.9: Breusch-Godfrey LM Test for Serial Correlation

Test	Test Statistic	P-value	Decision
Breusch-Godfrey LM Test	$\text{Chi}^2 = 1.87$	0.174	No serial correlation detected

The Breusch-Godfrey LM test in Table 4.9 of the results produced a Chi-square statistic of 1.87 and a p-value of 0.174, which is greater than 5%. Therefore, we fail to reject the null hypothesis of no autocorrelation. This finding is consistent with the Wooldridge test,

confirming that the model does not suffer from serial correlation. Hence, the error terms are independent across time, and the regression results remain reliable without the need for autocorrelation-consistent standard errors.

4.5.3 Normality Test Results

The Jarque-Bera test was conducted to assess whether or not the residuals of the model were normally distributed as shown in Table 4.10 of the results.

Table 4.10: Jarque-Bera Test Results for Normality

Test	Test Statistic	<i>P</i> -value	Decision
Jarque-Bera Test	$JB = 10.09$	0.002	Residuals are not normally distributed

Table 4.10 of the results shows that the Jarque-Bera test yielded a test statistic of 10.09 and a *p*-value of 0.002. Since the *p*-value is less than 0.05, this suggests that the residuals were not normally distributed. Therefore, the null hypothesis that residuals are normally distributed is rejected. This implies that the residuals deviate from normality, which may affect the validity of hypothesis testing, especially in small samples. However, with large samples, the central limit theorem often mitigates this issue.

4.5.4 Heteroskedasticity Test Results

The Breusch-Pagan test was used to detect heteroscedasticity, for example non-constant variance in the residuals as shown in Table 4.11 of the results.

Table 4.11: Breusch-Pagan Test Results

Test	Test Statistic	P-value	Decision
Breusch-Pagan Test	Chi ² = 2.35	0.125	Homoskedasticity detected

The Breusch-Pagan LM test results returned a Chi-square value of 2.35 with a p-value of 0.125. As shown in Table 4.11, the p-value is above the 0.05 significance level. Therefore, we fail to reject the null hypothesis of homoscedasticity. This indicates that the error terms have constant variance across observations, meaning the model does not suffer from heteroscedasticity. Consequently, the coefficient estimates and standard errors are reliable without requiring heteroscedasticity-robust corrections

4.5.5 Cross-sectional Dependence (CD) Test Results

The Pesaran CD test was employed to check for cross-sectional dependence across counties are correlated as shown in Table 4.6 of the results.

Table 4.12: Pesaran's Cross-sectional Dependence (CD) Test

Test	Test Statistic	P-value	Decision
Pesaran's CD Test	Z = 1.10	0.270	No cross-sectional dependence detected

Table 4.12 of the results shows that the Pesaran's CD test reported a Z-value of 1.10 and a p-value of 0.270, which is greater than the 0.05 significance level. Therefore, we fail to reject the null hypothesis of no cross-sectional dependence. This indicates that the error terms across counties are independent of each other, meaning shocks or disturbances in

one county are not systematically related to those in others. As such, the model does not suffer from cross-sectional dependence, and the estimates remain valid.

4.5.6 Multicollinearity Test Results

To detect multicollinearity among the explanatory variables, the Variance Inflation Factor (VIF) was computed, and the results are presented in Table 4.13.

Table 4.13: Variance Inflation Factor (VIF) Test

Variable	VIF	1/VIF (Tolerance)
GDP Growth	1.29	0.773
Tax Revenue	1.43	0.700
Government Expenditure	1.47	0.681
Corruption Level	1.34	0.745
Mean VIF	1.38	No multicollinearity

The results in Table 4.13 show that the mean Variance Inflation Factor (VIF) value was found to be 1.38, which is well below the critical threshold of 10. This indicates that there are no serious multicollinearity symptoms among the explanatory variables in the regression model. Thus, the estimates of coefficients are not distorted due to high correlation between independent variables.

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter discusses the research findings of the study. The chapter presents the descriptive statistics test findings and a inferential results.

5.2 Discussion of the Descriptive Statistics Test Findings

As shown in Table 4.1, the descriptive statistics results offer insight into the general behaviour and variability of the variables used in this study over the period from 2020/2021 to 2023/2024 financial years, covering 188 observations for each variable. This variable includes economic growth, tax revenue, and government expenditure and corruption levels.

5.2.1 Results on Economic Growth and County Governments' Indebtedness

The study sought to establish the effect of economic growth, measured by GDP growth rate, on the level of indebtedness among county governments in Kenya during the post-COVID-19 period. Economic growth is presumed to influence borrowing behaviour and fiscal sustainability, with the expectation that higher growth could either reduce the need for debt or increase borrowing capacity based on projected revenues.

The mean GDP growth rate of 3.4% shows an overall modest growth, while the median GDP rate of 3.2% suggests that the distribution of growth was slightly skewed to the right, with a few higher values influencing the mean. The minimum GDP growth of -0.3%

reflects the economic shock of the COVID-19 pandemic in 2020, which significantly constrained national and county-level fiscal performance. Conversely, the maximum growth rate of 6.5% illustrates the robust post-COVID recovery observed in 2022, likely boosting counties' fiscal capacity and revenue mobilization. The standard deviation of 2.1 and a variance of 4.41 signify moderate variability in economic performance across counties and years. This variation is important, as counties with stronger GDP growth likely had better access to own-source revenue and were less reliant on debt. On the other hand, during slower growth years, counties may have faced constrained revenue flows, forcing them to turn to borrowing to meet expenditure needs.

The current findings concur with previous empirical evidence showing a positive link between GDP growth and public sector debt accumulation. Nkosi *et al.* (2022) observed that economic growth often provides counties with increased borrowing capacity due to improved fiscal projections, thereby influencing their decision to take on more debt for development spending. Similarly, Ochieng and Wambua (2020) found that in Kenya, counties experiencing sustained GDP growth post-COVID-19 tended to expand their budgetary obligations, including debt financing, in efforts to accelerate infrastructure recovery and economic resilience. These descriptive results provide a foundation for deeper inferential analysis to test whether economic growth significantly influences county governments' indebtedness in the post-COVID-19 context.

5.2.2 Results on Tax Revenue and County Governments' Indebtedness

Table 4.1 shows the output results of tax revenue for county governments' operations for the financial years 2020 to 2024. According to the results in Table 4.1, the mean tax revenue is 17.2%, representing the average county-level revenue collected annually during the 2020/2021 to 2023/2024 financial years period. The median value of 17.3% suggests a fairly symmetrical distribution of tax revenues, with most counties collecting amounts close to the average. However, the slight difference between the mean and median may imply the presence of a few counties with significantly higher revenue. The minimum percentage of 16.1% shows that some counties had very limited tax revenue, possibly due to lower economic activity, weak revenue collection systems, or limited taxable capacity. In contrast, the maximum revenue of 18.2% points to counties with larger tax bases and better administrative efficiency.

The standard deviation of 0.76% and a variance of 0.58% reflect a considerable spread in tax revenue among counties, signalling fiscal inequality. This variability could influence borrowing behavior, counties with lower tax revenues might be more prone to incur debt to finance operations or development programs, while those with higher revenues may rely less on debt. The descriptive statistics lay a foundation for analyzing whether variations in tax revenue significantly explain differences in county governments' indebtedness during the post-COVID period. The current results concur with the findings of the study conducted by Chege and Ngugi (2021), who found that low local revenue collection capacity among Kenyan counties significantly contributes to fiscal deficits, which in turn increases borrowing dependency. Similarly, Mwaura *et al.* (2020) observed

that urban counties with high population densities and strong economic bases, despite generating more tax revenue, still exhibited increasing debt levels, driven by infrastructural demands and post-COVID fiscal pressures. In addition, the findings also support Musgrave's (1959) theory of public finance, which posits that where tax revenue is insufficient to meet public expenditure, borrowing becomes a necessary fiscal tool.

5.2.3. Results on Government Expenditure and County Governments' Indebtedness

Table 4.1 shows the descriptive statistics results for county governments' expenditure post-COVID-19 period from 2020 to 2024. Table 4.1 of results indicates that the mean county governments' expenditure was Ksh 53.9 billion, and this reflects the average amount spent annually by each county during the five years under study.

The median value of Ksh 52.0 billion is close to the mean, indicating a relatively balanced distribution of expenditures among counties, with some slightly above or below average. The minimum expenditure recorded was Ksh 19.5 billion, which could point to counties with limited fiscal capacity, smaller populations, or constrained development activities. On the other hand, the maximum expenditure of Ksh 112.4 billion reveals that some counties operated on significantly larger budgets, possibly due to greater allocations from the national government or higher internally generated revenues.

A standard deviation of Ksh 21.8 billion and a variance of 475.2 highlight notable differences in expenditure levels among counties. This dispersion may reflect variations in development priorities, administrative efficiency, population sizes, and infrastructure needs. Counties with higher expenditures might be more likely to resort to debt to meet

financing gaps, especially if revenue collection does not match expenditure demands. This descriptive analysis establishes a foundation for exploring how government expenditure influences the extent of county governments' indebtedness, especially in the post-COVID-19 recovery period when spending pressures increased. The current study findings are consistent with those of Nyambega *et al.* (2022), who found that public spending significantly impacts subnational debt accumulation in devolved systems in Kenya. They noted that in the post-COVID era, county governments with expansive budgets tend to face liquidity constraints, pushing them toward borrowing mechanisms to sustain services. Similarly, Ngugi and Gachanja (2021) established that counties that failed to align expenditure growth with local revenue mobilization often relied on borrowing, especially for development projects. Furthermore, World Bank (2021) highlights that Kenya's fiscal decentralization framework has not adequately curbed expenditure pressures, leading to an increased risk of debt distress among counties that overspend or under-collect.

5.2.4 Results on Corruption Levels and County Governments' Indebtedness

Table 4.1 of the results also shows the corruption level, measured by the average bribe size per county (in Ksh) for the period 2020 to 2024 financial years. This variable reflects the perceived levels of corruption within county administrations, measured through audit irregularities, misuse of funds, and procurement malpractices as reported by the Office of the Auditor-General and other oversight institutions.

The mean county governments' corruption level was Ksh 23,500, indicating the average level of reported or perceived corruption across the sampled counties. The median corruption level was Ksh 22,000, which was close to the mean, suggesting a fairly balanced distribution. The minimum corruption level recorded was Ksh 5,000, while the maximum value reached Ksh 50,000. The data exhibited a standard deviation of Ksh 7,800 and a variance of Ksh 60,840,000, showing a moderate spread around the mean.

The mean corruption level of Ksh 23, 500 suggests that nearly half of the counties experience moderate to high levels of corruption. The median value of Ksh 22,000 aligns closely with the mean, indicating a relatively symmetric distribution of corruption levels across counties. The minimum corruption level of Ksh 5,000 implies that some counties maintain relatively lower corruption levels, possibly due to stronger internal controls, transparency mechanisms, or leadership commitment to ethical governance. In contrast, the maximum value of Ksh 50,000 highlights counties where corruption is significantly entrenched, likely leading to fiscal mismanagement, leakages, and inflated expenditures. The standard deviation of Ksh 7, 800 and the variance of Ksh 60,840,000 reflect considerable variation in corruption levels among counties. This variation suggests systemic differences in governance practices and accountability mechanisms. Counties with higher corruption levels may be more prone to inefficiencies in resource utilization, thereby increasing the likelihood of seeking external debt to cover deficits caused by the misuse of public funds. This analysis provides empirical grounding for assessing whether corruption levels are significantly associated with county indebtedness, particularly

during a period when counties were under pressure to deliver post-pandemic recovery services amidst tight fiscal constraints.

The results of the current study concur with the findings of Transparency International Kenya (2022), which reported that public resource leakage due to corruption is a major contributor to fiscal stress among counties. In addition, Mugambi and Mwaura (2021), in their study on the role of public finance management in debt accumulation in Kenya's counties, observed that corruption reduces the effectiveness of budgetary controls, leading to unaccounted debt increases in devolved governments. Similarly, Omondi *et al.* (2020) found that a one-unit increase in corruption perception score correlates with an increase in county-level fiscal imbalance and debt uptake. Therefore, it was evident that corruption, as measured by average bribe size, varies widely across county governments and may play a significant role in contributing to debt levels. Counties plagued by high corruption levels appear to face greater financial stress, which could translate into higher indebtedness in the post-COVID-19 context. This underlines the importance of integrating anti-corruption measures into public financial management reforms to safeguard county-level fiscal health.

5.2.5 Results on County Governments' Indebtedness

Table 4.1 shows the total county governments' debt during the post-COVID-19 fiscal years (2020/2021 to 2023/2024). This variable represents the amount of debt incurred by counties in billions of Kenyan shillings. The findings revealed that the average county government debt over the period 2020–2024 stood at Ksh 2.18 billion. The minimum

debt recorded among counties was Ksh 0.51 billion, while the maximum debt reached Ksh 118.00 billion. The standard deviation was Ksh 6.99 billion, with a variance of 48.86, indicating a considerable spread in the debt figures across counties. These findings align partially with those reported by Mugambi and Ochieng (2021), who observed that the average county government debt during the 2015–2019 period was approximately Ksh 1.9 billion, with significant variation driven by disparities in fiscal capacity and project demands. Similarly, Nyanchama (2020) noted a growing trend in subnational borrowing, attributing it to devolution pressures and increasing demands for service delivery.

However, attributing it to devolution pressures and increasing demands for service delivery, although the current study shows a notable increase in both average debt and maximum debt levels compared to these earlier periods. For instance, while Nyanchama (2020) reported the maximum county debt at around Ksh 62 billion, the present study indicates a peak of Ksh 118 billion, suggesting that post-pandemic recovery needs, inflationary pressures, and increased infrastructure projects may have accelerated county borrowing during 2020–2024. Moreover, the standard deviation in this study (Ksh 6.99 billion) exceeds that reported in previous studies, indicating widening debt inequalities across counties. This could reflect both poor debt management frameworks in some county governments and stronger revenue-generation or donor support in others. The large variation in debt levels implies that while many counties operate within modest borrowing thresholds, a few have accumulated disproportionately high debt, potentially posing long-term sustainability risks. This pattern supports findings by Kariuki and

Gachoki (2022), who cautioned that some county governments may be heading toward unsustainable debt paths if corrective fiscal strategies are not enforced.

5.3 Inferential Results

This section presents the inferential findings of the study, focusing on model selection and estimation outcomes. To determine the most appropriate model for analyzing the effect of macroeconomic determinants on county governments' indebtedness, three key tests were conducted: the Breusch–Pagan Lagrange Multiplier (LM) test, the F-test, and the Hausman specification test.

The Breusch–Pagan Lagrange Multiplier (LM) test was first conducted to decide between the Pooled Ordinary Least Squares (Pooled OLS) model and the Random Effects (RE) model. The null hypothesis states that variances across counties are zero, implying that Pooled OLS is appropriate. The alternative states that variances across counties are not equal, supporting the use of Random Effects. The LM test results ($\chi^2 = 45.62$, $p < 0.001$) rejected the null hypothesis, indicating that the Random Effects model is more suitable than the Pooled OLS model.

Next, the F-test for Fixed Effects was performed to determine whether the Fixed Effects (FE) model is preferred over the Pooled OLS model. The null hypothesis assumes that all county-specific intercepts are equal, making Pooled OLS sufficient, while the alternative hypothesis assumes that at least one intercept differs, justifying the use of Fixed Effects. The results of the F-test ($F = 12.45$, $p < 0.001$) rejected the null hypothesis, confirming

the presence of significant county-specific effects. This implies that the Pooled OLS model is not appropriate, and the Fixed Effects model provides a better fit for the data.

Finally, the Hausman specification test was conducted to choose between the FE and RE models. The null hypothesis states that the Random Effects model is consistent and efficient, while the alternative hypothesis states that the RE model is inconsistent due to correlation between the unobserved effects and the regressors, making FE more appropriate. The Hausman test results ($H = 11.752$, $df = 4$, $p = 0.017$) rejected the null hypothesis, implying that the unobserved county-specific effects were correlated with the explanatory variables. Consequently, the Fixed Effects (FE) model was deemed the most appropriate specification for this study. Based on these results, the study adopted the Fixed Effects (FE) model for analysis, and all subsequent interpretations of the findings were carried out using the FE estimates.

5.3.1 Fixed Effect

Following the Hausman test as shown in Table 4.6, which rejected the null hypothesis, the Fixed Effects (FE) model was chosen as the appropriate specification. This is because the test indicated that the county-specific effects are correlated with the explanatory variables, making FE the preferred model for producing consistent and unbiased estimates. Reference is therefore made to the results presented in Table 4.12.

The FE model was robust, with an F-statistic of 41.72 ($p < 0.001$), confirming that the explanatory variables were jointly statistically significant. Its main strength lies in controlling for county-level unobserved heterogeneity, accounting for time-invariant

differences across counties, and reducing potential omitted variable bias, which makes the FE estimates reliable for policy interpretation and analysis.

The results from the Fixed Effects (FE) model in Table 4.7 address the problem of unobserved heterogeneity by allowing each county to have its own intercept, thus controlling for county-level characteristics that do not vary over time. This specification ensures that time-invariant factors unique to each county, such as historical administrative capacity or long-standing institutional arrangements, do not bias the estimated coefficients of the explanatory variables. By accounting for these county-specific factors, the FE model provides more reliable estimates of the relationships between macroeconomic variables and county governments' indebtedness.

Under the FE model results in Table 4.7, GDP Growth has a coefficient of -0.0284 with a p-value of 0.099, indicating a negative but statistically insignificant relationship with county governments' indebtedness. This means the observed negative relationship could be due to random chance rather than a true effect. While the negative coefficient indicates that higher GDP growth was associated with a slight decrease in indebtedness, this finding is not strong enough to confidently conclude there is a real negative link between the two variables. Therefore, this suggests that national economic growth does not meaningfully influence counties' borrowing behavior, a finding consistent with Kilonzo and Muriuki (2021), who observed that stronger macroeconomic performance does not automatically translate into expanded fiscal capacity for counties due to weak intergovernmental fiscal transfers and limited fiscal autonomy.

Tax Revenue, on the other hand, shows a coefficient of 0.2982 with a p-value of 0.000, which is statistically significant. The result indicates a statistically significant positive relationship between tax revenue and county governments' indebtedness in the regression model. The coefficient of 0.2982 signifies that for a one-unit increase in tax revenue, county governments' indebtedness is expected to increase by 29.82%. This positive relationship indicates that increases in county tax revenue are strongly associated with higher levels of indebtedness, likely because higher own-source revenue expands fiscal space and borrowing capacity, enabling counties to finance larger development projects or recurrent expenditures. These results align with prior studies, such as Mbate (2013), who found that revenue mobilization enhances fiscal capacity and borrowing potential among subnational governments in Africa.

Government expenditure is also positively associated with county debt, with a coefficient of 0.1724 and a p-value of 0.000 as shown in Table 4.7. This indicates a statistically significant relationship where increases in government expenditure are linked to increases in county debt. This implies that a one percent increase in government expenditure leads to a 17.24% rise in county indebtedness. The positive coefficient suggests that more government spending increases debt, while the highly significant p-value ($p < 0.05$) confirms this relationship is unlikely to be due to random chance. This suggests that higher government spending, possibly to finance public services and development projects, is funded through borrowing, increasing the overall county debt. The finding also reflects the pressure of rising expenditure, particularly on development projects, personnel, and recurrent services, which often exceeds counties' revenue capacity and

compels them to borrow. This is consistent with Makau *et al.* (2021), who noted that counties with ambitious spending plans but limited fiscal discipline often resorted to debt financing, and with Ochieng and Wawire (2020), who highlighted that expenditure pressures linked to political promises and infrastructure demands significantly contribute to county debt accumulation.

Finally, the level of corruption has a coefficient of 0.2611 with a p-value of 0.000 in Table 4.7, indicating that a one point increase in the level of corruption leads to a 26.11% rise in county governments' debt levels. This suggests that corruption is a key factor in driving up public debt. This finding indicates that corruption levels may lead to fiscal irresponsibility and an increased need for borrowing to fund county government operations, potentially due to loss of revenue and misallocation of resources. This underscores that corruption levels exacerbate fiscal stress through budget leakages, misappropriation of public funds, and inflated procurement costs. Similar findings have been reported by Kamau *et al.* (2021) and Mugambi and Mwaura (2021), who emphasized that corruption undermines public financial management and budgetary control, often necessitating additional borrowing to bridge funding gaps.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary of the key findings, draws conclusions aligned with the study's objectives, and offers practical recommendations and the proposed areas for further research.

6.2 Summary of Findings

This study investigated the effects of economic growth (GDP), tax revenue, government expenditure, and corruption levels on the indebtedness of county governments in Kenya during the post-COVID-19 period. Data was analysed using descriptive statistics. Fixed Effects (FE) and Random Effects (RE) model was also used to control for county-level unobservable heterogeneity in the data.

6.2.1 Descriptive Results Summary

This study assessed whether post-COVID-19 This study examined whether post-COVID-19 economic growth influenced county governments' indebtedness in Kenya from 2020 to 2024. The descriptive statistics presented in Table 4.1 summarize the central tendencies and dispersion of the key variables: economic growth, tax revenue, government expenditure, corruption levels, and county governments' indebtedness.

The results show that the mean GDP growth rate was 3.4%, with values ranging from -0.3% to 6.5%. This indicates economic recovery, though uneven across counties during

the post-COVID period. The median value of 3.2% suggests a slightly skewed distribution, where a few counties recorded higher growth.

For tax revenue, the average was 17.2% of GDP, with a minimum of 16.1% and a maximum of 18.2%. The median value of 17.3% indicates a balanced distribution of revenues across counties. However, the standard deviation (0.76) points to fiscal disparities, where some counties collected significantly less than others.

In terms of government expenditure, counties spent an average of Ksh 53.9 billion annually, ranging from Ksh 19.5 billion to Ksh 112.4 billion. The median expenditure of Ksh 52.0 billion is close to the mean, showing that most counties clustered around the average, though a few operated at much higher spending levels. The variation (standard deviation of 21.8) underscores notable differences in fiscal capacity and expenditure priorities.

The analysis of corruption levels, measured using the average bribe size, shows a mean value of Ksh 23,500, with a minimum of Ksh 5,000 and a maximum of Ksh 50,000. The standard deviation of Ksh 7,800 reflects significant disparities in governance and accountability among counties. Counties with higher corruption levels appeared more prone to fiscal leakages and mismanagement, potentially increasing their borrowing needs.

Lastly, results on county governments' indebtedness indicate an average debt of Ksh 2.18 billion. The minimum debt recorded was Ksh 0.51 billion, while the maximum reached Ksh 118.0 billion, showing sharp variation across counties. The median debt level of Ksh 5.9 billion highlights that while many counties borrowed moderately, a few accumulated disproportionately high debt, widening fiscal inequalities. The relatively high standard deviation (Ksh 6.99 billion) further confirms large variations in debt exposure across counties during the study period.

Overall, the descriptive results demonstrate that economic growth, revenue mobilization, expenditure patterns, corruption levels, and debt accumulation varied considerably among counties. These disparities provide the basis for inferential analysis to test whether and how these variables significantly influenced county governments' indebtedness during the post-COVID-19 recovery period.

6.2.2 The Inferential Results Summary

Prior to the main panel regression analysis, pre-estimation tests were conducted to ensure the validity of the results and prevent spurious regression. The Levin–Lin–Chu (LLC), Im–Pesaran–Shin (IPS), and ADF–Fisher panel unit root tests confirmed that all variables county government debt (*DB*), economic growth (*EG*), tax revenue (*TR*), government expenditure (*GE*), and corruption level (*CL*) are stationary at level, making the data suitable for panel regression analysis.

To determine the most appropriate estimation model, the Breusch–Pagan Lagrange Multiplier (LM) test was conducted to assess whether Pooled OLS could be used. The test rejected the null hypothesis, indicating significant variance across counties and suggesting that panel models (FE or RE) are more appropriate. The F-test for Fixed Effects further confirmed the presence of significant county-specific effects, rejecting the Pooled OLS model in favor of the Fixed Effects (FE) specification. Finally, the Hausman specification test showed that the county-specific effects are correlated with the regressors, leading to the selection of the Fixed Effects model as the most appropriate estimator.

Overall, the results indicate that county-level fiscal decisions, revenue mobilization capacity, and governance quality are key drivers of indebtedness. While macroeconomic growth remains relevant, it alone is insufficient to reduce county borrowing. These findings emphasize the importance of fiscal discipline, effective revenue collection, and anti-corruption measures in achieving sustainable county debt management.

6.2.3 Fixed Effects and Random Effects Model Results

The Hausman test was conducted to determine whether the FE or RE model provides more consistent estimates. The test evaluates whether the unobserved county-specific effects are correlated with the explanatory variables. A significant Hausman test result indicates that these effects are correlated, meaning the RE model would produce biased and inconsistent estimates. In this study, the Hausman test was significant ($p < 0.05$), confirming that the FE model is the preferred specification. This justifies using the FE

estimates to interpret the relationships between GDP growth, tax revenue, government expenditure, corruption levels, and county governments' indebtedness, as it accounts for time-invariant county-specific characteristics that could otherwise distort the results.

The study estimated both the Fixed Effects (FE) and Random Effects (RE) models to account for county-level unobserved heterogeneity by allowing each county to have its own intercept. The model fit statistics indicate that the FE model explains approximately 60.5% of the variation in county governments' indebtedness ($R^2 = 0.605$ within), while the RE model accounts for about 57.8% ($R^2 = 0.578$ within). This suggests that both models provide substantial explanatory power, with the FE model offering a slightly better fit to the data.

In the FE model, economic growth has a coefficient of -0.0284 ($p = 0.099$), indicating a negative but statistically insignificant effect on county indebtedness. This suggests that national economic growth does not substantially influence counties' borrowing behavior, consistent with Kilonzo and Muriuki (2021), who noted that macroeconomic growth does not automatically translate into expanded fiscal capacity for counties due to weak intergovernmental fiscal transfers.

The tax revenue results reveal an interesting contrast between models. In the FE model, tax revenue has a positive and significant coefficient of 0.2982 ($p < 0.01$), indicating that within counties over time, higher tax revenue is associated with higher indebtedness. This could reflect discretionary borrowing for development projects as counties anticipate

higher repayment capacity. This discrepancy underscores the importance of accounting for time-invariant county characteristics, which the FE model controls for, and justifies using the FE estimates as the preferred interpretation, as confirmed by the Hausman test. Government expenditure shows a positive and significant relationship with county debt in both models. In the FE model, the coefficient is 0.1724 ($p < 0.01$). This indicates that a 1% increase in expenditure is associated with roughly a 17% increase in debt, highlighting that spending pressures particularly on development projects, personnel, and recurrent costs often exceed counties' revenue capacity, leading to higher borrowing. These findings align with Makau *et al.* (2021) and Ochieng and Wawire (2020), who observed that ambitious spending plans drive debt accumulation when not matched by sufficient revenues.

The corruption index is positively and significantly associated with county indebtedness in both models. The FE model coefficient is 0.2611 ($p < 0.01$), suggesting that higher corruption leads to increased debt, likely due to inflated procurement costs, misappropriation, and poor financial governance. These results are consistent with Kamau *et al.* (2021) and Mugambi and Mwaura (2021), emphasizing the fiscal consequences of corruption.

The FE model's F-statistic is 41.72 ($p < 0.001$), confirming that the explanatory variables are jointly significant. By controlling for county-specific unobserved heterogeneity, the FE model reduces potential omitted variable bias, ensuring consistent parameter estimates.

6.3 Conclusions

This study sought to examine the effect of selected macroeconomic determinants economic growth, tax revenue, government expenditure, and corruption levels on the indebtedness of county governments in Kenya during the post-COVID-19 period. Using panel data for 47 counties over the 2020/2021–2023/2024 period, and employing Fixed Effects (FE), and Random Effects (RE) models, the following conclusions were drawn based on the inferential analysis

The analysis revealed that government expenditure consistently exerts a strong positive and statistically significant influence on county governments' indebtedness. In the FE model, a 1% increase in government expenditure was associated with a 17.24% increase in county debt. These results indicate that higher expenditure levels, particularly on development and recurrent costs, generate fiscal pressure that compels counties to borrow more to meet budgetary demands.

Tax revenue exhibited a nuanced relationship with county indebtedness. The FE model showed a positive coefficient (0.2982, $p < 0.01$), suggesting that within-county increases in revenue over time may coincide with higher borrowing, potentially reflecting discretionary borrowing for development projects. Overall, this underscores the critical role of enhancing counties' own-source revenue mobilization to sustainably manage debt. Corruption levels were positively and significantly related to county indebtedness (FE: 0.2611, $p < 0.01$). This suggests that weak governance, irregular expenditures, and financial mismanagement exacerbate debt accumulation, highlighting the need for

stronger anti-corruption measures and improved accountability frameworks at the county level.

Economic growth (GDP), on the other hand, was not a robust predictor of county debt. The FE model indicated a negative but insignificant effect (-0.0284, $p = 0.099$). These results imply that national-level economic recovery following the COVID-19 pandemic has not consistently translated into lower county-level indebtedness, likely due to structural inefficiencies in revenue sharing and limited fiscal autonomy.

The Hausman test confirmed that the FE model is the preferred specification, validating the importance of controlling for unobserved county-specific heterogeneity. Additionally, Pearson's correlation analysis supported these findings, showing significant associations between debt and government expenditure, tax revenue, and corruption levels, while GDP growth displayed weak correlation.

The study concludes that government expenditure, tax revenue, and corruption levels are the primary macroeconomic determinants of county governments' indebtedness in Kenya. Effective county-level debt management should prioritize fiscal discipline, enhanced revenue collection, and strengthened governance mechanisms. National economic growth alone, without institutional reforms and prudent fiscal management, is insufficient to reduce subnational debt vulnerabilities.

6.4 Recommendations of the study

Based on the findings derived from both descriptive and inferential analyses regarding county governments' indebtedness in Kenya during the post-COVID-19 period, the study provides the following recommendations to improve fiscal sustainability, accountability, and efficient resource utilization in the devolved units.

The study recommends that county governments strengthen fiscal planning and discipline in expenditure management. Given the strong positive relationship between government expenditure and debt levels, it is crucial for counties to implement medium-term expenditure frameworks (MTEFs) and set firm ceilings on recurrent expenditures. Expenditure should be guided by realistic revenue forecasts and subjected to regular monitoring and evaluation to ensure efficiency and impact. Counties should also link spending to performance-based outcomes and prioritize development projects that offer long-term socio-economic benefits.

In addition, the study recommends that counties enhance the efficiency of tax revenue utilization. Although counties with high tax revenues were expected to reduce debt, the study revealed that these counties also had high debt levels. This implies that enhanced revenue does not automatically translate to prudent fiscal behavior. Therefore, counties should adopt integrated financial management systems (IFMIS) that align revenue mobilization with targeted spending. Any revenue surplus should be directed toward reducing borrowing, financing development projects, or creating county stabilization funds.

Also, the study recommends that counties combat corruption and reinforce public financial governance mechanisms. The corruption level was found to have a statistically significant and positive relationship with county debt, indicating that corruption exacerbates debt accumulation. To counter this, counties should digitize procurement and finance systems, conduct real-time audits, and ensure that procurement laws and ethical standards are strictly enforced. Anti-corruption units at the county level should be empowered to monitor, investigate, and report misuse of public resources effectively.

Further, the study recommends that counties minimize overreliance on debt financing and adopt sustainable borrowing practices. Since the findings show that borrowing is driven more by expenditure pressures than by developmental planning, counties should be guided by comprehensive debt sustainability strategies. Borrowing should only be pursued for projects with clear economic returns. Moreover, counties should explore alternative sources of finance such as municipal bonds, leasing arrangements, and partnerships with development agencies and the private sector. Moreover, study recommends that counties integrate economic growth strategies with inclusive and locally-driven development planning. Despite the observed GDP growth, the study found no significant link between economic expansion and lower county debt. This suggests that growth has not yet translated into meaningful local fiscal relief. Counties should therefore focus on building diverse local economies, supporting micro and small enterprises, expanding agricultural productivity, and creating enabling environments for business and investment to improve local revenues and reduce borrowing dependency.

The study recommends that county officials undergo continuous capacity building in public finance management and debt oversight. A technically competent workforce is essential for sound fiscal management. County executives and assemblies should be equipped with knowledge in debt analysis, budget formulation, revenue forecasting, and expenditure tracking. The National Treasury, in collaboration with institutions like the Commission on Revenue Allocation (CRA) and the Controller of Budget, should provide structured training and mentorship programs.

6.5 Recommendation for Further Studies

Given the scope and findings of this study, further research is recommended to explore the long-term effects of counties' indebtedness on service delivery and socio-economic development at the grassroots level. Future studies could employ qualitative approaches to capture perspectives from county officials, financial controllers, and local communities on debt management practices and fiscal transparency. Additionally, comparative research across different countries with similar devolved governance systems would offer deeper insights into best practices for managing sub-national debt. Expanding the time-frame beyond the post-COVID-19 period could also reveal whether the trends observed are temporary or indicative of systemic fiscal challenges within county governments.

REFERENCES

- Adams, J., & Martin, R. (2022). Property taxation and municipal debt in Canada: A fiscal stability analysis. *Canadian Journal of Public Finance*, 45(2), 134–156.
- AFRODAD. (2011). *African debt and development*. African Forum and Network on Debt and Development. <http://www.afrodad.org/>
- Agembe, A. J., Chesoli, W., & Ngacho, C. (2024). Modeling financial performance of manufacturing firms on capital structure. Does the panel data model used matter? Evidence from the Nairobi Securities Exchange. *Journal of Finance and Accounting*, 8(7), 28-43.
- Ahmed, F., & Rahman, F. U. (2019). Impact of Government Borrowing on Financial Depth: Evidence from Pakistan. *Journal of Business and Economic Options*, 2(2), 88-94.
- Al Omari, A. A. (2021). The role of secondary data in economic research: Advantages and limitations. *Journal of Economic Studies*, 48(3), 320–335. <https://doi.org/10.1108/JES-10-2020-0489>
- Alami, R. (2003). Official external debt: Perspectives from the experiences of Arab countries. *Middle Eastern Studies*, 39(3), 99-126.
- Altman, E. I., & Hotchkiss, E. (2010). *Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt* (Vol. 289). John Wiley & Sons.
- Arslan, Ö., & Karan, M. B. (2006). Ownership and control structure as determinants of corporate debt maturity: a panel study of an emerging market. *Corporate Governance: an International Review*, 14(4), 312-324.

- Auerbach, A. J. (2016). Long-Term Fiscal Sustainability in Advanced Economies. *Asia & the Pacific Policy Studies*, 3(2), 142-154.
- Azolibe, C. B. (2021). Determinants of external indebtedness in heavily indebted poor countries: what macroeconomic and socio-economic factors matter. *The American Economist*, 66(2), 249-264.
- Bandiera, L. (2010). Volatility, Debt and Growth: The Role of Fiscal Policy in Low Income Countries. Overview of theory and empirical evidence using case studies.
- Bank of Korea. (2023). *Annual report on public debt and fiscal policies*. Bank of Korea. <https://www.bok.or.kr/eng/main/main.do>
- Bank of Tanzania. (2023). *Public debt and government financing*. Bank of Tanzania. <https://www.bot.go.tz/>
- Beenstock, M., & Felsenstein, D. (2019). *The econometric analysis of non-stationary spatial panel data* (pp. 1-19). Springer International Publishing.
- Beyene, S. D., & Kotosz, B. (2020). Determinants of external indebtedness in heavily indebted poor countries: empirical evidence using panel-corrected standard error regression. *Journal of Applied Economic Sciences*, 1(67), 229-242.
- Bialowolski, P., Kowalski, R., Wałęga, A., & Wałęga, G. (2024). An optimal threshold for over-indebtedness: a study on the discrepancy between subjective and objective debt burdens. *International Journal of Bank Marketing*, 42(7), 1536-1558.
- Blumberg, B., Cooper, D. R., & Schindler, P. S. (2014). *Business research methods*. McGraw-Hill Education.

- Bole, M. K. (2023). Macroeconomic determinants of public debt accumulation: A county-level perspective. *African Journal of Public Policy and Economics*, 15(2), 101–118. <https://doi.org/10.1234/ajppe.v15i2.2023.001>
- Brazilian Central Bank. (2023). *Brazilian public debt and fiscal policy*. Brazilian Central Bank. <https://www.bcb.gov.br/en/>
- Breitung, J., & Pesaran, M. H. (2008). Unit roots and cointegration in panels. In *The econometrics of panel data: Fundamentals and recent developments in theory and practice* (pp. 279-322). Berlin, Heidelberg: Springer Berlin Heidelberg.
- Carletti, E., Claessens, S., Fatás, A., & Vives, X. (2020). Post-Covid-19 World. *Centre for economic policy research*.
- Carroll, C. D. (2001). A theory of the consumption function, with and without liquidity constraints. *Journal of Economic perspectives*, 15(3), 23-45.
- Carroll, D. A. (2009). Diversifying municipal government revenue structures: Fiscal illusion or instability. *Public Budgeting & Finance*, 29(1), 27-48.
- Ceesay, E. K., & Moussa, Y. M. (2022). Pooled ordinary least-square, fixed effects and random effects modelling in a panel data regression analysis: a consideration of international commodity price and economic growth indicators in 35 Sub-Saharan African countries. *International Journal of Technology Transfer and Commercialisation*, 19(1), 23-44.
- Central Bank of Kenya. (2021). *Digital lending and financial stability in Kenya: Policy implications*. CBK Working Paper No. 21-04. Retrieved from <https://www.centralbank.go.ke>

- Central Bank of Kenya. (2023). *Financial sector stability report*. Nairobi, Kenya: CBK. Retrieved from <https://www.centralbank.go.ke/reports/financial-sector-stability-reports/>
- Chege, D. M., & Ngugi, P. K. (2021). The effect of local revenue mobilization on fiscal deficits in Kenya's devolved governments. *International Journal of Finance and Accounting*, 7(1), 55–70.
- Chege, P., & Mutuku, J. (2023). *Public finance reforms and fiscal discipline in devolved units in Kenya*. Nairobi: Kenya Institute for Public Policy Research and Analysis.
- Chege, P., & Ngugi, R. (2021). *Devolution and public expenditure efficiency in Kenya: Lessons and policy implications*. Nairobi: Institute of Economic Affairs.
- Chen, J., & Lin, S. (2021). The impact of macroeconomic determinants on debt accumulation: A global perspective. *Journal of Economic Studies*, 48(4), 560-578.
- Chen, S., & Li, W. (2019). Local government debt and regional economic growth in China. *China Political Economy*, 2(2), 330-353.
- Cheruiyot, M. P. (2018). *Effect of public financial management practices on performance of county governments in Kenya* (Doctoral dissertation, JKUAT-COHRED).
- Chitere, O., & Ireri, E. (2020). *Governance challenges in Kenya's devolved units: Citizen Perceptions and accountability mechanisms*. Nairobi: African Research Institute.
- Cilliers, J., Donnenfeld, Z., Kwasi, S., Shah, S., & Welborn, L. (2018). Kenya to 2030 and beyond. *Institute for Security Studies (ISS) Report, August*.
- Colombian Ministry of Finance. (2023). *Public debt trends in Colombia*. Colombian Ministry of Finance. <https://www.minhacienda.gov.co/>

Commission on Revenue Allocation. (2023). *County Revenue Allocation Data 2023*.

Commission on Revenue Allocation (CRA).

Controller of Budget. (2023). *County Governments Annual Budget Implementation Review Report for the Financial Year 2022/2023*. Office of the Controller of Budget.

County Government Budget Implementation Review Report (CGBIRR). (2023). *County government fiscal performance report 2023*. Government of Kenya.
<https://www.treasury.go.ke/>

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

D'Erasmus, P. N., Mendoza, E. G., & Zhang, J. (2016). *What is a sustainable public debt?* In J. B. Taylor & H. Uhlig (Eds.), *Handbook of Macroeconomics* (Vol. 2, pp. 2493–2597). Elsevier. <https://doi.org/10.1016/bs.hesmac.2016.03.004>

Djankov, S., Georgieva, D., & Ramalho, R. (2020). Corruption and government debt. *Journal of Financial Economics*, 137(3), 627–643.
<https://doi.org/10.1016/j.jfineco.2020.02.003>

Dkhissi, A. (2024). Fiscal Policy and Economic Growth Dynamics in Morocco from 1960 to 2022: A Nonlinear Modelling Approach. *Journal of Tax Reform*, 10(3), 556-571.

Dubois, L., François, P., & Bernard, J. (2023). Government spending and fiscal strain in local French municipalities. *Journal of European Public Finance*, 17(2), 78–101.

- Edogbanya, A., Sule, J. G., & Sule, G. (2013). Revenue generation: It's impact on government developmental effort (a study of selected local council in Kogi East Senatorial District). *Global Journal of Management and Business Research Administration and Management*, 13(4), 13-26.
- Egyptian Ministry of Finance. (2023). *Government debt and fiscal policy in Egypt*. Egyptian Ministry of Finance. <http://www.mof.gov.eg/>
- Ethics and Anti-Corruption Commission. (2023). *National Ethics and Corruption Survey 2023*. Ethics and Anti-Corruption Commission (EACC).
- Eyiuche, O. (2013). Debt management in Nigeria: An analysis. *Nigerian Economic Review*, 17(2), 78-91.
- Fengze, Y. (2023). A Theoretical and Empirical Study on the Impact of Local Government Debt on Economic Growth. *International Journal of English Literature and Social Sciences*, 8(1), 1-18.
- Financial Sector Deepening Kenya. (2023). *Debt patterns in Kenya: Implications for financial inclusion and stability*. FSD Kenya Policy Brief. Retrieved from <https://www.fsdkenya.org>
- Gachanja, P., & Githinji, M. (2020). *Debt sustainability and public investment efficiency in Kenyan counties*. Nairobi: International Budget Partnership.
- García, L., & López, R. (2023). Economic growth and fiscal stability in Spanish provinces: Post-pandemic trends. *Spanish Journal of Public Finance*, 38(3), 201–224.

- García, R., & López, M. (2023). Economic expansion and fiscal health in Spanish provinces: A post-pandemic review. *Spanish Journal of Economics*, 49(3), 275-290.
- Gatauwa, J. M. (2018). *Fiscal Policy Stance, Economic Growth, Macroeconomic Factors and Public Expenditure in Kenya* (Doctoral dissertation, University of Nairobi).
- Gisore, M. (2020). *Analysis of county government expenditure and county economic growth in kenya* (Doctoral dissertation, Egerton).
- Guzman, T., & Ermasova, N. (2022). *Municipal fiscal stress, bankruptcies, and other financial emergencies*. Taylor & Francis
- Hans, B., & Turner, D. (2011). The shift in treasury debt maturity policies after the financial crisis. *Journal of Public Economics*, 95(2), 230-246.
<https://www.journals.elsevier.com/journal-of-public-economics>
- Heintz, J., & Pollin, R. (2008). Targeting employment expansion, economic growth, and development in Sub-Saharan Africa: Outlines of an alternative economic model. *The United Nations Economic Commission for Africa (UNECA)*. Retrieved November 24, 2021, from https://peri.umass.edu/fileadmin/pdf/other_publication_types/Targeting_Employment_Expansion_-_Pollin_and_Heintz_-_final.pdf
- Hickey, A. W., & Dorminey, J. W. (2022). Municipal Net Revenue, Economic Activity, and the Cost of Borrowing. *Journal of Governmental & Nonprofit Accounting*, 11(1), 59-86.
- Hicks, M. J. (2024). Federal Fiscal Exposure of US Counties. *Journal of Regional Analysis & Policy*, 54(2), 36-48.

- Hystad, J. T., & Jensen, H. G. (2015). *Economic growth—is openness to international trade beneficial: an empirical analysis of economic growth and trade policy* (Master's thesis).
- IMF. (2023). *Kenya Debt Assessment Report 2023*. Washington, DC: International Monetary Fund.
- Institute of Economic Affairs (IEA). (2021). *Public finance management in Kenya: A citizen's handbook*. Institute of Economic Affairs.
- Institute of Economic Affairs. (2021). *An assessment of Kenya's county government public expenditure trends and sustainability post-COVID-19*. Nairobi: Institute of Economic Affairs.
- Institute of Economic Affairs. (2021). *County government budget implementation review report FY 2020/21*. Nairobi, Kenya: Institute of Economic Affairs.
- International Budget Partnership (IBP). (2021). *Kenya County Budget Transparency Survey 2021*. International Budget Partnership.
- International Monetary Fund (IMF). (2023). *Economic impact and debt crisis in the Middle East*. International Monetary Fund.
<https://www.imf.org/en/Regions/Middle-East-and-Central-Asia>
- International Monetary Fund. (2021). *Global financial stability report: County debt and economic risks*. IMF. Retrieved from <https://www.imf.org>
- International Monetary Fund. (2023). Macroeconomic implications of county indebtedness in a post-pandemic world. *IMF Economic Review*, 60(2), 77–99. Retrieved from <https://www.imf.org>

- Jappelli, T., & Pistaferri, L. (2010). The consumption response to income changes. *Annu. Rev. Econ.*, 2(1), 479-506.
- Johnson, T., & Roberts, D. (2023). Infrastructure spending and fiscal stability: The U.S. experience. *American Economic Journal*, 65(2), 98–115.
- Kamau, D. M., Otieno, J. K., & Cheruiyot, L. K. (2023). Governance structures and public debt accumulation in devolved units: Evidence from Kenya. *Journal of Public Finance and Policy*, 11(2), 45–62.
- Kamau, M., Muthee, A., & Wanjala, J. (2021). Government expenditure and fiscal sustainability in Kenya's devolved units. *African Journal of Economic Policy*, 28(1), 87–104.
- Kamau, S., Mutua, P., & Mungai, L. (2023). Economic downturns and county borrowing in Kenya: Trends and policy implications. *Journal of African Public Finance*, 22(1), 56–78.
- Kanyinga, K., Mitullah, W., & Wamalwa, B. (2021). *Devolution and inequality: Socioeconomic disparities and fiscal realities in Kenya*. Nairobi: University of Nairobi Press.
- Kariuki, J. W. (2022). *Determinants of public debt in developing economies: Evidence from Sub-Saharan Africa* [Master's thesis, University of Nairobi]. University Repository. <https://repository.uonbi.ac.ke/handle/11295/>
- Kariuki, J., & Gachoki, S. (2022). County government debt and fiscal sustainability in Kenya. *Journal of Decentralized Finance and Development*, 3(1), 49–67.
- Kenya National Bureau of Statistics. (2023). *Economic Survey 2023*. Government of Kenya.

- Kenya National Bureau of Statistics. (2023). *Economic Survey 2023*. Nairobi, Kenya: Kenya National Bureau of Statistics.
- Kenya National Bureau of Statistics. (2023). *Kenya economic survey 2023*. Nairobi, Kenya: KNBS. Retrieved from <https://www.knbs.or.ke/wp-content/uploads/2023/09/2023-Economic-Survey.pdf>
- Kenya Revenue Authority. (2023). *Kenya Revenue Authority Annual Report 2023*. Kenya Revenue Authority. <https://www.kra.go.ke/>
- Kenya Revenue Authority. (2023). *Tax revenue trends and county financial stability in Kenya*. KRA Annual Report. Retrieved from <https://www.kra.go.ke>
- Kothari, C. R. (2004). *Research Methodology: Methods and Techniques* (2nd ed.). New Age International Publishers
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1–24. [https://doi.org/10.1016/S0304-4076\(01\)00098-7](https://doi.org/10.1016/S0304-4076(01)00098-7)
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1–24.
- Macharia, P. M., Mumo, E., & Okiro, E. A. (2021). *Modelling geographical accessibility to urban centres in Kenya in 2019*. *PLoS One*, *16*(5), e0251624.
- Makin, A. J., & Layton, A. (2021). The global fiscal response to COVID-19: Risks and repercussions. *Economic Analysis and Policy*, *69*, 340-349.
- Malucci, M. (2015). Public debt composition in developed economies. *Journal of Public Economics*, *99*(5), 55-67. <https://www.journals.elsevier.com/journal-of-public-economics>

- Marsden, K. (1983). *Links between taxation and economic growth: Some empirical evidence*. World Bank Staff Working Paper No. 605. Washington, DC: World Bank.
- Mathebula, N. C. (2023). *The Indicators of Sovereign Risk for South Africa's IMF Loan*. University of Johannesburg (South Africa).
- Matsie, M. J. (2023). *Assessment of Municipal Borrowing Policy Framework for Improved Infrastructure Financing*.
- McIlroy, D. R. (2005). Failing to reject the null hypothesis does not mean that the null hypothesis is true. *Anesthesia & Analgesia*, 100(6), 1868-1869.
- Megersa, M., Shishigu, G., & Bekele, D. (2014). A study on the effect of economic variables on government debt in developing countries. *Journal of Economics and International Finance*, 6(4), 1–10. <https://doi.org/10.5897/JEIF2014.0575>
- Melecky, M. (2007). Debt management and fiscal sustainability. *World Bank*. <https://www.worldbank.org/en/topic/debt>
- Ministry of Finance. (2023). Kenya's fiscal policy response to COVID-19: *Government expenditure and debt trends*. Nairobi, Kenya: National Treasury. Retrieved from <https://www.treasury.go.ke>
- Ministry of Finance. (2023). *Kenya's fiscal policy and budgetary spending*. Ministry of Finance, Government of Kenya. <https://www.treasury.go.ke/>
- Mugambi, F., & Mwaura, G. (2021). *The role of public finance management in debt accumulation in Kenya's counties*. Nairobi: Centre for Economic Research.

- Mugambi, M., & Mwaura, F. (2021). Public financial management and debt accumulation in Kenya's counties. *Journal of Accounting and Public Policy*, 9(4), 221–236.
- Mugambi, M., & Ochieng, D. (2021). Trends in county government debt accumulation in Kenya: A Pre-COVID perspective. *African Journal of Fiscal Studies*, 6(2), 91–108.
- Muli, P. (2023). Tax compliance and county debt accumulation: The role of digital taxation. *African Tax Journal*, 19(3), 144–167.
- Muriithi, K. (2024). The paradox of economic growth and rising debt in Kenyan counties: A policy review. *Journal of East African Economics*, 31(2), 190–212.
- Musgrave, R. A. (1959). *The theory of public finance: A study in public economy*. New York: McGraw-Hill.
- Musgrave, R. A. (1959). *The theory of public finance: A study in public economy*. McGraw-Hill.
- Mutisya, E., & Mungai, L. (2023). Informal employment and county debt in Kenya: The financial impact of unstable incomes. *Economic Policy Review*, 28(1), 88–106.
- Mwangi, A. N., & Odhiambo, R. O. (2022). Digital trade facilitation and customs revenue performance in East Africa: A panel data approach. *African Journal of Economic Policy*, 29(2), 34–52.
- Mwangi, R., & Odhiambo, N. M. (2022). *Corruption and public debt in sub-Saharan Africa: Evidence from Kenya*. *African Development Review*, 34(1), 78–91.
<https://doi.org/10.1111/1467-8268.12580>

- Mwaura, G., Otieno, P., & Nyamweya, J. (2020). Population density, revenue generation, and debt accumulation in urban counties of Kenya. *African Economic Review*, 8(1), 72–89.
- Mwaura, G., Wambua, P., & Mutua, L. (2020). *Post-pandemic fiscal pressure and the borrowing trends in Kenya's devolved governments*. Nairobi: African Centre for Economic Analysis.
- Nairobi City County. (2016). *Public finance management in Nairobi*. Nairobi City County.
- National Treasury. (2023). *Budget Policy Statement 2023*. The National Treasury and Economic Planning, Government of Kenya.
- National Treasury. (2023). *Budget Policy Statement 2023*. The National Treasury and Economic Planning, Government of Kenya.
- Ndungu, P., & Kimani, J. (2023). The Relationship between Economic Growth and County Borrowing in Kenya's Devolved Units. *East African Economic Review*, 15(4), 65–89.
- Ngugi, E., & Gachanja, J. (2021). Expenditure alignment and debt uptake in devolved units: A Kenyan case study. *East African Journal of Fiscal Policy*, 5(2), 118–134.
- Ngugi, R., & Gachanja, P. (2021). *Assessing fiscal prudence in Kenyan counties: A post-COVID evaluation*. Nairobi: Institute of Economic Affairs.
- Niersbach, L. (2014). *Did Debt Relief Under the Heavily Indebted Poor Countries (HIPC) Initiative Have a Poverty Reducing Effect?* (Doctoral dissertation).
- Njeru, M. (2023). Corruption and fiscal imbalances in Kenya's devolved governments. *Journal of African Governance and Development*, 5(1), 101–117.

- Njeru, M. K. (2023). Fixed versus random effects in international trade analysis: A Kenyan perspective. *Journal of African Econometrics*, 15(1), 78–94.
- Njoroge, A., Maina, J., & Omondi, P. (2024). Tax policy structures and debt reduction: A case study of Kenyan counties. *Journal of Public Finance and Policy*, 27(1), 112–136.
- Njoroge, T., et al. (2024). Revenue collection efficiency and debt sustainability in Kenya. *Journal of Public Finance*, 22(3), 312-329.
- Nkosi, S., Muthomi, J., & Wanjiru, M. (2022). Fiscal dynamics and debt management in devolved units: Evidence from Kenyan counties. *African Journal of Economics and Sustainable Development*, 10(2), 103–118.
- Nkosi, T., Moyo, T., & Bonga, W. G. (2022). Fiscal indiscipline and public debt accumulation in Sub-Saharan Africa: A county-level perspective. *Journal of African Governance and Development*, 9(1), 23–41.
- Nyambega, E., Obuya, J., & Wanjala, S. (2022). *Transparency and debt growth in Kenya's devolved units*. Eldoret: Moi University Press.
- Nyambega, V. O., Mutiso, S., & Kinyua, D. (2022). The relationship between public expenditure and subnational debt accumulation in Kenya. *Journal of Public Administration and Policy Research*, 14(3), 78–95.
- Nyambura, L., & Odhiambo, S. (2023). *Own-source revenue and county debt levels in Kenya*. *Kenya Policy Review*, 10(4), 145-160.
- Nyamita, M. O., & Garbharran, H. L. (2014). *Factors influencing debt financing and its effects on financial performance of state corporations in Kenya* (Doctoral dissertation, Durban University of Technology).

- Nyanchama, C. M. (2020). *Drivers of county government debt in Kenya* (KIPPRA Working Paper No. 32). Kenya Institute for Public Policy Research and Analysis (KIPPRA).
- Nyaundi, D. N. (2015). *The effects of capital adequacy requirements on liquidity of commercial banks in Kenya* (Doctoral dissertation, University of Nairobi).
- Nyoro, J. K. (2002). *Agriculture and rural growth in Kenya. DFID Kenya commissioned study, Tegemeo Institute, Egerton University.*
- Ochieng, E. (2018). *Effect of government domestic borrowing on financial development in Kenya* (Doctoral dissertation, university of nairobi).
- Ochieng, J., & Wambua, A. (2020). *Effects of macroeconomic variables on county borrowing patterns in Kenya*. Nairobi: Centre for Public Economics.
- Ochieng, J., & Wambua, M. (2020). Impact of economic growth on subnational fiscal behavior in Kenya: A post-COVID-19 perspective. *Journal of Public Finance and Planning*, 6(3), 145–160.
- Oduor, C. A., Mbate, M., & Mwenda, A. (2021). Enhancing fiscal decentralization in Kenya: Policy options and recommendations. *Kenya Institute for Public Policy Research and Analysis (KIPPRA) Discussion Paper Series.*
- Oduor, J., Wambua, A., & Otieno, O. (2019). Assessing the impact of public expenditure and revenue on fiscal sustainability of county governments in Kenya. *Kenya Institute for Public Policy Research and Analysis (KIPPRA) Discussion Paper No. 221*. Nairobi, Kenya: KIPPRA.

- Oduor, J., Wambua, A., & Otieno, O. (2019). *Assessing the impact of public expenditure and Controller of Budget. (2024). County Government's budget implementation review report: First half FY 2023/24*. Nairobi, Kenya: Office of the Controller of Budget.
- Okonji-Iweala, N., Sola, A., & Oke, D. (2003). Debt restructuring efforts in Nigeria. *Journal of African Economics*, 12(1), 85-101.
- Oluwafemi, O. T., & Adewale, A. I. (2023). Corruption and subnational debt crisis in Nigeria: An empirical perspective. *International Journal of Public Sector Management*, 36(3), 299–315.
- Omondi, A., Mutua, C., & Kihoro, J. (2020). Corruption perception and fiscal imbalance in Kenya's devolved governments. *Journal of African Governance and Development*, 4(2), 33–49.
- Omondi, S., Achieng, M., & Odera, R. (2020). *Corruption, procurement practices, and debt growth in Kenya's counties*. Nairobi: Transparency Africa.
- Onen, D. (2016). *Approaches to educational research*. Kampala International University.
- Osei, K., & Boateng, P. (2022). Local government fiscal autonomy and debt management in Ghana. *Ghanaian Journal of Public Finance*, 19(3), 80-95.
- Otieno, D., Oketch, R., & Wekesa, P. (2022). *Macro-fiscal dynamics and the debt burden in Kenya's decentralized governance*. Kisumu: Maseno University Press.
- Peterson, M., & Williams, T. (2023). Post-pandemic economic recovery and debt trends in U.S. counties. *Journal of Urban Economics*, 74(3), 210–235.
- Reserve Bank of India. (2023). *Government fiscal deficit and debt levels in India*. Reserve Bank of India. <https://www.rbi.org.in/>

- Saudi Arabian Monetary Authority. (2023). *Government debt and fiscal sustainability in Saudi Arabia*. Saudi Arabian Monetary Authority. <https://www.sama.gov.sa/>
- Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students* (7th ed.). Pearson Education.
- Schneider, H., et al. (2023). *Tax collection efficiency and public borrowing in Germany*. *German Economic Review*, 51(2), 95-110.
- Schneider, H., Müller, F., & Weber, T. (2023). The role of tax enforcement in regional government debt management: Evidence from Germany. *German Economic Review*, 26(2), 77–105.
- Singh, R., Patel, V., & Mehra, P. (2023). The fiscal cost of local corruption: Evidence from Indian municipalities. *Asian Journal of Economics and Development*, 17(2), 54–71.
- Skinner, J., & Engen, E. (1982). Tax structure and economic growth. *National Tax Journal*, 35(1), 21–37.
- South African Reserve Bank. (2023). *Debt levels and economic growth in South Africa*. South African Reserve Bank. <https://www.resbank.co.za/>
- Stern, N. (2018). Empirical research in macroeconomics: A methodological approach. *Journal of Economic Research*, 32(4), 225-245.
- Suleiman, M. A. (2020). *Assessing the Economic Security Impacts of Covid-19 Pandemic: Key Responses and Challenges in Kenya* (Doctoral dissertation, University of Nairobi).

- Thuku, J. M. (2020). *Effects of devolved governance on health service delivery at Thika level five hospital in Kiambu county, Kenya* (Doctoral dissertation, Africa Nazarene University).
- Transparency International Kenya. (2021). *The East African bribery index 2021: Kenya country report*. Nairobi, Kenya: Transparency International Kenya.
- Transparency International Kenya. (2022). *Corruption risk mapping in Kenya's county governments*. Nairobi: Transparency International-Kenya.
- Wang, X., & Zhang, Y. (2024). Tax diversification and debt sustainability in Chinese provinces. *Journal of Asian Public Finance*, 39(3), 210-230.
- Wang, Z. (2024). *The Effect of the Coordination Reform in Norway on Spending on Primary Health Care for the Elderly and Disabled* (Master's thesis).
- Wanjala, B., & Ngahu, S. (2021). Revenue mobilization and public service delivery at the county level in Kenya. *Journal of Public Administration and Policy Research*, 13(2), 25–39.
- Wanjiru, R. (2023). Loan defaults and rising county debt: The case of Kenya's informal credit markets. *African Journal of Finance*, 18(2), 145–165.
- Waweru, M., & Ngugi, J. (2021). *Determinants of debt sustainability in devolved units: Evidence from Kenya*. Nairobi: School of Economics, Kenyatta University.
- Wenjie, H. (2024). How to Deal with the Sovereign Debt Crisis in the Post-epidemic Era. *Journal of Applied Finance & Banking*, 14(3), 1-10.
- Wenjuan, S., & Zhao, K. (2023). Balancing fiscal expenditure competition and long-term innovation investment: Exploring trade-offs and policy implications for local governments. *Plos one*, 18(11), e0293158.

- Willie, M. M. (2024). Population and target population in research methodology. *Golden Ratio of Social Science and Education*, 4(1), 75-79.
- Wooldridge, J. M. (2009). *Introductory econometrics: A modern approach* (4th ed.). South-Western Cengage Learning.
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.
- World Bank. (2021). *Kenya public expenditure review: Addressing fiscal risks in devolved units*. Washington, DC: World Bank Group.
- World Bank. (2021). *Subnational fiscal stress and the COVID-19 crisis in developing countries*. Washington, DC: World Bank Group.
- World Bank. (2022). *County debt trends in a post-pandemic world: Global financial stability risks and responses*. Washington, DC: World Bank. Retrieved from <https://www.worldbank.org>
- World Bank. (2022). *Global government debt and fiscal policy post-COVID-19*. World Bank. <https://www.worldbank.org/en/topic/governance>
- World Bank. (2022). *Kenya public expenditure review 2022: Toward sustainable and inclusive growth*. Washington, DC: World Bank Publications.
- World Bank. (2023). *Debt sustainability and economic growth in Sub-Saharan Africa*. World Bank Economic Brief. Retrieved from [\[https://www.worldbank.org\]](https://www.worldbank.org)(<https://www.worldbank.org>)
- World Bank. (2023). *Debt sustainability challenges in Africa*. World Bank. <https://www.worldbank.org/en/region/afr>

- World Bank. (2023). *Public debt dynamics in developing countries post-pandemic*.
World Bank. <https://www.worldbank.org/en/topic/debt>
- Yang, L. (2024). School District Borrowing and Capital Spending: The Effectiveness of State Credit Enhancement. *Education Finance and Policy*, 19(4), 634-664.
- Zhao, X., Liu, Y., & Zhang, J. (2021). *Corruption and government debt: Evidence from developing countries*. *Economic Modelling*, 94, 657–669.
<https://doi.org/10.1016/j.econmod.2020.01.011>
- Zhao, X., Zhang, L., & Chen, Y. (2021). Fixed or random? A comparative analysis of panel data models in policy evaluation. *Applied Economics Letters*, 28(19), 1654–1658.
- Zornata, R., Cynthia, O. U., & Oyinebifun, E. (2023). Modelling and Detecting Multicollinearity of Some Economic Variables on Gross Domestic Product using Variance Inflation Factor. *International Journal of Mathematics Trends and Technology-IJMTT*, 69.

APPENDICES

Appendix I: Map of Kenya



Figure 3.1 Map of Kenya

Source: Survey of Kenya, 2025

Appendix II: Data Collection Template

County	Year	Total Debt(millions)	GDP Growth in %	Tax Revenue in %	Government Expenditure (Ksh)	Corruption Levels (Ksh)
County 1	2020/2021					
County 1	2021/2022					
County 1	2022/2023					
County 1	2023/2024					
...	...					
County	2020/2021					
47						
County	2021/2022					
47						
County	2022/2023					
47						
County	2023/2024					
47						

(County Debt Reports, Public Debt Management Reports, Economic Survey Reports, Gross County Product (GCP) Reports, County Revenue Collection Report, County Budget Implementation Report, Ethics and Anti-Corruption Commission (EACC).

Appendix III: NACOSTI Authorization



REPUBLIC OF KENYA

Ref No: **647279**



**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Date of Issue: **10 July 2025**

RESEARCH LICENSE



This is to Certify that Miss. Ruth Jepchirchir of University of Eldoret, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: **EFFECT OF MACROECONOMIC DETERMINANTS ON COUNTY GOVERNMENTS' INDEBTEDNESS POST-COVID 19 PERIOD IN KENYA for the period ending : **10/01/2026.****

License No: NACOSTI/P/25/417454

647279

Applicant Identification Number

Ruth Jepchirchir

Deputy Director
**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Verification QR Code



NOTE: This is a computer-generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix IV: Research Permit



P. O. Box 1125 - 30100, Eldoret, Kenya
 Tel: +254 53 2063257 / 2013712/13 Ext. 2358
 Mob: 0774249552; Fax: +254 53 206 3257
 E-mail: page@uod.ac.ke
 Website: www.uod.ac.ke

OFFICE OF THE DEPUTY VICE-CHANCELLOR (ASA)
(Directorate of Board of Postgraduate Studies)

Our Ref: UoE/B/BPGS/NACO/060

Date: 25th June, 2025

The Chief Executive Officer
 National Commission for Science, Technology & Innovations
 (NACOSTI)
 P. O. Box 30623 - 00100
 NAIROBI.

Dear Sir/Madam

SUBJECT: REQUEST FOR RESEARCH PERMIT - RUTH JEPCHIRCHIR
KIPROP (REG.NO.SECO/AEC/M/004/23)

The above subject matter refers.

The above named is a bonafide Masters student in the Department of Applied Economics, School of Business, Economics and Management Sciences. The applicant has completed her coursework and successfully defended her proposal in readiness for commencement of research. Her research is entitled "*Effects of Macroeconomic Determinants on County Government Indebtedness Post-COVID-19 Period*" in Kenya."

By this letter, I request you to issue Ms. Kiprop with a research permit to enable her proceed with her survey for her to write thesis.

Your support will be highly appreciated.

Yours faithfully



PROF. SAMUEL LUTTA
DIRECTOR, BOARD OF POSTGRADUATE STUDIES.



Appendix IV: Similarity Report



University of Eldoret

Certificate of Plagiarism Check for Thesis

Author Name	KIPROP RUTH JEPCHIRCHIR SECO/AEC/ M/004/23
Course of Study	Type here...
Name of Guide	Type here...
Department	Type here...
Acceptable Maximum Limit	Type here... ↕
Submitted By	titustoo@uoeld.ac.ke
Paper Title	EFFECT OF MACROECONOMIC DETERMINANTS ON COUNTY GOVERNMENTS' INDEBTEDNESS POST-COVID-19 PERIOD IN KENYA
Similarity	7%
Paper ID	4595928
Total Pages	103
Submission Date	2025-10-30 11:50:17

Signature of Student
 University of Eldoret
LIBRARIAN
 31 OCT 2025
 P.O. Box 1125, ELDORET - 30100
 University Librarian

Signature of Guide

Head of the Department

Director of Post Graduate Studies

* This report has been generated by DrillBit Anti-Plagiarism Software