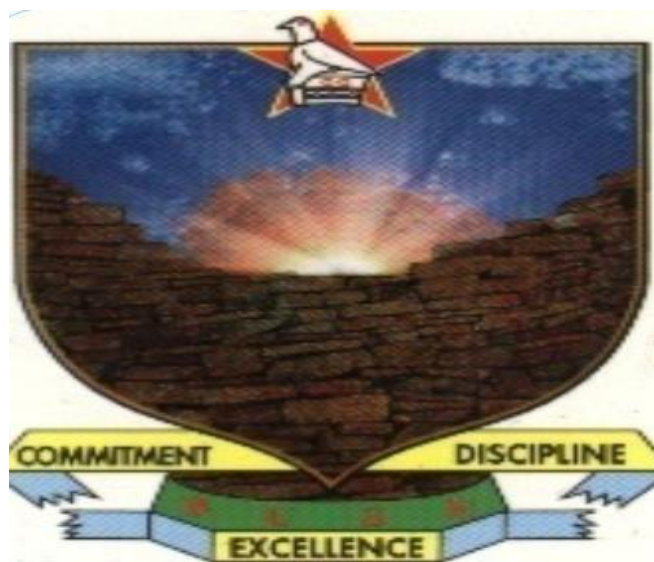# BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF SCIENCE AND ENGINEERING

DEPARTMENT OF STATISTICS AND MATHEMATICS

An Investigation of the Impact of Macro-Economic Factors on Revenue Collection in City Councils of Zimbabwe. A Case of Chitungwiza City Council.

SUBMITTED

BY

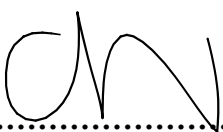**NYAGONDO OLGA RUVARASHE (B192134B)**

A DISSERTATION SUBMITTED TO BINDURA UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE BACHELOR OF SCIENCE HONOURS DEGREE IN STATISTICS AND FINANCIAL MATHEMATICS.

SUPERVISOR: DR T. W. MAPUWEI

JUNE 2023

DECLARATION OF AUTHOURSHIP

I OLGA RUVARASHE NYAGONDO, declare that research project is my original work and has not been copied or extracted from previous sources without due acknowledgement of the source.

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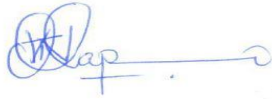Signature   Date

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The undersigned certify that they have read and recommended to the Bindura University of Science Education of a dissertation entitled **"An Investigation of the Impact of Macro-Economic Factors on Revenue Collection in City Councils. A case of Chitungwiza Municipality."**

Submitted by **B192134B** in partial fulfilment of the requirements of the Bachelor of Science (Honours) Degree in Statistics and Financial Mathematics

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Student's signature   Date

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DEDICATION

I dedicate this work to my beloved parents, Mr. C. Nyagondo and Mrs. R. Nyagondo, as a gesture of my affection and gratitude for everything they have done for me. Their constant support and encouragement have been the bedrock of my academic accomplishments, and their unwavering faith in me has sustained me through the challenging and arduous path that I have traversed.

ACKNOWLEDGEMENT

Abstract

The City Councils in Zimbabwe are encountering difficulties in achieving their revenue targets, highlighting potential concerns with their present revenue collection methods and the impact of macroeconomic factors on their revenue collection. Given that city councils play a significant role in providing essential public services, like water supply, this study aims to explore the influence of macroeconomic factors on revenue collection of city councils in Zimbabwe, with a focus on the Chitungwiza city council. The primary objectives of the research were to investigate whether macro-economic factors have a short-term and long-term relationship with revenue collection and to review pertinent literature on revenue collection by city councils, including the challenges they face in Zimbabwe and strategies for increasing revenue. Interest rates, inflation, and exchange rates were used to examine their short-run and long-run impact on revenue collection, as they are among the macro-economic factors that influence revenue collection. Secondary sources, including Chitungwiza council's financial records, ZIMSTATS publications, and the Reserve Bank of Zimbabwe's website, were used to collect data on these factors through quantitative research. The ARDL approach of Pesaran (2001) was employed in the data analysis using Eviews 12 software. The data revealed a long-run and short-run relationship between interest rates, inflation, and exchange rates and revenue collection of Chitungwiza town council, with no short-run Granger causality between the investigated variables. Interest rates had a positive short-run relationship with revenue collection, while inflation and exchange rates had a negative short-term relationship. Therefore, the ECM answered the first objective. The f-bound test established the long-run impact, with interest rates having a negative long-run relationship, and inflation and exchange rates showing positive long-term relationships with revenue collection. The second objective was addressed by this test. The study found that exchange rates, interest rates, and inflation were all relevant macro-economic factors affecting revenue collection in the Chitungwiza town council. As a result, the researcher recommended that fiscal and monetary policies be enhanced, revenue sources diversified, revenue collection systems strengthened, and public awareness increased.

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ACRONYMS

ADF- Augmented Dickey-Fuller

AIC- Akaike Information Criterion

ARDL – Autoregressive Distributed Lag

CPI – Consumer Price Index

ECM- Error Correction Model

ECT- Error Correction Term

EXR – Exchange Rate

LM- Lagrange Multiplier

RBZ-Reserve Bank of Zimbabwe

RC-Revenue Collection

TWI- Trade Weighted Index

WB – World Bank

ZIMSTATS- Zimbabwe Statistics Agency

CHAPTER ONE: INTRODUCTION AND BACKGROUND OF THE STUDY

1.0 Introduction

This study aims to examine how macro-economic variables affect revenue collection of city councils in Zimbabwe with reference to Chitungwiza City Council. This chapter aims to present the historical context that led to the study, identify the problem being addressed, and outline the objectives or goals of the research. Additionally, this chapter will address the research hypothesis, the importance of the study, the extent of its coverage, and the underlying assumptions. The chapter will also explore the constraints of the study, provide clear definitions of key terms, and conclude with a summary.

1.1 Background of the Study

The population of Chitungwiza has been growing, with new areas emerging, resulting in its elevation to city status by the ministry. However, Zimbabwe has been experiencing a decline in the value of its currency, the RTGS, leading to weekly increases in the costs associated with commodities and amenities and the cost of borrowing. This has negatively impacted citizens who bear the brunt of these issues. Local authorities, including the Chitungwiza City Council, are empowered by Section 276(2)(b) of Amendment 20 to the Constitution of Zimbabwe enacted in 2013, and the Urban Councils Act (29.15) that enables the collection of revenue from local communities. This revenue can be collected in the form of burial charges, clinic fees, property taxes, residential rates, and other sources. Despite these opportunities to generate revenue, the Council has been struggling to collect the revenue due to macro-economic factors that have impoverished citizens. Due to inflation eroding citizens' salaries and wages, they can barely afford to make a living, resulting in defaults on paying rates, which negatively affects the council's operations. The lack of adequate funds has also hindered the council from executing its duties effectively. Revenue collection poses challenges for many African countries, where most people are too poor to pay taxes or rates. Effective revenue collection is essential for governments as it reduces the burden and enables funds to be allocated to other councils in need. The quality of services offered by many local authorities has deteriorated significantly in recent years due to poor revenue collection caused by macroeconomic factors. The 2008 hyperinflation in Zimbabwe is a testament to this fact. These macroeconomic factors

cannot be ignored and must be addressed to help citizens improve their living standards and enable local authorities to collect revenue effectively with minimal defaults.

1.2 Statement of the Problem

The ability of Zimbabwe's city councils to collect revenue has been affected by various macro-economic factors such as inflation, currency exchange rates, government regulations, and economic growth. However, the extent of their impact on revenue collection remains uncertain. Thus, the aim of this research is to examine the influence of macroeconomic factors on the ability of Chitungwiza City Council to collect revenue and explore potential solutions to improve revenue collection.

1.3 Research Objective

The goal of the research is to investigate and analyze the macro-economic variables that affect the revenue collection of Zimbabwean city councils, with a particular focus on the Chitungwiza City Council as a case study.

1.3.1 Specific Objectives

- To determine the short-run impact of macro-economic factors on revenue collection of city councils.
- To determine the long-run impact of macro-economic factors on revenue collection of city councils.

1.4 Research Questions

- What are macro-economic factors impacting revenue collection in city councils?
- What is the short-run impact of macro-economic factors on revenue collection in city councils?
- What is the short-run impact of macro-economic factors on revenue collection in city councils?

1.5 Research hypothesis

To be able to analyse and draw a conclusion on revenue collection and to answer the main research questions we need to make two testable hypotheses as follows:

H_0: macro-economic factors has a short-run impact on revenue collection of city
    Councils in Zimbabwe

H_1: macro-economic factors has a short-run impact on revenue collection of city
    Councils in Zimbabwe.

H_0: macro-economic factors has a long-run impact on revenue collection of city
    Councils in Zimbabwe

H_1: macro-economic factors has a long-run impact on revenue collection of city
    Councils in Zimbabwe.

1.6 Assumptions

- The study assumes that accurate and reliable data on revenue collection, inflation rates, economic growth, interest rates, and exchange rates will be available for the city councils under investigation.
- The study assumes that the city councils under investigation are willing to share their revenue collection data and cooperate with the researchers.

- The study assumes that the macroeconomic factors under investigation have a short- and long-term impact on revenue collection, and that this impact can be measured accurately.

1.7 Significance of the Study

- This research will add to the current pool of information regarding the influence of macroeconomic variables on revenue collection by city councils. It will showcase the university's research capabilities and its commitment to producing relevant research that can be applied to real-world problems.

- The study will provide the student with an opportunity to gain practical and theoretical knowledge of the impact of macroeconomic factors on revenue collection. The research procedure will provide the student with valuable abilities in research, including data analysis, critical thinking, and problem-solving. The study will also be a valuable addition to the student's academic portfolio.

- The study will provide the council with insights into how macroeconomic factors impact revenue collection. It will help the council to identify areas where revenue collection can be improved and develop strategies to maximize revenue collection. The study will also provide the council with enhanced comprehension of the connection between macroeconomic factors and revenue collection, enabling them to make informed decisions about revenue collection policies.

1.8 Limitations of the Study

- The availability of time was a constraint since data collection required more time, but the researcher had to allocate most of their days to other school assignments and activities.
- The need for confidentiality of certain information hindered the researcher's access to some data during their research.
- The student was not receiving any financial support due to economy and resources used for the study were scarce.

- It is possible that the participants may be unavailable at critical times, so it is necessary to make prior arrangements before attempting to meet with them.

1.9 Delimitations of the Study

- Geographic Scope: The research is confined to a particular region, city, Chitungwiza city council and the findings may not be generalizable to other regions or countries.

- Timeframe: The study is focusing on a period of three years, from 2020 to 2022 and may not account for changes that occur after the study period.

- Revenue Collection System: The research is solely centered on investigating the influence or effect of... macroeconomic factors on revenue collection and may not account for other factors that may impact revenue collection, such as tax compliance and administration.

1.10 Definition of Terms

- **Investigation**

Investigation refers to the process of gathering information, examining evidence, and analyzing data in order to uncover and understand facts or circumstances related to a specific topic or issue.

- **Council**

A council is a group of individuals or an organization that is responsible for making decisions on behalf of a larger community or group.

- **City Council**

A city council is a form of local government in a city or town, typically consisting of elected officials who are responsible for making decisions on behalf of the community. City councils may also be called town councils, municipal councils, or city commissions, depending on the region or jurisdiction.

- **Macro-economics**

Macroeconomics is a branch of economics that studies the conduct and productivity of a whole economy, instead of concentrating solely on particular markets or enterprises.. This area of study aims to understand how different economic variables, such as national income, output, employment, inflation, and economic growth, behave collectively and influence one another.

1.11 Chapter Summary

In the initial chapter, the study's contextual background, problem statement, research goals, and hypotheses were highlighted. Additionally, the study's importance, restrictions, assumptions, and constraints were also discussed, and the terminologies were clarified. The subsequent chapter will cover the literature review.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

City councils are responsible for providing public services to their residents, such as infrastructure, education, and healthcare. To finance these services, city councils rely on revenue from a range of sources, including taxes, grants, and fees. However, the revenue collection of city councils can be impacted by a range of macroeconomic factors, such as inflation, exchange rate, and interest rate. Understanding how these factors impact revenue collection is crucial for city councils to effectively manage their finances and provide essential public services.

2.1 Sources of Mobilising Revenue

The government and its local authorities have a critical responsibility to provide services to citizens. One of the key components of this is revenue collection, which depends on contributions from residents, ratepayers, industries, factories, and non-governmental organizations. To ensure the Chitungwiza City Council can continue to provide essential services, revenue is sourced from a variety of channels, such as property and land rates, penalties and fines, license fees, plan approvals, development fees, land sales, rental fees, and other sources. It is important for local authorities to explore different revenue streams to sustain their operations.

- **Taxation**

The government in many countries generates revenue through income taxes. However, in Zimbabwe, which is a developed country, this is not the only source of income. To increase revenue, the government could consider raising tax rates and closing any loopholes that allow for tax evasion. This would result in a larger budget for the government, which could in turn allocate more funds to the Chitungwiza council.

- **Charges, Fines and User Fees**

The term "fines" refers to charges imposed by local authorities for non-compliance with rules and regulations. In addition to fines, the Chitungwiza City Council also generates

revenue through vehicle permits, water rates, tax clearance, and other sources. Recent studies indicate that user fees and charges have become the primary source of revenue for local councils.

- **Loans**

The Chitungwiza Council is also qualified to submit a loan application to financial institutions.

- **Grants**

Local councils can receive grants from world-wide financial organizations such as the IMF, World Bank, and Africa Development Bank, which are provided as aid. Additionally, councils can receive grants from the Ministry of Local Government within their own country.

2.2 Strategies for Revenue Collection

There are three fundamental principles that should be followed when collecting taxes: certainty, convenience, and diversity. These principles assist local authorities in collecting revenue in a more efficient and effective manner.

Certainty

As per Smith, safeguarding rate payers from being harassed by tax collectors is a crucial factor in enhancing revenue collection for local authorities. It is imperative to uphold the rights of taxpayers and ensure that they are treated with fairness and dignity while implementing efficient taxation policies.

Convenience

Smith recognized the importance of timing and convenience when it came to levying taxes that were fair and just for the taxpayer. He used the example of a farmer to illustrate this point, suggesting that taxes should be collected after they have sold their produce, rather than at the point of harvest or another inconvenient time.

Diversity

It was recommended that local councils should diversify their revenue sources in order to increase their overall revenue. By introducing multiple avenues for revenue, low revenue collection can be reduced.

Debt Collection

Debt collection is a process employed by local councils to recover revenue from individuals who have overdue payments, Machingauta (2016). In Zimbabwe, local authorities are governed by the Rural District Councils Act 29.13 section 110 (3) for rural councils and by the Urban Council Act 29.1 for urban councils. Local authorities in Zimbabwe have the legal right to take action against individuals who default on payments after receiving final demand letters.

2.3 Challenges associated with revenue collection

Local councils encounter numerous challenges when it comes to revenue collection. According to Chakaipa in 2010, a major issue is the lack of proper policies in place to hold individuals accountable for defaulting on payments. This can make it difficult for local councils to collect revenue efficiently and effectively. The nature of businesses in Zimbabwe also makes it harder. In Zimbabwe, they are many informal sectors which are not regulated, as a result tax is lost.

2.4 Theoretical Review

In this research, we are going to use Ricardian Equivalence Hypothesis Theory and Principal of Real Business Cycle theory. The theory of ability to pay and theory of optimal taxation will also be noted and explained.

2.4.1 The Ricardian Equivalence Hypothesis Theory

The Ricardian Equivalence Hypothesis is a proposition that suggests that government debt does not affect economic activity. This theory postulates that in the event of the government raising its debt, people tend to save more in anticipation of future tax hikes. This increase in savings, in turn, offsets any rise in government spending. The hypothesis can be useful in assessing the impact of government borrowing on revenue generation.

2.4.2 Principal Real Business Cycle theory

As per the Real Business Cycle Theory, changes in economic activity are caused by shifts in productivity and technological advancements. This theory proposes that an increase in productivity leads to a rise in economic activity, which subsequently results in an improvement in tax collection. This concept can be applied to predict the impact of productivity improvements on revenue collection.

2.4.3 The Quantity Theory of Money

According to the quantity theory of money, variations in the money supply can affect the level of prices. This idea states that prices will rise in response to an increase in the money supply and vice versa. As high inflation can result in a decline in the real worth of government revenue, this theory may be useful for understanding how inflation affects revenue collection.

2.4.4 The Theory of Optimal Taxation

The Theory of Optimal Taxation posits that there exists an ideal tax rate that can optimize government revenue. According to this theory, if tax rates are too high, they can lead to a decrease in economic activity and revenue collection. Conversely, if tax rates are too low, they can lead to a reduction in government revenue. This theory can be relevant for analyzing the impact of changes in tax policy on revenue collection.

2.5 Empirical Evidence

A study on the revenue potential and revenue strength in rising Asian nations was conducted from 1984 to 2010. Their empirical findings specified that GDP per capita was a significant factor in determining revenue performance. Additionally, trade openness, interest rates, and inflation rates were also found to impact revenue performance. The analysis of revenue potential and effort was dependent on the level of development and macroeconomic policies of the respective countries studied.

In 2013, Mzenzi conducted research on the source of revenue collection, collection procedures, and rules governing revenue collection in Local Government Authorities (LGAs). Based on his findings, he recommended that LGAs establish a taxpayer database, revise laws governing revenue collection, adopt promotional strategies to encourage compliance, take legal action against defaulting taxpayers, and introduce new revenue sources such as Hotel House Levy, Property Tax on Rural LGAs, Motorcycles Registration Fee, and Telecommunication Towers Fee.

In the case of Temeke Municipal Council, the study concentrated on revenue collection strategies. Questionairres and participatory observations were used. Results showed that performance was not to standards. 62% respondents concluded that the strategies in place were

not performing well whilst 25% thought the strategies were perfect with 13% indifferent. 40% explained that this was because of inefficient rules that governs the revenue collection process, 10% said that it was because of poor motivation and lack of training among tax collectors.

Lolojih (2008) conducted a research on revenue collection in Zambia and the research showed that property taxes contributed more revenue to Zambian local councils. The study also showed that local councils are failing to maximize on revenue collection because of failing to update the valuation roll. If valuation roll is not available, it is not possible to collect taxes from owners of new property. Regardless of all this, local taxes contribute greatly to local authorities revenue. It was noted that government transfers are a big source of revenue for authorities.

2.6 Discussion and Research Gap

The area of the study has been researched by many researchers before. The research is interested in the effects of macro-economic factors on revenue collection for Chitungwiza Council. However, many researchers have researched more on effects of any factor, micro or macro on revenue collection but this study focuses on macro only. Also, many researchers have left out critical data on effective strategies that can be put in place to boost revenue.

Previous studies used interviews among other methods to see the effectiveness of strategies developed but this study will use statistical tests to answer all these questions. Scholars have also left out the impact in the short and long run, this study will fill that gap. Researchers have also failed to give legal framework that governs local councils and hence the study is going to try and fill in the gap left by other researchers.

2.7 Conceptual Framework

According to Tamene (2016), conceptual framework is a structure of concepts, beliefs and theories that informs the study. The framework should capture the matter in hand and does it in a simple manner which can be remembered easily. In this research, the researcher links the features obtained from our theoretical literature and the sources of revenue, strategies to improve revenue and those factors that affect revenue collection. The macro-economic factors

negatively affect Chitungwiza Council revenue collection with respects to the objectives in Chapter 1.
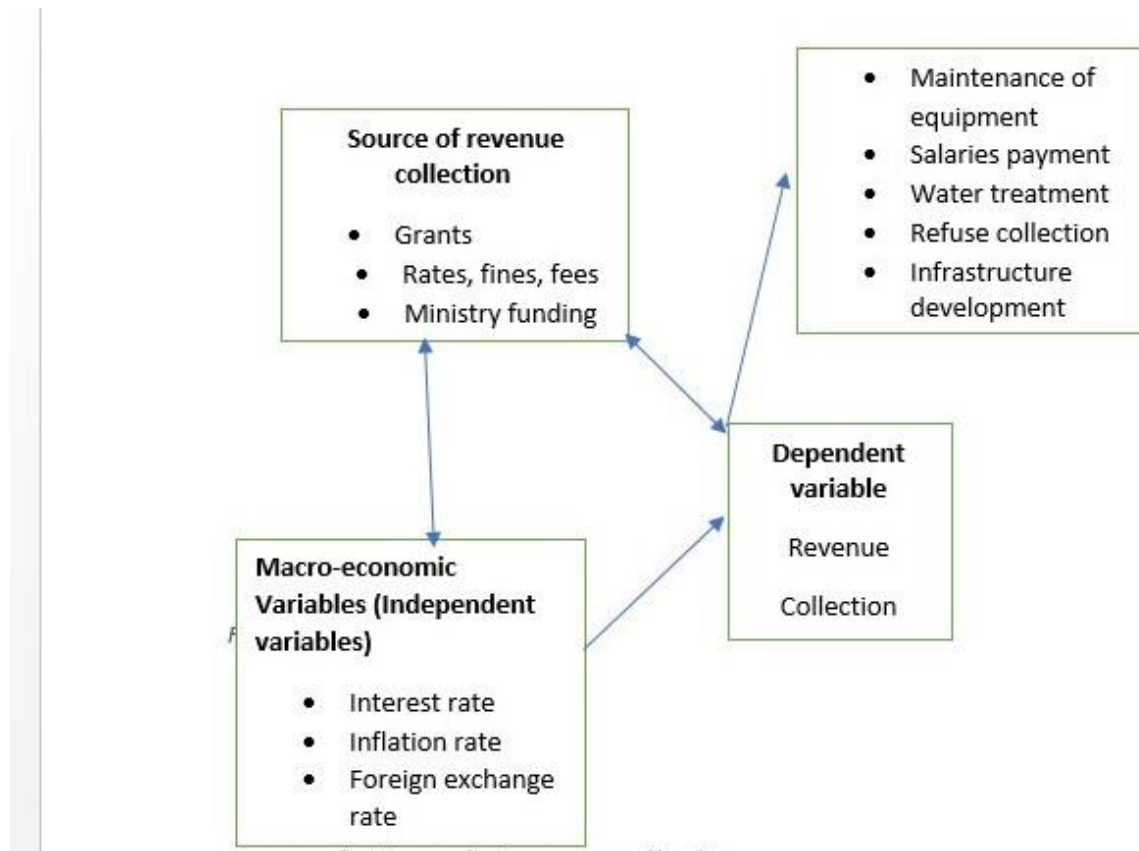
Figure 1: Source-The Researcher's conceptualization

2.7.1 Conceptualization of Local Council Revenue

Revenue refers to the earnings made from business activities, such as the sale of goods and services, before expenses are subtracted. Organizations can also get revenue on interest, royalties, or subscriptions. Typically, revenue is received in the form of cash over a specific period then rates income refers to the income that council receives from ratespayers. This money must comply with specific accounting standards. The British colonial rule over Zimbabwe led to the creation of local government in the country. In recent years, there have been changes in the naming and structure of these councils. Prior to colonial rule, Zimbabwe did not have a local administration, and governance was solely by chiefs and traditional leaders. However, this system was ineffective, and the British used it to administer the country.

During the period between 1990 and 1999, there were notable changes in local governance in Zimbabwe, which included the creation of local councils to manage staff and responsibilities.

A critical theme that emerged during this time was fiscal decentralization, which involves transferring taxing and expenditure to improve government's financial capabilities. However, revenue collection in Zimbabwe is impacted by several factors that require attention and resolution.

2.8 Chapter Summary

This chapter gave the local authorities' sources of funding together with problems faced and strategies to collect more revenue. Theoretical literature and Empirical Evidence followed showing the findings of previous researchers. The chapter also highlighted areas that can be improved in the future, the differences between other studies and this study. The following Chapter will show the method used in the investigations, how it was done, the methods used in data gathering and the dependability of the data.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter outlines the methods utilized to acquire, analyze, and interpret data for the research, including the study's design, data collection equipment, sampling techniques, data acquisition procedures, data presentation, and analysis methods. Research methodology is explained as a description of a process, concept, or idea linked to a specific field of study. The methodology section of the research paper examines the outcomes of the assessment of the impact of macro-economic factors on city council revenue collection using the automatic regression distribution lag (ARDL) approach developed by Pesaran, Shin, and Smith (1996).

3.1 Research Design

With an emphasis on examining the economic factors that affect revenue collection in city councils, this study used a quantitative research design. It is a secondary research study that relies on pre-existing data as the primary source for evaluating the consequence of inflation, interest rates, and exchange rates on revenue collection in city councils. Secondary data refers to information that has been previously collected by others, including government publications and foreign government publications.

3.2 Data Collection

The study depend on secondary data, which was chosen due to its ease of accessibility and analysis. It is a survey of secondary data that uses pre-existing data as its primary source to scrutinise impact of economic factors, including inflation, interest rates, and exchange rates, on revenue collection in city councils. The data was collected over a period of two years and was obtained from various sources, including government publications and foreign government publications. The data was downloaded and saved onto a computer in an Excel spreadsheet.

3.2.1 Data sources

Data on revenue collection was gathered by the researchers from the offices of the Chitungwiza city council. Data on exchange rates and interest rates were gathered from publications by the Reserve Bank of Zimbabwe (RBZ), whilst data on inflation rate was gathered from publications by the Zimbabwe National Statistics Office (ZIMSTATS).

3.2.2 Data and variables used

The data is collected monthly from January 2020 to December 2022, with a total of 36 observations. The study will focus on Chitungwiza municipality as a city council.

Table 1: Data and Variables

Variables	Indicator	Source
Revenue Collection	US$	Reserve Bank of Zimbabwe (RBZ)
Inflation rate	Consumer price index (CPI) Percentage	Zimbabwe National Statistic Agency (ZIMSTATS)
Interest Rate	Percentage	Reserve Bank of Zimbabwe (RBZ)
Foreign exchange rate	Trade weighted index (TWI)	Reserve Bank of Zimbabwe (RBZ)

Source: authors computation

3.2.3 Justification of Variables

- **Revenue Collection**

Revenue collection is a critical aspect of local government operations, as it provides the financial resources necessary to fund public services and infrastructure projects. According to Singh and Singh (2015), revenue collection is the primary source of income for local governments, and it plays a crucial role in financing public services and infrastructure.

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Effective revenue collection is also important for ensuring the financial viability and sustainability of city councils. Without sufficient revenue, cities may be unable to meet their financial obligations, such as paying employees, maintaining infrastructure, and providing essential services. This can lead to budget deficits, debt accumulation, and even bankruptcy in extreme case. Revenue collection is essential for ensuring the fiscal sustainability of local governments, and it helps to stimulate economic development.

Therefore, understanding impact of macro-economic factors on revenue collection is crucial for local governments to make informed decisions and develop effective policies. This knowledge can help city councils to anticipate changes in revenue collection and adjust their financial strategies accordingly, ensuring the continued provision of essential services to their communities. For local governments to create successful revenue generation plans and guarantee long-term fiscal sustainability, they must have a thorough grasp of the variables that affect revenue collecting.

- **Inflation**

Inflation is a key macroeconomic factor that can affect the revenue collection of city councils since it indicates a general increase in prices for goods and services over time, reducing the purchasing power of money. This can result in increased costs for providing public services, such as healthcare and education. Furthermore, inflation can have an impact on tax revenue collected by city councils since the value of taxable income decreases as prices of goods and services increase, leading to decreased tax revenue.

Inflation can also have broader macroeconomic consequences, such as reducing economic growth and increasing unemployment rates, Mishkin (2011). Therefore, understanding the impact of inflation on revenue collection is crucial for local governments to develop effective revenue generation strategies and ensure long-term fiscal sustainability.

- **Interest Rate**

Interest rate is a macroeconomic factor that can impact revenue collection for city councils. Interest rate refers to the cost of borrowing money, and it can affect the cost of borrowing for

both individuals and businesses interest rates can impact local governments' revenue collection by affecting the cost of borrowing for infrastructure projects and other capital investments.

Furthermore, interest rates can have broader macroeconomic implications, such as affecting exchange rates and inflation rates. Changes in interest rates can impact the demand for currency, which can be able to affect exchange rates and international trade. Interest rates can also impact inflation rates, as changes in interest rates can affect borrowing cost and spending, which can affect the demand for goods and services and ultimately impact inflation.

- **Exchange Rate**

The exchange rate refers to the worth of a currency compared to another currency, and it can influence the revenue collection of city councils. This is due to the fact that fluctuations in exchange rates can affect the expenses associated with imported goods and services, as well as the revenue generated from exports. Changes in exchange rates can also impact the costs associated with public services and infrastructure projects for local governments. As a result, it is crucial for city councils to understand the effects of exchange rates on revenue collection to develop successful revenue generation plans that guarantee long-term financial stability.

Table 2: Prior Expectations of Results

Variable	Relationship	Explanation
Inflation	Negative (-)	High inflation negatively affects revenue collection as it reduces income.
Exchange Rate	Negative(-)	High exchange rate is more likely to have a negative relationship with revenue collection.
Interest Rate	Negative(-)	High interest rate have negative relationship with revenue collection.

3.3 Data analysis

The study utilized E Views 12 software to analyze the data. Additionally, the internet was used to access previous research on how inflation, exchange rate, and interest rate impact revenue collection for Chitungwiza town council. The research approach employed the Autoregressive Distributed Lag (ARDL) model to examine the short-term and long-term effects of these variables on revenue collection for Chitungwiza council. The study's objective is to identify the factors that facilitate or impede revenue collection in Chitungwiza Municipality during the designated time period. The aim of the study is to propose recommendations that can improve revenue collection in the future.

3.3.1 Models

The Autoregressive Distributed Lag (ARDL) model is a statistical technique that researchers use in econometric analysis to investigate both short-term and long-term connections between variables. Its flexibility allows for various combinations of variables and lag lengths, making it suitable for analyzing time-series data and examining causal relationships between variables in different research studies. In this particular scenario, the ARDL model will be utilized to determine how macroeconomic factors, including inflation, exchange rates, and interest rates, impact the revenue collection of a city council.

Model 1

The generalized model of inflation, exchange rate, and interest rate on Revenue Collection

$$RC_t = f(INF_t, EXR_t, INR_t, RC_{t-1}) \qquad (1)$$

And the function is

$$RC_t = In\beta_0 + \beta_1 INF_t + \beta_2 EXR_t + \beta_3 INR_t + \beta_4 RC_{t-1} + \varepsilon_t \quad (2)$$

To show the relationship between tax collection and inflation, exchange rates, and interest rates, the study will use an ARDL technique. The model will be examined to see if the independent variables are cointegrated. The following equation can be used to show the relationship between the variables:

$$RC_t = C_0 + \delta_1 RC_{t-1} + \delta_2 INF_{t-1} + \delta_3 INR_{t-1} + \sum_{i=0}^{p} \Phi i \Delta RC_{t-1} + \sum_{j=0}^{q1} \Psi j \Delta INF_{t-j}$$

$$+ \sum_{i=0}^{q2} Yl \Delta EXR_{t-1} + \sum_{k=0}^{q3} \omega k \Delta INR_{t-1} + \varepsilon_t$$

$RC_t \rightarrow$ current revenue collection

$INF_{t-j} \rightarrow$ inflation rate in the jth lag backward

$EXR_{t-1} \rightarrow$ floating foreign exchange rates lagging back from the current rate at time t.

$INR_{t-1} \rightarrow$ Interest rate lagging back from the current time at t.

$\delta_i \rightarrow$ long-run multipliers in the model

$C_0 \rightarrow$ constant term

$, \Psi_j, \phi_i, Y_1 \ \omega k \rightarrow$ long run coefficients

$\varepsilon_t \rightarrow$ white noise error

The Long-run Autoregressive Distributed Lag Model 1 for Inflation, Exchange Rate, and Interest Rate on the Revenue Collection of a City Council.

$$RC_t = C_0 + \sum_{i=0}^{p} \delta 1 \ InRC_{t-1} + \sum_{j=0}^{q1} \delta_{2i} \ INF_{t-j} + \sum_{i=o}^{q} \delta_3 \ EXR_{t-1} + \sum_{k=0}^{q3} \delta_4 \ INR_{t-1} + \varepsilon_t$$

3.4 Model tastes

3.4.1 Unit root test

To assess if the data is stationary or non-stationary and to prevent inaccurate results, the unit root test is used. For any lag, there is a constant mean, variance, and autocovariance if the data is stationary, and the opposite is true if the data is non-stationary. To examine stationary unit-roots, utilize the extended Dickey-Fuller (ADF) unit root test. The ADF test can be approximated as follows assuming a random walk with a drift around the stochastic error trends defined by increasing the lag value of the stated variable Yt: Three independent regressions are used in the Dickey and Fuller (1979) unit root test Chung (1995). Regressions include:

$$\Delta Y_t = \beta_i + \beta_{2t} + \alpha Y_{2t-1} + U^t Y_t + \varepsilon_t$$

Where ε_t is the white noise error term

A white noise series represents the error term. In other words, the variance is constant and the mean is zero. In other words, there is no correlation between the error terms for various times (t). Tau (£) statistics can be utilized to apply (ADF) techniques.

H_0: $\alpha=0$ (the series is stationary)

H_1: $\alpha\neq0$ (the series is not stationary)

3.4.2 Multicollinearity test

A statistical concept known as multicollinearity is the presence of two or more independent variables in a linear regression model that have a high degree of correlation, which can produce inaccurate or misleading findings. This can happen for a number of reasons, including the wrong use of variables, choosing null hypotheses incorrectly, and choosing dependent variables. Multicollinearity's effects on statistical models may result in decreased reliability and widened confidence ranges for independent variables. The degree of multicollinearity in multiple regression models is measured statistically using the variance expansion factor (VIF). The pairwise correlation test is used to assess if the model exhibits multicollinearity, with a result of 0.85 or above suggesting a breach of the assumptions of the classical linear regression model.

3.5 Model specifications

It is crucial to check for cointegration when variables have a unit root non-stationary feature.

The Autoregressive Distributed Lag (ARDL) model is utilized to handle cointegration relationships and estimate long-term and short-term correlations. The ARDL model employs combined orders of I(0), I(1), or a combination of the two to analyze the relationships. In this research, a lag model with self-returning variance was used to examine how inflation, interest rates, and exchange rates impact revenue collection for city councils. The use of the ARDL model in cointegration analysis produces accurate and realistic outcomes.

3.5.1 Cointegration test

The cointegration test is a statistical method for figuring out whether two or more non-stationary time series variables have a long-term relationship. It is a necessary step in econometric analysis to ensure that the regression models used are valid and reliable. Cointegration testing involves the estimation of a regression model for the variables of interest and testing the residuals for stationarity. When the residuals are stationary, it signals the existence of cointegration, which suggests a long-term relationship between variables. Cointegration testing is a widely used method in economic research to investigate the connections between various economic factors, such as interest rates, exchange rates, and inflation.

3.5.2 Autoregressive distributed lag approach

If a cointegration vector exists, the underlying variable can be either I(0), I(1), or a mixture of both, as the cointegration procedure is not restricted to a particular order of integration. In such situations, applying the ARDL approach to cointegration yields a reliable and effective estimate. The ARDL approach assists in identifying the cointegration vector, where every fundamental variable functions as one long-term relational equation. Once the cointegration vector is identified, the ARDL model is reparameterized into an error correction model (ECM).

3.5.3 The error correction model

In order to ensure the stability and dynamism of the model over an extended period of time, error correction models are employed. Error correction models results provide both short-term dynamics and long-term relationships for the variables within the single model, as the ARDL model is one model dynamic equation and has the same format as the error correction model. The error correction term (ECT) is utilized to assess the effectiveness of ARDL models. The error correction term is a parameter that reflects the effect of any errors on the rate adjustment to equilibrium or the estimation model.

The Akaike Information Criterion (AIC) approach offers the ideal delay length for the data, whereas the Schwartz Information Criterion (SIC) method is the most frequently used way for determining the delay length of a model. It is therefore applicable to this model.

Error correction model

$$\Delta lnRC_t = C_o + \sum_{i=1}^{p} \delta_2 \, \Delta INF_{t-j} + \sum_{i=1}^{q2} \delta_3 \, EXC_{t-1} + \sum_{k=0}^{q3} \delta_4 \, INR_{t-1} \delta_4 ECT_{t-1} + \varepsilon_t$$

3.5.4 Post estimation model tests

The data in every statistical study or survey should conform to the Normal Distribution. The assumption of normality of the distribution underlies the hypothesis and the confidence intervals, which are most frequently assessed by the Jacque Bera Statistic (JB). According to Greene, (2003) normality is frequently considered to be of little importance in regression analysis and is not necessary in order to produce the results that demonstrate robustness in multiple regression analysis.

3.5.5 Normality test

If the residuals are normal, S = 0 and K = 3, and the JB statistics are equal to zero. Null hypothesis is failed to be rejected if there is no sufficient proof in the data; but, if there is sufficient evidence in the data, the null hypothesis is rejected and there is no normality.

3.5.6 Heteroscedasticity

The Breusch-Pagan-Godfrey test and the Arch test will be utilized to test for heteroscedasticity. Unequal variances in Ordinary Least Squares can lead to inaccurate and biased coefficient estimates. According to Greene (2002), heteroscedasticity can increase the model's standard errors, resulting in unreliable confidence intervals and insignificant test results. However, if the explanatory variables are explicitly stated, the observations are independent, and the model has non-constant variances, heteroscedasticity is not an issue. Serial correlation has the same effects as heteroscedasticity, and the Durbin Watson statistic will be employed to detect it.

After estimating the model coefficients, a critical post-estimation step is assessing the model's validity using the F and R2 tests. A higher R2 value indicates a successful goodness-of-fit test for the model, demonstrating the percentage of dissimilarity in the response variable that can be clarified by its predictors within the larger model.

Although some variables may only account for a small portion of the variation in the model, the R2 value tends to increase with the number of regressors, making an adjusted R2 value more appropriate.

3.5.7 Granger causality testing

Granger causality test is an arithmetical method utilized in time series analysis to determine causality between two variables. Clive Granger, who was awarded the Nobel Prize, developed this technique in 1969. The Granger causality test examines whether past values of one variable can be utilized to forecast future values of a second variable. The test is based on the notion that if variable A causes variable B, the past values of A must provide valued information for forecasting future values of B, over and above what can be predicted by past values of B alone. The Granger causality test is extensively used in various fields such as econometrics, finance, and social sciences to investigate the trend of connection between variables. However, it is important to note that the Granger causality test only indicates the direction of effect between two variables, not causality in the genuine sense.

H_0: There is no causal relationship between the variables at 1%, 5%, and 10% significance levels.

H_1: There is a causal relationship between the variables at 1%, 5%, and 10% significance levels.

3.6 Chapter Summary

In this chapter, the relationship between revenue collection and inflation, exchange rates, and interest rates was examined. Variables of interest were identified, and their sources were discussed, along with an overview of the model specifications and the ARDL procedure. The first step involved evaluating the stationarity of the variables over a unit root test, followed by a boundary test to assess the occurrence of cointegration among the variables. The ARDL and error-correction models were then utilized to analyze the variables' short-term and long-term dynamics. Additionally, the Granger causality test was employed to investigate the causal link between inflation and the performance of microfinance institutions. The coming chapter will concentrate on the presentation and explanation of the data analysis.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.0 Introduction

The emphasis is on analyzing and presenting data that was gathered in the previous chapter. The ARDL approach and Eviews 12 software were employed for data analysis. The Eviews 12 program's outcomes involve a statistical examination of how economic variables which are inflation, interest rates, and exchange rates impact the amount of tax revenue collected by municipal governments.

4.1 Descriptive statistics

The primary purpose of gathering data on inflation, interest rate, and exchange rate and their effect on revenue collection of a city council was to arrange the unprocessed data in a manner that would facilitate a descriptive examination of the variables under investigation. The subsequent table presents a condensed version of the statistical characteristics of the data.

Table 3: Descriptive Statistics

	Revenue Collection	Interest Rate	Inflation	Exchange Rate
Mean	6.186240	3.584361	1.33034	4.592324
Median	6.214608	3.306423	1.677053	4.436734
Maximum	6.396930	5.108669	3.569533	6.483107
Minimum	5.948035	2.814210	0.470004	2.823757
Std. Dev.	0.115358	0.698036	0.898510	0.996733
Skewness	-0.003600	0.938593	0.529576	0.210179
Kurtosis	2.307483	2.761571	2.133947	2.802322
Jarque-Bera	0.71944	5.371019	2.807774	0.323665
Probability	0.697869	0.068186	0.245640	0.850583
Sum	222.7046	129.0370	65.98924	165.3237
Sum Sq. Dev	0.465760	17.05389	28.25618	34.77168

Observations	36	36	36	36

Source: authors computation

Table 3 provides descriptive statistics for the variables of interest, including revenue collection, interest rate, inflation, and exchange rate.

The mean revenue collection was 6.186240, indicating that the average revenue collected by the city council was approximately 6.2 units. The median revenue collection was slightly higher at 6.214608, which suggests that the distribution of revenue collection is slightly skewed.

The mean interest rate was 3.584361, indicating an average interest rate of approximately 3.6%. The standard deviation of the interest rate was relatively high at 0.698036, which suggests that the interest rate varies considerably over time.

The mean inflation was 1.33034, indicating an average inflation rate of approximately 1.3%. With a positive value of 0.529576, the skewness of the inflation variable suggests that it is somewhat skewed towards higher values. The mean exchange rate was 4.592324, indicating an average exchange rate of approximately 4.6 units. The standard deviation of the exchange rate was relatively high at 0.996733, which suggests that the exchange rate varies considerably over time.

The Jarque-Bera test was conducted to test the normality of the data. The test results indicate that the data for all variables, except for interest rate, are normally distributed at a significance level of 5%.

Generally, these descriptive statistics can provide valuable insights into the behavior of the variables over time and inform the development of statistical models to investigate associations between these variables and revenue collection for the city council

4.2 Normality Test
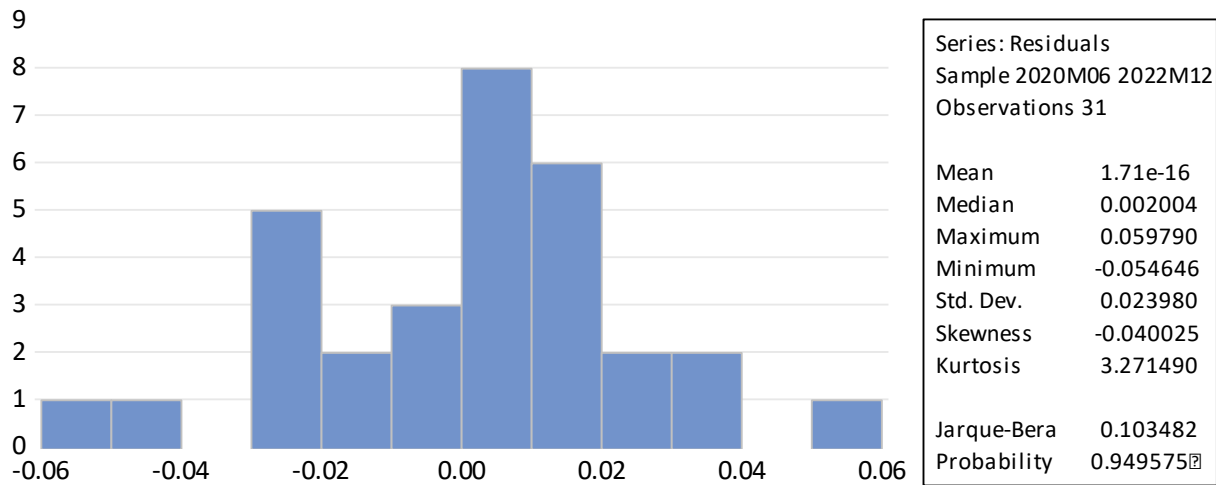
Figure 2: Normality Test

In Figure 2, the Jarque-Bera test was employed to evaluate whether the residuals demonstrate a normal distribution, with a null hypothesis (H0) value of 0.103482. The results of the test indicate that the probability value is 0.949575, which surpasses the 5% level of significance. Based on this finding, we can infer that the data conforms to a normal distribution. Therefore, we accept the null hypothesis and draw this conclusion.

4.3 Multicollinearity Test

Table 4: ARDL model of Inflation, Interest rate and Exchange rate on Revenue Collection.

	Revenue Collection	Interest Rate	Inflation	Exchange Rate
Revenue Collection	1			
Interest Rate	0.01603906	1		
Inflation	0.01064534	-0.1269693	1	
Exchange Rate	0.05662111	0.89568034	-0.2840465	1

Source: authors computation

Table 4 presents the results of the ARDL model that investigates the relationship between revenue collection and the economic variables of interest, including interest rate, inflation, and exchange rate.

The diagonal values represent the coefficient estimates for each variable when regressed on itself, which are all equal to 1. This indicates that each variable has a perfect correlation with itself.

The off-diagonal values represent the coefficient estimates for the relationship between pairs of variables. For example, the coefficient estimate for interest rate and revenue collection is 0.01603906, indicating a positive relationship between these variables. This suggests that rise in interest rates is associated with an rise in revenue collection for the city council.

Similarly, the coefficient estimate for exchange rate and revenue collection is 0.05662111, indicating a positive relationship between these variables. This suggests that a stronger exchange rate is associated with higher revenue collection for the city council.

However, the coefficient estimate for inflation and revenue collection is 0.01064534, indicating a relatively weak positive relationship between these variables. This suggests that inflation has a minor influence on city councils revenue collection.

ARDL model results suggest that interest rate and exchange rate are the most significant economic variables affecting revenue collection for the city council. These findings can be used to inform policy decisions and revenue collection strategies.

4.4 Pretest the results

4.4.1 Unit root test

Various methods were employed to test the given hypothesis, including levels, initial differences at intersections, intersections with trends, and trends without intersections. Table 5 below shows the results. . The Augmented Dickey-Fuller Test (ADF) was utilized at both intersections to assess the stationarity properties.

H0: the unit root exists or the variable is non-stationary.

H1: there is no unit root or the variable is stationary.

Table 5: unit root Test

Variables		Intercept	Trend and Intercept	Order of integration
Revenue Collection	Level	-5.885552	-.5882969	I(1)
	1st difference	-9.502682	-7.244072	I(1)
Interest Rate	Level	3.464291	0.669112	
	1st difference	-1.292481	-6.475953	I(1)
Inflation	Level	-2.172610	-2.390262	
	1st difference	-5.266943	-5.054064	I(1)
Exchange Rate	Level	-0.329181	-1.282085	
	1stdefference	-4.636189	-4.555202	I(1)

Source: authors computation

Significance level for stationary was 0.01.

4.4.2 Optimal lag selection

Table 6: Lag Selection

Variable	Lag length
Revenue Collection	4
Interest Rate	5
Inflation	5
Exchange Rate	5

Source: authors computation from e-views

Table 6 displays selected lag length for each variable:

- Revenue Collection: 4

- Interest Rate: 5

- Inflation: 5

- Exchange Rate: 5

The findings showed that the ARDL(4.5.5.5) model is the best fit for the study.

4.4.3 Cointegration test

It was suggested that if one or both variables exhibit a long-term relationship, it suggests the presence of a cointegration property. The unit root test results show that the time-series have a variety of features, and none of them are I(2) in all tests. Therefore, it is possible to use the ARDL restriction test.

Table 7: F-bounds test

f-bounds test		Null hypothesis	No level	Relationship
		Asymptotic n= 1000		
Test statistics	Value	Significance	I(0)	I(1)
F-statistics	16.32693	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: authors computation from e-views

Table 7 indicates that the null hypothesis of no long-term association can be dismissed for both the I(0) and I(1) scenarios, as seen in the test statistics value of 16.32693 at a 10% significance level. This suggests that the variables have a long-term relationship.

4.4.4 Long-run coefficients

Table 8: long-run coefficients

Variable	Coefficient	Std. Error	t-Statistic	Probability
Interest Rates	-0.467913	0.071574	-6.537460	0.0002
Inflation	0.342989	0.078469	4.371038	0.0024
Exchange Rates	0.450076	0.060116	7.486738	0.0001

Source: authors computation from e-views

EC=REVENUE COLLECTION-(-0.4679*INTEREST RATES+0.3430*

INFLATION+0.4501*EXCHANGE RATES+5.3514)

The long-run coefficients for the variables of interest in the model are presented in Table 8. The table reports the coefficient values, standard errors, t-statistics, and corresponding probabilities for each variable.

The results suggest that interest rates, inflation, and exchange rates have a statistically significant impact on revenue collection in the long run. Specifically, a one-unit increase in interest rates leads to a 0.4679-unit decrease in revenue collection, holding all other variables constant. Similarly, a one-unit increase in inflation can lead to a 0.3430-unit increase in revenue collection, and a one-unit increase in exchange rates leads to a 0.4501-unit increase in revenue collection.

4.4.5 Error correction model of the ARDL (4.5.5.5)

The Error Correction Model (ECM), which gauges the rate of error correction in the short run, is used to determine whether there is cointegration between the variables. The table below shows the short-term dynamics of the variables under study.

Table 9: Error Correction Model

Variable	Coefficient	Std. Error	t-Statistics	Probability
D(REVENUE COLLECTION(-1))	0.791212	0.159491	4.960865	0.0011
D(REVENUE COLLECTION(-2))	-0.223074	0.85893	-2.597105	0.0318
D(REVENUE COLLECTION(-3))	0.148172	0.094567	1.566847	0.1558
D(INTEREST RATES)	-0.076181	0.039574	-1.925033	0.0904
D(INTEREST RATES(-1))	0.264535	0.062300	4.246138	0.0028
D(INTEREST RATES(-2))	0.294311	0.054514	5.398781	0.0006
D(INTEREST RATES(-3))	0.207726	0.39302	5.285423	0.0007
D(INTEREST RATES(-4))	0.114296	0.035959	3.178471	0.0130
D(INFLATION)	0.036124	0.018984	1.902843	0.0936
D(INFLATION(-1))	-0.597157	0.061126	-9.769268	0.0000

D(INFLATION(-2))	-0.270780	0.044975	-6.020657	0.0003
D(INFLATION(-3))	-0.290586	0.047541	-6.112384	0.0003
D(INFLATION(-4))	0.063016	0.019779	3.185956	0.0129
D(EXCHANGE RATES)	-0.537163	0.069260	-7.755712	0.0001
D(EXCHANGE RATES(-1))	-1.025117	0.125427	-8.173039	0.0000
D(EXCHANGE RATES(-2))	-1.512006	0.142288	-10.62641	0.0000
D(EXCHANGE RATES(-3))	-0.935109	0.128271	-7.290121	0.0001
D(EXCHANGE RATES(-4))	-0.890633	0.111239	-8.006474	0.0000
CointEq(-1)*	-1.920922	0.1`73591	-11.06580	0.0000

R-squared	0.976999
Adjsted R- Squared	0.942497
SE of regression	0.037915
Sum Squared residual	0.017251
Log likelihood	72.16836
Durbin-Watson stat	2.378901

Source: authors computation from e-views

Table 9 are results of Error Correction Model (ECM) analysis on the short-run dynamics of the variables of interest. The table presents the coefficients, standard errors, t-statistics, and probabilities for each variable included in the ECM model.

Results indicate that the lagged values of revenue collection have an important impact on the present value of revenue collection. Specifically, the coefficients for D(REVENUE COLLECTION(-1)), D(REVENUE COLLECTION(-2)), and D(REVENUE COLLECTION(-

3)) are positive, negative, and positive, respectively, indicating that the current value of revenue collection is influenced by the previous values of revenue collection.

The coefficients for the lagged values of interest rates, inflation, and exchange rates are also significant. The results show that as the lagged values of interest rates increase, the current value of revenue collection decreases, while the lagged values of inflation and exchange rates have a positive effect on the current value of revenue collection.

The CointEq(-1) coefficient is also significant, showing the presence of a long-run equilibrium relationship among the variables in the model.

The R-squared value of 0.976999 indicates that the model fits the data well, and the Durbin-Watson statistic of 2.378901 suggests that there is no significant autocorrelation in the residuals.

4.4.6 Testing for Heteroscedasticity

Table 10: Breusch-Pagan-Godfrey Test

F-statistic	0.855856	Prob. F(2,8)	0.6393
Obs*R-square	21.75621	Prob.ChiSquare(22)	0.4745
Scale explained SS	1.645587	Prob.ChiSquare(22)	1.0000

Source: authors computation

Table 10 above shows Breusch Pagan Godfrey test which conducted to test the hypothesis that there is no heterogeneity in the model. The test results indicate that the null hypothesis cannot be rejected since all probability values are more than the 0.05 significance level. Therefore, the model is considered homoscedastic and not heterogeneous at the 5% significance level.

4.4.7 Serial Correlation

Table 11: Breusch-Godfrey Serial Correlation LM

F-statistics	0.36199	Prob. F(2,6)	0.17117
Obs*R-squared	3.323067	Prob. Chi-square(2)	0.1898

Source: authors computation

Table 11 Breusch-Godfrey Serial Correlation LM test examines whether there is serial correlation in the model. The F-statistic value is 0.36199, and the associated probability value is 0.17117, indicating that there is no significant serial correlation in the model. The Obs*R-squared value is 3.323067, and the associated probability value is 0.1898, further supporting the absence of serial correlation.

4.4.8 Short-run Granger Causality Test

Table 12: Granger causality test

Null Hypothesis	Obs	F-statistic	Prob
INTEREST RATES does not Granger Cause REVENUE COLLECTION	34	4.31398	0.0229
REVENUE COLLECTION does not Granger Cause INTEREST RATES	34	2.54869	0.0956
INFLATION does not Granger Cause REVENUE COLLECTION	34	0.42448	0.6581
REVENUE COLLECTION does not Granger Cause INFLATION	34	1.72825	0.1954

EXCHANGE RATES does not Granger Cause REVENUE COLLECTION	34	0.31825	0.7299
REVENUE COLLECTION does not Granger Cause EXCHANGE RATES	34	1.39392	0.2642
INFLATION does not Granger Cause INTEREST RATES	34	1.17367	0.3235
INTEREST RATES does not Granger Cause INFLATION	34	1.80234	0.1829
EXCHANGE RATES does not Granger Cause INTEREST RATES	34	4.07263	0.0276
INTEREST RATES does not Granger Cause EXCHANGE RATES	34	1.32266	0.2820
EXCHANGE RATES does not Granger Cause INFLATION	34	1.97186	0.1574
INFLATION does not Granger Cause EXCHANGE RATES	34	12.6417	0.0001

Source: authors computation from e-views

Table 12 displays the findings of the Short-run Granger Causality Test, which examines whether one variable can predict another variable in the short run. The results of the Granger causality test for the variables of interest are presented in the table.

According to the results, interest rates Granger cause revenue collection, implying that changes in interest rates can be used to predict changes in revenue collection in the short run. However, revenue collection does not Granger cause interest rates.

Furthermore, the test results indicate that exchange rates Granger cause interest rates, meaning that changes in exchange rates can be utilized to forecast changes in interest rates in the short run. However, interest rates do not Granger cause exchange rates.

On other side, the test results suggest that there is no significant short-run causal relationship between inflation and revenue collection, as well as between inflation and exchange rates.

Overall, the Granger causality test provides insights into the short-run causal relationships between the variables, which can be useful for policymakers and analysts interested in understanding the dynamics of these variables.

4.5 Chapter summary

This chapter involved conducting various tests to examine the relationships between the dependent and independent variables. The stability test results showed that these variables had

different integration levels, which made the ARDL boundary test more appropriate. The ARDL boundary tests showed that cointegrations exist between revenue collection and interest rates, inflation, and exchange rates, indicating long-term relations among these variables. The long-term coefficients of inflation and exchange rates had positive and negative values, respectively, in relation to interest rates. Furthermore, the short-term coefficients of the variables were analyzed using the error correction model, and their significance was determined. Diagnostic tests were conducted, and the results showed that there were no issues with heterogeneity, serial correlation, or model mis-specification, and the residuals were normally distributed. The next chapter will provide a summary of the paper, make recommendations, and present conclusions.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The objective of the study was to analyze the influence of macro-economic factors on the revenue collection of Chitungwiza city council. The research findings suggest that the impact of these factors on revenue collection is depending on whether it is a short-term or long-term relationship. This section provides a brief overview of the previous chapter, highlighting the conclusions and recommendations based on the research findings.

5.1 Summary of the Study

The study aimed to examine the impact of macro-economic factors on revenue collection in city councils using Chitungwiza city council as a case study. The first chapter of the study outlined the research objectives, which included investigating the long- and short-term effects of macro-economic factors on revenue collection in Zimbabwean city councils.

The objectives were achieved in chapter four when the researcher used the autoregression lag and error correction model. The cointegration test revealed a long-run correlation between revenue collection and interest rate, inflation, and exchange rate. Data applied in the study was obtained from Chitungwiza City Council, RBZ, and ZIMSTATS and covered the period of January 2020 and December 2022.

The study employed revenue collection as the dependent variable and interest rate, inflation, and exchange rate as independent variables. The researcher used Eviews 12 software to analyze the data and confirmed that all variables were stationary at the order I(1).

Based on the results, the researcher drew conclusions that could be useful for Chitungwiza city council and other similar municipalities to enhance their revenue collection. The study provides valuable insights that can ultimately help city councils, particularly Chitungwiza city council, to grow and flourish.

5.2 Summary of the Findings

Tables 4.5 and 4.6 addressed the second objective of the investigation, which was to ascertain the long-term impact of macroeconomic factors on revenue collection in the city council. The

cointegration and F-bounds test results revealed that interest rates have a negative long-term relationship with revenue collection, while inflation and exchange rates have positive long-term relationships. Specifically, a 1% increase in interest rates is expected to decrease revenue collection by 47% in the long run while holding other factors constant. On the other hand, a 1% increase in inflation is predicted to increase revenue collection by 34% in the long run, ceteris paribus. Similarly, a 1% increase in exchange rates is expected to result in a 45% increase in revenue collection in the long run, holding other factors constant.

The long-term relationship between interest rates and revenue collection is generally negative, while the relationships between inflation and exchange rates tend to be positive. The short-term relationship between revenue collection and interest rates, inflation, and exchange rates was confirmed by the error correction model presented in Table 4.7. The results indicate that revenue collection is positively affected by the first and third lag and negatively affected by the second lag. This suggests that the level of revenue collection in higher lags impacts revenue collection in the second lag.

It was found that inflation and exchange rates have a negative impact on revenue collection in the short run, while interest rates have a positive effect on revenue collection in the short run, holding other factors constant. Specifically, an increase in inflation or exchange rates will decrease revenue collection in the short run, while an increase in interest rates will increase revenue collection in the short run, holding other factors constant. However, there is a negative long-term relationship between interest rates, inflation, and exchange rates, as confirmed by the coefficient of adjustment in the long-run equilibrium with a speed of 19%.

Based on these findings, policymakers should focus on implementing sound fiscal and monetary policies that promote economic stability and growth. Additionally, city councils should diversify their revenue sources, strengthen their revenue collection systems, and increase public awareness and education to improve compliance with tax laws. Future research could explore the impact of other macroeconomic factors on revenue collection and conduct comparative studies of revenue collection in different municipalities.

5.3 Conclusions

The study has provided valuable insights into the relationship between macroe-conomic factors and revenue collection in Chitungwiza city council, which can be used to inform policy

decisions aimed at enhancing revenue collection and promoting the growth and development of the city council.

The findings suggest that interest rate, inflation, and exchange rates are important factors that influence revenue collection in the long run and the short run. The results of the autoregressive distributed lag (ARDL) model indicate that these factors have significant effects on revenue collection, and changes in one of these factors can impact revenue collection in a predictable manner.

In conclusion, the study provides valuable information that can be used by Chitungwiza city council and other similar municipalities to enhance their revenue collection and ultimately contribute to their growth and prosperity.

5.4 Recommendations

1. Improve fiscal and monetary policies: The study highlights the importance of interest rates, inflation, and exchange rates in revenue collection. Therefore, policymakers should implement sound fiscal and monetary policies that promote economic stability and growth, and reduce inflation and interest rates.

2. Diversify revenue sources: The study shows that revenue collection is impacted by macro-economic factors, which are beyond the control of the city council. Therefore, it is recommended that city councils diversify their revenue sources to reduce reliance on a single source of revenue. This will help to mitigate the adverse effects of macroeconomic factors on revenue collection.

3. Strengthen revenue collection systems: The study highlights the need for effective revenue collection systems that are efficient and transparent. Therefore, it is recommended that city councils strengthen their revenue collection systems by adopting modern technologies, such as electronic payment systems, and implementing effective enforcement mechanisms to ensure compliance with tax laws.

4. Increase public awareness: The study shows that public awareness and education can have a positive impact on revenue collection. Therefore, it is recommended that city councils increase public awareness and education on the importance of paying rates and the benefits that

accrue from revenue collection. This will help to improve compliance and increase revenue collection.

5.5 Suggested Areas for Future Research

1. The impact of other macroeconomic factors on revenue collection: This study focused on the impact of interest rates, inflation, and exchange rates on revenue collection. However, there are other macroeconomic factors, such as GDP growth, unemployment, and government expenditure that can also impact revenue collection. Future research could examine the impact of these factors on revenue collection and how they interact with the factors studied in this research.

2. A comparative study of revenue collection in different municipalities: This study focused on revenue collection in Chitungwiza city council. Future research could compare revenue collection in different municipalities with varying economic and socio-demographic characteristics. This could help to identify the factors that contribute to successful revenue collection and the challenges that different municipalities face in collecting revenue. Comparative studies could also provide insights into best practices that could be adopted by other municipalities to improve revenue collection.

5.6 Chapter Summary

The questions and study objectives were covered and summary of the discoveries was provided in the chapter. Conclusions were reached based on the pre-test, the diagnostic tests carried out, and the model utilized. Some recommendations for the various parties involved were also covered.

REFERENCES

Benschop, T., Machingauta, C., & Welch, M. (2016). Statistical Disclosure Control for Microdata: A Practice Guide. *International Household Survey Network and the World Bank, Tech. Rep*.

Chakaipa, S. (2010). Local government institutions and elections. *Local government reform in Zimbabwe: A policy dialogue*, 31-70.

Choi, I., & Chung, B. S. (1995). Sampling frequency and the power of tests for a unit root: A simulation study. *Economics Letters*, *49*(2), 131-136.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American statistical association*, *74*(366a), 427-431.

Greene, W. (2002). *Alternative panel data estimators for stochastic frontier models*. Working paper, Stern School of Business, New York University (September 2002).

Greene, W. H. (2003). *Econometric analysis*. Pearson Education India.

Lolojih, P. (2008). Local government administration and service delivery in the third republic.

Mishkin, F. S. (2011). *Monetary policy strategy: lessons from the crisis* (No. w16755). National Bureau of Economic Research.

Mzenzi, S. (2013). *Accounting practices in the Tanzanian Local Government Authorities (LGAs): The grounded theory of manipulating legitimacy* (Doctoral dissertation, University of Southampton).

Pesaran, M. H., Shin, Y., & Smith, R. J. (1996). *Testing for the'Existence of a Long-run Relationship'* (No. 9622). Faculty of Economics, University of Cambridge.

Sharma, P., & Singh, J. (2015). Determinants of tax-revenue in India: a principal component analysis approach. *International Journal of Economics and Business Research*, *10*(1), 18-29.

Tamene, E. H. (2016). Theorizing conceptual framework. *Asian Journal of Educational Research Vol*, *4*(2), 50-56.

APPENDIX

Descriptive Statistics

	LNREVENU...	LNINTERES...	LNINFLATION	LNEXCHAN...
Mean	6.186240	3.584361	1.833034	4.592324
Median	6.214608	3.306423	1.677053	4.436734
Maximum	6.396930	5.108669	3.569533	6.483107
Minimum	5.948035	2.814210	0.470004	2.823757
Std. Dev.	0.115358	0.698036	0.898510	0.996733
Skewness	-0.003600	0.938593	0.529576	0.210179
Kurtosis	2.307483	2.761571	2.133947	2.802322
Jarque-Bera	0.719447	5.371019	2.807774	0.323665
Probability	0.697869	0.068186	0.245640	0.850583
Sum	222.7046	129.0370	65.98924	165.3237
Sum Sq. Dev.	0.465760	17.05389	28.25618	34.77168
Observations	36	36	36	36

Multicollinearity Test

	LNREVENU...	LNINTERES...	LNINFLATION	LNEXCHAN...
LNRE...	1	0.01603906...	0.01064534...	0.05662111...
LNINT...	0.01603906...	1	-0.1269693...	0.89568034...
LNINF...	0.01064534...	-0.1269693...	1	-0.2840465...
LNEX...	0.05662111...	0.89568034...	-0.2840465...	1

Cointegration; F-Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	16.32693	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Error Correction Model

ARDL Error Correction Regression
Dependent Variable: D(LNREVENUECOLLECTION)
Selected Model: ARDL(4, 5, 5, 5)
Case 2: Restricted Constant and No Trend
Date: 06/07/23   Time: 21:54
Sample: 2020M01 2022M12
Included observations: 31

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNREVENUECOLLE...	0.791212	0.159491	4.960865	0.0011
D(LNREVENUECOLLE...	-0.223074	0.085893	-2.597105	0.0318
D(LNREVENUECOLLE...	0.148172	0.094567	1.566847	0.1558
D(LNINTERESTRATES)	-0.076181	0.039574	-1.925033	0.0904
D(LNINTERESTRATES(...	0.264535	0.062300	4.246138	0.0028
D(LNINTERESTRATES(...	0.294311	0.054514	5.398781	0.0006
D(LNINTERESTRATES(...	0.207726	0.039302	5.285423	0.0007
D(LNINTERESTRATES(...	0.114296	0.035959	3.178471	0.0130
D(LNINFLATION)	0.036124	0.018984	1.902843	0.0936
D(LNINFLATION(-1))	-0.597157	0.061126	-9.769268	0.0000
D(LNINFLATION(-2))	-0.270780	0.044975	-6.020657	0.0003
D(LNINFLATION(-3))	-0.290586	0.047541	-6.112384	0.0003
D(LNINFLATION(-4))	0.063016	0.019779	3.185956	0.0129
D(LNEXCHANGERATES)	-0.537163	0.069260	-7.755712	0.0001
D(LNEXCHANGERATES...	-1.025117	0.125427	-8.173039	0.0000
D(LNEXCHANGERATES...	-1.512006	0.142288	-10.62641	0.0000
D(LNEXCHANGERATES...	-0.935109	0.128271	-7.290121	0.0001
D(LNEXCHANGERATES...	-0.890633	0.111239	-8.006474	0.0000
CointEq(-1)*	-1.920922	0.173591	-11.06580	0.0000

Granger Causality Test

Pairwise Granger Causality Tests
Date: 06/07/23   Time: 21:51
Sample: 2020M01 2022M12
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNINTERESTRATES does not Granger Cause LNREVENUECOLLECTION	34	4.31398	0.0229
LNREVENUECOLLECTION does not Granger Cause LNINTERESTRATES		2.54869	0.0956
LNINFLATION does not Granger Cause LNREVENUECOLLECTION	34	0.42448	0.6581
LNREVENUECOLLECTION does not Granger Cause LNINFLATION		1.72825	0.1954
LNEXCHANGERATES does not Granger Cause LNREVENUECOLLECTION	34	0.31825	0.7299
LNREVENUECOLLECTION does not Granger Cause LNEXCHANGERATES		1.39392	0.2642
LNINFLATION does not Granger Cause LNINTERESTRATES	34	1.17367	0.3235
LNINTERESTRATES does not Granger Cause LNINFLATION		1.80234	0.1829
LNEXCHANGERATES does not Granger Cause LNINTERESTRATES	34	4.07263	0.0276
LNINTERESTRATES does not Granger Cause LNEXCHANGERATES		1.32266	0.2820
LNEXCHANGERATES does not Granger Cause LNINFLATION	34	1.97186	0.1574
LNINFLATION does not Granger Cause LNEXCHANGERATES		12.6417	0.0001

Long-run Coefficients

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNINTERESTRATES	-0.467913	0.071574	-6.537460	0.0002
LNINFLATION	0.342989	0.078469	4.371038	0.0024
LNEXCHANGERATES	0.450076	0.060116	7.486738	0.0001
C	5.351450	0.134777	39.70594	0.0000

EC = LNREVENUECOLLECTION - (-0.4679*LNINTERESTRATES + 0.3430
    *LNINFLATION + 0.4501*LNEXCHANGERATES + 5.3514)

Variance Inflation Factors
Date: 06/07/23   Time: 21:38
Sample: 2020M01 2022M12
Included observations: 36

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LNINTERESTRATES	0.004682	156.1496	5.552815
LNINFLATION	0.000608	6.307873	1.194480
LNEXCHANGERATES	0.002457	135.6999	5.942774
C	0.014806	37.07146	NA

Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.855856	Prob. F(22,8)	0.6393
Obs*R-squared	21.75621	Prob. Chi-Square(22)	0.4745
Scaled explained SS	1.645587	Prob. Chi-Square(22)	1.0000