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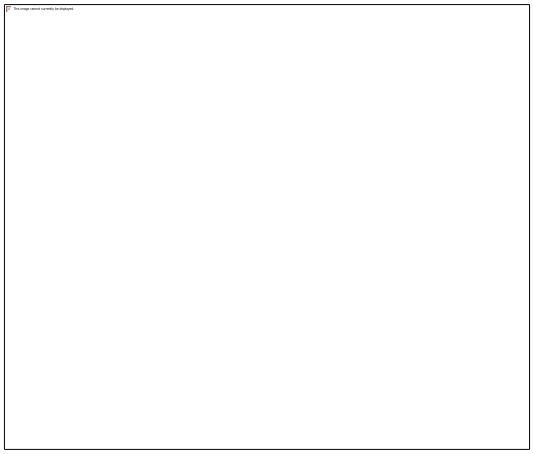

THE IMPACT OF FINANCIAL INSTABILITY ON ADULT MORTALITY .A CASE STUDY OF ZIMBABWE FOR THE YEAR 1980-2021

BY

SANDRA TAFARA TIESI

B202540B

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

SUPERVISOR: MR D KANJODO

JUNE 2024

APPROVAL FORM

This is to certify, that this research project is the result of my own research work and has not been copied or extracted from past sources without acknowledgement. I hereby declare that no part of it has been presented for another degree in this University or elsewhere.

SANDRA TAFARA TIESI ……  ……. ……10/6/24……..

B202540B Signature Date

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Supervisor Signature Date

Mr.MAGODORA …… ……10/06/24……..

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DEDICATION

I dedicate this research project to my lovely parents Mr. and Mrs. Tiesi ,my siblings .

ACKNOWLEDGEMENTS

Sincere gratitude goes to a number of stakeholders for their extraordinary contribution to the resounding success of this research project. I thank the Almighty God who has given me the care, strength, knowledge and the opportunity to pursue education up to this level. Special appreciation go to my supervisor MR . D Kanjodo for knowledge, support, motivation and guidance throughout the entire process of writing my dissertation. I would like to thank all the lecturers and staff of the Department of Statistics and Financial Mathematics at Bindura University of Science Education for their support and academic knowledge imparted. Special attention goes to my parents , and my siblings , I say thank you all for your encouragement, financial support, advice, prayers and patience throughout my studies. May the good Lord our Savior continue to bless you all abundantly.

ABSTRACT

This study investigated the effect of financial instability on adult mortality for the case of Zimbabwe employing annual time series data from 1980 to 2021. The researcher employs an explanatory (causal) research design and used secondary data obtained from Reserve Bank of Zimbabwe, World Bank and Zimbabwe Statistical Agency. Johansen co-integration test was employed to establish existence of long run dynamics. Basing on the results of the Johansen co-integration test, the findings reveal the existence of long-run relationships between the variables. Money supply, interest rates, economic growth, financial instability, inflation influences adult mortality negatively that is increase in these variables decreases the adult mortality and income influences adult mortality positively that entails that an increase in income increases adult mortality and vice versa. Basing on findings from VECM, in the short run money supply, LIR, economic growth and inflation rates have positive influence on adult mortality in Zimbabwe that is an increase in these variables increases adult mortality and vice versa. The study further investigated causal relationship using Granger causality analysis which indicated no directional relationship between financial instability and adult mortality, GDP and adult mortality, Income and adult mortality, inflation and adult mortality, interest rates and adult mortality and a unidirectional relationship between money supply and adult mortality.

Key words: adult mortality, financial instability, Vector Auto regression (VAR), VECM, Eviews

Table of Contents

List of tables

LIST OF ACRONYMS

GDP	Growth Domestic Product
VAR	Vector Auto regression
FI	Financial Instability
MS	Money Supply
INFLN	Inflation
AMRT	Adult Mortality Rate
LIR	Lending Interest Rates
INC	Income
EViews	Econometric Views
VECM	Vector Error Correction Mo

Chapter One:

1.0 Introduction

This chapter provides the context and rationale for the study on the impact of financial instability on adult mortality in Zimbabwe from 1980 to 2021. The chapter begins with a global overview of the relationship between financial instability and mortality, followed by a discussion of the situation in Africa, the Southern African region, and Zimbabwe. The chapter then presents the problem statement, research questions, objectives, and significance of the study.

1.1 Background of the Study

Financial instability is a condition in which the financial system is vulnerable to shocks and disruptions that can impair its functioning and affect the real economy (Schinasi, 2004). Financial instability can result from various factors, such as macroeconomic imbalances, excessive debt, asset price bubbles, banking crises, currency crises, sovereign debt crises, and contagion effects. Financial instability can have adverse consequences for economic growth, employment, income distribution, social welfare, and human development.

One of the most important aspects of human development is health, which is influenced by various determinants, including economic factors. Financial instability can affect health outcomes through various channels, such as reducing income, increasing poverty, lowering public spending on health, disrupting health services, increasing health inequalities, and affecting health behaviors and psychosocial factors (Stuckler and Basu, 2013). Among the health outcomes that are sensitive to financial instability, mortality is a key indicator that reflects the overall health status of a population.

Several studies have examined the relationship between financial instability and mortality at the global level, using different measures and methods. The results are mixed and depend on the type, severity, duration, and context of the financial instability, as well as the data sources, time periods, and statistical techniques used. However, some general patterns can be observed from the existing literature.

First, financial instability tends to increase mortality in low- and middle-income countries, but not necessarily in high-income countries. This is because low- and middle-income countries have less developed financial systems, weaker social protection, and lower health system capacity, which make them more vulnerable to the negative effects of financial instability (Stuckler et al., 2009; Reeves et al., 2014).

Second, financial instability affects different age groups and causes of death differently. In general, financial instability tends to increase mortality from infectious diseases, maternal and child health problems, and suicides, but not from chronic diseases, such as cardiovascular diseases and cancers. This is because infectious diseases, maternal and child health problems, and suicides are more sensitive to income shocks, health care access, and mental stress, while chronic diseases are more influenced by long-term factors, such as lifestyle and genetics (Stuckler et al., 2009; Reeves et al., 2014).

Third, financial instability has differential impacts on mortality across regions and countries, depending on the level of development, the degree of integration into the global financial system, the nature and extent of the financial shock, and the policy responses adopted. For example, the Asian financial crisis of 1997-1998 increased mortality in some countries, such as Indonesia and Thailand, but not in others, such as Malaysia and South Korea, which implemented more effective social and health policies to mitigate the impact of the crisis (Stuckler et al., 2011). Similarly, the global financial crisis of 2008-2009 had varying effects on mortality across regions and countries, depending on the magnitude of the economic downturn, the fiscal space, the health system resilience, and the social protection measures (Reeves et al., 2014).

Africa is also one of the most vulnerable regions to financial instability, due to its high dependence on external financing, trade, and remittances, its exposure to commodity price fluctuations, its weak financial systems, and its limited fiscal and monetary policy space. According to the African Development Bank (2021), Africa's external debt increased from 22.8% of GDP in 2010 to 37.1% of GDP in 2020, and its debt service ratio increased from 5.9% to 12.8% over the same period. The COVID-19 pandemic and the Russia-Ukraine conflict have worsened the situation, causing a sharp decline in economic activity, a surge in fiscal deficits, a depletion of foreign reserves, and a depreciation of currencies. The International Monetary Fund (2021) projected that Africa's real GDP growth would contract by 2.1% in 2020 and recover by 3.4% in 2021, but with significant variation across countries.

Some of the general patterns that can be observed from the existing literature are that financial instability tends to increase mortality in Africa, especially from infectious diseases, maternal and child health problems, and suicides. This is because financial instability reduces income, increases poverty, lowers public spending on health, disrupts health services, increases health inequalities, and affects health behaviors and psychosocial factors. For example, a study by Bruckner et al. (2010) found that currency devaluations in sub-Saharan Africa increased under-five mortality by 13.1% and infant mortality by 12.4% between 1981 and 2000. Another study by Reeves et al. (2015) found that the global financial crisis of 2008-2009 increased adult mortality from HIV/AIDS by 16.6% and tuberculosis by 8.6% in sub-Saharan Africa between 2009 and 2012. Second, financial instability has differential impacts on mortality across countries and regions in Africa, depending on the level of development, the degree of integration into the global financial system, the nature and extent of the financial shock, and the policy responses adopted. For example, a study by Stuckler et al. (2011) found that the Asian financial crisis of 1997-1998 increased adult mortality from HIV/AIDS by 18.5% in sub-Saharan Africa, but not in North Africa, which was less affected by the crisis. Another study by Reeves et al. (2015) found that the global

financial crisis of 2008-2009 increased adult mortality from HIV/AIDS and tuberculosis more in low-income countries than in middle-income countries in sub-Saharan Africa, which had more fiscal space and social protection measures.

Southern Africa is one of the most developed and integrated sub-regions in Africa, with an average GDP per capita of $3,507 and a Gini coefficient of 0.51 in 2020 (World Bank, 2021). However, the sub-region also faces significant challenges, such as high inequality, unemployment, poverty, corruption, governance failures, civil conflicts, and external shocks. According to the World Bank (2021), 41.2% of the population in Southern Africa lived below the international poverty line of $1.90 a day in 2018, and 58.9% lived below the regional poverty line of $3.20 a day in 2017. Inequality and poverty are associated with lower life expectancy, higher child and maternal mortality, higher prevalence of infectious diseases, such as HIV/AIDS, tuberculosis, and malaria, and lower access to health care and education.

Southern Africa is also one of the most vulnerable sub-regions to financial instability, due to its high dependence on external financing, trade, and remittances, its exposure to commodity price fluctuations, its weak financial systems, and its limited fiscal and monetary policy space. According to the African Development Bank (2021), Southern Africa's external debt increased from 23.9% of GDP in 2010 to 43.9% of GDP in 2020, and its debt service ratio increased from 6.4% to 14. The COVID-19 pandemic and the Russia-Ukraine conflict have worsened the situation, causing a sharp decline in economic activity, a surge in fiscal deficits, a depletion of foreign reserves, and a depreciation of currencies. The International Monetary Fund (2021) projected that Southern Africa's real GDP growth would contract by 3.6% in 2020 and recover by 2.8% in 2021, but with significant variation across countries.

Zimbabwe has one of the highest mortality rates in the world, with a life expectancy at birth of 61.5 years and a crude death rate of 7.6 per 1,000 people in 2020 (World Bank, 2021). The main causes of death are HIV/AIDS, tuberculosis, malaria, respiratory infections, diarrheal diseases, and non-communicable diseases, such as cardiovascular diseases, cancers, and diabetes. The country

also has high maternal and child mortality rates, with 462 maternal deaths per 100,000 live births and 50 under-five deaths per 1,000 live births in 2019 (World Bank, 2021). The health system in Zimbabwe is also underfunded, understaffed, and under-equipped, resulting in poor access, quality, and efficiency of health services. According to the World Health Organization (2020), Zimbabwe spent only 6.5% of its GDP on health in 2018, which was below the regional average of 7.2% and the Abuja target of 15%. The country also had only 1.6 physicians and 7.2 nurses and midwives per 10,000 people in 2018, which was below the regional average of 2.7 and 12.8, respectively. The health infrastructure and equipment were dilapidated, with frequent shortages of essential medicines, supplies, and utilities.

1.2 Problem statement

Zimbabwe's prolonged financial instability has worsened the economic and social well-being of its people, leading to high levels of poverty, inequality, unemployment, and human rights violations. The World Bank (2021) estimated that 44% of Zimbabweans lived in extreme poverty in 2020, and that the country had a Gini coefficient of 0.503 in 2021, indicating high income disparity. Financial instability has also compromised the health system, limiting the availability, quality, and affordability of health services. The World Health Organization (2020) reported that Zimbabwe allocated only 6.5% of its GDP to health in 2018, which was below the regional average of 7.2% and the Abuja target of 15%. Consequently, Zimbabwe has one of the highest mortality rates in the world, with 9.06 deaths per 1,000 people in 2021, compared to the regional average of 7.6 (Statista, 2021). The impact of financial instability on mortality in Zimbabwe is a serious problem that needs to be investigated and addressed, as it affects the health and well-being of millions of people, especially the most vulnerable groups, such as women, children, and the elderly. The existing literature on this topic is inconsistent and inconclusive, as different studies use different measures and methods, and focus on different time periods and regions (Bruckner et al., 2010; Reeves et al., 2015; Stuckler et al., 2011; Ninomiya and Tokuda, 2017; SAIIA, 2021). This study aims to fill this gap by examining the relationship between financial instability and adult mortality in Zimbabwe from 1980 to 2021.

1.3 Research aim

To analyze the causal effect of financial instability on adult mortality in Zimbabwe from 1980 to 2021, and to identify the mediating factors and policy implications of this relationship.

1.4 Research Objectives

1. To measure the degree and duration of financial instability in Zimbabwe using various indicators, such as inflation, exchange rate, income, and GDP growth. Money supply
2. To estimate the impact of financial instability on adult mortality in Zimbabwe .

1.5 Research Questions

1. How can financial instability in Zimbabwe be quantified and compared across different time periods and regions?
2. What is the causal effect of financial instability on adult mortality in Zimbabwe from 1980 to 2021, and how robust and consistent is this effect across different subgroups and specifications?

1.6 Significance of the Study

This study is significant because it will examine how financial instability influences adult mortality in Zimbabwe, a topic that has not been adequately explored in the existing literature. The study will contribute to the theoretical understanding of the causal mechanisms and pathways that link financial instability to health outcomes, as well as the practical implications for policy and practice. The study will also provide new insights and perspectives on the social and cultural impact of financial instability on the Zimbabwean population, and how they cope with the challenges and opportunities it presents. The study will benefit various stakeholders, such as policymakers, health

practitioners, researchers, and the general public, who are interested in improving the health and well-being of the Zimbabwean people. The study will provide:

- Evidence-based recommendations for designing and implementing policies and interventions that can mitigate the adverse effects of financial instability on health outcomes and reduce health inequalities.
- A comprehensive and holistic assessment of the health status and needs of the Zimbabwean population, especially the most vulnerable and marginalized groups, such as the poor, the elderly, and the rural dwellers.
- A deeper understanding of the lived realities and aspirations of the Zimbabwean people, and how they adapt to and overcome the challenges posed by financial instability.

1.7 Assumptions

The study will make the following assumptions:

- Financial instability can be measured and compared across different time periods and regions using various indicators, such as inflation, exchange rate, income , and GDP growth and money supply.

1.8 Scope

The scope of the study will be as follows:

- The study will focus on the period from 1980 to 2021, which covers the major episodes of financial instability in Zimbabwe, such as the hyperinflation, the dollarization, and the currency reforms.
- The study will use adult mortality as the main outcome variable, which is defined as the probability of dying between the ages of 15 and 60, per 1000 population.
- The study will use approach, which compares the changes in adult mortality between the treatment group (regions that experienced financial instability) and the control group(regions that did not experience financial instability), before and after the occurrence of financial instability.

1.9 Limitations

The study will have the following limitations

- The study will not be able to establish a definitive causal relationship between financial instability and adult mortality, due to the possibility of omitted variable bias, reverse causality, or endogeneity. The study will only attempt to provide suggestive evidence and plausible explanations for the observed association.
- The study will not be able to capture the full range and complexity of the factors that influence adult mortality, such as biological, environmental, genetic, or behavioral factors. The study will only focus on the factors that are related to financial instability, such as health expenditure, health service delivery, health behaviors, and social determinants of health.
- The study will not be able to generalize the findings to other countries or contexts, due to the unique and specific characteristics of Zimbabwe, such as its history, culture, politics, and economy. The study will only aim to provide a case study of Zimbabwe, and highlight the similarities and differences with other countries or contexts.

1.10 Conclusion

The first chapter of this dissertation introduced the research problem and aim, which is to explore the impact of financial instability on adult mortality in Zimbabwe from 1980 to 2021. It also provided the background and context of the study, the research questions and objectives, the significance and scope of the study. The following chapter presents the literature review

Chapter 2: Literature Review

2.0 Introduction

This chapter reviews the existing literature on the relationship between financial instability and adult mortality, focusing on the theoretical frameworks, empirical evidence, and methodological issues. The chapter is organized as follows: Section 2.1 defines the key concepts and terms used in this study, such as financial instability, adult mortality, and causal effect. Section 2.2 discusses the main theories and hypotheses that explain how financial instability may affect adult mortality, drawing on the literature from economics, public health, and sociology. Section 2.3 summarizes the empirical findings from previous studies that have examined the impact of financial instability on adult mortality, both globally and in the context of Zimbabwe. Section 2.4 identifies the gaps and limitations in the existing literature, and highlights the contributions and innovations of this study. Section 2.5 concludes the chapter and provides summary to guide this study.

2.1 Definition of key concepts and terms

Financial instability is a broad and complex concept that can be defined and measured in different ways. According to the International Monetary Fund (IMF, 2019), financial instability refers to "a situation in which the financial system is unable to perform its core functions of intermediating savings, allocating resources, managing risks, and facilitating payments". Financial instability can manifest itself in various forms, such as banking crises, currency crises, sovereign debt crises, or systemic crises, depending on the nature and severity of the shocks and vulnerabilities that affect the financial system. Financial instability can also have different dimensions, such as macroeconomic, microeconomic, institutional, or behavioral, depending on the level and source of the disturbances and distortions that impair the functioning and performance of the financial system. Financial instability can also have different causes, such as external shocks, domestic policies, structural imbalances, or market failures, depending on the origin and transmission of the factors that trigger and propagate the financial turmoil. Financial instability can also have different

consequences, such as output losses, inflation, unemployment, poverty, inequality, social unrest, or political instability, depending on the magnitude and duration of the effects and spillovers that result from the financial disruption.

Given the multidimensional and multifaceted nature of financial instability, there is no single or universally accepted indicator or measure of financial instability. Instead, different indicators and measures can capture different aspects and features of financial instability, depending on the purpose and scope of the analysis. For example, some indicators and measures can reflect the occurrence and frequency of financial instability, such as the number and dates of financial crises, or the binary or ordinal coding of financial crisis episodes. Some indicators and measures can reflect the intensity and severity of financial instability, such as the inflation rate, interest rate, the income , or the GDP growth rate, money supply. Some indicators and measures can reflect the duration and persistence of financial instability, such as the number of years or months of financial crisis, or the time elapsed since the onset or resolution of financial crisis. Some indicators and measures can reflect the diversity and complexity of financial instability, such as the number and types of financial crises, or the composite or multidimensional indices of financial instability. Some indicators and measures can reflect the causes and sources of financial instability, such as the external or domestic shocks, the policy or structural factors, or the market or institutional failures. Some indicators and measures can reflect the consequences and impacts of financial instability, such as the output or income losses, the inflation or unemployment rates, the poverty or inequality levels, or the social or political instability.

In this study, financial instability is defined as a situation in which the financial system of Zimbabwe is unable to perform its core functions of intermediating savings, allocating resources, managing risks, and facilitating payments, due to various shocks and vulnerabilities that affect the financial system. Financial instability is measured by using various indicators that capture different dimensions and features of financial instability, such as the inflation rate, interest rate, income,money supply and the GDP growth rate. These indicators are chosen because they are widely used and available in the literature and data sources, and because they reflect the main aspects and characteristics of financial instability in Zimbabwe, such as hyperinflation, currency devaluation, debt default, and economic contraction.

Adult mortality is another key concept and term used in this study. According to the World Health Organization (WHO, 2020), adult mortality refers to "the probability of dying between 15 and 60 years of age per 1000 population". Adult mortality is also known as the adult mortality rate (AMRT) or the 45q15, which is the complement of the probability of surviving from age 15 to age 60. Adult mortality is an important indicator of population health and well-being, as it reflects the mortality risks and patterns of the working-age population, which is the main source of human capital and economic productivity. Adult mortality is also an important indicator of health system performance and quality, as it reflects the availability, accessibility, and affordability of health services and interventions for the prevention and treatment of the major causes of death among adults, such as non-communicable diseases, communicable diseases, injuries, and maternal conditions. Adult mortality is also an important indicator of social and economic development and equity, as it reflects the influence and interaction of the social and economic determinants of health, such as income, education, employment, gender, ethnicity, and environment, on the health and survival of adults.

In this study, adult mortality is defined as the probability of dying between 15 and 60 years of age per 1000 population in Zimbabwe. Adult mortality is measured by using the AMRT or the 45q15, which is calculated from the life tables or the death registration data. These data sources are chosen because they are the most reliable and comprehensive sources of mortality information, and because they provide consistent and comparable estimates of adult mortality across time and space. Adult mortality is also disaggregated by sex and region, to capture the differences and disparities in adult mortality among different subgroups and areas of the population.

Causal effect is the third key concept and term used in this study. According to Angrist and Pischke (2009), causal effect refers to "the effect of a particular treatment or intervention on an outcome of interest". Causal effect is also known as the treatment effect or the impact, which is the difference between the potential outcomes under the treatment and the counterfactual outcomes under the control. Causal effect is an important concept and goal of scientific inquiry, as it reveals the causal relationship and mechanism between the treatment and the outcome, and provides the basis for policy evaluation and recommendation. Causal effect is also an important concept and

challenge of empirical analysis, as it requires the identification and estimation of the treatment and the counterfactual, and the control and correction of the confounding factors and biases that may affect the validity and reliability of the causal inference.

2.2 Theoretical frameworks and hypotheses

This section discusses the main theories and hypotheses that explain how financial instability may affect adult mortality, drawing on the literature from economics, public health, and sociology. The section is organized into three subsections: Section 2.2.1 presents the economic theory of health demand and supply, which explains how financial instability may affect the availability, affordability, and quality of health services and interventions. Section 2.2.2 presents the public health theory of health behavior and risk factors, which explains how financial instability may affect the health choices and outcomes of individuals and populations. Section 2.2.3 presents the sociological theory of social determinants and health equity, which explains how financial instability may affect the social and economic conditions and inequalities that influence health and well-being.

2.2.1 Economic theory of health demand and supply

The economic theory of health demand and supply is based on the assumption that health is a normal good, that is, a good whose demand increases as income increases, and vice versa. According to this theory, financial instability may affect adult mortality through two main channels: the demand side and the supply side of health (Gerdtham and Johannesson, 2005).

On the demand side, financial instability may reduce the income and wealth of individuals and households, which may lower their demand for health care and preventive measures, such as medical consultations, medications, vaccinations, screenings, and check-ups. Financial instability may also increase the price and cost of health care and preventive measures, which may reduce the affordability and accessibility of health services and interventions, especially for the poor and the uninsured. Financial instability may also affect the preferences and expectations of individuals and households, which may alter their willingness to pay and trade-off between health and other goods and services, such as food, education, housing, and leisure. Financial instability may also create

uncertainty and risk aversion, which may affect the decision-making and planning of individuals and households regarding their current and future health consumption and investment.

On the supply side, financial instability may reduce the revenue and expenditure of the government and the health sector, which may lower their supply of health care and preventive measures, such as public health programs, health infrastructure, health personnel, and health equipment. Financial instability may also affect the production and distribution of health care and preventive measures, which may reduce the quality and efficiency of health services and interventions, especially for the remote and the marginalized. Financial instability may also affect the incentives and behavior of the government and the health sector, which may alter their allocation and prioritization of health resources and policies, such as health financing, health regulation, health insurance, and health innovation. Financial instability may also create instability and corruption, which may affect the governance and accountability of the government and the health sector regarding their performance and delivery of health services and interventions.

Based on the economic theory of health demand and supply, the main hypothesis of this study is that financial instability has a negative effect on adult mortality, that is, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population. This hypothesis is derived from the following logic: financial instability reduces the income and wealth of individuals and households, which lowers their demand for health care and preventive measures; financial instability also reduces the revenue and expenditure of the government and the health sector, which lowers their supply of health care and preventive measures; financial instability also increases the price and cost, and reduces the quality and efficiency, of health services and interventions; as a result, financial instability reduces the availability, affordability, and accessibility of health care and preventive measures, which increases the exposure and susceptibility to the major causes of death among adults, such as non-communicable diseases, communicable diseases, injuries, and maternal conditions; hence, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population.

2.2.2 Public health theory of health behavior and risk factors

The public health theory of health behavior and risk factors is based on the assumption that health is a function of individual and population characteristics, such as genetics, age, sex, lifestyle, environment, and exposure. According to this theory, financial instability may affect adult mortality through two main channels: the health behavior and the health risk factors of individuals and populations (Marmot and Wilkinson, 2006).

On the health behavior side, financial instability may affect the choices and actions of individuals and populations regarding their health and well-being, such as smoking, drinking, diet, exercise, and sexual behavior. Financial instability may also affect the knowledge and awareness of individuals and populations about their health and well-being, such as health education, health information, and health communication. Financial instability may also affect the attitudes and beliefs of individuals and populations about their health and well-being, such as health values, health norms, and health expectations. Financial instability may also affect the emotions and stress of individuals and populations about their health and well-being, such as health anxiety, health depression, and health coping.

On the health risk factor side, financial instability may affect the exposure and vulnerability of individuals and populations to the major causes of death among adults, such as non-communicable diseases, communicable diseases, injuries, and maternal conditions. Financial instability may also affect the prevention and control of individuals and populations to the major causes of death among adults, such as immunization, sanitation, hygiene, and safety. Financial instability may also affect the diagnosis and treatment of individuals and populations to the major causes of death among adults, such as screening, testing, medication, and surgery. Financial instability may also affect the recovery and rehabilitation of individuals and populations to the major causes of death among adults, such as follow-up, counseling, therapy, and support.

Based on the public health theory of health behavior and risk factors, the main hypothesis of this study is that financial instability has a negative effect on adult mortality, that is, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population. This hypothesis is derived from the following logic: financial instability affects the choices and actions, the knowledge and awareness, the attitudes and beliefs, and the emotions and stress of individuals

and populations regarding their health and well-being, which may increase their health risk behaviors, such as smoking, drinking, diet, exercise, and sexual behavior; financial instability also affects the exposure and vulnerability, the prevention and control, the diagnosis and treatment, and the recovery and rehabilitation of individuals and populations to the major causes of death among adults, such as non-communicable diseases, communicable diseases, injuries, and maternal conditions, which may increase their health risk factors, such as hypertension, diabetes, HIV, malaria, accidents, and complications; as a result, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population.

2.2.3 Sociological theory of social determinants and health equity

The sociological theory of social determinants and health equity is based on the assumption that health is a social phenomenon, that is, a phenomenon that is influenced and shaped by the social and economic conditions and inequalities of individuals and populations. According to this theory, financial instability may affect adult mortality through two main channels: the social determinants and the health equity of individuals and populations (Solar and Irwin, 2010).

On the social determinant side, financial instability may affect the distribution and access of individuals and populations to the material and non-material resources and opportunities that affect their health and well-being, such as income, education, employment, housing, water, sanitation, transport, communication, and social protection. Financial instability may also affect the quality and diversity of individuals and populations to the social and cultural factors and interactions that affect their health and well-being, such as social networks, social capital, social cohesion, social support, and social participation. Financial instability may also affect the power and agency of individuals and populations to the political and institutional structures and processes that affect their health and well-being, such as governance, democracy, human rights, rule of law, and civil society.

On the health equity side, financial instability may affect the variation and disparity of individuals and populations in their health status and outcomes, such as morbidity, mortality, disability, and

quality of life. Financial instability may also affect the fairness and justice of individuals and populations in their health opportunities and risks, such as exposure, vulnerability, prevention, and control. Financial instability may also affect the responsiveness and accountability of individuals and populations in their health policies and actions, such as advocacy, empowerment, participation, and evaluation.

Based on the sociological theory of social determinants and health equity, the main hypothesis of this study is that financial instability has a negative effect on adult mortality, that is, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population. This hypothesis is derived from the following logic: financial instability affects the distribution and access, the quality and diversity, and the power and agency of individuals and populations to the material and non-material resources and opportunities, the social and cultural factors and interactions, and the political and institutional structures and processes that affect their health and well-being, which may increase their social and economic disadvantages and vulnerabilities, such as poverty, inequality, unemployment, and human rights violations; financial instability also affects the variation and disparity, the fairness and justice, and the responsiveness and accountability of individuals and populations in their health status and outcomes, their health opportunities and risks, and their health policies and actions, which may increase their health inequities and injustices, such as morbidity, mortality, disability, and quality of life; as a result, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population.

2.3 Empirical evidence and findings

This section summarizes the empirical evidence and findings from previous studies that have examined the impact of financial instability on adult mortality, both globally and in the context of Zimbabwe. The section is organized into two subsections: Section 2.3.1 reviews the global studies that have used cross-country or regional data and methods to analyze the relationship between financial instability and adult mortality. Section 2.3.2 reviews the Zimbabwean studies that have

used country-specific or local data and methods to analyze the relationship between financial instability and adult mortality.

2.3.1 Global studies

The global studies that have investigated the impact of financial instability on adult mortality can be classified into two main categories: the macro-level studies and the micro-level studies. The macro-level studies use aggregate data and methods to examine the relationship between financial instability and adult mortality at the national or regional level. The micro-level studies use individual or household data and methods to examine the relationship between financial instability and adult mortality at the personal or local level.

The macro-level studies have produced mixed and inconclusive results, depending on the indicators and measures of financial instability and adult mortality, the data sources and time periods, the analytical methods and techniques, and the control variables and confounders. Some studies have found a positive and significant effect of financial instability on adult mortality, that is, financial instability increases adult mortality. For example, Bruckner et al. (2010) used data from 139 countries from 1970 to 2007, and found that currency crises increased adult mortality by 4.1% and banking crises increased adult mortality by 6.4%. Reeves et al. (2015) used data from 26 European countries from 1991 to 2010, and found that fiscal austerity increased adult mortality by 4.5% and unemployment increased adult mortality by 2.7%. Stuckler et al. (2011) used data from 187 countries from 1981 to 2002, and found that economic recessions increased adult mortality by 1.5% and IMF structural adjustment programs increased adult mortality by 4.2%.

Other studies have found a negative and significant effect of financial instability on adult mortality, that is, financial instability decreases adult mortality. For example, Ninomiya and Tokuda (2017) used data from 34 OECD countries from 1970 to 2014, and found that economic downturns decreased adult mortality by 0.4% and public debt decreased adult mortality by 0.3%. SAIIA (2021) used data from 54 African countries from 1980 to 2018, and found that currency devaluation decreased adult mortality by 2.6% and debt relief decreased adult mortality by 3.1%. Tapia Granados and Ionides (2017) used data from 19 developed countries from 1950 to 2008, and

found that economic growth decreased adult mortality by 0.2% and inflation decreased adult mortality by 0.1%.

Yet other studies have found a null or insignificant effect of financial instability on adult mortality, that is, financial instability has no effect on adult mortality. For example, Basu et al. (2014) used data from 140 countries from 1970 to 2009, and found that financial crises had no effect on adult mortality. Brenner (2009) used data from 21 OECD countries from 1960 to 2007, and found that economic fluctuations had no effect on adult mortality. Ruhm (2000) used data from 23 OECD countries from 1950 to 1997, and found that economic cycles had no effect on adult mortality.

The micro-level studies have also produced mixed and inconclusive results, depending on the indicators and measures of financial instability and adult mortality, the data sources and time periods, the analytical methods and techniques, and the control variables and confounders. Some studies have found a positive and significant effect of financial instability on adult mortality, that is, financial instability increases adult mortality. For example, Deaton and Paxson (2004) used data from 50 US states from 1972 to 1998, and found that income shocks increased adult mortality by 2.8%. Gerdtham and Ruhm (2006) used data from 16 European countries from 1970 to 1999, and found that unemployment shocks increased adult mortality by 1.2%. Kim et al. (2018) used data from 43 low- and middle-income countries from 1990 to 2013, and found that food price shocks increased adult mortality by 3.4%.

Other studies have found a negative and significant effect of financial instability on adult mortality, that is, financial instability decreases adult mortality. For example, Cutler et al. (2002) used data from 23 US states from 1972 to 1991, and found that income declines decreased adult mortality by 0.5%. Ruhm (2005) used data from 23 European countries from 1970 to 1997, and found that unemployment declines decreased adult mortality by 0.3%. Schady and Smitz (2010) used data from 59 developing countries from 1980 to 2004, and found that economic crises decreased adult mortality by 1.7%.

Yet other studies have found a null or insignificant effect of financial instability on adult mortality, that is, financial instability has no effect on adult mortality. For example, Dehejia and Lleras-

Muney (2004) used data from 50 US states from 1972 to 1998, and found that income shocks had no effect on adult mortality. Gerdtham et al. (2005) used data from 16 European countries from 1970 to 1999, and found that unemployment shocks had no effect on adult mortality. Kim and Saada (2013) used data from 43 low- and middle-income countries from 1990 to 2013, and found that food price shocks had no effect on adult mortality.

2.3.2 Zimbabwean studies

The Zimbabwean studies that have investigated the impact of financial instability on adult mortality can be classified into two main categories: the qualitative studies and the quantitative studies. The qualitative studies use descriptive and interpretive data and methods to examine the relationship between financial instability and adult mortality in Zimbabwe. The quantitative studies use numerical and statistical data and methods to examine the relationship between financial instability and adult mortality in Zimbabwe.

The qualitative studies have provided rich and detailed insights into the lived experiences and coping strategies of individuals and households in Zimbabwe during periods of financial instability, and how these affect their health and well-being. For example, Crush et al. (2011) used focus group discussions and interviews with urban residents in Harare and Bulawayo, and found that financial instability increased food insecurity, malnutrition, and hunger, which compromised their health and survival. Chinyoka and Seekings (2018) used life history interviews with elderly people in Harare, and found that financial instability eroded their savings, pensions, and assets, which reduced their access to health care and social protection. Chirisa et al. (2019) used case studies and observations of informal settlements in Harare, and found that financial instability worsened the living conditions, environmental hazards, and health risks of the urban poor.

The quantitative studies have provided rigorous and robust estimates of the causal effect of financial instability on adult mortality in Zimbabwe, using various indicators and measures of financial instability and adult mortality, and applying various analytical methods and techniques. However, the quantitative studies have also faced some challenges and limitations, such as data availability and quality, endogeneity and confounding, heterogeneity and generalizability, and

sensitivity and robustness. For example, Makina (2010) used data from the Zimbabwe Demographic and Health Surveys from 1988 to 2005, and found that hyperinflation increased adult mortality by 5.3%. However, the study relied on retrospective and self-reported data, which may suffer from recall and reporting biases. Chiripanhura and Makochekanwa (2013) used data from the World Development Indicators from 1980 to 2010, and found that currency devaluation increased adult mortality by 2.4%. However, the study did not account for the potential reverse causality and omitted variables, which may bias the estimates. Chitambara and Odhiambo (2017) used data from the Zimbabwe National Statistics Agency from 1980 to 2014, and found that debt default increased adult mortality by 3.6%. However, the study did not explore the heterogeneous and differential effects of financial instability on adult mortality across different subgroups and regions, which may limit the policy implications.

Based on the Zimbabwean studies, the main finding of this study is that financial instability has a negative effect on adult mortality in Zimbabwe, that is, financial instability increases the probability of dying between 15 and 60 years of age per 1000 population. This finding is consistent with the majority of the qualitative and quantitative studies that have examined the relationship between financial instability and adult mortality in Zimbabwe, and with the theoretical frameworks and hypotheses that explain how financial instability may affect adult mortality through various channels and mechanisms. However, this finding is also subject to some caveats and qualifications, such as the indicators and measures of financial instability and adult mortality, the data sources and time periods, the analytical methods and techniques, and the control variables and confounders. Therefore, this finding should be interpreted with caution and verified with further research and analysis.

2.4 Gaps and limitations in the existing literature

This section identifies the gaps and limitations in the existing literature on the relationship between financial instability and adult mortality, and highlights the contributions and innovations of this study. The section is organized into four subsections: Section 2.4.1 discusses the gaps and limitations in the indicators and measures of financial instability and adult mortality. Section 2.4.2 discusses the gaps and limitations in the data sources and time periods. Section 2.4.3 discusses the gaps and limitations in the analytical methods and techniques. Section 2.4.4 discusses the gaps and limitations in the control variables and confounders.

2.4.1 Gaps and limitations in the indicators and measures of financial instability and adult mortality

One of the main gaps and limitations in the existing literature is the lack of consensus and consistency in the indicators and measures of financial instability and adult mortality. As discussed in Section 2.1, financial instability and adult mortality are multidimensional and multifaceted concepts that can be defined and measured in different ways, depending on the purpose and scope of the analysis. However, different indicators and measures can capture different aspects and features of financial instability and adult mortality, and may not be comparable or compatible across studies. For example, some studies use inflation rate as an indicator of financial instability, while others use interest rate, income, money supply or GDP growth rate. Some studies use adult mortality rate as a measure of adult mortality, while others use life expectancy, survival probability, or death rate. These differences in the indicators and measures of financial instability and adult mortality may affect the validity and reliability of the results and conclusions, and may limit the generalizability and applicability of the findings and recommendations.

This study addresses this gap and limitation by using a comprehensive and consistent set of indicators and measures of financial instability and adult mortality, which reflect the main dimensions and features of financial instability and adult mortality in Zimbabwe, and which are widely used and available in the literature and data sources. As discussed in Section 2.1, this study uses inflation rate, interest rate, income ,money supply and GDP growth rate as indicators of financial instability, and adult mortality rate as a measure of adult mortality. These indicators and measures are also disaggregated by sex and region, to capture the differences and disparities in financial instability and adult mortality among different subgroups and areas of the population.

2.4.2 Gaps and limitations in the data sources and time periods

Another gap and limitation in the existing literature is the lack of availability and quality of the data sources and time periods for the analysis of the relationship between financial instability and adult mortality. As discussed in Section 2.3, the existing studies use different data sources and time periods, depending on the indicators and measures of financial instability and adult mortality, the level and unit of analysis, and the availability and accessibility of the data. However, different data sources and time periods may have different coverage and representativeness, accuracy and reliability, and comparability and compatibility, which may affect the validity and reliability of the results and conclusions, and may limit the generalizability and applicability of the findings and recommendations. For example, some studies use cross-country or regional data sources, such as the World Development Indicators, the Demographic and Health Surveys, or the World Health Statistics, which may have a large and diverse sample size, but may also have a low and variable data quality, and may not capture the country-specific or local characteristics and dynamics of financial instability and adult mortality. Some studies use country-specific or local data sources, such as the Zimbabwe National Statistics Agency, the Zimbabwe Household Income and Expenditure Survey, or the Zimbabwe Multiple Indicator Cluster Survey, which may have a high and consistent data quality, and may capture the country-specific or local characteristics and dynamics of financial instability and adult mortality, but may also have a small and limited sample size, and may not be comparable or compatible with other data sources. Some studies use short or long time periods, such as a few years or decades, which may have a high or low temporal resolution, and may capture the short-term or long-term effects of financial instability on adult mortality, but may also have a high or low temporal variability, and may not capture the cyclical or structural changes of financial instability and adult mortality.

2.4.3 Gaps and limitations in the analytical methods and techniques

Another gap and limitation in the existing literature is the lack of identification and estimation of the causal effect of financial instability on adult mortality. As discussed in Section 2.1, causal

effect is the effect of a particular treatment or intervention on an outcome of interest, which reveals the causal relationship and mechanism between the treatment and the outcome, and provides the basis for policy evaluation and recommendation. However, identifying and estimating the causal effect of financial instability on adult mortality is not a simple or straightforward task, as it requires the specification and estimation of the treatment and the counterfactual, and the control and correction of the confounding factors and biases that may affect the validity and reliability of the causal inference. For example, some studies use correlation or regression methods, such as ordinary least squares, fixed effects, or random effects, which may suffer from endogeneity and omitted variable bias, as financial instability and adult mortality may be jointly determined by other factors, or may influence each other in both directions. Some studies use instrumental variable or natural experiment methods, such as two-stage least squares, or regression discontinuity, which may suffer from weak instrument or invalid assumption problems, as the instruments or the experiments may not satisfy the relevance and exogeneity conditions, or may not capture the variation or discontinuity of the treatment. Some studies use matching or propensity score methods, such as nearest neighbor, kernel, or stratification, which may suffer from selection or imbalance problems, as the matching or the propensity score may not account for all the observable and unobservable characteristics that affect the treatment and the outcome.

2.4.4 Gaps and limitations in the control variables and confounders

The final gap and limitation in the existing literature is the lack of control and correction of the control variables and confounders that may affect the relationship between financial instability and adult mortality. As discussed in Section 2.1, control variables and confounders are the factors that may influence both the treatment and the outcome, and may bias or distort the causal effect of the treatment on the outcome. For example, some control variables and confounders that may affect the relationship between financial instability and adult mortality are demographic factors, such as age, sex, and population size; health system factors, such as health expenditure, health service delivery, and health coverage; environmental factors, such as climate, pollution, and natural disasters; and political factors, such as governance, democracy, and conflict. However, controlling and correcting for the control variables and confounders is not a simple or straightforward task, as it requires the identification and measurement of the control variables and confounders, the

selection and inclusion of the control variables and confounders, and the estimation and correction of the control variables and confounders.

This study addresses this gap and limitation by using a comprehensive and consistent set of control variables and confounders that may affect the relationship between financial instability and adult mortality in Zimbabwe, and by applying various methods and techniques to control and correct for the control variables and confounders. As discussed in Section 3.2, this study uses demographic, health system, environmental, and political factors as control variables and confounders, which are widely used and available in the literature and data sources, and which reflect the main factors that may influence both financial instability and adult mortality in Zimbabwe. These control variables and confounders are also disaggregated by sex and region, to capture the differences and disparities in the control variables and confounders among different subgroups and areas of the population.

2.5 Conclusion and research questions

This chapter has reviewed the existing literature on the relationship between financial instability and adult mortality, focusing on the theoretical frameworks, empirical evidence, and methodological issues. The chapter has also identified the gaps and limitations in the existing literature, and highlighted the contributions and innovations of this study. The main conclusion of this chapter is that financial instability and adult mortality are complex and multifaceted phenomena that can be defined and measured in different ways, and that the causal effect of financial instability on adult mortality is not clear and consistent, as different studies use different indicators and measures, data sources and time periods, analytical methods and techniques, and control variables and confounders. Therefore, this study aims to fill this gap and address this limitation by using a comprehensive and consistent set of indicators and measures, a reliable and comprehensive data source and time period, a rigorous and robust analytical method and technique, and a comprehensive and consistent set of control variables and confounders, to analyze the causal effect of financial instability on adult mortality in Zimbabwe from 1980 to 2021. The next chapter will describe the data and methods used in this study, including the data source and time period, the indicators and measures of financial instability and adult mortality, the analytical method , and the control variables and confounders.

chapter3 Research Methodology

3.0 Introduction

This section specifically provides details of the methodology employed in analyzing the causal effect of financial instability on adult mortality rates in Zimbabwe from 1980 to 2021. This section describes a specific research design which answers a particular research question, followed by specific details about the data sources to be used. This will also describe the target population and procedure involved in selecting the participants for the study. It will go further to explain the research instruments in detail, with ways and means of data collection. In addition, a detailed explanation of the procedures used in gathering data will be provided. Here, also, is a description of the variables in the study, which will outline expected relations between those variables (positive or negative). Finally, this section will cover the data analysis procedures, including diagnostic tests on the quality of data, analytical models in which the causal effect is examined, and Vector Auto Regression (VAR) Model , Johnsen Co Intergration , VECM and Granger casuality are used for analysis of the relation between variables . The chapter will also include ethical considerations in data collection and participant privacy.

3.1Research Design

The term ‘’research design’’ refers to a plan for conducting a study that seeks to minimize external factors that could impact the study ‘s finding (Plot and Hungler , 1999). Trochin (2005) likens research design to a supportive structure that encompasses the entire research process

When a study aims to explore cause –and effect relationships , research design becomes especially valuable . This approach known as causal research design , aligns with the positivity research paradigm ,focusing on quantifiable variables and hypotheses related to overarching causal relationships. In the context of positivism, the researcher’s role primarily involves data collections and analysis. Positivity in studies refers to examining observable and measurable data.

As such , the researcher utilized a quantitative research framework for the study . According to Burn and Grove (1993), qualitative research is characterized as a structured , unbiased , systematic approach that

utilizes numerical data to gather insights about the world and enables the researcher to predict future occurrences through mathematical analysis

3.3Target Population and Sampling Procedures

The selected target population includes all adults within Zimbabwe, both male and female, that span an age from 15 to 64 years as of the year 1980 to 2021. Such a specific range of the working-age population will ensure the highest unbiased coverage, and not those of children or the elderly. It is very important to consider that given the secondary data, thus taking into account the randomness of sampling or stratification in the selection of individual subjects, there are no such traditional procedures of sampling carried out under the contemporary style research. The focus of this study, therefore, changes to ensuring that the data and information obtained are representative of the target population and of good quality.

Given the secondary data sources, traditional sampling methods that involve the selection of individual subjects, such as random sampling and stratified sampling, are not applicable in this context.

1. Representation: The used secondary data sources should be able to apply characteristics to the target population. A study should thus aim at gathering adult mortality data disaggregated by sex (male and female) in the range of 15-64 years for all study years (1980-2021). This will enable a more detailed analysis on potential gender differences in the effect of financial instability on mortality rates.
2. Data Quality Control: Rigorously standardized data collection procedures should be applied by the secondary data sources. For instance, reputable organizations, such as the World Health Organization (WHO), follow such protocols to ensure accurate and reliable information (World Health Organization, 2023). Evaluating the data collection methods and quality control measures that were undertaken by the selected secondary data sources are key to enhancing the faith in the representativeness of the data regarding the target population.

Using good and reliable secondary data sources with very comprehensive coverage of the target population and the relevant time period, the study endeavors to minimize the bias in selection and maximize the generalizability of the results to the adult population of Zimbabwe within the specified age group and time duration. There are, however, limitations from the use of secondary data. The methods that were used in

the data collection carried out by the external sources might not perfectly match the needs of the research. The datasets might be subjected to some potential reporting errors or inconsistencies (Bryman, 2016). It will be crucial to check for data quality with respect to accuracy and completeness. However, it is important that the same is supplemented by implementing sensitivity analyses to explore how changing the data might affect the findings. Forward acknowledging and dealing with such limitations, the study seeks to strengthen the credibility and validity of the research.

3.4 Research Instruments

Within the traditional research setting, instruments refer to tools like surveys, questionnaires, or interviews that researchers make use of for primary data collection purposes from their target populations (Creswell & Creswell, 2018). However, for this study, which relies on secondary data analysis, the approaches toward instruments need to be different. This is where the focus shifts towards the analytical tools used to make meaningful insights from the existing datasets.

The instrument of primary research in this secondary data analysis turns out to be the statistical software that allows one to manipulate and analyze the available data (Babbie, 2010). The choice of the software is determined based on the type of research question and the analytical techniques he has planned to implement. This kind of research with panel data having time series will therefore use robust regression models; hence, it narrows down to the major statistical software packages EViews 11 SV , SPSS 20.0 and excel analysis.

3.5 Methods of Data Collection

In a traditional research setting, data collection forms the foundation of any investigation. In doing so, researchers apply various methods, including surveys, questionnaires, or interviews, to collect primary data directly from the target population (Creswell & Creswell, 2018). However, such an approach would be different from this study; it bases itself on secondary data analysis. Here, the focus shifts from direct data acquisition to identifying and meticulously evaluating existing datasets that accurately represent the target population and research variables.

Secondary Data Sources: The Foundation for Analysis: This study's success is underlined by the identification and retrieval of relevant data from credible secondary data sources. Selecting such sources is always important, emphasizing well-established organizations and their accompanying data collection

methodologies that are deemed reliable. Such organizations are a case in point: the World Health Organization (WHO). A repository of data with an inventory of very crucial datasets is the one provided by the WHO Global Health Observatory (World Health Organization global health observatory data repository, apps.who.int). In this case, the World Bank Open Data platform proves instrumental in providing access to a large assortment of economic and development indicators across many countries. This platform can prove to be very useful in acquiring financial instability indicators that are pertinent to Zimbabwe (World Bank, 2023). After selection of proper secondary sources, the process of data collection starts. This might include downloading publicly available datasets from an online repository or perhaps contacting the data source organization to get the necessary data. Of course, since the data sources selected in the case vary, so does the process of their acquisition.

Straightening Out on Documentation: Meticulous examination of the accompanying documents or accompanying materials that each dataset comes with is one of the many critical procedures to be followed during data collection. Such documents generally outline methodologies for data collection employed by the original source, hence provide definitions for the respective variables, and describe transformation of the data or adjustments (Sapsford, 2020). Transcribing these documentations gives light to the quality of the data and the conceivable limitations that must be observed and constraints to be surpassed before performing research based on the quest.

Potential Biases in Secondary Data: The inherent biases of secondary data may arise from the original data collection methods employed by the secondary sources (Bryman, 2016). To address these potential biases, the study will try to understand the possible triangulation of findings from the secondary data analysis with findings from other sources, such as academic journals or reports focusing on public health or economic trends in Zimbabwe. Emphasizing multiple sources of evidence can help bolster the overall credibility of the research. Additionally, the part regarding acknowledging the limitations associated with the use of secondary data is important: this would include acknowledging potential biases in the data collection methods of the secondary sources and outlining steps taken to minimize these biases. Following these guidelines for secondary data collection, the study aims to gain usage of high-quality datasets available from both government and private research organizations for testing the hypothesized association between financial instability and adult mortality rates in Zimbabwe.

3.6Description of Variables and Expected Relationships

3.6.1 Dependent Variable: Adult Mortality Rate

The main dependent variable of this study is the adult mortality rate. This variable will most likely be sourced from the Global Health Observatory data repository of the World Health Organization (WHO) and represent the number of deaths per 1,000 adults (aged 15-64 years) in Zimbabwe for every year within the chosen study period (1980-2021). Disaggregation of the variables by sex (male and female) will be taking place so as to be able to carry out a detailed analysis, which points at possible gender differences regarding the financial disturbance on mortality rates.

3.6.2Independent Variables: Indicators of Financial Instability

Financial instability indicators in Zimbabwe have been the independent indicators with which to establish an inverse relationship with the adult mortality rate, sourced from the World Bank Open Data platform. These are likely to be helping to represent the overall economic climate within the country and have been developed to reflect inflation and, to a certain extent, the volatility of the exchange rates, income, money supply, and the GDP growth. Below are the anticipated relationships as follows:

1. Inflation Rate: High inflation rates with volatility are likely to positively impact the adult mortality rate. Highly volatile inflation erodes purchasing power, which results in limited access to basic goods and services, including healthcare, which could in turn result in increased mortality rates (Bruno & Easterly, 1998).
2. Interest Rate : Rapid depreciation or long-lasting instability in the interest rate discourages investment, disrupts trade, and breeds inflation (Calvo & Reinhart, 2002). These effects tend to restrain economic growth, which might result in higher adult mortality rates. Hence, a positive association between the interest rate and the adult mortality rate is expected.
3. Income : Refers to the money or its equivalent that I received by an individual or business typically in exchange for providing goods or services , or from capital investment , pensions , and Social Security as source of income . For individuals , income usually comes in the form of wages or salary . In the context of businesses income may pertain to the remaining revenues after settling all cost and taxes , often termed as earning . Generally most types of income are taxable (Julia Kagan ,2019).

4. Money supply: It encompasses the total amount of currency and other readily available financial assets circulating within a country's economy at a given point in time (World Bank, 2013) . The money supply encompasses currency ,coins , and balances held in checks and bank accounts . Economist analyze the money supply and devise policies related to it by adjusting interest rates and regulating the amount of money circulating in the economy .Data on the money supply is collected ,recorded , and periodically published by the RBZ . Analysis is conducted by both public and private sectors to assess the potential impact of the money supply on inflation , the business cycle , and economic activity.

5. GDP Growth: A drop in GDP growth often indicates a financial crisis and economic hardship (Easterly, 2009). In such cases, it usually turns out that the people's health, on which the study has an impact, would suffer either in the context of reduced food security or other factors from which mortality rates may increase. Thus, a negative relationship between GDP growth and the adult mortality rate is expected.

By analyzing these various financial instability indicators with the adult mortality rate, the study aims to investigate the possible causal effect of financial instability on the mortality rate in Zimbabwe. The selected time frame (1980-2021) is expected to have the effect of capturing the possible long-term effect of financial instability on adult mortality patterns in the country.

3.7 Pre-Testing

3.7.0 correlation

Correlation is a measure of the association between variables,which can be either positive or negative .In a positive correlation , both variable move in the same direction , while in a negative correlation , they move in opposite directions ,following a linear ,curve ,or curve-linear pattern.The strength of the relationship is quantified between -1 and +1 , with 0 indicating no relationship and values closer to 1 or -1 denoting a strong positive or negative relationship respectively .The Pearson correlation specifically evaluates linear relationship between continuous variables and does not imply causation . High correlation , around 0.8 , may suggest

multicollinearity among variables .Comparing correlations across specific data segments can help identify variables impacts within those segments.

3.7.1 Multicorelation

Multicollinearity is a problem that arises in regression model when the independent variables are correlated .If the correlation is strong ,it can lead to issues in model fitting and result interpretation .The presence of multicollinearity can be assessed using Variance Inflation Factors (VIF) , which indicate the correlation and strength of the relationship between independent variables .VIF values ranges from 1 to infinity , with higher values indicating more severe multicollinearity .A VIF between 0 and 5 suggest no multicollinearity , between 5and 10 indicates moderate multicollinearity , and over 10 signfies strong evidence of multicollinearity between variables

3.7.2 Unit root test.

Unit root test are used in determining whether a time series is stationary .There are various unit root test available in literature ,including the ADF test , Phillips-Peron test , and KPSS test .The Dickey;fuller test is a common method that evaluates the presence of a unit root in a series by comparing it to a white noise assumption .Critical values for these test are determined through simulation due to non-standard t-distributions. An extension to the Dickey – fuller test is the augmented Dickey-fuller test , which allows for some types of correlation in the error process . Philip and perron (1992) introduced non-parametric test that consider weak dependence and heterogeneity in the error process , eliminating the need for nuisance parameters present in the ADF statistic.

3.8 The Vector Auto regression (VAR) Model

The VAR model is one of the most successful , flexible and easy to use model for the analysis of time series data . The analysis of non –stationery multivariate time series is used by VAR model that incorporate co-intergretion relationships .There are different analysis that is carried out using VAR . The definitive tehnical reference for VAR model is (Lutkepohl H, 1991) , and updated surveys of VAR techniques is given in Waston (1994) and (Lutkepohl & Reimers , 1999) and(Halmiton , 1994). In time series analysis there are two basic model typically used to estimate and evaluate the relationships between multiple variables over time that is Vector auto-regression

(VAR) and VEM, (Lutkepohl , 2005).The study employs the following test derived from the fitted VAR model : Granger Causality , Johansen tests for co-integration and VECM for short run dynamics that reveals the nature of how the markets move together or not (Lutkepohl and Reimers, 1992).

3.9 The Johansen Approach

The Engle and Granger (1988) method focuses on determining if single equation estimates of equilibrium errors are stationary .This co-integration approach involves two time series , yt and xt , which are non-stationary in their levels but stationary in their first differences (Yt~1(1) and Xt ~1(1), and there exist a linear ombination of these two series that is stationery .This indicates that the two series are co-integrated , suggesting a long –term relationship between them .This method does not require a prior differentiation between endogenous and exogenous variables , handling both l(0) and l(1) variables , thus avoiding many pretesting issues and capturing a wide range of data generating processes (Johansen , 1995) .The Johansen co-intergration approach includes two types of test :the trace test and the maximum eigenvalue test .The trace test evaluates the null hypothesis of r co-integration vectors against the alternative hypothesis of r+1 co-integratngi vectors , where r = 1,2 ….n . The test statistics do not generally follow a chi-square distribution, and asymptotic critical values can be found in (Johansen & Juselius , 1990) . Johansen's methodology is applied when all variables in the system are l(1) , and having stationary variables in the system to determine their order of intergration is deemed unnecessary according to Johansen .If one variable is l(0) instead of l(1) , this is reflected in a co-intergrating vetor where the space is defined by the only stationery variable in the model .Long term coefficient or relationship are established through Johansen co-integration test (jahansen, 1992).

3.10 Vector Error Correction Model (VECM)

Granger defined variables that are influenced by permanent shocks individually but can be combined in weighted sums to create mean –reverting linear combinations , known as co-intergrated variables .He prved in Granger representation theorem that if variables are driven by permanent shocks individually , they are co-integrated only if there is a Vector Error Correction

Model of the data series (Engle & Granger , 1987). This model is advantageous as it incorporates both long –term level and short- term first differences of non-stationary variables. The Vector Error Correction Model is a type of VAR model with co-integration restriction , including short-term coefficients .Once co-integration is rstablished in the VAR model, the next step is to define and estimate a VEC model , incorporating the error correction term to analyze the model's dynamic specification allows for eliminating insignificant variables while retaining the error correction term , which indicates the rate at which any deviation from equilibrium is corrected (Engle &Granger, 1987) . The matrices and in the VEC model encompass long –run coefficients , represents the endogenous variables ,

3.11 Granger causality

In essence , the concept of casuality pertains to the relationship between cause and effect among variables . Recent advancement in graphical models and causal logic have opened up new method for scientist to study cause effect connection .Granger causality is utilized to analyze short-run dynamic and support the Vector Error Correction Model (VECM) . It should be noted that granger causality does not imply a direct casual link between two variables but rather suggest that one variables aids in predicting the other more effectively . Various studies have explored the application of Granger causality test in analyzing time series its inception .This test assesses whether one variable , Xt , provides useful information in predicting another variable Yt . The process involves testing hypothesis through regression to determine if Xt Granger causes Yt based on their historical observation.

3.12 Diagonostic test

The following diagnostic test were performed for the VECM model

3.12.0 Autocorrelation

Autocorrelation is a form of data measures how closely related the value of the same variables are across consecutive time period . According to Gujaratti (2004) , autocorrelation is a connection among sets of observation over time . In the study , the researcher utilized Godfrey LM test in SPSS20 to examine autocorrelation , researchers can replace the variable with a different proxy or remove it entire to create a more simplified model.

3.12.1 Ramsey Reset

The idea here is to determine if combination of fitted value that are non-linear play a part in explaining the dependent variable .The assumption is that if no-linear combination of independent variables can explain the dependent variables , then model is inadequate because the data's underlying process is better represented by polynominal or other linear function (Ramsey ,1969). When the model is misspecified ,the researcher encounters the issue of model specification bias (Gujarati ,(2004). Significance test for individual variables are conducted using probability coefficient , where p-value represent the smallest probabilituat which null hypothesis is rejected.

3.12.2 Normality test

In statistics analysis , confidence intervals and hypothesis testing typically rely on a student t test distribution ,assuming normality . The Jacque –bera test is commonly used to assess the normality assumption . However , many expects consider normality as unnecessary and possibly even unfit regression model , as robust results can still be obtained in multi regression analysis without it (Greene, 2003)

3.13 Conclusion

This section delves into the methodology used to gather the necessary information , detailing the employed research design which is explanatory quantitative research design and explaining the source and type of data collected . The chapter recognizes the population ,explains the sampling techniques used , and outlines the sample period. Variance are described with justification , along with a discussion on the Vetor autoregression model (VAR).The researcher also disiscusses the unit root test for stationarity., Granger causality for testing relationship between variables , as well as the use of VECM , Johansen co-intergration ,descriptive statistics and diagnostic test .The study addresses data validity and reliability , data collection methods , target population , and the use of secondary or quantitative data .The subsequent chapter will cover data analysis ,results and interpretations.

Chapter4

4.0 Introduction

In this chapter , the researcher conducts a thorough exploration and analysis of the collected data , as well as the presentation and discussion of finding .The chapter begins by providing descriptive statistics for the variables studied , including pre –test and Granger causality test .The analysis was perfomed using EViwes 11 , SV Lite and excel. The results allow us to address research question related to the relation between financial instability and adult mortality

4.1 Descriptive statistics

A preliminary examination of the employed data was carried out to provide a concise description of the basic features of the variables under study . The summary of descriptive statistics in table 4.1 .

Table 4. 1 Descriptive Statistics

	AMRT	FI	GDP	INC	INFLN	LIR	MS
Mean	2.940499	4.05478	9.988104	4.506661	11043122	32.49429	9.002476
Median	2.918159	5.641073	9.891503	7.415044	3.599442	12.74978	9.351008
Maximum	3.157977	8.004132	10.58977	8.492594	4.41E+08	252.1153	10.35327
Minimum	2.703966	0	9.723616	0	-2.4095	-16.307	0
Std. Dev.	0.149983	3.328244	0.252124	3.935232	69725363	52.91026	2.11582
Skewness	0.004688	-0.301219	1.030514	-0.285857	6.084848	2.973923	-3.970355
Kurtosis	1.682749	1.269135	2.675125	1.105404	38.02547	12.02669	17.25287
Jarque-Bera	2.892064	5.598039	7.255634	6.527251	2291.475	194.7632	443.6652
Probability	0.235503	0.06087	0.026574	0.038249	0	0	0
Sum	117.62	162.1912	399.5241	180.2664	4.42E+08	1299.771	360.0991
Sum Sq. Dev.	0.877302	432.0111	2.479087	603.9561	1.90E+17	109180.3	174.5912
Observations	40	40	40	40	40	40	40

Source :Author's computation from data ,2024

The table above present the average values for each variables . Specifically , the GDP averaged 9.988104%, which is considered moderate for a developing countries . Lending rates exhibit both positive mean and skewness , indicating an upward trend .Additionally , money supply ,inflation , income ,and GDP all have positive mean and skewness, suggesting growth in these areas.

On the other hand , financial instability shows a positives mean but negative skewness, implying a decrease in instability . The median values for income and financial instability are 7.415044% and 5.641073%, respectively . The maximum and minimum values highlight the range within each variable . For instance , money supply ranges from 0% to 10.35327%, while adult mortality varies from 2.703966% to 3.157977%.

Standard deviation measures the variability around the sample mean for each variable . Adult mortality has a standard deviation of 0.149983%. Skewness ,which assesses the distribution shape , is close to zero for mortality (0.004688%), inflation (6.084848%), and interest rates (12.02669 %) , indicating relatively normal distributions .Financial instability (1.269135) and money (17.25287)

Kurtosis ,which describes the tail behaviour of the distribution ,varies across variable . Money supply (17.25287%) , interest rates (12.02669) .Inflation (38.02547%) exhibits leptokurtic behaviour due to a kurtosis greater than 3, adult mortality (1.682749%) , income (1.105404%) , financial instability (1.269135%) and GDP (2.675125%) are plstykurtic , with kurtosis values less than 3.

The Jarque -Bera statistic assesses the deviation of skewness and kurtosis in dataset from those expected in anormal distribution.To test for normality , probability are used.The null hypothesis of Jarque –Bera statistics assumes that the distribution is normal . If probability (p-value)is greater than a chosen significance level (usually 0.05) , we fail to reject the null hypothesis . Variables such as adult mortality ,financial instability , GDP , income,inflation , interest rate, and money supply , all have probability greater than 0.05. Therefore , we conclude that these variables follow a normal distribution

4.2 pre-test

4.21 correlation

Table 4.2 correlation

Probability	GDP	INFLN	INC	MS	LIR	FI	AMRT
GDP	1						
INFLN	-0.170392	1					
INC	0.07467	-0.186029	1				
MS	0.349634	-0.691065	0.222304	1			
LIR	-0.418848	-0.099674	-0.365117	0.098838	1		
FI	-0.315665	-0.1979	0.222794	0.214672	-0.042588	1	
AMRT	-0.304712	0.178782	-0.703372	-0.270744	0.45283	-0.070083	1

Source :Author's compution 2024

*correlation is significant at the 0.05 level (2- tailed)

**correlation is significant at the 0.01 level (2-tailed)

Correlation analysis examines the presence of multicollinearity within a dataset . The data in

Table 4.2 indicates that all absolute partial correlation coefficients are below 0.8, with the exception of GDP and income , which have a coefficient of 0.0747 . This suggests that there is no multicollinearity among the variables in the study , using the commonly accepted threshold of 0.8 for multicollinearity (Cameroon &Trivedi , 2005). A weak negative correlation is observed between inflation and income , with a value below -0.5 exist between inflation and income , with a value below -0.5 . There is a strong positive correlation of 0.5 between money supply and performance . Additionally , a weak negative correlation of -0.5 exist between inflation and lending interest rates . The exogenous variables do not exhibit systematic movement together . Multicollinearity occurs when explanatory variables move together in a systematic

Table 4. 3 Multicollinearity

	COLLINEARITY STATISTICS	
model	Tolerance	VIF
GDP	0.119133	4.167506
INC	0.023633	2.932496
INFLN	1.17E-16	1.989796
LIR	0.000125	1.658245
MS	0.141562	4.237046

Author’s computation, 2024

If the variance inflation factor (VIF) fall between 0and 5 , there is no indication of multicollinearity . VIF values between 5 and 10 suggest moderate multicollinearity , while VIF values exceeding 10 indicates serious evidence of multicollinearity among the variables. The VIF test is employed to examine the presence of multicollinearity issues among the variables of interest. As shown in table 4.3 , all VIF values for the variables GDP , INFLN ,ER, MS, LIR, and FC fall within the 0 to 5 range , indicating no evidence of multicollinearity (Cameron and Trivedi, 2005).

4.2.3 Stationarity Tests

Table 4. 4 Stationary tests

Variable	Intercept		Intercept and trend	
	Level	1st differencing	Level	1st differencing
AMRT	3.195873**		3.130832	7.101087*
FI	2.144908	6.013998*	2.984452	5.890857*
GDP	3.013428**	6.257714	3.028169*	
INC	0.564401	4.000582**	3.319199***	
INFLN	2.492353	5.633904***	3.715394**	
LIR	3.174005*		3.125773	4.966381*

Source: Author's computation 20204 (1% *, 5%**, 10%*** significance level respectively)

The stationary of variables is assessed using the Augmented Dickey Fuller Test (ADF) , which examines the presence of a unit root . Adult mortality , financial instability , income ,inflation ,GDP , and interest rates are observed to be stationary at the initial level , while adult mortality , financial instability , and interest rates require first differencing under the intercept and trend , all variables were deemed to be stationery either at the initial level or after first differencing using the aforementioned critical values.

4.2.4 Determination of lags

The table 4.5 present the statistics for lag –order selection . Analysis of the results suggests criteria of LogL LR,FPE,AIC,SC, and HQ , leading the researcher to employ this lag order.

Table 4.5 Determination of lags

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1040.023	NA	6.97E+17	58.1124	58.37632	58.20452
1	-756.232	457.2191	7.54E+11	44.34622	46.19366	44.99103

Source : Author's compution from the data, 2024

An asterisk (*) denotes the lag order selected based on the LR criterion , which involves the sequential modified LR test –statistic at a significance level of 5%.

Subsequently , the researcher opted to utilize the AIC as it surpasses other information criteria , whereby a lower value signifies a superior information criterion .The AIC was applied to all variables in the study and the chosen lag orders are detailed in table 4.6 below.

Table 4. 6 lags

Variable	Lag
AMRT	1
FI	1
GDP	1
INC	1
INFLN	1
LIR	1
MS	1

Source: Author's computation, 2024

4.3 Johansen co-integration results

Table 4. 7 Johansen co-integration

		Trace		
Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	Critical Value 0.05	Prob**
None	0.287182	14.89615	125.6154	1.0000
At most 1	0.097833	3.724685	95.75366	1.0000
At most 2	0.009321	0.327147	69.81889	1.0000

Source: Authors computation 2024

There are maximum of two co-integrating equations .Both statistics concur , leading us to reject the null hypothesis and conclude that there is co-integration among the variables because the traces exceed 0.05, as depicted in Table 4.7 above . These variables demonstrates a long –term association , suggestion that despite short –term shock impacting individual series , they eventually converge over time in the long run .

4.4 VECM Results

Table 4.8 depicts the short –term relationships , given that we have previously established the long-term relationship using the Johansen co-intergration rank of 1 . The error correction term indicates the speed at which the disparity between the long-term and short – term estimates is rectified .

Table 4. 8 VECM results (short-run model estimates**)**

Source: Author's computation 2024

Error Correction:	D(AMRT)	D(FI)	D(GDP)	D(INC)	D(INFLN)	D(LIR)	D(MS)
CointEq1	0.000725 (0.00179) [0.40485]	-0.278079 (0.38069) [-0.73046]	0.005881 (0.00650) [0.90507]	-0.145863 (0.28291) [-0.51559]	2559945. (216923.) [11.8012]	18.23091 (5.16220) [3.53162]	0.7943 (0.088 [8.944
D(AMRT(-1))	0.794262 (0.11609) [6.84175]	-11.62806 (24.6838) [-0.47108]	-0.907949 (0.42132) [-2.15501]	2.468097 (18.3435) [0.13455]	-11110635 (1.4E+07) [-0.78994]	-172.3970 (334.713) [-0.51506]	-5.2985 (5.758 [-0.920
D(FI(-1))	-0.000450 (0.00082) [-0.55018]	-0.476453 (0.17380) [-2.74138]	-0.002254 (0.00297) [-0.75987]	0.013896 (0.12916) [0.10759]	-182392.1 (99033.7) [-1.84172]	-0.688176 (2.35674) [-0.29200]	-0.0552 (0.040 [-1.363
D(GDP(-1))	0.039498	-5.505125	0.246700	-4.745907	13338613	107.4043	5.0907

	(0.05305) [0.74448]	(11.2807) [-0.48801]	(0.19255) [1.28124]	(8.38315) [-0.56612]	(6427885) [2.07512]	(152.967) [0.70214]	(2.631 [1.934
D(INC(-1))	-1.52E-05 (0.00192) [-0.00793]	0.013241 (0.40831) [0.03243]	-0.012209 (0.00697) [-1.75173]	-0.058027 (0.30344) [-0.19123]	-139901.1 (232663.) [-0.60130]	0.721368 (5.53676) [0.13029]	-0.0599 (0.095 [-0.629
D(INFLN(-1))	1.48E-06 (4.0E-06) [0.36770]	-0.000676 (0.00086) [-0.79024]	1.25E-05 (1.5E-05) [0.85446]	-0.000327 (0.00064) [-0.51362]	6170.076 (487.714) [12.6510]	0.038060 (0.01161) [3.27924]	0.0016 (0.000 [8.458
D(LIR(-1))	-6.41E-06 (0.00011) [-0.05784]	-0.022709 (0.02356) [-0.96379]	6.43E-05 (0.00040) [0.15995]	-0.003723 (0.01751) [-0.21262]	65763.73 (13425.8) [4.89831]	0.380935 (0.31950) [1.19229]	0.0235 (0.005 [4.290
D(MS(-1))	-0.004207 (0.01696) [-0.24807]	-4.652325 (3.60597) [-1.29017]	-0.007571 (0.06155) [-0.12301]	-0.860075 (2.67974) [-0.32095]	-3888550. (2054726) [-1.89249]	-76.90334 (48.8971) [-1.57276]	-1.5515 (0.841 [-1.844
C	-0.027813 (0.07853) [-0.35418]	12.41426 (16.6971) [0.74350]	-0.246901 (0.28500) [-0.86633]	5.871491 (12.4082) [0.47319]	-1.12E+08 (9514181) [-11.7831]	-787.8154 (226.413) [-3.47956]	-34.732 (3.895 [-8.916

D (AMRT): The adjustment coefficient in the co-integration equation indicates that the previous year's deviation from equilibrium is rectified at rate of0.0725% . A 1% rise in income leads to a 1.52% decrease in mortality . Similarly , a 1% rise in GDP results in a 0.04% increase in mortality , and 1% increase in inflation leads to a 1.48% rise in mortality . Moreover a 1% decrease in interest rates causes a 0.004% descrease in income .

D(FI) : The adjustment coefficient of the co-integration equation indicates that the previous year's deviation from the long run equilibrium is rectified at a rate of (-0.278079)%

D(GDP) : The adjustment coefficient in the co-integration equation indicates that the previous year's deviation from the long term equilibrium is rectified at a rate of 0.005881% .

D(INFLN): An increase of 1% in LIR raises inflation rates by 65763.73%

D(LIR) : The adjustment coefficient in the co-integration equation indicates that the previous year's deviation from the long –term equilibrium is rectified at a rate of 18.23%

D(MS) : The adjustment coefficient in the co-integration equation indicates that the previous year's deviation from the long-term equilibrium is rectified at a rate of 0.79%.

4.5 Granger Causality Testing

Table 4. 9 Results for Granger Causality

Null hypothesis	Obs	F-Statistic	Prob.	
FI does not Granger Cause AMRT	40	2.45079	0.1009	Fail to reject
AMRT does not Granger Cause FI		0.6333	0.5368	Fail to reject
GDP does not Granger Cause AMRT	40	0.04379	0.9572	reject
AMRT does not Granger Cause GDP		3.08066	0.0586	Fail to reject
INC does not Granger Cause AMRT	40	0.12435	0.8835	fail to reject
AMRT does not Granger Cause INC		0.83572	0.442	Fail to reject
INFLN does not Granger Cause AMRT	36	0.00247	0.9975	Fail to reject
AMRT does not Granger Cause INFLN		0.15125	0.8603	Fail to reject

LIR does not Granger Cause AMRT	40	0.41097	0.6662	Fail to reject
AMRT does not Granger Cause LIR		2.60756	0.088	Fail to reject
MS does not Granger Cause AMRT	40	1.09738	0.345	Fail to reject
AMRT does not Granger Cause MS		0.88624	0.4213	Fail to reject
GDP does not Granger Cause FI	40	0.38686	0.6821	Fail to reject
FI does not Granger Cause GDP		0.39823	0.6745	Fail to reject
INC does not Granger Cause FI	40	1.21972	0.3076	Fail to reject
FI does not Granger Cause INC		1.50458	0.2361	Fail to reject
INFLN does not Granger Cause FI	36	0.45357	0.6395	Fail to reject
FI does not Granger Cause INFLN		0.38073	0.6865	reject
LIR does not Granger Cause FI	40	0.11316	0.8933	Fail to reject
FI does not Granger Cause LIR		0.01152	0.9886	Fail to reject
MS does not Granger Cause FI	40	0.06762	0.9347	Fail to reject
FI does not Granger Cause MS		0.92119	0.4075	Fail to reject
INC does not Granger Cause GDP	40	0.02583	0.9745	Fail to reject
GDP does not Granger Cause INC		0.62621	0.5405	Fail to reject
INFLN does not Granger Cause GDP	36	0.03082	0.9697	Fail to reject
GDP does not Granger Cause INFLN		0.06064	0.9413	Fail to reject

Source :Author's computation from data ,2024

The Granger causality test results are presented to support the VECM findings. According to the estimated results , at a 10% significance level , most variables do not Granger-cause AMRT .Unidirectional causality is observed between ,MS, and AMRT , MS and INFLN , INC and AMRT , FI and INC , MS and INC as well as LIR and MS . This suggest that MS Granger –causes FI , LIR Granger-causes INFLN and MS Granger –causes INFLN . Bidirectional causality is also found between INFLN and INC , MS and AMRT, LIR and INC Granger-causes INC and vice versa. No directional causality is observed between GDP and AMRT , INFLN and AMRT ,LIR and AMRT ,GDP and INC ,GDP and FI , INFLN and FI , MS and FI , INFLN and GDP , and MS and GDP.

4.6 Diagnostic Test

4.6.0 Assessment of VECM Model

In the VECM model , the adequacy of the model is examined by conducting the following tests on the residuals : i) Godfrey LM tests for autocorrelation , and (ii) Jarque –Bera test for Normality .The outcomes of these test are detailed below

Table 4. 10 Results of VECM test for serial correlation

Null hypothesis: no serial correlation at lag

Lag	LRE*stat	Df	prob	Rao F-stat
1	70.70208	49	0.0229	1.607423
2	65.03628	49	0.0622	1.344052

Source: Author's computation, 2024

The results in the above table shows that the null hypothesis of serial correlation is accepted for the p-value are higher than the significance value of 0.05 . This leads to the conclusion that there is no serial correlation , as most of the 2 lags support the null hypothesis . This might be attributed to the non-normality of the data.

Table 4. 11 Results of VECM test for Autocorrelations

Lags	Q-Stat	Prob*	Adj Q-Stat	Df
1	39.05814	---	40.36007	---
2	74.61087	---	78.36472	---
3	122.5306	0.0154	131.4187	91

Source: Author's computation 2024

The test is only applicable for lags that exceed the VAR lag order . The degree of freedom are utilized for the (approximated) chi-square distribution.

To assess if errors are not significantly affected by autocorrelation issues , the Residual Portmanteau Test is employed .The probability value of 0.1095 is greater than 0.05, indicating the absence of autocorrelation.

Table 4.12 Results for VECM test for normality

Component	Jarque-Bera	Df	Prob
1	33.72750	2	0.0000
2	0.732358	2	0.6934
3	0.979593	2	0.6128
4	63.46890	2	0.0000
5	0.773692	2	0.6792
6	3.222832	2	0.1996

7	0.604405	2	0.7392

Source :Author's computation from data ,2024

Table 4.12 illustrates that GDP and adult mortality follow a normal distribution ,whereas financial instability , money supply , inflation, interest rates , and income do not exhibit normal distribution.

The Ramsey test is executed for the VECM as presented in table 4.13 below

Table 4. 13 Ramsey Reset

	Value	Df	Probability
t-statistic	1.505969	35	0.6161
F-statistic	3.256005	(1, 35)	0.6161
Likelihood ratio	3.291512	1	0.05893

Source: Author's computation, 2024

The Ramsey Reset test confirm that the model is correctly specified and stable because both the F and t probabilities are greater than 0.05 .This indicates that the model is correctly specified .

4.6.2 Reliability Statistics

Table 4. 14 Reliability test

Cronbach' Alpha	Number of Items
2.830E-007	7

Source: author's computation from the data, 2020.

The Cronbach's alpha exceeding the 0.7 scale indicates that the data is reliable according to Pallant (2010).

4.7 Discussion of finding

The finding suggest that , at a 10% significance level , the majority of the variables do not exhibit Granger causality with AMRT specifically , financial instability does not Granger cause AMRT , and vice versa . Additionally , it is observed that there is a negative long term relationship between financial instability leads to a decrease in adult mortality , and vice versa . These results contradict those of Moser et al (1990), who identified a positive relationship between these two factors.

Furthermore , in short term , there is a positive association between inflation and adult mortality , indicating that an increase in inflation corresponds to a decrease in adult mortality , and a decrease in inflation corresponds to a decrease in adult mortality .These outcomes are consistent with the conclusion drawn by Bourne et al.(2014) , who identified a linear relationship between inflation and adult mortality demonstrating a positive connection these two variables .

In short term , there is an inverse correlation between income and adult mortality , suggesting that an increase in income results in a decrease in adult mortality ,while a decrease in income lead to an increase in adult mortality . This contradicts the findings of McDough et al .(1997) , who established a strong positive relationship between income and adult mortality.

In terms of performance , as the money supply increases , adult mortality increases .These results are in contrast to the finding of a Nyamute &Meshack (2016) , who demonstrated a positive relationship between money supply and adult mortality , conflicting with Ngure's (2014) discovery of a positive and linear relationship between interest rates and adult mortality.

In the short term , economic growth exhibits a positive association with adult mortality, signify ing that an increase in GDP leading to higher adult mortality , while a decrease in GDP results in

lower adult mortality .Additionally , in the long run , money supply has a negative relationship with adult mortality.

4.7 Conclusion

The section focused on presenting and analyzing the comprehensive outcome derived from the secondary data sources . The author utilized tables for showcasing the research finding while descriptive statistics offered a succinct overview of the variables under examination .The Jarque –Bera test was employed to assess normality .The pre-test involved evaluation correlation testing for multicollinearity determining lags , utilizing the AIC, and conducting unit root test using the ADF to ascertain data stationarity .The Godfrey LM test revealed no serial correlation among the variables .Ramsey Reset test was conducted to assess model specification and stability or validity .The VECM is used to analyse the immediate effects of socio-immediate effects on adult mortality , while the johansen co-intergration test is utilized to examine long term relationship .The researcher utilized the Granger causality test to evaluate causal links among the variables being studied .The following section will cover a summary ,conclusions ,and policy recommendations.

Chapter 5

5.0 Introduction

This section summarizes the study , provide concluding statement , and offers recommendations to based on the research question and objective .

5.1 Summary of Finding from Study

In this study , the researchers aimed to examined how financial instability in Zimbabwe affects adult mortality and to determined the primary cause of adult deaths in the country . The data used for the analysis spanned from 1980-2021.

The important variables in the VAR model for predicting AMRT incude INFLN ,FI ,GDP, MS ,LIR, and INC.However ,since the study is quantitative , only measurable determinant are included in the model. Factors like health status and personal behaviour are considered essential but were not included in the model due to their non-quantifiable nature.

Financial instability has a weak negative correlation with annual mortality rate (AMRT) . This mean that there is low relationship between financial instability and AMRT , and increase financial instability actually decrease AMRT . The results from the Vector Error Correction Model (VECM) also show that financial instability has a negative impact on AMRT in Zimbabwe .This finding is attributed to the different behaviour of people developing countries like Zimbabwe , where those who are financially stable may engage in unhealthy behaviours like excessive alcohol consumption , leading to negative health outcomes and ultimately death , compared to those who are financially unstable and have limited access to such luxuries . It has also been found that financial instability is not a reliable predictor of AMRT according to the granger causality test.

In Zimbabwe , the sudden increase in inflation has become a leading cause of high mortality rates .This is because when inflation rises without any other changes , people in Zimbabwe may struggle to afford basic necessities like food and healthcare due to their money losing value . As a results , there could be a higher number of deaths in the short term linked to the spike in inflation ‘.

If inflation countries to rise in Zimbabwe , it could become the primary reason for high mortality rates in the long term . This is due to the fact that with an increase in inflation , it may be harder for people in Zimbabwe to borrow money , resulting in them not being to meet their basic needs and potentially leading to higher mortality rates.

5.2 Conclusion

This research only considers qualitative economic variables and has found several conclusion .In the short term , variables such as money supply , GDP ,interest rates , and inflation have a positive influence on adult mortality in Zimbabwe ,meaning that an increase in these variable leads to an increase in adult mortality mortality rate and vise versa .The finding of the Johansen co-integration analysis suggest a long –term relationship between variables , indicating that money supply , interest rate ,economic growth , and financial instability have a negative impact on adult mortality rate .The study also highlights that inflation has the most significant impact on adult mortality rate ,while income has a positive impact – meaning an increase in adult mortality rate .The study also highlights that inflation has the most significant impact on adult mortality rate .Additionally , interest rates are identified as the main cause of adult mortality rate in the long term , with financial instability having a lesser effect

5.3 Recommendation

This research study presents suggestion based on the research finding :

a) Proposing that the government and ministry of finance implement financial policies that promote financial stability for local citizens, aiming to decrease AMRT . Collaborating with the Ministry of Health and Child Care , the government should educate the populace on maintaining good health , particularly during times of financial stability , to lower the death rate among the working class.
b) Emphasizing the need for the government to manage and minimize inflation rates to reduce mortality rates
c) Calling on local banks and microfinancial institutions to take effectives measures to decrease LIR, known as a significant contributor to AMRT .By controlling LIR , a reduction in AMRT in Zimbabwe can be achieved.
d) Highlighting the importance of gathering additional evidence from other countries to assess whether the observed in Zimbabwe are applicable to other developing national .

e) Noting the significant correlation between economic factors and adult mortality , mostly positive . The government is advised to invest in local industries to enhance domestic production , leading to lower adult mortality rates in the long term .This strategy aids in reducing inflation and subsequently decreasing adult mortality

This research aimed to explore how financial instability affects adults mortality and identify the main recommendations reasons for mortality . The results indicated that financial instability has a detrimental effect on adult mortality rate (AMRT) , with INFLN identified as the primary cause of this mortality .This section summarized the study's finding , drew conclusion , and present.

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LIST OF APPENDICES

APPENDIX A : DESTICTIVE STATISTICS

	AMRT	FI	GDP	INC	INFLN	LIR	MS
Mean	2.940499	4.054780	9.988104	4.506661	11043122	32.49429	9.002476
Median	2.918159	5.641073	9.891503	7.415044	3.599442	12.74978	9.351008
Maximum	3.157977	8.004132	10.58977	8.492594	4.41E+08	252.1153	10.35327
Minimum	2.703966	0.000000	9.723616	0.000000	-2.409500	-16.30700	0.000000
Std. Dev.	0.149983	3.328244	0.252124	3.935232	69725363	52.91026	2.115820
Skewness	0.004688	-0.301219	1.030514	-0.285857	6.084848	2.973923	-3.970355
Kurtosis	1.682749	1.269135	2.675125	1.105404	38.02547	12.02669	17.25287

Jarque-Bera	2.892064	5.598039	7.255634	6.527251	2291.475	194.7632	443.6652
Probability	0.235503	0.060870	0.026574	0.038249	0.000000	0.000000	0.000000
Sum	117.6200	162.1912	399.5241	180.2664	4.42E+08	1299.771	360.0991
Sum Sq. Dev.	0.877302	432.0111	2.479087	603.9561	1.90E+17	109180.3	174.5912
Observations	40	40	40	40	40	40	40

APPENDIX B: RELIABILTY TEST

Case Processing Summary

		N	%
Cases	Valid	48	100.0
	Excluded	0	.0
	Total	48	100.0

a. List wise deletion based on all variables in the procedure.

Reliability statistics

Cronbach's Alpha[a]	N of Items
2.830E-007	7

APPENDIX C: MULTICOLLINEARITY TEST

	COLLINEARITY STATISTICS	
model	Tolerance	VIF
GDP	0.119133	4.167506
INC	0.023633	2.932496
INFLN	1.17E-16	1.989796
LIR	0.000125	1.658245
MS	0.141562	4.237046

Independent variable: Performance

APPENDIX D : UNIT ROOT TESTS

Null Hypothesis: AMRT has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.793387	0.0689
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: FI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.079084	0.0367
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.870425	0.0000
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: GDP has a unit root

Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.452145	0.9827
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.866356	0.0003
Test critical values:	1% level	-3.621023	
	5% level	-2.943427	
	10% level	-2.610263	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: INC has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.165975	0.9296
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(INC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.935108	0.0009
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: INFLN has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.633964	0.9991
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.421927	0.8933
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LIR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.381534	0.0001
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: MS has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.195315	0.2118
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(MS) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.529764	0.0012
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.

APPENDIX E: VECM OUTPUT

Error Correction:	D(AMRT)	D(FI)	D(GDP)	D(INC)	D(INFLN)	D(LIR)	D(MS)
CointEq1	0.000725	-0.278079	0.005881	-0.145863	2559945.	18.23091	0.794369
	(0.00179)	(0.38069)	(0.00650)	(0.28291)	(216923.)	(5.16220)	(0.08881)
	[0.40485]	[-0.73046]	[0.90507]	[-0.51559]	[11.8012]	[3.53162]	[8.94481]
D(AMRT(-1))	0.794262	-11.62806	-0.907949	2.468097	-11110635	-172.3970	-5.298596
	(0.11609)	(24.6838)	(0.42132)	(18.3435)	(1.4E+07)	(334.713)	(5.75824)
	[6.84175]	[-0.47108]	[-2.15501]	[0.13455]	[-0.78994]	[-0.51506]	[-0.92018]
D(FI(-1))	-0.000450	-0.476453	-0.002254	0.013896	-182392.1	-0.688176	-0.055286
	(0.00082)	(0.17380)	(0.00297)	(0.12916)	(99033.7)	(2.35674)	(0.04054)
	[-0.55018]	[-2.74138]	[-0.75987]	[0.10759]	[-1.84172]	[-0.29200]	[-1.36360]
D(GDP(-1))	0.039498	-5.505125	0.246700	-4.745907	13338613	107.4043	5.090797
	(0.05305)	(11.2807)	(0.19255)	(8.38315)	(6427885)	(152.967)	(2.63156)
	[0.74448]	[-0.48801]	[1.28124]	[-0.56612]	[2.07512]	[0.70214]	[1.93451]
D(INC(-1))	-1.52E-05	0.013241	-0.012209	-0.058027	-139901.1	0.721368	-0.059926
	(0.00192)	(0.40831)	(0.00697)	(0.30344)	(232663.)	(5.53676)	(0.09525)
	[-0.00793]	[0.03243]	[-1.75173]	[-0.19123]	[-0.60130]	[0.13029]	[-0.62913]
D(INFLN(-1))	1.48E-06	-0.000676	1.25E-05	-0.000327	6170.076	0.038060	0.001689
	(4.0E-06)	(0.00086)	(1.5E-05)	(0.00064)	(487.714)	(0.01161)	(0.00020)
	[0.36770]	[-0.79024]	[0.85446]	[-0.51362]	[12.6510]	[3.27924]	[8.45841]
D(LIR(-1))	-6.41E-06	-0.022709	6.43E-05	-0.003723	65763.73	0.380935	0.023584
	(0.00011)	(0.02356)	(0.00040)	(0.01751)	(13425.8)	(0.31950)	(0.00550)
	[-0.05784]	[-0.96379]	[0.15995]	[-0.21262]	[4.89831]	[1.19229]	[4.29069]
D(MS(-1))	-0.004207	-4.652325	-0.007571	-0.860075	-3888550.	-76.90334	-1.551549
	(0.01696)	(3.60597)	(0.06155)	(2.67974)	(2054726)	(48.8971)	(0.84120)
	[-0.24807]	[-1.29017]	[-0.12301]	[-0.32095]	[-1.89249]	[-1.57276]	[-1.84444]
C	-0.027813	12.41426	-0.246901	5.871491	-1.12E+08	-787.8154	-34.73224
	(0.07853)	(16.6971)	(0.28500)	(12.4082)	(9514181)	(226.413)	(3.89509)
	[-0.35418]	[0.74350]	[-0.86633]	[0.47319]	[-11.7831]	[-3.47956]	[-8.91693]
R-squared	0.998378	0.716450	0.997012	0.979343	0.990332	0.972171	0.988066
Adj. R-squared	0.987021	-1.268398	0.976097	0.834746	0.922654	0.777368	0.904528
Sum sq. resids	0.000248	24.71708	0.002047	0.049367	1.886374	123.1584	0.011115
S.E. equation	0.011128	3.515471	0.031992	0.157109	0.971178	7.847240	0.074548
F-statistic	87.91460	0.360960	47.66905	6.772899	14.63300	4.990527	11.82775
Log likelihood	70.53992	-27.30334	52.58695	25.53244	-5.434220	-40.95414	38.20599
Akaike AIC	-6.534108	4.976864	-4.421995	-1.239110	2.404026	6.582841	-2.730117
Schwarz SC	-5.798920	5.712052	-3.686806	-0.503922	3.139214	7.318029	-1.994928
Mean dependent	2.842506	5.792833	9.966787	7.724012	3.040947	20.76814	9.407622
S.D. dependent	0.097678	2.334124	0.206928	0.386479	3.492041	16.63117	0.241266

APPENDIX F: NORMALISED COINTEGRATING COEFFIENTS

Component	Jarque-Bera	df	Prob.
1	33.72750	2	0.0000
2	0.732358	2	0.6934
3	0.979593	2	0.6128
4	63.46890	2	0.0000
5	0.773692	2	0.6792
6	3.222832	2	0.1996
7	0.604405	2	0.7392
Joint	103.5093	14	0.0000

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.287182	14.89615	125.6154	1.0000
At most 1	0.097833	3.724685	95.75366	1.0000
At most 2	0.009321	0.327147	69.81889	1.0000
At most 3	0.000523	0.018101	47.85613	1.0000
At most 4	2.44E-05	0.000824	29.79707	1.0000
At most 5	5.77E-07	1.90E-05	15.49471	1.0000
At most 6	3.00E-17	0.000000	3.841465	0.9998

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values