The impact of economic crises and government debt on consumption expenditure in South Africa

by

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DECLARATION

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I would also like to acknowledge and thank the university for its resources, as they afforded me the opportunity to go on Research and Development Leave to complete my thesis.

DEDICATION

To my children, Ndaloyenkosi and Zanokuhle. To my grandmother, Jacobeth Hlobo.

ABSTRACT

This study investigated the impact of economic crises and government debt on consumption expenditure in South Africa using quarterly time series data from 1993Q1 – 2020Q4 from the South African Reserve Bank (SARB) and Quantec (Easy Data). The study used both a linear and non-linear autoregressive distributed lag model (ARDL and NARDL). The variables of the study included consumption expenditure, total foreign debt, national government debt, government expenditure, government expenditure for social protection, the fuel levy, value added tax, personal income tax, gross domestic product (GDP), and inflation. Economic crises cause governments to increase their debt accumulation, which they later repay partly through taxes, and this has an impact on consumption expenditure. The conceptual framework describes how an economic crisis can reduce consumption by substituting certain goods for others, which can lead to a decrease in consumption expenditure. However, when it comes to data analysis, economic crises increase consumption expenditure due to taxes being a burden on consumers. Using the ARDL model, the study finds that total foreign debt (proxy for economic crises), government expenditure, government expenditure for social protection, and the fuel levy all increase consumption expenditure. Thus, it would be prudent for the government to employ more tax strategies to ease the pressure on consumers. The NARDL shows that in the long run, national government debt is insignificant. However, in the short run the variable shows itself to be significant. The study's Granger causality test shows a unidirectional causality from consumption expenditure to all variables apart from inflation. This study will contribute to scholarship by contributing to the contemporary literature on the impact of economic crises on consumption expenditure. It will also illuminate the relationship between taxes and consumption in South Africa. The results of the study can be used for research and policy decision-making by institutions such as, but not limited to, the Davis Tax Committee, the South African Revenue Services, the National Treasury, and the South African Reserve Bank.

Keywords: Consumption expenditure; government debt; Autoregressive Distributed Lag Model; economic crisis; taxation; Granger causality; Non linear Autoregressive Distributed Lag Model

ISIFINYEZO

UMTHELELO WEZINXUSHUNXUHUSHU ZOMNOTHO NEZIKWELETU ZIKAHULUMENI EKUSETSHENZISWENI KWEMALI YOKUDLA ENINGIZIMU AFRIKA

Lolu cwaningo lugxile ekuhloleni umthelela wezinxushunxushu zomnotho kanye nezikweletu zikahulumeni ekusetshenzisweni kwemali yokudla eNingizimu Afrika. Kusetshenziswe idatha yamaviki amane kusukela ngonyaka ka-1993 (isigaba sokuqala) kuya ku-2020 (isigaba sesine), etholwe eBhange Elikhulu laseNingizimu Afrika (SARB) naseQuantec (Easy Data). Ucwaningo lusebenzise izindlela ezimbili zokuhlaziya: i-Autoregressive Distributed Lag Model (ARDL) kanye ne-Non-linear Autoregressive Distributed Lag Model (NARDL).

Izinto eziguqukayo ezifakiwe ocwaningweni zifaka phakathi: ukusetshenziswa kwemali yokudla (consumption expenditure), izikweletu zangaphandle (total foreign debt), izikweletu zikahulumeni kazwelonke (national government debt), izindleko zikahulumeni (government expenditure), izindleko zikahulumeni zokuvikelwa komphakathi (government social protection expenditure), intela kaphethiloli (fuel levy), intela yokungezwa inani (value-added tax), intela yemiholo yomuntu siqu (personal income tax), umkhiqizo kazwelonke ophelele (GDP), kanye nokwenyuka kwamanani (inflation).

Ngokomongo wocwaningo, izinxushunxushu zomnotho zivame ukuphoqa uhulumeni ukuba andise izikweletu, lezo zikweletu kamuva zikhokhwa ngendlela yentela, into leyo ethinta ngqo izinga lokusetshenziswa kwemali ngabathengi. Uhlaka lwemibono luveza ukuthi inxushunxushu yomnotho ingaba nomthelela wokunciphisa ukusetshenziswa, njengoba abathengi beshintsha indlela abathenga ngayo, okungaholela ekwehleni kokusetshenziswa kwemali. Nokho, ekuhlaziyweni kwedatha, kwatholakala ukuthi izinxushunxushu zomnotho zandisa ukusetshenziswa kwemali ngenxa yokuthi intela iba ngumthwalo omkhulu kubathengi.

Imiphumela etholwe kusetshenziswa imodeli ye-ARDL iveze ukuthi izikweletu zangaphandle (njengophawu lwezinxushunxushu zomnotho), izindleko zikahulumeni, izindleko zikahulumeni zokuvikelwa komphakathi, kanye nentela kaphethiloli konke

kudlala indima enkulu ekwenyukeni kokusetshenziswa kwemali. Ngakho-ke, kuyelulekwa ukuba uhulumeni asebenzise izindlela ezihlukahlukene zentela ezithambile, ukuze kuncishiswe ingcindezi ebhekene nabathengi.

Ucwaningo luphetha ngokwethula izincomo ezengeziwe, likhomba imikhawulo ebhekene nocwaningo, kanye nezindawo ezifanele ukuqhubekiselwa phambili ocwaningweni lwesikhathi esizayo.

Amagama angukhiye: Ukusetshenziswa kwemali yokudla; izikweletu zikahulumeni; imodeli ye-ARDL; izinxushunxushu zomnotho; intela

ISISHWANKATHELO

IMPEMBELELO YEENGXAKI ZOQOQOSHO NEMALI MBOLEKO KAHULUMENI KWIINKCITHO ZABATHENGI EKWILIZWE LASEMHLA BUSELWE (SOUTH AFRICA)

Olu phando lujolise ekuhloleni impembelelo yeengxaki zoqoqosho kunye nemali-mboleko kahulumeni kwiinkcitho zabathengi eMzantsi Afrika. Uphando luqokelele idatha yeendlela zexesha rhoqo (kwikota) ukusukela kwikota yokuqala ka-1993 ukuya kwikota yesine ka-2020, efunyenwe kwiBhanki enkulu yeSizwe yaseMzantsi Afrika (iSARB) kunye neQuantec (Easy Data). Kuphando kusetyenziswe iimodeli zombini – ezithe ngqo (linear) kunye nezingathethi ntweni ngqo (non-linear) – zohlalutyo lwexesha ezaziwa njenge-Autoregressive Distributed Lag (ARDL) kunye ne-NARDL.

Iinguqu eziphambili ezihlolwe ziquka: inkcitho yabathengi (consumption expenditure), imali-mboleko epheleleyo yangaphandle (total foreign debt), imali-mboleko karhulumente wesizwe (national government debt), iinkcitho zikarhulumente (government expenditure), iinkcitho zikarhulumente zokhuselo lwentlalo (social protection), irhafu yefutha (fuel levy), iValue-Added Tax (VAT), irhafu yengeniso yomntu ngamnye (personal income tax), iGross Domestic Product (GDP), kunye nokunyuka kwamaxabiso (inflation).

Iimeko zoqoqosho ezingazinzanga zihlala zikhokelela ekubeni urhulumente anyuse imali-mboleko, aze kamva ayihlawule ngokusebenzisa irhafu — into echaphazela ngqo inkcitho yabathengi. Isakhelo somqondo ochazwe kolu phando sithi iimeko zoqoqosho ezinzima zinganciphisa inkcitho ngokutshintsha iimpahla ezithile kwezinye, nto leyo enokuthi iphose ekunciphiseni inkcitho iyonke. Nangona kunjalo, uhlalutyo lwedatha lubonisa okwahlukileyo — iimeko zoqoqosho ezingazinzanga zandisa inkcitho yabathengi ngenxa yomthwalo werhafu odluliselwa kubathengi.

Iziphumo ezifunyenwe kusetyenziswa imodeli ye-ARDL zibonisa ukuba: imali-mboleko epheleleyo yangaphandle (njengesalathisi seengxaki zoqoqosho), iinkcitho zikarhulumente, iinkcitho zokhuselo lwentlalo, kunye nerhafu yefutha — konke oku kudityaniswe nokunyuka kwenkcitho yabathengi. Ngenxa yoko, lolu phando lucebisa ukuba urhulumente makasebenzise imigaqo-nkqubo yerhafu enobuchule ukukhulula uxinzelelo kubathengi.

Ucwaningo luphetha ngokunika iingcebiso ezongezelelweyo, luvuma imida yalo, kwaye luphakamisa neendawo ezifuna uphando olongezelelweyo.

Amagama aphambili: inkcitho yabathengi; imali-mboleko karhulumente; ARDL; ingxaki yoqoqosho; irhafu

LIST OF ABBREVIATIONS & ACRONYMS

The following abbreviations or acronyms are used throughout the study:

AD	Aggregate Demand
ADF	Augmented Dickey-Fuller
AIDS	Almost Ideal Demand System
AR	Autoregressive
ARDL	Autoregressive Distributed Lag Model
AS	Aggregate Supply
ASEAN	The Association of Southeast Asian Nations
BRICS	Brazil, Russia, India, China, South Africa
CE	Consumption Expenditure
DW	Durbin-Watson
ECM	Error Correction Model
FL	Fuel Levy
GD	Government Debt
GDP	Gross Domestic Product
GMM	General Method of Moments
IRF	Impulse Response Function
JB	Jarque-Bera
LCH	Life Cycle Hypothesis
LM	Lagrange Multiplier
NARDL	Non-Linear Autoregressive Distributive Model
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares

OPEC	Organisation of the Petroleum Exporting Countries
PAYE	Pay As You Earn
PIH	Permanent Income Hypothesis
P-Value	Probability Value
PFMA	Public Financial Management Act
PIT	Personal Income Tax
PP	Phillips-Perron
RIH	Relative Income Hypothesis
SASSA	South Africa Social Security Agency
SARB	South African Reserve Bank
SARS	South African Revenue Service
StatsSA	Statistics South Africa
USA	United States of America
VAT	Value Added Tax
VAR	Vector Autoregression
VECM	Vector Error Correction Model

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND

Economic crises have been a main feature in the global economy, have been persistent throughout decades and South Africa has felt the burden of a few . Economic crises that stand out in history include the Great Depression in the 1930s, the Organisation of Petroleum Countries (OPEC) oil crisis in the 1970s, the Asian crisis and the 2008 global economic crisis; the Greek crisis; COVID-19 and to a less extent, the Stock Market crash of April 2025 (Ridzuan et al., 2014).

The Great Depression in the 1930s was also known as the Great Contraction, from 1929 to 1933, when the United States economy suffered great losses, such as a decline in investment and productivity. This is due to the collapse of the gold standard where individuals' uncertainty caused them to demand more currency, reducing money stock and thereby causing a resultant banking crisis (Greasley, Madsen & Oxley, 2001; Friedman & Schwartz, 1963; Eichengreen, 1992; Anderson & Butkiewicz, 1980). Greasley, Madsen and Oxley (2001) also note that there was the largest decrease in consumer spending of 9% in 1932 due to this crisis.

Zulkifli and Haqeem's (2022) study on the Organisation of Petroleum Exporting Countries (OPEC) oil crisis in 1973 provides some insights into its impact on consumption expenditure. The study asserts that the crisis was in fact an embargo where OPEC countries increased the price of Brent crude oil, and this was due to the Yom Kippur War (Zulkifli & Haqeem, 2022). This was a war where the United States assisted Israel by supplying them with arms in a war against a coalition of Arab states, including Saudi Arabia and Libya. Issawi (1978) and Schumacher (1985) note that by the mid-1980s, the price of oil had increased twelvefold. This had a severely negative impact, especially on the United States, because of its over-reliance on Middle Eastern oil. By 1975, the United States' unemployment rate had increased by 9.2%, and 8.5 million people had lost their jobs (Zulkifli & Haqeem, 2022; Shama, 1978). Conversely, the embargo had a positive impact on the consumption expenditure of the Arab countries as the embargo significantly favoured their economies.

Another significant economic crisis following the OPEC oil crisis was the Asian crisis of 1997. Islam and Siwar (2005), Kang and Sawada (2008), and Ang (2001) all assert that the crisis started with the depreciation of the Thai baht when it was changed into a floating currency. In six months' time, there was a contagion in Asia and all currencies had depreciated by a maximum of 20% against the United States Dollar ($) (Ang, 2001). The main causes of the crisis were weak governmental policies, the reliance on short-term, denominated debt, moral hazards, and bank fragility. As much as it is important to understand the crisis from an overall macroeconomic perspective, what is of paramount interest in this study is the impact on consumption expenditure. The Asian crisis affected spending patterns in Malaysia for low-income households, where they had to substitute a significant food component of their consumption towards more normal goods. This is because the elasticity of non-food items was higher in the year prior to the crisis year. In addition, in Indonesia and China, there was also a substantial substitution of their staple foods (Thomas & Frankenberg, 2007). Korea also coped by substituting away from luxurious goods, which shows the decreased welfare effects of the Asian crisis (Kang & Sawada, 2008). Dutt and Padmanabhan (2011) support this stance through their assertion that consumer behaviour in any crisis is associated with consumption smoothing, and it affects all categories of expenditure.

The global economic crisis is comparable to the Great Contraction in terms of its contagion and the volume of economic losses incurred. It was propagated by lax credit issuing where individuals were given mortgage loans they could not afford. This high-risk mortgage lending led to many individuals defaulting on their loans, and it triggered a housing crisis (Maccheroni & Piccarreta, 2018). There was also a subsequent impact on consumption expenditure where the crisis undermined the safety of the household and there was a decrease in the size of households between 2008 – 2013.

In the United States, the crisis caused private consumption to increase faster than disposable income. Ireland and Denmark’s positions were exacerbated as they had significant household debt even prior to the crisis, while Spain’s GDP only recovered at the end of 2013 (Martínez & Camara, 2022).

As regards consumption, Maccheroni and Piccarreta (2018) classified consumption expenditure in Italy according to “food and beverages” and “non-food” categories. In their study they surprisingly found, unlike in the Asian cases, that the crisis affected the food and beverages to a lesser extent than non-food.

Nevertheless, Basev (2014) notes that in the United Kingdom (UK), the global economic crisis increased costs, kept wages fixed, decreased working hours, thereby increasing unemployment. Individuals do not spend as much as they did before the crisis. However, as with the previous crises, there was a substitution away from luxurious goods to more of one’s normal goods, especially staple foods. A common trend that exists between economic crises and consumption expenditure is that of substituting away from one’s more expensive goods to normal goods like staple food.

While South Africa has been generally experiencing a downward phase for the past 17 years, it experienced its first contraction since 1992 in 2009 of 1.5% (Hlongwane & Daw, 2022; Fourie & Blom, 2022). The global economic crisis showed a great level of vulnerability for this country with external government debt standing at US$4.3 billion (Fourie & Blom, 2022). The vulnerability showed itself as a significant reduction in exports, employment and lower capital inflows. This certainly affected consumption expenditure in that an increase in unemployment reduces income and in turn consumption expenditure in any household.

At times, there are economic crises in their purest form, but also, economic crises spurred on by pandemics, including the Spanish flu and, most recently, the COVID-19 recession. The Spanish flu originated in Spain in 1918 and eventually spread throughout Europe and the United States of America (Belitski et al., 2022; Ajam, 2020). COVID-19 is much like the Spanish flu, where there has not only been a significant loss of life but also an adverse impact on the global economy (Belitski et al., 2022). The SARS-2 COVID virus originated in Wuhan, China, where the first infections were recorded in November 2019. The virus rapidly spread globally forcing governments to impose restrictions to stop the speed at which the virus was spreading. In South Africa, these measures included social distancing, wearing masks, and sanitisation while the government was in the process of procuring or manufacturing vaccines. While all these measures were the best efforts of states to save lives, they were the biggest shock to the South African economy. Sectors that were hardest hit by the lockdown restrictions

include the hospitality, services, entertainment and tourism industries. This is because, by their nature, the industries that require physical interaction in their transactions. These implications worsened the challenges faced by the National Treasury which include unemployment, poverty and inequality (Heald & Hodges, 2020; Fourie & Blom, 2022)..

While the scene has been set regarding how economic crises affect consumption expenditure, it must be noted that government debt is the main channel through which this occurs. Government borrowing can be beneficial only if it is for growth-enhancing activities. Hlongwane and Daw (2022) support this notion for the South African context too. However, if this is not the case, it can make the country vulnerable to economic and financial shocks as well as increase debt service costs. The traditional functions of government are threefold. They are to stabilise the economy, where it increases borrowing when the economy is in recession, while reducing borrowing when that is not the case. Secondly, the government has a bridging function which is called tax smoothing and lastly, the burden sharing function (Holtfrerich et al., 2016).

The latter function of burden sharing implies that when governments borrow, they must make their repayments and service their debt, by passing on the costs to consumers as taxes (Hyman, 2011). This is the crux of the study. Households and individuals are always at the forefront of the tax burden. This is because most of the taxes implemented in South Africa affect the individual or household first before they can impact firms, the government, and other institutions in the economic cycle. For instance, taxes such as income tax, the fuel levy, and VAT are all taxes that hit the consumer's pocket first before they can filter through to other stakeholders in the economy. South Africa’s unemployment rate continues to climb, and this leaves even fewer individuals to contribute to the tax revenue.

1.2 PURPOSE STATEMENT

The purpose of this study is to investigate the impact of economic crises and government debt on consumption expenditure.

1.3 RESEARCH PROBLEM

Several historical crises have affected government debt. The study by Yang et al. (2022) confirms this by noting the harshly adverse impact of the global economic crisis

and COVID-19 on various governments' budget balance. In a regime switching model of South Africa by Hlongwane and Daw (2022), two regimes are tested regarding determinants of public debt. Regime 1 is the global economic crisis and regime 2 is the COVID-19 induced recession. For regime 1, they find that a 1% increase in government expenditure will increase public debt by 1.49%, and by 0.25% in regime 2.

It is the norm for governments to borrow more than usual during economic crises, and it is understood to cushion the blow of the economic downturn and redirect government spending according to newly realised priorities. According to Hlongwane and Daw (2022), in 2021, South Africa's estimated debt-to-GDP ratio stood at 82.76%, and between 2022 and 2023, the national debt was R4,38 trillion. Much of this government debt has been acquired because of borrowing, however, over time, it has its own effects, one of which is on consumption expenditure.

Much of the debt that is accumulated by government is one that cannot be paid back in one lifetime, thus it falls on several generations (Broadstock, Wang & Zhang, 2014; Ang, 2001; Islam & Siwar, 2005). This debt becomes a burden for households, as some of this debt is passed on to them in the form of taxes. Thus, the problem is how this issue is affecting consumption expenditure, especially since it accounts for nearly 60% of South Africa's GDP. There are limited South African studies that focus on the impact of economic crises and government debt on consumption expenditure, and thus begs for investigation.

1.4 RESEARCH QUESTIONS

In this research study, the main question is formulated as follows:

"What is the impact of economic crises and government debt on consumption expenditure in South Africa?"

The following are the sub-questions:

i) What is the impact of economic crises and government debt on consumption expenditure in South Africa?
ii) What is the impact of economic crises on government debt in South Africa?

iii) What is the impact of the tax burden on consumption expenditure?
iv) What is the impact of economic crises on government debt?
v) What can be done to alleviate the impact of economic crises and government debt on consumption expenditure in South Africa?

1.5 RESEARCH OBJECTIVES

The following objectives are set for this study:

i. To address the impact of economic crises on consumption expenditure
ii. To examine the impact of the tax burden on consumption expenditure
iii. To investigate the impact of government debt on consumption expenditure
iv. To investigate the impact of economic crises on government debt
v. To investigate possible remedies to reduce the tax burden

1.6 HYPOTHESES OF THE STUDY

The hypotheses of the study are as follows:

1.6.1 Investigative hypotheses

1. Economic crises have an impact on consumption expenditure
2. The tax burden has an impact on consumption expenditure
3. Economic crises have increased government debt
4. Government debt has an impact on consumption expenditure

1.6.2 Empirical hypotheses

H_0 : The long and short-run variables that have an impact on consumption expenditure are total foreign debt, national government debt, personal income tax, VAT, fuel levy, government expenditure, government expenditure on social protection, GDP, and inflation.

H_1 : The long and short-run variables that do not have an impact on consumption expenditure are total foreign debt, national government debt, personal income tax, VAT, fuel levy, government expenditure, government expenditure on social protection, GDP, and inflation.

1.7 SIGNIFICANCE OF THE STUDY

Economic crises are macroeconomic shocks that have many adverse effects on the economy, particularly consumption expenditure, and therefore impose a burden on consumers. In South Africa, the global economic crisis of 2008/9 presented itself as a shock to an already ailing consumer with significant levels of household debt, asset price shocks and shocks to income (Nomatye & Phiri, 2017). Magubane and Mothibi (2025) also note that the global economic crisis exposed South Africa to vulnerability in terms of household debt and the destabilizing effects of private sector leveraging. In addition, the COVID-19-induced economic crisis also presented the National Treasury with challenges where they had to borrow R500 billion from external stakeholders, for instance (Hlongwane & Daw, 2022; Fourie & Blom, 2017). Thus, it is important to have tools to remedy such effects.

This study will contribute to these remedies by contributing to the contemporary literature on the impact of economic crises on consumption expenditure. It will also illuminate the relationship between taxes and consumption in South Africa. The results of the study can be used for research and policy decision-making by institutions such as, but not limited to, the Davis Tax Committee, the South African Revenue Services, the National Treasury, and the South African Reserve Bank. As far as the author is aware, this study is unique, and there is no exact existing study.

1.8 RESEARCH METHODOLOGY

Creswell and Creswell (2017) assert that the concept of a research design can be split into three types, namely qualitative, quantitative, and mixed methods. Quantitative studies include statistical or empirical research designs. This is an empirical study that will use an ARDL model to establish a long-run relationship between the variables of the study. According to Nkoro and Uko (2016), the ARDL model is useful in many respects. Firstly, the ARDL model is applicable to test for cointegration amongst variables of different orders, namely I (0) and I (1). Secondly, endogeneity issues are resolved by the ARDL model (Mothibi & Mncayi, 2019). Lastly, the model allows a researcher to use a small sample size, which is useful for this quarterly study of 1993 – 2020. The non-linear ARDL model is also utilised in the study, whose benefits include the ability to test for nonlinearity or symmetry.

1.9 SCOPE AND DELIMITATION

The scope of this study is limited to the South African economy. Specifically, it is limited to the time series between 1993 – 2020. In addition, the study is limited to the specific variables and how they are defined when collected. Therefore, studies outside of this scope may not produce the same results.

Chapter 1 is the introduction and background to the study. It introduces the study by citing the fact that economic crises have persisted throughout history, where the crux of the matter is how economic crises create government debt and then have an adverse impact on consumption expenditure. The background later discusses how such events eventually trickle down to a burden for the consumer. This is because governments tend to use taxes to pay off their debt. The chapter then goes on to discuss the research problem, research questions and objectives, hypotheses, methodology, limitations, and scope, as well as the significance of the study.

Chapter 2 will give a concise conceptual framework on consumption expenditure. The chapter discusses the definitions and concepts of consumption expenditure, as well as key statistics, as they relate to South Africa. It further goes on to discuss consumption expenditure in other developing countries such as China and India, as well as the impact of household debt on consumption expenditure, where decreases in consumption expenditure are interpreted as a reduction in welfare gains. The chapter also unpacks the main points regarding consumption expenditure and social spending, as well as taxation. The principles of a good tax are thoroughly discussed, and particular attention is paid to the personal income tax, VAT and the fuel levy since these are the tax variables of the study. It also discusses the more focused form of the wealth tax as an important concept to consider and pursue in South Africa, to ease the pressure on the consumer.

Chapter 3 goes on to discuss several economic crises, namely the Great Depression, the OPEC oil crisis, the Asian crisis, the Greek debt crisis, COVID-19 and much less the stock market crash. Particular attention is drawn to the devastating impact of the crises not only on the economy but on individuals and households. Lastly, the chapter discusses government debt, the key factors being the types of government debt, which the study has included, which are national government debt and foreign government debt, and their relationship with consumption expenditure.

Chapter 4 will discuss the theoretical and empirical literature review. The theoretical literature review will focus on theories around consumption. The point of departure of the consumption theories is the notion that there are two methodological channels or schools of thought that arrive at the notion of consumption theory. The first is through the concept of utility, which focuses on the microeconomic aspect of consumption. Utility purports that consumption should be understood as a form of measurement wherein the tools of analysis are indifference curves and marginal revenue–marginal cost functions, to give a few examples. The second is through understanding consumption as an abstract idea, which is later expounded by theory. These theories include the absolute income hypothesis, the relative income hypothesis, and the life cycle hypothesis. The chapter also goes on to give an empirical literature review for government debt, where the theories discussed are the Keynesian debt management theory, Ricardian Equivalence, debt overhang and the New Keynesian Sovereign default risk theory.

Chapter 5 will discuss the research methodology. The chapter will discuss the econometric theory as well as the model that will be used in the study. Such theory includes unit root testing as well as several diagnostic tests, which will be performed on the estimated model. The model that will be used in the study is the Autoregressive Distributive Lag Model (ARDL). This model is suitable for the study because of its econometric properties, which adhere to the traditional Ordinary Least Squares (OLS) assumptions. The study also uses a non-linear ARDL (NARDL), which has the advantage of checking both the positive and negative impact on a specific variable simultaneously. The diagnostic tests which will be run include tests for serial correlation, heteroscedasticity, as well as misspecification tests.

Chapter 6 will complement Chapter 5 by conducting a thorough data analysis and presenting the findings. It will start with a graphical and descriptive view of the variables and thereafter, the results of the unit root tests will be displayed. The unit root tests conducted are the Augmented Dickey-Fuller test and the Phillips-Perron test. The ARDL model will be estimated, where the long run model and error correction model will be established, and thereafter the diagnostic tests will be performed. Granger causality test results will also be contained in this chapter. Lastly, a NARDL will also be estimated, where the long run model and error correction model are also run, but will go further to test for symmetry, which is the test for non-linearity.

Chapter 7 will conclude the study by correlating the data analysis, conceptual framework and literature review with the intended research objectives. In addition, the chapter will highlight the limitations of the study. Some recommendations of policy decisions and areas to be studied further will also be outlined in this chapter, where the main crux of the recommendations is the easing of taxes towards consumers.

CHAPTER TWO

CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

This chapter will give an overview of the literature associated with the study. Section 2.2 will start with a discussion on consumption expenditure, while section 2.3 will discuss consumption expenditure and household debt. The section that follows, which is section 2.4 will give a brief outline on consumption expenditure, government expenditure and government expenditure on social protection and section 2.5 will unpack consumption expenditure and taxation. Thereafter, the chapter will conclude with section 2.6.

2.2 CONSUMPTION EXPENDITURE

Consumption is the activity of making purchases of goods or services and consuming them. It begins with a decision to engage in the process of acquisition to meet the needs and wants of an individual or household. The means of this process include real income, autonomous income such as credit cards or savings, as well as other financial means. Consumption expenditure involves trying to find the value of commodities and services at a fixed point in time, which is also at the place where they are deemed to be available for use (Desai, 1948).

The increased incidence of internet use has considerably contributed to an increase in consumption expenditure (Chunfang, Yifeng & Suyun, 2023). Online shopping, which has become very popular, is the main way in which this process of consumption is completed with a convenient delivery to one's doorstep. Typical retailers include Takealot, Amazon, Superbalist, as well as traditional face-to-face retailers such as Woolworths and Checkers. The greatest benefit of this type of shopping is that it can be done at any time and is not restricted by retail hours.

The individuals and households which can partake in the process of consumption are usually those who are employed because they have the means to do so. However, employment does not deter the process of consumption because the unemployed are able to engage through financial means in the form of social safety nets, like the

various social grants available in the country. Another form of engaging in the process of consumption for the unemployed is through food parcels and feeding schemes, and this is not an exhaustive list. Figure 2.1 below shows the process of consumption, which has four steps wherein an individual or household identifies a need or want; acquires the means to purchase it; does so, and finally consumes that said good or service.

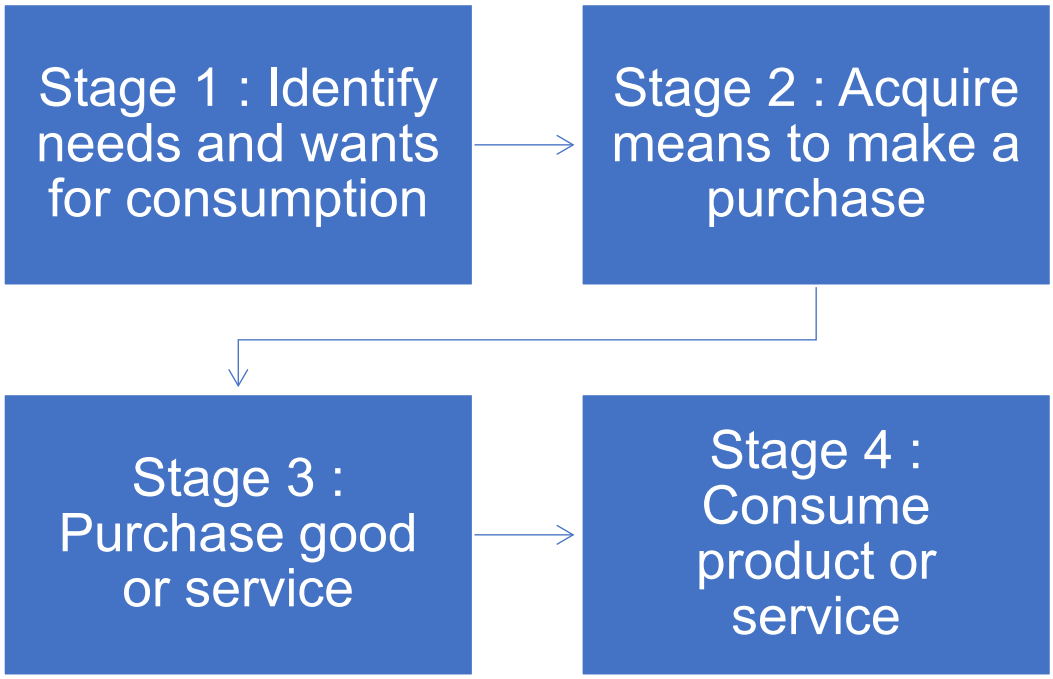


Figure 2.1.: The Consumption Process
Source: Author (2025)

An extension of consumption expenditure is consumer behaviour, and it is influenced by several factors, including personal, environmental, and even psychological factors. When one considers the personal influences of consumer behaviour, one can infer factors such as personality, demographics and attitudes, while environmental factors are more influenced by culture and trends (Basev, 2014). Lastly, there are psychological influences on consumer behaviour, and they include learning processes and information (Schiffman & Kanuk, 2004).

2.2.1 Components of consumption expenditure

Consumption expenditure is one of the most important injections into the economy. It is estimated to be one-third of Gross Domestic Product (GDP) for most economies (Ezeji & Ajudua, 2015). Therefore, one can firmly say that consumption expenditure is a steady component of economic growth. There are two main types of consumption expenditure, government expenditure and household expenditure. Countries tend to pursue the notion of investment-led growth while disregarding the fact that it is consumption which feeds this growth (Chen, Luan & Huang, 2014).

This study is mainly focused on household consumption, which is also known as private expenditure. Household consumption expenditure contributes 65% to global GDP and 75% to South African GDP between 1960 – 2019 (Garidzirai & Mapanga, 2022). This is corroborated by Mishra (2011), who asserts that consumption expenditure contributes between 70% - 75% to GDP in developing economies. Household consumption expenditure is an important variable which contributes to the Sustainable Development Goals, such as responsible consumption and production, as well as sustainable cities (United Nations, 2025). There is a broad range of goods which households consume. The main components of household consumption expenditure include durable, semi-durable goods, non-durable goods, as well as services. Figure 2.2 below shows the total household consumption expenditure in South Africa from 1986 to 2023. The highest total household consumption was during 2023 at R3,7 trillion. The series shows a steady upward trend which surprisingly does not dip in 2008 but does so in 2020. This shows that the impact of the global economic crisis affected consumption to a lesser extent. However, these periods are still significant because they were during the times of economic crisis, which were during the 2008 global economic crisis and COVID-19 respectively. This depicts the main thrust of the study, that economic crises eventually affect households or individuals by causing them to decrease their consumption. However, an analysis of consumption trends will provide better insight into this figure.

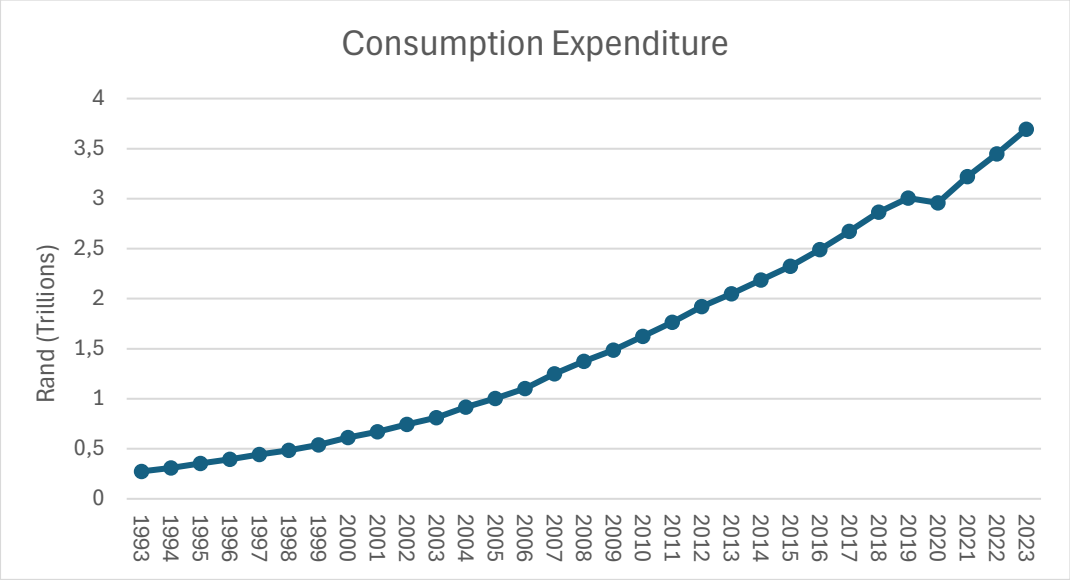


Figure 2.2: Total Household Consumption Expenditure (1990 - 2023)
Source: Author (2025)

2.2.2 South African trends in consumption expenditure

According to Price Waterhouse Coopers (PwC), consumer patterns have changed and consumers are spending more cautiously and consciously. In their publication of the Voice of the Consumer 2024, they conducted a study of 1,009 South Africans which indicated that since COVID-19, 44% would trade luxury brands for cheaper ones, while 7% decided against this (PwC, 2024). While Deloitte shares the same sentiments, they add that the anxiety of consumers due to COVID-19 is beginning to normalise even though inflation has remained high between December 2022 and December 2023 (Deloitte, 2025). This is supported by the stance of the South African Council of Shopping Centres (SACSC), who asserts that retailers increased their expenditure receipts by 90% during December 2024 (SACSC, 2024). In the last month of 2024, the Consumer Price Index (CPI) was 2,9%.

Table 2.1 shows several types of retailers which exist in South Africa. The most popular being general dealers as well as clothing, textiles, footwear and leather goods. The table corroborates the statistics provided by various associations and companies in this section where it shows a 5,4% increase in overall trade sales in South Africa during October 2023 – December 2023 and 5,4% during October 2024 – December 2024 respectively.

Table 2.1: Retail trade sales at constant 2019 prices for October – December 2023 and October – December 2024

Type of retailer	Oct – Dec 2023 (R million)	Weight (%)	Oct – Dec 2024 (R million)	% change between Oct – Dec 2023 and Oct – Dec 2024	Contribution (% points) to the total % change
General dealers	139 221	42,9	150 011	7,8	3,3
Food, beverages and tobacco in specialised stores	25 403	7,8	25 788	1,5	0,1
Pharmaceuticals and medical goods, cosmetics and toiletries	21 730	6,7	22 537	3,7	0,2
Textiles, clothing, footwear and leather goods	65 143	20,1	70 154	7,7	1,5
Household furniture, appliances and equipment	14 499	4,5	15 820	9,1	0,4
Hardware, paint and glass	24 590	7,6	23 914	-2,7	-0,2
All other retailers	33 783	10,4	33 701	-0,2	0,0
Total	**324 369**	**100,0**	**341 925**	**5,4**	**5,4**

Source: StatsSA (2025)

Figure 2.3 shows a more holistic look at quarterly retail trade sales from January 2019 – January 2025. There was a sharp decrease in retail trade sales between March and May 2020. This was in response to the COVID-19-induced recession and found many households either losing their employment or finding other sources of spending. The consequence of this was an increase in household debt. Magubane and Mothibi (2025) support such an occurrence by revisiting the adverse impact of the 2008 global economic crisis on household and thereby household spending.

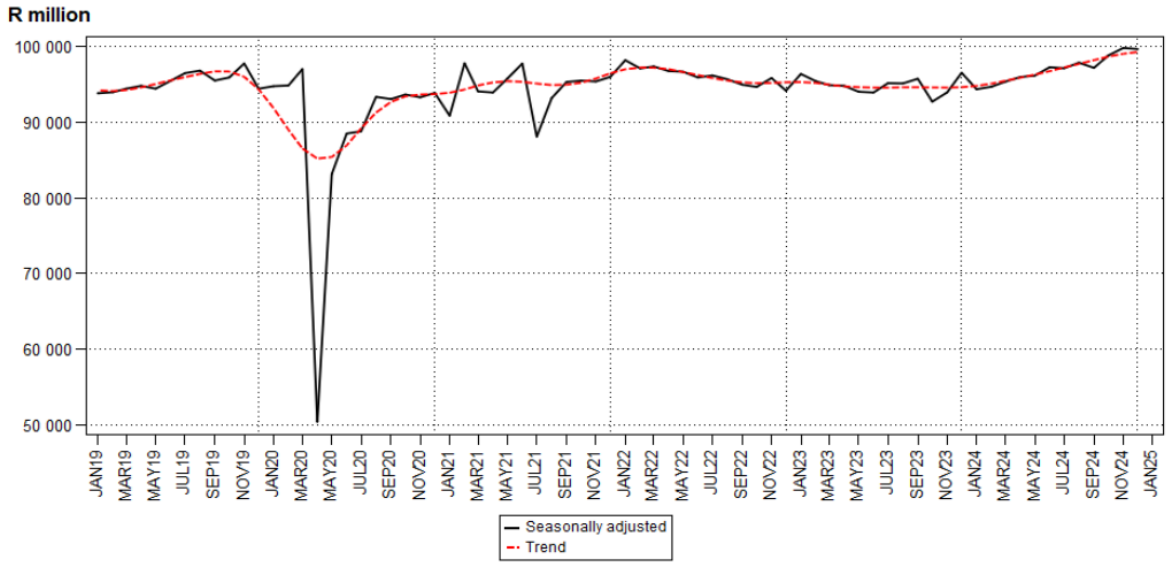


Figure 2.3: Retail trade sales at constant 2019 prices
Source: StatsSA (2025)

2.2.3 Consumption expenditure in other developing countries

(i) India

India is one of the largest developing countries and is part of the BRICS economic organisation. Consumption expenditure contributed 60% to real GDP growth in India between 1950-2009 (Mishra, 2011). As such, Mishra (2011) asserts that economic growth in India is consumption-led, and such is the case with many developing countries where economic growth is not investment or production-led. Deshmukh and Vyavahare (2018) note that post-globalisation has increased India's income and expenditure, and these changes can be witnessed in both the rural and urban areas. However, when they concentrate on food expenditure, they postulate that monthly per capita expenditure on food has decreased from 72,83% to 52,76% because households have substituted more towards non-food items, where there was an increase in their purchasing from 27,15% to 47,24%.

Deshmukh and Vyavahare (2018) assert that consumption expenditures in India are increasingly shifting towards non-food items, with food consumption being lower. They deduce their findings based on data from the National Service Scheme (NSS) during 1972-2010. Their findings indicate a continual decline in food purchases and an increase in the purchase of miscellaneous goods in both rural and urban areas. A study conducted in the Amreli district of Gujarat over three different seasons also yields similar results regarding India's consumption patterns (Upadhyay et al., 2000). Using Engel curves to fit consumption expenditure and elasticity data, they found total non-food items to be highly elastic which shows that consumers are continually leaning towards increasing their expenditure of non-food items. A similar study was done with the rural households of Western Odisha, where it was also found that consumption expenditure on non-food items was increasing due to urbanisation and an increase in non-food expenditure (Sethi & Pradhan, 2012).

Sethi and Pradhan (2012) conducted a study on India's adjustment of personal consumption expenditure to disposable income. They did so using the Granger causality and Kyock approaches with data from 1950-1993. Their findings indicate that

the mean log of Kyock's model is 30%, indicating that personal consumption expenditure takes a long time to adjust to changes in disposable income. On the other hand, they also found that a 1% increase in disposable income results in a 16% increase in personal consumption expenditure. This leaves a small percentage of income for saving. However, Dutta and Panda (2014) cite that there has been a considerable decrease in absolute poverty using National Sample Survey data on household consumption between 2004 and 2012. Despite increasing consumption expenditure, and its apparent positive social welfare effects, much of the literature for India shows that there is inequality. Agrawal and Agrawal (2023) use the India Human Development survey to arrive at this conclusion.

(ii) Consumption expenditure in China

Since 2004, the political leadership of China decided to change its growth strategy from being export/ investment-led to pursuing a domestic demand-driven growth path (Lardy, 2019). In short, they decided to support consumption as the main contribution to China's growth. One way to put this into effect could be increasing social expenditure to increase household consumption (Coady, D'Angelo & Evans, 2010).

Several other studies have been conducted in China regarding consumption expenditure. They include those of Arapova (2018); Yang et al. (2022); Lardy (2019); Li, Huang and Chang (2023); Lu and Lau (2015) and several others.

Household spending in China is very low at 32% of GDP while that of most developing countries is over 50% of this. This spending pattern is explained by the change in the savings rate and changes in household income. As regards savings, the Chinese population are saving more towards their health and education while they also experience a weak wage growth and limited distribution of firms' profits (Coady, D'Angelo & Evans, 2010; Wang, Sindelar & Busch, 2006). However, since the post-2008 economic crisis, consumption expenditure has been increasing in China.

A study by Bakri et al. (2017) investigated the relationship between consumption expenditure and household income as well as inflation. The researchers found a positive relationship between consumption expenditure and income and that inflation discourages consumption.

Lu and Lau (2015) conducted an analysis of consumption expenditure in Changchun city of China and found that it has been increasing. They did so by using the almost ideal demand system (AIDS) model for a cross-sectional panel data of 300 households from January 2009 to December 2011. Their results also showed that food, education and culture, as well as recreation, are necessity goods in that city where their expenditure share continues to increase despite the increase in prices.

Consumption expenditure is also related to life stages. Using the life cycle hypothesis approach, Yang et al. (2022) found that age and population have a significant impact on spending. That is, older adults tend to spend less than when they were in their prime. Li, Huang and Zhang (2023) investigated the relationship between consumption expenditure and life satisfaction and found that there is a positive relationship between the two variables.

A study on the happiness of rural farmers in China using data from 2016 China Labour Force Dynamics data has found a positive relationship with consumption expenditure (Zhu et al., 2021). The researchers established this using a two-stage residual inclusion approach to mitigate the potential endogeneity issue of happiness. Their results further indicated that this happiness is associated with consumption in basic living goods, education and gifts. While this shows positive sentiments for the rural community, another study by Li, Lin and Gan (2016) finds that credit constraints are an impediment to household consumption expenditure. Using two instrumental variables to correct the issue of endogeneity between credit constraints and consumption expenditure, they find that 54,9% of farmers' household consumption expenditure is constrained by credit. Therefore, it could be concluded that in China, there are more welfare effects of consumption expenditure compared to India.

2.3 CONSUMPTION EXPENDITURE AND HOUSEHOLD DEBT

Household debt has a significantly adverse impact on the spending activities of households. Mutezo (2014) asserts that South Africans' household debt has been increasing rapidly for consumers to maintain their spending patterns. Consumer spending and affordability depend on several factors, including but not limited to disposable income, household income, interest rates, and access to credit (Chimeri & Oluwatayo, 2022). Nyiputen and Abijia (2023) found that there is a negative

relationship between private domestic credit and the consumption expenditure of manufactured goods. In the US, household indebtedness allowed private consumption to grow faster than disposable income (Martínez & Camara, 2022).

COVID-19, much like the global economic crisis, had a detrimental effect on South Africa's consumption spending. Prior to the pandemic, between 2010 and 2019, consumption had increased by 2,11%, while after the start of the pandemic, from 2019 to 2020, it decreased by 5,43% depicting decreased welfare effects of consumer spending (Chimeri & Oluwatayo, 2022). The global economic crisis did affect South Africa, although to a lesser extent, causing a recession which had not been experienced in 17 years (Nomatye & Phiri, 2017). Accordint to the IMF, the growth projection between 2008 and 2009 was exceptionally negative with 3.062% in 2008 and -2.171% in 2009 (Chitiga, Mabugu & Masiovanne).

This is the general picture when one takes a global look at this phenomenon. In the UK, aggregated consumption decreased by 2% after 2007 for households with debt (Bunn and Rostom, 2014). Bunn and Rostom (2014) also find that household debt increased by 160% in 2008 and mortgages were the key reasons for this debt spike. His recommendation in this regard, is prudence when issuing debt and doing interest rate tests for borrowers before any debt is issued. Teulings, Wouterse and Ji (2023) corroborate Bunn and Rostom's (2014) study with data from Dutch households from 2006-2015. They find that households with mortgage debt have experienced a decrease in spending over this period as opposed to households that do not have mortgage debt. Nyupen and Abijia's (2023) study also finds a negative correlation between private domestic credit and consumption expenditure.

In Korea however, Kim and Hwang's (2016) panel data study for 2007-2009 and 2011-2013 find that these depressive impacts on consumer spending because of debt differ across types of spending and household characteristics. They find that the effects of indebtedness have been stronger for durable goods expenditures and that the wealthy have decreased their spending even more than low-income earners. Nevertheless, they do concur with previous studies that household indebtedness is a significant factor when it comes to consumer spending (Mishkin, 1976, 1978; Mishkin, Gordon & Hymans, 1977). What is important to note from the Korean case is that households with mortgaged debt not only adjusted their spending during the global financial crisis

but afterwards as well. It can therefore be stated that household debt has an overall negative effect on consumption expenditure.

2.4 CONSUMPTION AND GOVERNMENT EXPENDITURE ON SOCIAL PROTECTION

Government expenditure is a burden on the consumer and this can be seen in expenditures such as those of social spending (Modigliani & Sterling, 1986). However, studies by Williams (2007), Meth (2008), Samson (2002), Triegaardt (2007, 2009), Meth and Dias (2004) and the Department of Social Development (2006) all give appraisal to the benefits of the social grants as far as its recipients are concerned.

There are four major components of social security, namely private savings, social insurance, social assistance, and social relief (Maistry & Vasi, 2010:8-9). Indeed, there is a presence of all four forms of social security in South Africa; however, there are broadly two concepts of social security in South Africa: insurance and redistribution (Leibbrandt et al., 2010:46).

There are seven types of social grants which are provided by the South African Social Security Agency (SASSA), namely the Old Age Grant (OAG), the War Veteran Grant (WVG), the Disability Grant (DG), the Grant in Aid (GIA), the Care Dependency Grant (CDG), the Foster Care Grant (FCG) and the Child Support Grant (CSG) (Williams, 2007:5). Due to these grants, South Africa is seen as an unusually big social spender relative to other middle-income countries (Marais, 2011:238). The social grants have certainly been a supportive source of income in that they take care of both adults who are not eligible for work, children whose parents are not in the financial position to take care of them, and various other grant specifications which serve as compensation for one contingency or another.

Tables 2.2 and 2.3 below show social grant trends from 2005 to date. They show the growth in the recipients of social grants in South Africa, as well as the respective growth rates of these trends between each two-year period. These tables show the increasing number of people that the social grants are reaching every period.

Table 2.2: Social Grant trends by number of people (2005 – 2016)

Grant type/ Period	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2015/16
OAG	2 146 344	2195018	2 229 550	2 390 543	2 546 657	2 678 554	3 207 280
WVG	2817	2340	1924	1500	1216	958	233
DG	1 315 143	1 422 808	1 408 456	1 286 883	1 264 477	1 200 898	1 073 866
GIA	26 960	31 918	37 434	46 069	53 237	58 413	142 604
FCG	317 434	400 503	454 199	474 759	510 760	512 874	130 864
CDG	90 112	98 631	102 292	107 065	110 731	112 185	487 383
CSG	7 075 266	7 863 841	8 189 975	8 765 354	9 570 287	10 371 950	11 931 494
Total	10 947 076	12 015 059	12 423 739	13 072 173	14 057 365	14 935 832	16 973 724
Annual Growth		9%	3,4%	5,2%	7,5%	6,2%	13,64% since 2005/06

Source: SASSA (2024)

Table 2.3: Social Grant trends by number of people (2019 – 2024)

Grant type/ Period	2019/20	2020/21	2021/22	2022/23	2023/24
OAG	3 676 791	3 722 675	3 774 604	3 886 708	4 041 763
WVG	62	40	25	15	9
DG	1 042 025	997 752	1 004 798	1 035 437	1 056 270
GIA	273 922	267 912	283 771	328 507	401 761
CDG	154 735	150 151	153 768	156 982	165 764
FCG	355 609	309 453	294 031	274 130	253 256
CSG	12 787 448	12 992 589	13 166 342	13 147 937	13 218 701
Total	18 290 592	18 440 572	18 677 339	18 829 716	19 137 524
Annual Growth	2,69%	0,81%	1,28%	0,82%	1,63%

Source: SASSA (2024)

Throughout the literature there has been a general appraisal of the SASSA grants as being one of the best poverty alleviating tools, the largest of which is the Child Support Grant. However, it should be noted that in the year of inception of the child social grant, the state had spent R17 559 000, while a staggering R80 410 191 was spent on this type of grant in the 2023/24 financial year (SASSA, 2024).

While government and political figures have expressed scepticism of this grant on the grounds of possible dependency, many authors have proven this scepticism to be baseless and unsubstantial.

As regards consumption expenditure, the impact of government expenditure on social grants is twofold. First, social grants allow an increase in consumption expenditure for their recipients. However, they are a burden to the consumer who must be taxed to fund this expenditure.

2.5 CONSUMPTION EXPENDITURE AND TAXATION

A tax is an involuntary payment of funds to the state, which is paid in different forms. It is mandatory and is used towards government expenditure that creates an environment for growth, provides social safety nets and engages in spending programmes for the betterment of the country. Such spending programmes include health, education, defence and the like. The tax system in South Africa includes but is not limited to taxes on income and wealth, the fuel levy and value-added tax (VAT) (Steenekamp, 2012; Ncanywa & Mgwangqa, 2018; van Rensburg & Krygsman, 2020).

There are five main tax categories or tax classifications, namely 1) taxes on profits, income and capital gains, 2) taxes on property, 3) domestic taxes on goods and services, 4) taxes on international trade and transactions as well as 5) other taxes and user charges (Black, Calitz & Steenekamp, 2016; Hyman, 2011). Of these categories, there is also the Value Added Tax (VAT), which is charged on all goods at a standard rate of 15%.

There are also customs and excise duties which are called sin taxes on tobacco and alcohol products (National Treasury, 2024). Less commonly known taxes include environmental levies such as the plastic levy and electric filament lamps. Other sources of government revenue are from user-charges like service fees for licences,

birth certificates, fines and penalties, toll gates, refuse, and sewerage collection. This study's tax variables are VAT, the fuel levy and personal income tax.

There are different types of tax systems, the main ones being a regressive and progressive tax system. In a regressive tax system, the more an individual earns, the less tax he/she pays. However, in a progressive system, the more an individual earns, the more tax he/she pays. South Africa has a progressive tax system. This means that a taxpayer's average tax rate is less than his marginal tax rate (Hyman, 2011).

There are three tax bases which are on 1) income, 2) wealth and 3) consumption. There are various disputes regarding which tax base to use and controversy surrounds the wealth tax base the most. However, there are some countries that use a hybrid of all tax bases. If one looks closely at these three tax bases, one finds that they are all related. This is because one spends one's income (consumption) and it is assumed one saves the rest of it, which is the accumulation of wealth.

2.5.1 Tax theory

There are several tax theories which expound on the notion of taxation, its purpose and how it should be viewed. However, at the core of these is the optimal taxation theory. The optimal taxation theory is concerned with the government deciding what the appropriate tax is. Whether to tax income or whether to tax commodities and their role is to minimise the excess burden of tax (Gentry, 1999). Another tenet of the optimal taxation theory is the Ramsey problem, which is whether to charge all goods at a flat rate (Ramsey, 1927).

According to Slemrod (1990), the optimal taxation theory has three cornerstones, and they are firstly, that the individual's preferences, market structure and technology are clearly stated. Secondly, the state must gather a significant amount of revenue with the few tax instruments it has. And lastly, there must exist a criterion which ranks the optimal tax amongst the different options.

2.5.2 Principles of a good tax

The principles of a good tax assert that it should be fair, efficient and administratively easy to collect and flexible (Hyman, 2011). These concepts are important to understand especially in dealing with discussions around taxes and weighing the advantages and disadvantages of a particular tax.

(i) Equity

Equity or fairness is a very important concept in public economics because the government has obligations to promote fairness through its budget. As a result, equity in the economy is closely tied to income distribution and inequality, as well as the type of tax structure which is used in that economy. So, when the concept of equity is analysed, it is closely related to two principles, the first being the ability to pay principle and the second being the benefit principle. In terms of the ability to pay, it is perceived as equitable for individuals to pay taxes according to their affordability. This means there is a different treatment of individuals in certain income brackets, both vertically and horizontally. Vertically, this means that individuals should pay different amounts of tax because of different Living Standards Measurement (LSM) categories or income deciles. On a horizontal basis, people in the same income category should be treated the same. Another important evaluation of equity is the tax incidence, which is the study of who bears the burden of tax, consumers or producers, and is thereby a concept of tax shifting (Black, Calitz & Steenekamp, 2016:170).

The Living Conditions Survey (LCS) and the Income and Expenditure Survey (IES) conducted by Stats SA are the two primary contributors toward profiling and monitoring poverty and inequality over time. These two surveys are fundamental components to the survey programme of any statistical agency. The highly unequal income distribution in South Africa also places a burden on the notion of equity, placing more responsibility on the government for equitable fiscal redistribution.

(ii) Efficiency

Taxes have the capacity to create inefficiency because they distort the market by reallocating resources from private to government use. The distortion occurs because both consumers and producers are adversely affected by taxes which ultimately change commodity prices. According to the general equilibrium analysis of taxes, this resultant increase in the price of commodities can cause firms to increase their prices due to increases in production costs. This increase in costs is factored into the price of the commodity and therefore shifted towards the consumer. This eventually creates a decrease in consumer satisfaction (Black & Dollery, 1992:2). According to Zee (1998), taxes have the capacity to create inefficiency because they distort economic behaviour. The inefficiency results because it changes individuals' and firms' rational

decisions. These include the incentives related to the labour-leisure trade-off. This also relates to the incentives for firms to make investments in the economy. As a result, taxes create an excess burden, and this causes a deadweight loss for every economic actor affected by these taxes.

In essence, taxes do not create efficiency, but rather result in inefficiency (Hyman, 2011:58). However, Black, Calitz and Steenekamp (2016) disagree and point to the fact that taxes are efficient because they can be used towards spending programmes, which in turn create economic growth for the country. For instance, taxes collected for spending on health programmes promote free public healthcare. Once citizens take advantage of this healthcare they will be healthy and contribute to the productivity of the country by being part of the labour force.

(iii) Administrative ease

This aspect of a tax is very crucial to the entire tax collection process, which is undoubtedly a difficult task. In the United States for instance, tax collections are facilitated by the Internal Revenue Service (IRS), while in South Africa, the South African Revenue Service (SARS) is responsible for our tax administration (SARS, 2017:1; Budget Review, 2017:38). Administrating tax collection for the entire country entails that there should be systems in place for this process to run more smoothly. For much of SARS' time, tax returns had to be completed manually and sent to the various SARS branches. This disincentivised many individuals from submitting their tax returns because of the cost (time) of doing so. As a result, there is a great extent of tax evasion, which is the illegal non-payment or underpayment of taxes. There is also the incidence of tax avoidance, which is more intentional and calculated than tax evasion. When one avoids taxes, one arranges one's financial affairs to minimise one's tax liability.

2.5.3 Personal income tax

There are several studies associated with personal income tax, but one of the first few is captured by Pigou (1929), Slitor (1948), Reynolds and Smolensky (1977), as well as Kakwani (1977, 1984). The very first personal income tax was levied in the UK in 1799 and it is an involuntary payment which is levied on salaries, wages and other forms of income. Most of South Africa's government revenue comes from taxation, and more specifically, income tax. As such, it affects all income deciles and Living

Standards Measurement (LSM) categories, apart from those who are not required to do so. Pay as You Earn (PAYE) for instance, is administratively easy to collect because it is collected by SARS through the employer on every monthly salary date. One of the purposes of personal income tax is to fund the state to cover its expenditures or pay for debt, whether national or foreign. Personal income tax accounts for the government's highest revenue collection. In the OECD in 2012, personal income tax accounted for 29% of government revenue (Zhang, 2017).

Zhang (2017) conducted a study on the impact of China's personal income tax on resident consumption expenditure from 1999 – 2012 and found that China has played an important role in narrowing the income inequality gap across Chinese income deciles. However, there is still a relatively low collection of tax revenue in the Republic. There are two types of research that concern themselves with personal income tax. The first is the study of the impact of personal income on an individual as an economic agent, while the second is concerned with the system design of income taxes. This study analyses the former and is concerned with the redistributive effect of personal income tax as well as its progressivity. One of the tools of analysis for such a study is the use of indices. In order to establish whether income distribution has occurred, Zhang (2017) uses a Gini coefficient for the Musgrave and Thin (1949) index, which is captured in the following way:

$$MT = G - G^*$$

where G is the pre-tax Gini coefficient and G* is the post-tax coefficient. If MT is greater than zero, this implies the tax contributes to income distribution, and if it is negative, the tax does not. The index is further decomposed into the Kakweni (1984) index to investigate the progressivity of the tax (Nyamongo & Schoeman, 2007):

$$MT = \frac{tP}{1-t}$$

$$P = C - G$$

where t is the average tax rate, P is the progressivity index and C is the tax concentration rate. On the discussion of redistributive effects of personal income tax, further evidence is found in the study by Riedel and Zinke (2025) through the investigation of the key components of the tax, which are the marginal tax rate schedule, tax deduction, allowances, and tax credits. Through the Pfahler

decomposition method, they find that the marginal tax rate schedule is the primary driver of redistribution; however, tax expenditures often favour higher-income individuals, which points to some adverse effects of the personal income tax. They also find that below-inflation adjustments of marginal tax schedules increase post-tax inequality and weaken the redistributive system of the personal income tax.

A microsimulation test of South Africa's personal income tax gaps also adds to the literature on the aforementioned tax; however, this speaks more to compliance rather than the redistributive impact of personal income tax, so it is a study to be noted rather than applied to this study. The microsimulation test is performed by Dare, Du Plessis, and Jansen (2019) using the income and expenditure survey of 2005/6 and 2010/11. They find that personal income tax gaps occur due to non-compliance of salaried and non-salaried taxpayers. They assert that South Africa lost R60.1 billion in tax revenue in 2005/6 and likewise R26,2 billion in 2010/11. They continue to posit that in the compliance gap of 2005, 28,5% emanated from taxpayers with salaried income, 71.5% from non-salaried income taxpayers. Finally, Dare, Du Plessis and Jansen (2019) conclude in their study that, regardless of an improvement in overall compliance, there still exists a personal income tax gap.

However, personal income tax contributed 39.1% of total tax revenue collection in 2020/21 (Erero, 2022). Using a StatsSA census, tax assessments, and IRP 5 data from SARS through the SAS software, Erero (2022) found that there were 3.7 million individuals who contributed to personal income tax in 2011. Table 2.4 below shows that SARS (2025) has collected R1 592 805 million in personal income tax in 2023 compared to R917 029 million in 2014. This means over a 10-year period, SARS has increased its collection by 57%. This shows that South Africa has a progressive tax system. Our country's percentage of revenue collected from income tax and capital gains is comparable to the United States, whose percentage has on average, been 60% for the same time period.

Table 2.4: Taxable income of assessed taxpayers by taxable income group (10-year cohort across 10 consecutive years), 2014 – 2023

Tax year			2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Taxable income group		Number of taxpayers[1]	(R million)	(R million)	(R million)	(R million)	(R million)	(R million)	(R million)	(R million)	(R million)	(R million)
A:	< 0	35 331	-13 758	-13 685	-14 228	-13 689	-13 529	-13 862	-14 790	-15 062	-16 070	-17 852
B:	= 0	72 564	–	–	–	–	–	–	–	–	–	–
C:	1 – 20 000	60 752	582	410	362	348	333	334	371	485	459	456
D:	20 001 – 30 000	30 780	775	541	474	442	418	424	441	583	532	535
E:	30 001 – 40 000	33 220	1 168	849	706	652	613	604	623	800	721	745
F:	40 001 – 50 000	37 187	1 680	1 223	995	933	867	842	859	1 083	963	953
G:	50 001 – 60 000	47 271	2 623	1 848	1 483	1 347	1 254	1 183	1 171	1 444	1 237	1 243
H:	60 001 – 70 000	65 915	4 307	3 007	2 231	1 874	1 679	1 545	1 525	1 813	1 581	1 549
I:	70 001 – 80 000	64 650	4 854	4 146	3 572	3 268	2 955	2 689	2 593	2 504	2 044	1 962
J:	80 001 – 90 000	69 665	5 927	4 882	3 882	3 288	2 848	2 630	2 456	3 325	3 075	2 623
K:	90 000 – 100 000	75 023	7 137	5 921	4 838	4 132	3 528	3 181	2 979	3 309	2 846	3 169
L:	100 001 – 110 000	77 821	8 175	7 172	5 988	4 998	4 326	3 809	3 451	3 812	3 347	3 117
M:	110 001 – 120 000	80 027	9 212	8 279	7 260	6 300	5 372	4 783	4 239	4 393	3 990	3 735
N:	120 001 – 130 000	79 430	9 931	9 044	7 933	7 009	6 057	5 404	4 811	5 101	4 343	4 132
O:	130 001 – 140 000	80 521	10 872	10 008	8 758	8 033	7 058	6 218	5 599	5 650	5 051	4 586
P:	140 001 – 150 000	82 365	11 946	10 889	10 182	8 968	7 989	7 098	6 336	6 433	5 700	5 329
Q:	150 001 – 200 000	393 074	68 714	67 832	62 411	58 021	52 141	46 769	42 474	41 809	37 749	35 122
R:	200 001 – 250 000	366 170	82 389	81 487	78 368	74 843	70 215	65 065	59 260	56 808	51 991	48 463
S:	250 001 – 350 000	521 837	153 670	169 748	176 829	174 927	169 793	162 687	154 031	147 587	140 895	132 204
T:	350 001 – 500 000	354 392	146 998	169 407	194 439	217 783	238 446	251 414	258 899	249 806	255 885	252 321
U:	500 001 – 750 000	233 030	140 562	166 734	190 534	210 215	238 469	263 593	287 044	280 852	307 016	321 514
V:	750 001 – 1 000 000	84 471	72 354	87 860	103 852	117 519	136 960	155 119	171 299	168 114	189 519	202 627
W:	1 000 001 – 2 000 000	73 262	97 240	118 859	138 468	154 637	182 066	208 757	234 042	233 961	276 656	320 251
X:	2 000 001 – 5 000 000	18 646	53 204	68 013	74 733	86 498	93 138	104 030	112 418	109 218	132 308	158 844
Y:	5 000 001 +	3 646	36 470	54 084	55 006	65 535	62 633	68 178	72 967	65 287	86 339	105 178
Total		**3 041 050**	**917 029**	**1 038 558**	**1 119 073**	**1 197 878**	**1 275 628**	**1 352 494**	**1 415 099**	**1 379 115**	**1 498 178**	**1 592 805**
	<= 0	107 895	-13 758	-13 685	-14 228	-13 689	-13 529	-13 862	-14 790	-15 062	-16 070	-17 852
	1 – 70 000	275 125	11 135	7 878	6 250	5 594	5 164	4 933	4 990	6 208	5 494	5 480
	70 001 – 350 000	1 890 583	372 825	379 409	370 020	353 787	332 282	310 333	288 229	280 731	261 031	244 441
	350 001 – 500 000	354 392	146 998	169 407	194 439	217 783	238 446	251 414	258 899	249 806	255 885	252 321
	500 000 +	413 055	399 829	495 550	562 593	634 403	713 266	799 676	877 770	857 432	991 838	1 108 415
Total		**3 041 050**	**917 029**	**1 038 558**	**1 119 073**	**1 197 878**	**1 275 628**	**1 352 494**	**1 415 099**	**1 379 115**	**1 498 178**	**1 592 805**

Source: SARS (2025)

However, this has a severe challenge on the consumers' expenditure as it shows that they are burdened and that the middle class is carrying the most weight. This is shown in Table 2.4, where the middle class makes up 18% of all taxpayers whose salary is between R180 000 to R500 000 per year (Visagie & Posel, 2013). When one compares row T in the table above, those middle-income taxpayers pay far more tax at R252 321 million compared to just R105 178 million at row Y, which is collected from the richest in the country. This table violates the principles of a good tax as far as equity is concerned because the middle class are carrying South Africa.

Table 2.5: An overview of the personal income tax system for the 2019 tax year: distribution of taxpayers, taxable income and tax liability by taxable income groups and taxable income bands

	Number of taxpayers	% share of total	Taxable income	% share of total	Tax liability	% share of total
0 - 70 000	7 379 060	49,2	201 704	7,8	4 246	0,8
70 001 - 150 000	2 643 913	17,6	273 354	10,6	12 623	2,5
150 001 - 250 000	1 775 620	11,8	349 924	13,5	36 793	7,3
250 001 - 350 000	1 174 786	7,8	348 006	13,4	52 763	10,4
350 001 - 500 000	935 570	6,2	387 686	15	75 492	14,9
500 001 - 750 000	597 062	4,0	360 777	13,9	89 992	17,8
750 001 - 1,000 000	232 749	1,6	199 561	7,7	59 033	11,7
1,000 001 - 1,500 000	149 870	1,0	179 004	6,9	59 095	11,7
1,500 001 +	99 426	0,7	290 106	11,2	115 834	22,9
0 - 189 880	10 914 576	72,8	628 713	24,3	30 874	6,1
189 881 - 296 540	1 607 354	10,7	396 560	15,3	51 489	10,2
296 541 - 410 460	1 007 792	6,7	361 436	14	63 296	12,5
410 461 - 555 600	570 014	3,8	274 428	10,6	59 250	11,7
555 601 - 708 310	341 903	2,3	213 419	8,2	54 144	10,7
708 311 - 1 500 000	446 991	3,0	425 458	16,4	130 982	25,9
1 500,001+	99 426	0,7	290 106	11,2	115 834	22,9
Total	**14 988 056**	**100,0**	**2 590 122**	**100**	**505 871**	**100,0**

Source: SARS (2025)

More current data on the percentage of the middle class which contributes to the tax system is shown in Table 2.5. It shows that in 2019, the middle class made up a total of 32.6% of total taxes. And this is why there should be a more concentrated focus on the wealth tax.

2.5.4 Wealth tax

This section will discuss the wealth tax with the view that it is needed to assist in weighing off the tax burden on not only the middle class but the whole economy. The idea of a wealth tax is one that has been heavily debated in South Africa, but in essence, the wealth tax is not new to the Republic and has had a long history. The definition of a wealth tax according to Ernst and Young (2015:12), is:

> "a levy based on the aggregate value or stock of all assets belonging to an individual (or in some cases, a household), including … housing, cash and other bank deposits, money funds, savings in insurance and pension plans, investment in non-owner-occupied real estate, unincorporated businesses, corporate stock, financial securities and personal trusts. In other words, the assets typically accumulated by the wealthy**."**

Another definition of a wealth tax could be a tax on the total market value of assets owned. The wealth tax is also known as a capital tax, equity tax, or net worth tax. Some of the variables of wealth tax are personal assets, savings (insurance & pension plans), investment in real estate, cash/bank deposits, and corporate stock. It is also another form of increasing government revenue or finance (Hyman, 2011). A broader definition of wealth is a property tax, and this is opined by Bird (1991:323).

The concept of wealth has been defined by Hyman (2011) as an accumulation of assets in the form of inheritances, gifts as well as not spending one's entire income. In South Africa, the top 10% of the population hold 90% of the wealth as a result of the injustices of apartheid, and so the debate on the wealth tax has gained much attention, and rightly so. The distribution of wealth in a country is a result of historical incidents, and these are entrenched or supported by the law. For instance, to preserve wealth, one secures it in the form of trust funds, stocks, and securities. However, the main point is that wealth is a constant intergenerational transfer of income, which causes the wealthy to have a head start in life, especially when it comes to the accumulation of assets, such as real estate and automobiles.

As suggested at the beginning of this section, the wealth tax in South Africa is not new and has been in place for decades. There are three specific types of wealth taxes in South Africa, and they include (Arendse & Stack, 2018):

i) A wealth transfer in the form of estate duty as per the Estate Duty Act No.45 of 1955 (Union Gazette Extraordinary, 1955)
ii) Donations tax as per Sections 54 and 56 of Income Tax No.58 of 1962 (Government Gazette Extraordinary, 1962) and
iii) A wealth transfer in the form of securities as per the Securities Transfer Act No.25 of 2007 (Government Gazette, 2007)

While indeed a wealth tax is present in South Africa, what has never been taxed is wealth holdings or the wealth of individuals.

There is a strong concern regarding taxing individuals, as it could have many implications, such as capital flight and low tax yields. It could also discourage entrepreneurship and the accumulation of wealth itself. There could also be high administrative costs of collecting this tax, along with increased tax avoidance. South Africa has an income tax and a consumption tax that have been working relatively well together, albeit with all the decades-long debates about how they should be structured. The addition of a wealth tax poses the question of whether it will also be integrated into this tax base relationship.

In many OECD (Organisation for Economic Co-operation and Development) countries, the wealth tax has been abolished for quite some time, and the redistributive impact of tax revenue has proven to be less effective in these countries over the 1990s (Hinrichs, 2009).

However, Germany is starting to revive its wealth tax and based on a proposal which was drafted in 2012 by several red-green governed Bundestag, it is estimated that a wealth tax could generate 20 billion euros a year in government revenue (Hinrichs, 2009). The same trend in the concentration of wealth exists in Germany as in South Africa, where, from a 2011 estimated net wealth of 8 600 billion euros, the top 1% of households owned 32% of this total wealth.

The idea of equity now comes into play, and with this idea comes the debate on whether a wealth tax is fair to the people who are paying it and to those who are

receiving it. Certainly, in the South African context, one can easily deduce that the tax is fair in the direction of its recipients. Evans (2013) supports this notion by noting that a wealth tax will promote vertical and horizontal equity, promote efficiency, and signal to poor people that they have not been forgotten. A 'Poverty Trends in South Africa' report released by the Statistician General reports that poverty has been on the incline since 2015 (Statistics South Africa, 2025:1). Furthermore, the report indicates that over 30,4 million people were living in poverty in 2015. These statistics alone are enough to justify the importance of tax distribution, and more so, the wealth tax. One of the aims of the Katz Commission in 1987 was to improve fairness, along with improving economic performance overall and this can be achieved with a wealth tax on holdings.

2.5.5 Value added tax

Prior to what is known as the Value Added tax, there was a general sales tax (GST) in South Africa which started in 1978 and ended in 1990. VAT was instituted in September 1991, which shows that the government implemented a tax reform or change to their tax policy design (Mabugu & Simbanegavi, 2015).

VAT is an indirect tax imposed at every stage of commodity production or market transactions (Black, Calitz & Steenekamp, 2016:198). VAT is charged at 15% on all goods (Haines, 2018). The 2025 Budget Speech recently announced that VAT will not increase by 0.5% in 2025 and also not increase by 0.5% again in 2026 as was initially planned (National Treasury, 2025). This was certainly unconventional fiscal policy, but one way in which the state justified this was by noting a revenue gap of R22 billion in 2024 (National Treasury, 2024). Due to a dispute amongst the government of national unity (GNU), the budget was rejected, and the VAT stayed at 15%.

VAT is thought to be an efficient method of taxation because it is almost invisible and because it is more of a form of consumption tax that taxes what individuals buy rather than what they earn. Obiakor, Kwarbai, and Okwu (2015) also find positive sentiments about VAT as they assert it has a significant positive effect on households in Nigeria.

When one considers the efficiency of VAT collection, one notes that it is efficient because it is taxed on all goods and services at different stages of production, and it is administratively easy to collect. However, like the flat income tax rate, VAT is a regressive tax in that as incomes increase, the tax rate still remains unchanged at a

certain percentage. Therefore, when equity is considered, it is very unequal because VAT constitutes a large proportion of income for the poor versus the wealthy. The other reason why it is not equitable is that it charges at every stage of production, thereby causing added costs to the production process of goods and services. According to Adegbite (2018), VAT has a negative effect on household consumption expenditure in Nigeria. Using a General Method of Moments study of 15 European countries between 1961 and 2005, Alm and El-Ganainy (2013) also find an adverse impact of VAT on consumption expenditure. They find that a 1% increase in VAT decreases consumption expenditure by almost a percentage in the short run and even larger percentage in the long run.

In a panel study of ten years from 2002-2011 using a random sampling of 356 tax officials and 353 households with VAT rated goods, Taiwo and Murufu (2016) find that VAT and consumption expenditure are cointegrated and that VAT necessitates the increase in consumption expenditure.

Figure 2.4 below shows the amount of VAT that the revenue service collects from different industries, of which the highest comes from the financial industry at R44 billion, and the second comes from wholesale and retail trade, where most consumption expenditure occurs.

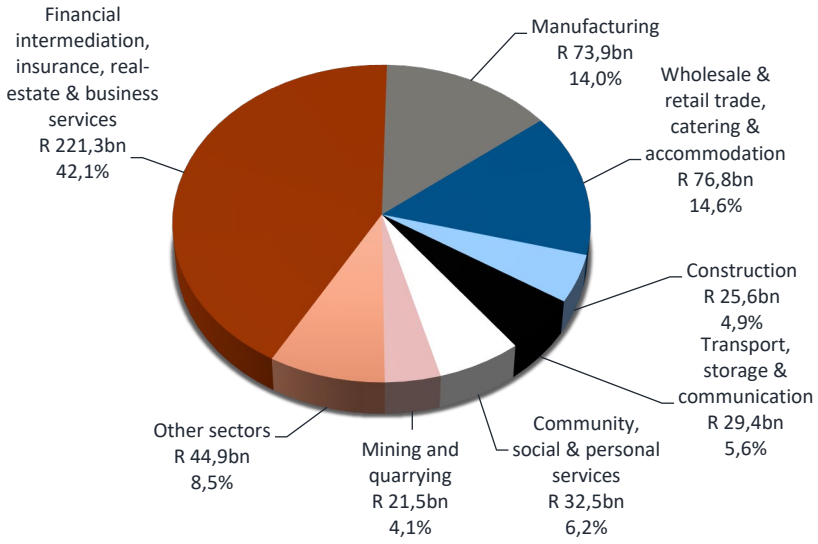


Figure 2.4: VAT collection for 2025
Source: SARS (2025)

It is quite disconcerting that VAT is calculated according to vendors, imports and industries and yet there is no exact measure of how it affects the consumer. This is why it is a deterrent to the well-being of the individual and households, and continues to assert the stance of this study, that taxes are a burden on consumption expenditure.

2.5.6 Fuel levy

The fuel levy is an excise tax levied on petroleum products such as petrol and diesel and is a key source of government revenue. The key function of the fuel levy is the maintenance of roads. Van Rensburg and Krygsman (2020) assert that the fuel levy is justified under the principle of fairness and equity because it charges those who use the resource. This is called the user-pay principle. While this is the case, the levy still burdens fuel users since it contributes adversely to consumers' expenditure. On the other hand, Mabugu, Chitiga and Amusa (2009) disagree with this statement. They postulate that there are low welfare effects of increasing the fuel levy. They found this conclusion in their study of a hypothetical 10% increase in the fuel levy at a provincial level. The 2022-2024 Budget also supports their study by leaving the general fuel levy unchanged; however, it has now increased in the 2025 Budget due to proposals by the government of national unity (GNU). In addition, there has also been a diesel refund relief for primary sectors (Budget Review, 2025). The petrol price in South Africa depends on global markets' crude oil price, where high oil prices may lead to

high costs of production, thereby increasing general prices and consumption expenditure (Habanabakize, 2021). Ncanywa and Mgwangqa (2018) also support the notion that the fuel levy is a burden on consumers in the VECM study of South Africa from 1988-2015 using quarterly data.

2.6 CONCLUSION

This chapter has provided a conceptual framework of the study. It started with the introduction in Section 2.1, followed by Section 2.2, which dealt with the concept, definitions, components, and case studies of consumption expenditure, unpacked at length. Section 2.3 highlighted consumption expenditure and household debt. Section 2.4 gave a brief discussion on consumption expenditure and government expenditure on social protection. Section 2.5 expounded on the South African tax system, how it relates to the study's variables, as well as a discussion on a possible remedy for the tax burden of South Africa, which is the wealth tax.

CHAPTER THREE

ECONOMIC CRISES AND GOVERNMENT DEBT

3.1 INTRODUCTION

There have been several global economic crises, all revealing a common trend. This trend is that they are associated with an adverse effect on consumption expenditure. Section 3.2 will discuss several economic crises across decades, starting from the 1930s with the Great Depression to date. These crises include the great depression, the OPEC oil price shock, the Asian financial crisis, the global economic crisis, the European debt crisis, COVID-19, and the Stock Market Crash. Section 3.3 of the chapter will discuss government debt, how it is categorised under foreign and national, as well as how it relates to consumption expenditure. Section 3.4 concludes the chapter.

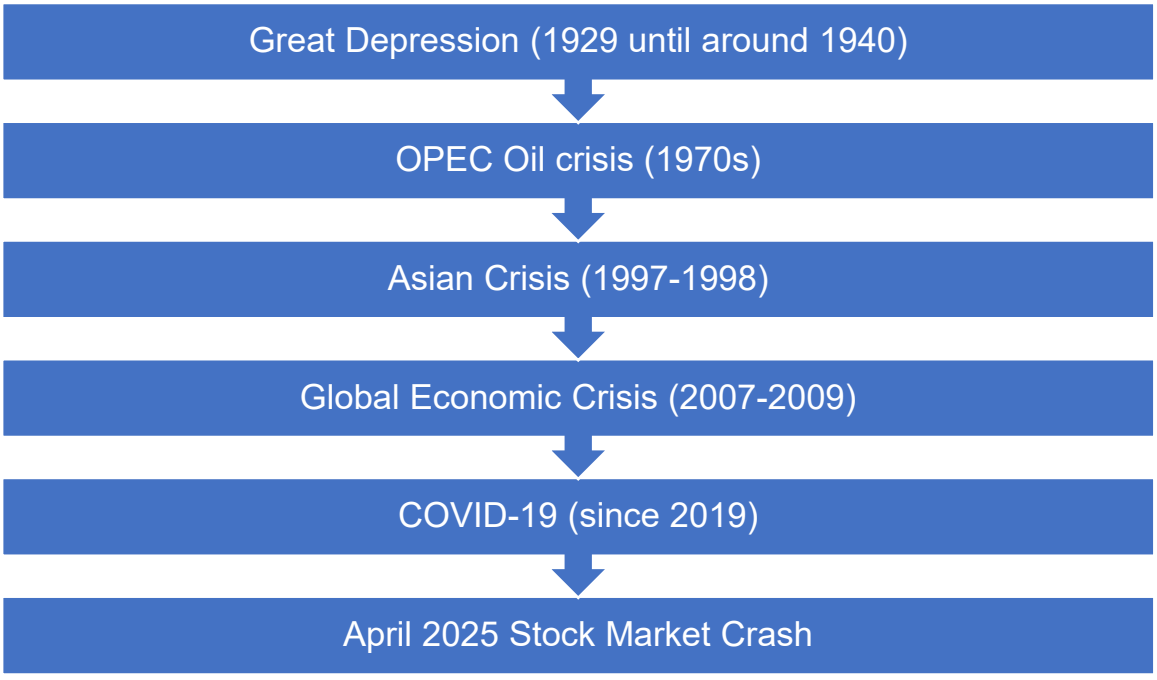


Figure 3.1: A timeline of economic crises
Source: Author (2025)

An economic crisis can be dissected into several categories, of which the main two are a banking crisis and a currency crisis. There are a few differences between the two, where a banking crisis is signalled by the financial sector experiencing a large

number of defaults, an increase in the frequency of bank runs, increased liquidity support for banks, bailouts, and bank closures (Dutt & Padmanabhan, 2011). A currency crisis is more defined by changes in the exchange rate system, where you find either a sharp correction in the country's exchange rate or a depreciation in the currency due to capital flight or a reduction of consumer confidence. In a currency crisis, there is at least a 20% increase in the currency's nominal depreciation and at least a 10% increase in the depreciation of the exchange rate. A currency crisis is far easier to measure or analyse due to the ready availability of data. Dutt and Padmanabhan (2011) find a strong correlation between economic crises and consumption expenditure. In their study of 99 developed and developing countries from 1960-2003, they find that 6.4% of their entire sample contained economic crises. They use an ARDL model, the Arenallo-Bond GMM model estimation, as well as the Pesarin-Smith mean group and pooled mean group estimator, to arrive at this conclusion. More importantly, they find that consumers respond to economic crises in the following ways: first, they change how much they spend, and second, they alter the composition of their consumption expenditure, which means they may allocate their spending to different classes of goods. Lastly, there is a marked variation in patterns of consumption across developed and developing countries.

3.2 ECONOMIC CRISES

3.2.1 The Great Depression

The great depression, also dubbed the Great Contraction, is one of the earliest economic crises in economic history and introduced the globe to the concept of contagion. It occurred in the 1930s and proved devastating to the American economy. Its main cause was the Wall Street market crash in late October 1929. Using Romer's (1990) hypothesis based on share price variability, the uncertainty that came with the stock market crash of 1929 caused a significant decrease in durable goods in 1930. According to Romer (1990), the greatest decrease in total consumer spending was in 1932 at 9%. However, Greasley, Madsen, and Oxley (2001) contend that there was also a powerful decrease in the spending on non-durable goods which affected consumers beyond 1930, and this decrease accounted for 72.4%. This contention is

carried out in their study which uses a GARCH model and Schwert's (1998) price volatility measure.

There was also the Dust Bowl in 1930, which was a drought, and it created a food panic (Tapia Granados & Diez Roux, 2009). A bank panic in early 1931 saw the unfortunate subsequent failure of banks in 1933. This was due to citizens demanding more currency as they drew down on money stock because of the collapse of the gold standard (Frideman & Shwartz, 1963; Anderson & Butkiewicz, 1980). This subsequent failure of banks also caused them to implement deflationary policies (Eichengreen, 1992; Ferderer & Zalewski, 1994). Coupled with this, there was also a widespread increase in unemployment, with the government having to take measures to support its citizens. It did so by providing social safety nets and acquiring more government debt. However, due to the collapse of the gold standard, the economy did not have spare capacity, had a decrease in investment, and thereby adversely affected consumption expenditure (Greasley, Madsen & Oxley, 2001). The great depression was also exacerbated by the Second World War in 1939. While the depression started in the United States, it spread out to the rest of the world.

3.2.2 OPEC Oil Price Shock (1973)

Energy is one of the most important inputs to production and sources of economic growth, and with its scarcity comes the slowing down of productivity and even recessions. The 1973 oil crisis started on the 19th October of that year and was an embargo where the price of a barrel of oil was raised by a staggering 70%, and by mid-1980, the price of crude oil had increased nearly twelvefold (Schumacher, 1985; Gately, 1984). It was precipitated by the Yom Kippur War (an Arab-Israel war), and the US was one of the first countries to be sanctioned by several Arab countries, including Saudi Arabia and Libya (Zulkifli & Haqeem, 2022; Schumacher, 1985). Israel was also affected as it found itself having to import oil from Venezuela (Issawi, 1978). The main reason for the embargo towards the US was its supply of military equipment to Israel, which was at war with Arab countries at the time.

The key macroeconomic variables that were affected were unemployment and inflation. The manufacturing industry was also severely and adversely affected. There was an increase in prices, unemployment, and wage stagnation, which had a negative

impact on consumption expenditure. In May of 1975, there were job losses of 8.5 million Americans which increased their unemployment by 9.2% (Zulkifli & Haqeem, 2022; Issawi, 1978). There was also an increase in inflation, a reduction in real output and a decrease in capacity utilisation.

There were many adverse effects on the US in this regard, as most of its sectors were based on the reliance on Middle Eastern oil (Gately, 1984). One such sector was the automotive industry. Many of the automobile firms at the time had little regard for fuel economy and so built automobiles with large engines that used high-energy cylinders (Zulkifli & Haqeem, 2022). Two particular companies include Ford and Chrysler. Figures 3.2 and 3.3 below show a significant decrease in 8-cylinder units for engines from 1976 and an increase in the use of 4-cylinder engines. This was because the 8 cylinders required the automobile to consume much more energy, while the 4 cylinders were not as heavy on fuel consumption.

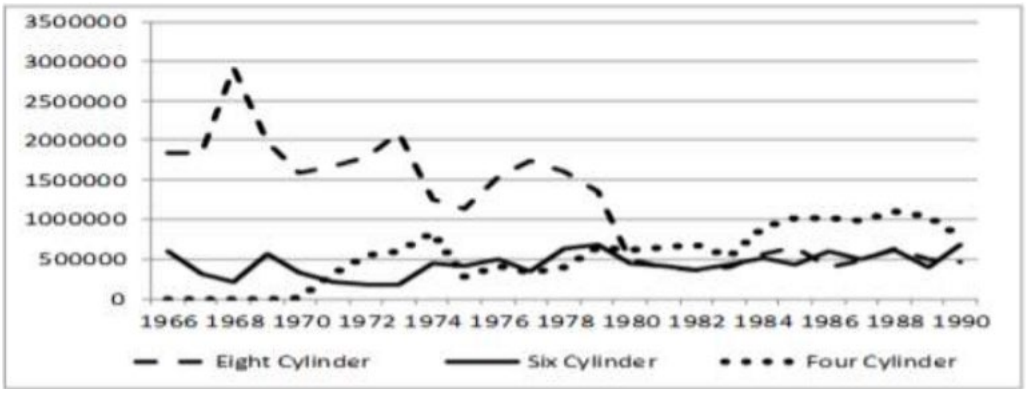


Figure 3.2: Ford unit production by cylinders
Source: Ward's Automotive Yearbook (1990)

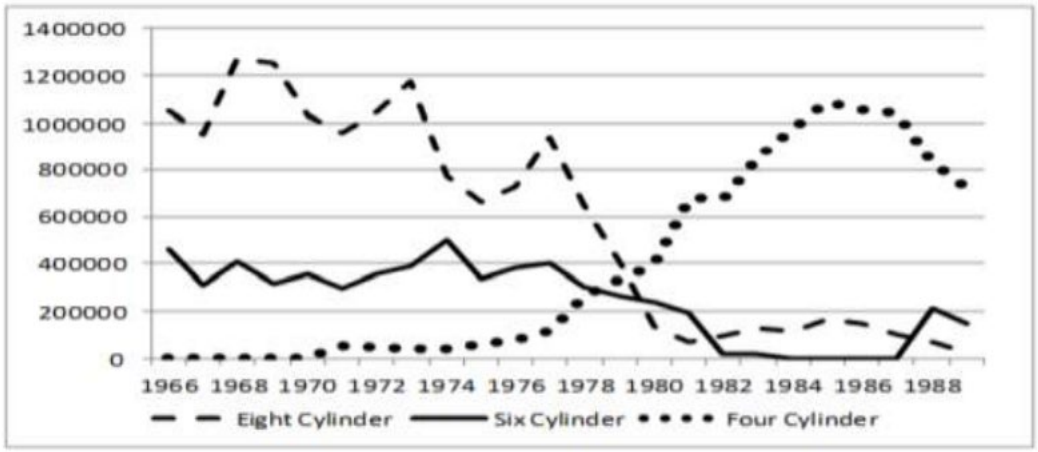


Figure 3.3: Chrysler unit production by cylinders
Source: Ward's Automotive Yearbook (1990)

While the oil crisis seems to have affected the US most, Broadstock, Wang and Zhang (2014) assert that oil shocks also had a significantly adverse impact on the ASEAN countries as well as East Asia. The literature is relatively silent on the impact of the OPEC oil crisis on consumption expenditure since the Arab countries made $130 billion from the embargo, as it was to their benefit.

3.2.3 The Asian Crisis

Asia has been known to be a productive continent and boasts high rates of economic growth, employment, and it is ahead of the world when it comes to innovation. This was also the case, especially in the 1980s, when Asian economies were booming. However, the 1990s saw the continent take a negative turn. The Asian Crisis is also known as the “Asian Contagion”. It occurred between 1997 and 1998 when Asia was affected by currency devaluations, starting with the collapse of the Thai baht when it was set to a floating currency (Rethel, 2020). In six months, several currencies depreciated between 20%-70%, and the stock market fell by 50% to 70% (Ang, 2001). There were also massive borrowings in US dollars, which were based on personal relations rather than project viability. As a result, when the currencies got devalued, it was difficult to pay back the US dollar-denominated loans (Ang, 2001). Several other factors that triggered the Asian crisis include poor governmental policies, lax regulation, the dependence on short-term debt denominated in foreign currency, fixed exchange rate regimes, and poor financial infrastructure (Islam & Siwar, 2005). In Malaysia in particular, some of the causes were the slowing down of foreign direct investment, an increase in short-term debt, and an economic recession in Japan (Islam & Siwar, 2005).

In Malaysia, in the year of the Asian crisis, there was a substantial increase in inflation, unemployment, the insolvency of financial institutions, and capital flight. There was also a contraction of GDP by 6.7% (Islam & Siwar, 2005). Furthermore, all low-income households significantly increased the share of their budget spent on food, thereby indicating a reduction in their welfare. Another factor was the increase in elasticity of luxury goods in the year of the crisis compared to the prior year (Islam & Siwar, 2005). This is also an indication of the reduction in the welfare of Malaysian low-income households. Thomas and Frankenberg (2007) also support this notion for Indonesia,

where the Asian crisis created a significant substitution towards staple foods such as rice. Kang and Sawada (2008) are also in agreement that Korean households coped during the crisis by decreasing their consumption of luxury goods.

3.2.4 The Global Economic Crisis and Greek Economic Crisis

The term global crisis is self-explanatory in that its contagion is spread worldwide, where key macroeconomic effects are experienced. Since it is a global phenomenon, one of the most impacted areas is international trade between countries, but more so, the financial markets. The 2008 global economic crisis started as an asset bubble that eventually “popped”. Banks were approving mortgage loans for consumers who couldn’t afford to pay or sustain their loans. Furthermore, these mortgage loans were being traded as financial products on the stock market until they had no return, as consumers were increasingly defaulting on their mortgage loans (Hasan et al., 2021). This eventually caused an American banking crisis, which later became a global economic crisis. This saw the Federal Reserve Bank increasing its debt to cushion the economy from the impact of this crisis.

A study by Meniago et.al (2013) conducted a study using a Vector Error Correction Model (VECM) to model the determinants of household debt, among them being consumer price inflation, GDP and household expenditure. The time period of the study places itself firmly in the timeline of the global economic crisis. While some scholars understate the impact of the economic crisis on South Africa and other African countries, this recession was the first in 17 years for South Africa (Hlongwane & Daw, 2022). Therefore the impact of the global economic crisis was certainly an adverse one in this country. Nkala and Tsegaye (2017) also note that household spending grew at a decreasing rate after the global economic crisis and only started to increase in 2014 at 2.6%.

Due to the widespread impact of the crisis, the UK was also affected. Basev (2014) conducted a study on the economic effect of the 2008 crisis on food consumption in the UK, and his focus was on food consumption. Using a convenience sampling research approach for a semi-structured questionnaire among 72 consumers, he made several inferences. He found that consumers still preferred meat products, did not change their brands, and still preferred healthy, environmentally friendly, and organic food. Martínez and Camara (2022) conducted a study on the nature of household spending after the 2008 crisis. They did so by using an input-output model for the years 2005 and 2015 for young Spanish households. They found that durable goods were the most affected when it came to a decrease in the Spanish consumer spending.

One of the risks of a country being in a union or group is the challenge of contagion. Since 2009, the European Union has faced the challenge of the Greek government debt crisis. At the core of the crisis is the substantial accumulation of government debt, coupled with generally low taxes, which contribute to low government revenue. Fearing contagion, many countries in the union threatened to leave it. According to Crookes et al. (2020) the impact of the Greek crisis found the official unemployment rate of 14,8% in June 2011, increasing to 17,2% in September 2011, and it stood at 26,1% in September 2014. This had a negative impact on the consumers and thereby denied them the opportunity to engage in any spending. According to Martínez and Camara (2022), there is a general disregard for interest rates and inflation when it comes to consumer spending in the EU. The European debt crisis also had an impact on Italy. A study by Maccheroni and Piccarreta (2018) examined the changing structure and consumption of households during 2008-2013 using monthly data from the Household Budget survey run by the Italian National Institute of Statistics. In addition, they categorised their data according to regions since there are some regions whose spending habits are heavily influenced by culture, despite economic crises. While conducting the study, they categorised their consumption spending criteria according to food and beverages and non-food. They found that the crisis affected the spending on food and beverages to a lesser extent than non-food items.

3.2.5 COVID-19

The SARS-CoV-2 coronavirus originated in Wuhan in late 2019. It started as a health crisis where various containment measures were instituted in China to avoid the spread of the virus. Unfortunately, because of the nature of globalisation, which is characterised by individuals travelling between nations, it was unable to be contained to China alone and spread over the world as a pandemic including South Africa (Chronopoulos, Lukas & Wilson, 2020).

Countries had to embark on measures to mitigate the spread of COVID-19, and that entailed a restriction on human contact. Policymakers were stuck with the hard decision to save jobs or to save lives. The restriction of human contact came in the form of what was known as lockdowns, which South Africa implemented. There was a restriction on provincial movement, and only essential workers were permitted to have mobility. This implied that the movement of individuals was restricted, causing various sectors in the economy to be shut down (Onyeaka et al., 2021).

Of these, the most affected were the services industry, especially tourism. The virus also caused a significant decrease in GDP, supply chains, and international trade (Fernández et al. 2021; Oravský, Tóth & Bánociová, 2020).

However, it must be emphasised that COVID-19 had an impact on consumption expenditure. In the US, aggregate consumer spending dropped by 13 percentage points, which was mainly comprised of travel and clothing (Coibion, Gorodnichenko & Weber, 2020). Put differently, spending dropped by $1 000 per month between January 2020 and April 2020. There was also a wave of defaults on mortgage loans, student loans, and automobile loans despite households spending less on discretionary expenses such as entertainment, recreation, travel, and transport (Coibion, Gorodnichenko & Weber, 2020). There was also a large decrease in planned spending on durables and a reduction in medical expenses, utilities, and food, although to a lesser extent. Coibion, Gorodnichenko and Weber (2020) note, interestingly, that countries which went into lockdown earlier than other countries experienced an approximate increase in unemployment of 14% and a macroeconomic outlook of an increase in the unemployment rate for the next 3-5 years. Their study was conducted using a survey drawn from the Nielsen database of the US, and this was combined to create a panel model.

A study from the SA- TIIED computed calculations and measurements associated with the losses incurred by South Africa due to Covid-19. When trying to quantify the impact on household consumption, they measured the impact on different income deciles. Surprisingly, 70% of households in the lower income deciles were not severely impacted by the crisis as they depend largely on social grants, which are immune to economic shocks since they are determined by an autonomous government (Arndt, et al., 2020). This study is supported by Chitiga-Mabugu (2021), who note that even though the higher income deciles were adversely affected by the crisis, the lower ones were cushioned by social grants. A study by Sucheran (2022) on COVID-19 and the accommodation sector also notes that the sector experienced a significant decrease in revenue and an even more pronounced impact on job losses. Chimeri and Oluwatayo (2022) conducted a South African study that used data from the Household and Income Expenditure Survey between 2010 and 2020. In their study they found that the COVID-19 induced crisis had a negative impact on disposable income growth and spending of households at a macro level.

A study on the impact of COVID-19 on consumption expenditure in Britain shows similar results to those of the US. According to Chronopoulos, Lukas and Wilson (2020), the virus and particularly the lockdowns created a strong increase in spending on groceries, persistent with panic buying and stockpiling. This was two weeks after the World Health Organisation (WHO) announced the virus as a global pandemic. In Ireland, consumer spending accounts for half of Gross National Income (GNI), thus it is an important variable as regards how it was impacted by COVID-19. In a study using card payment data, Byrne et al. (2020) assert an average decline of 3,3% in consumer spending between October and November 2020 compared to the same months in 2019. The study corroborates the studies by Coibion, Gorodnichenko and Weber (2020) and Chronopoulos, Lukas and Wilson (2020) regarding the significant decrease in consumer spending on travelling, entertainment, and recreational activities, as well as an increase in the reallocation of spending.

Consumer spending in Ireland during COVID-19 affected three channels, namely opportunity to spend, willingness to spend, and precautionary savings. This implies that restrictions on activity limited the opportunity to spend, due to uncertainty and job losses, consumers were less willing to spend, and there was a significant increase in precautionary savings. Byrne, et al. (2020) go further to say 50% of savings

accumulated during the virus were forced and concentrated mostly in the high-income households.

3.2.6 2025 Stock Market Crash

President Donald Trump started to impose tariffs on steel and aluminium products in 2018. He did so by invoking trade laws from the Section 232 Trade Expansion Act, which investors viewed as detrimental to the US defence companies (Klomp, 2025). The key targets of the tariffs were China, Canada, the European Union, South Korea and Mexico. According to Brown and Zhang (2019) the tariffs cover nearly 12,6% of all US imports. Furthermore, these tariffs can have an impact on one product at more than one time. For instance, the tariff on steel also has an impact on washing machines and on steel and wire conductors, thereby showing that washing machines are targeted three times by the tariff increase. On the 1st April 2025, President Donald Trump announced several more changes in US tariffs to other nations. Amongst these were South Africa and China, whose tariffs were significantly increased by 40%. Due to the macroeconomic and financial implications of these announcements, there was a negative abnormal financial reaction, which caused a stock market crash in the US around the time of these announcements. According to Stock TV (2025), the Japanese Nikkei 225 faced a loss of over 7% in a single session, and the Hong Kong Hang Seng index declined by over 13%. While this stock market crash did in fact cause a crisis, it is an economic crisis to a lesser extent in that it did not have a global contagion.

3.3 GOVERNMENT DEBT

Government debt has three distinct features in its development. Firstly, government debt surged because of the Second World War. Secondly, it was paid down rapidly between World War 2 and 1973. Lastly, there was a subtle rise in the debt-to-GDP ratios of industrialised countries from the 1970s (Holtfrerich et al., 2016). Figures 3.4 and 3.5 below show the government debt to GDP ratios of industrialised countries from 1885-2015 as well as 1970-2011 respectively.

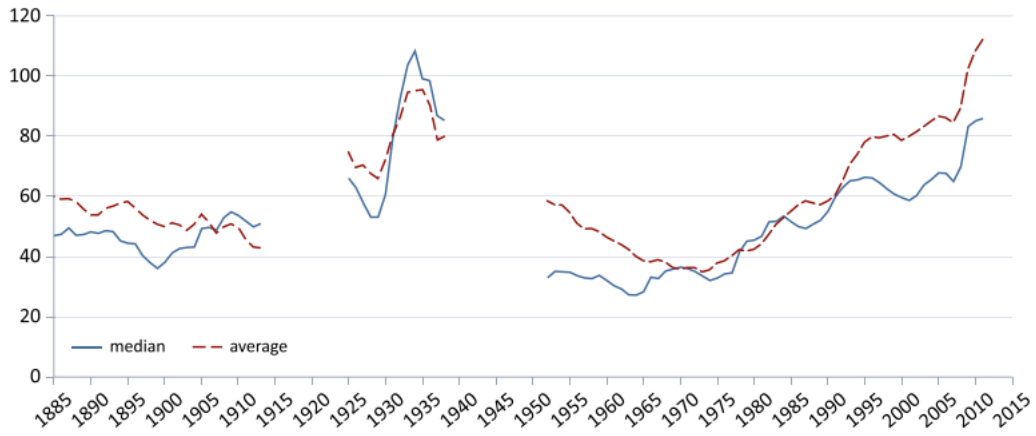


Figure 3.4: Government debt in percentage of GDP during 1885-1913; 1925-1938; 1952 - onward

Source: Holtfrerich et al. (2016)

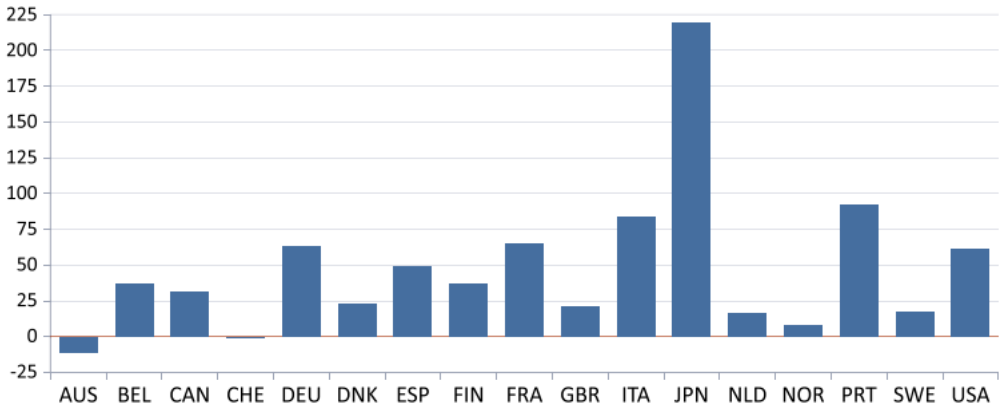


Figure 3.5: Government debt in percentage of GDP during 1970-2011

Source: Holtfrerich et al. (2016)

Government debt is persistent in any economy. That is, there is no country that doesn't have government debt; the only difference is the amount. Countries source their debt from local and international institutions like the African Development Bank (AfDB), the International Monetary Fund (IMF), and the World Bank. All governments must ensure that their countries are run as effectively as possible, and for this to occur, there needs to be some balance between revenue and spending. It is known that a budget balance is only a theoretical concept because no government operates under such a condition, and that creates neither a budget deficit nor surplus. Most countries are running at a

deficit, which is when spending exceeds revenue. So, some governments try to avert this by borrowing to sustain their spending. Government spending includes but is not limited to expenditure on education, housing, health, and social safety. Another key reason for borrowing is when a country has been met with some kind of macroeconomic shock, such as a pandemic, recession or economic crisis which have occurred throughout history, namely the Great Depression; OPEC oil crisis; Asian crisis; global economic recession, COVID-19 and to a lesser extent, the 2025 April stock market crash.

In 2020, the then Finance Minister, Mr Tito Mboweni presented the Supplementary Budget (National Treasury, 2020). This was the first of its kind in South African economic history and so reveals the gravitas of the COVID-19 recession. In this Budget, several funds were redirected to municipalities and social services (De Villiers, Cerbone & Van Zijl, 2020). The main purpose was for the various COVID-19 hospitals which had to be constructed/ initiated across municipal properties as well as food parcels. In addition to this redirection of funds, the government borrowed an amount of R500 billion from various global institutions (De Villiers, Cerbone & Van Zijl, 2020).

It has been established that borrowing is a source of finance for the government. This borrowing tends to create a steep increase in government debt, which has an adverse impact on consumption expenditure, and it does so through the taxation system. Continuous government borrowing is unsustainable, which leads governments to source their finance from taxes to pay back the principal and interest payments of the borrowed loans. The budgetary impact of COVID-19 has been significantly adverse across all economies. The Chinese government's debt balance rose to 46,5 trillion yuan in 2020. Yang et al. (2022) also note that the United States' federal bank also increased its debt to 126% in 2020. Unfortunately, South Africa has experienced the same fate as the aforementioned economies as far as budgetary impact is concerned.

3.3.1 National government debt

Public finances in South Africa are governed by legislation. The most important is the Public Financial Management Act 1 of 1999 (PFMA, 1999). The Division of Revenue Act of 2001 is also critical to discussing government debt. This Act is important because it speaks to how the state is supposed to manage its finances and how those finances should be divided. The mandate of the PFMA Act 1999 is:

> To regulate financial management in the national government and provincial governments; to ensure that all revenue, expenditure, assets and liabilities of those governments are managed efficiently and effectively; to provide for the responsibilities of persons entrusted with financial management in those governments; and to provide for matters connected therewith.

The Auditor General is also an important agent in making sure the state manages its funds accordingly and that this mandate is upheld.

Government debt is accrued when governments borrow funds from various institutions or creditors. This type of debt is known as sovereign debt. In South Africa, there is national or domestic debt as well as foreign debt. National debt in South Africa is accrued from finance institutions such as the Development Bank of South Africa (DBSA) and the African Development Bank. Otaki (2015) and Keynes (1936) note that debt is not necessarily a bad phenomenon; however, it must be used productively to reap its benefits. The downside to debt is the repayments because they are charged interest, and this is what is known as the borrowing requirement. In 2023, South Africa's national government debt was recorded at just over R5,25 trillion. Figure 3.6 shows that the national government debt has been relatively stable between 1990 and 2008 and growing at a slow pace. However, from 2008, the debt increased significantly and at a very fast rate. Since 2010, the loan debt has increased exceptionally every year to date. Both these steep increases occurred during the 2008 global economic crisis and the COVID-19 pandemic, respectively. This confirms the very new and scant literature that postulates a direct relationship between economic crises and government debt (Costa Junior, Garcia-Cintado & Junior, 2021). To highlight the fact that crises are correlated with government debt, the IMF pledged $110 billion in short-term loans to Thailand, Indonesia, and South Korea during the Asian crisis of 1997.

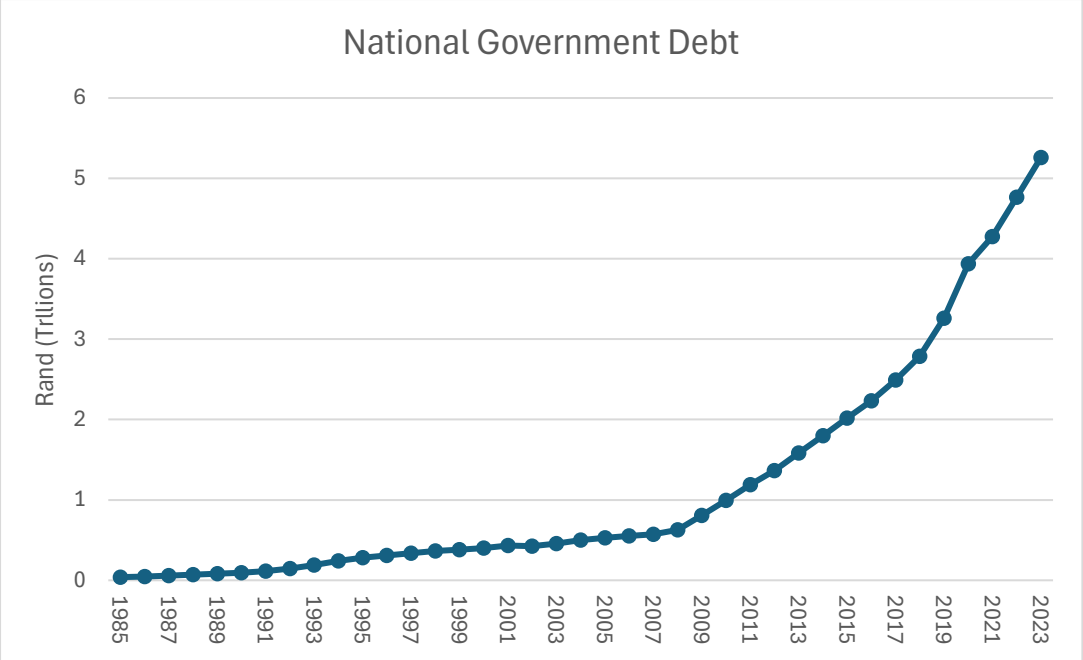


Figure 3.6: Total gross loan debt (1986-2023)
Source: Author's computation from SARB (2025)

Figure 3.7 shows both consumption expenditure and national government debt on one panel and it is shown that both variables have been steadily increasing since the beginning of the period. While consumption expenditure seems to be higher than government debt for most of the series, 2019 showed a sharp increase in government debt which was due to COVID-19. Government debt then outstripped consumption expenditure from there on.

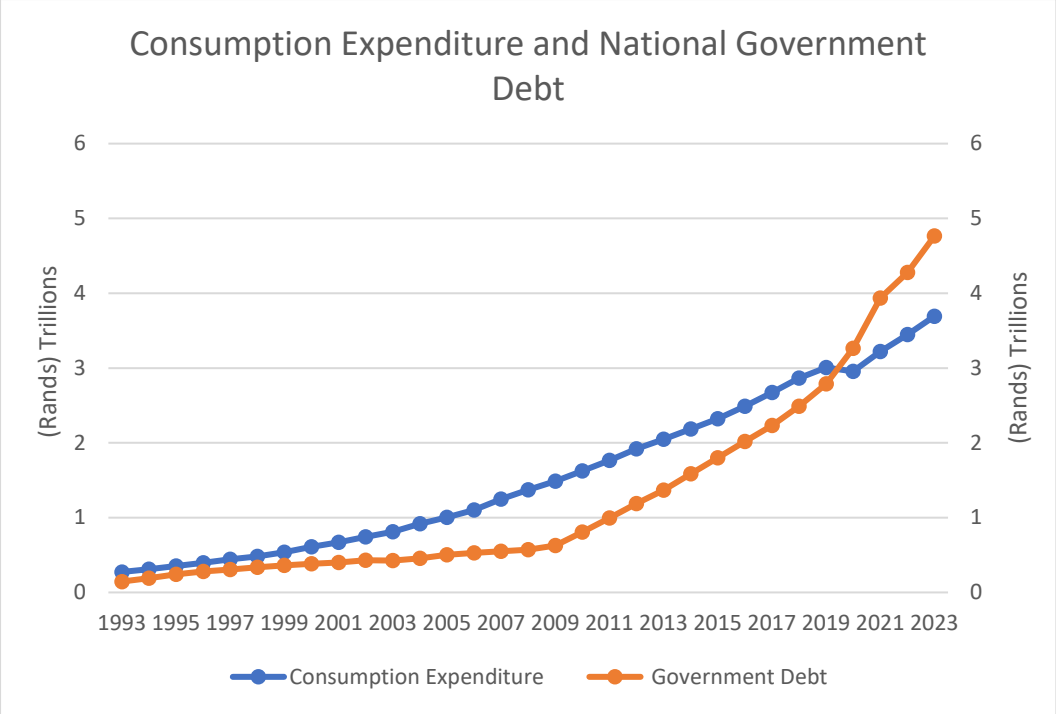


Figure 3.7: Consumption expenditure & national government debt (1993-2023)
Source: Author's computation from SARB (2025)

3.3.2 Foreign national debt

Fiscal policy is concerned with the way in which the government uses its budget to achieve certain objectives in the economy, either to stimulate aggregate demand or to contract it. For instance, the government can stimulate consumption by households by increasing its money supply. This asserts what has been established in the previous sections, that there is a correlation between consumption expenditure and government debt. There are several components of foreign national debt, including but not limited to foreign marketable loans, non-marketable loans, and the like.

Figure 3.8 below shows the amount of foreign loans which were acquired by the then Finance Minister, Tito Mboweni and it echoes de Villiers, Cerbone and van Zijl's (2020) study when he highlighted the various funds which were being accrued as part of the Supplementary Budget. This is shown by the sharp increase in foreign loans from almost R16 trillion in 2020 to R54 trillion in 2021.

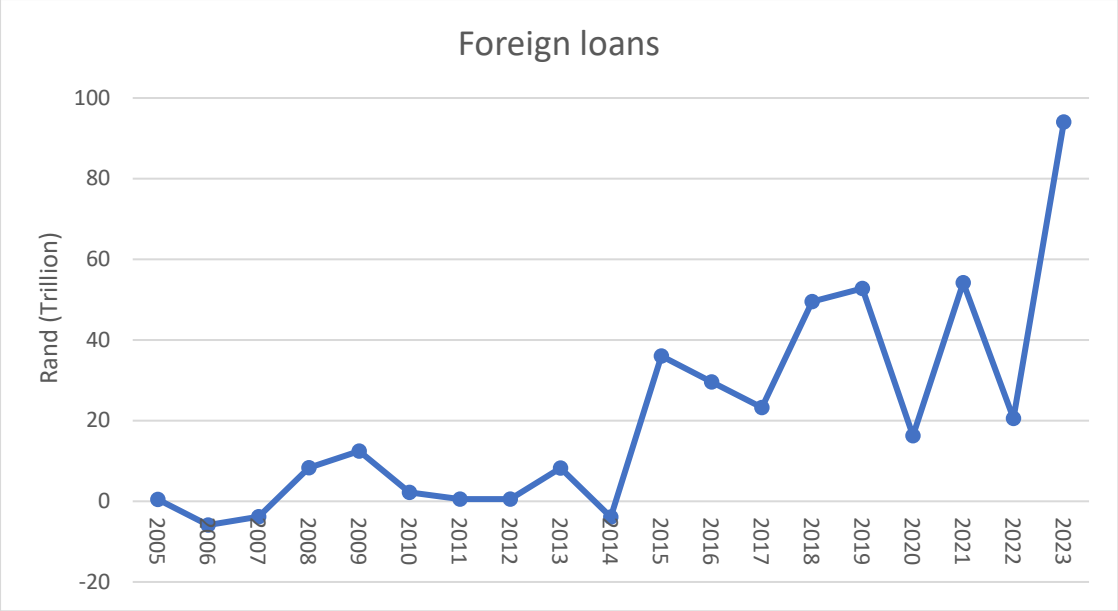


Figure 3.8: Foreign national debt (2005-2023)
Source: Author (2025)

Figure 3.8 shows a significant amount of foreign marketable loans that have been acquired by South Africa from 2005 to 2023. Notable increases have been during the global economic crisis and COVID-19. This corroborates the information regarding the Supplementary Budget of 2020 and that economic crises are associated with increases in government debt (Costa Junior, Garcia-Cintado & Junior, 2021; Otaki, 2015). This figure firmly supports the crux of the study.

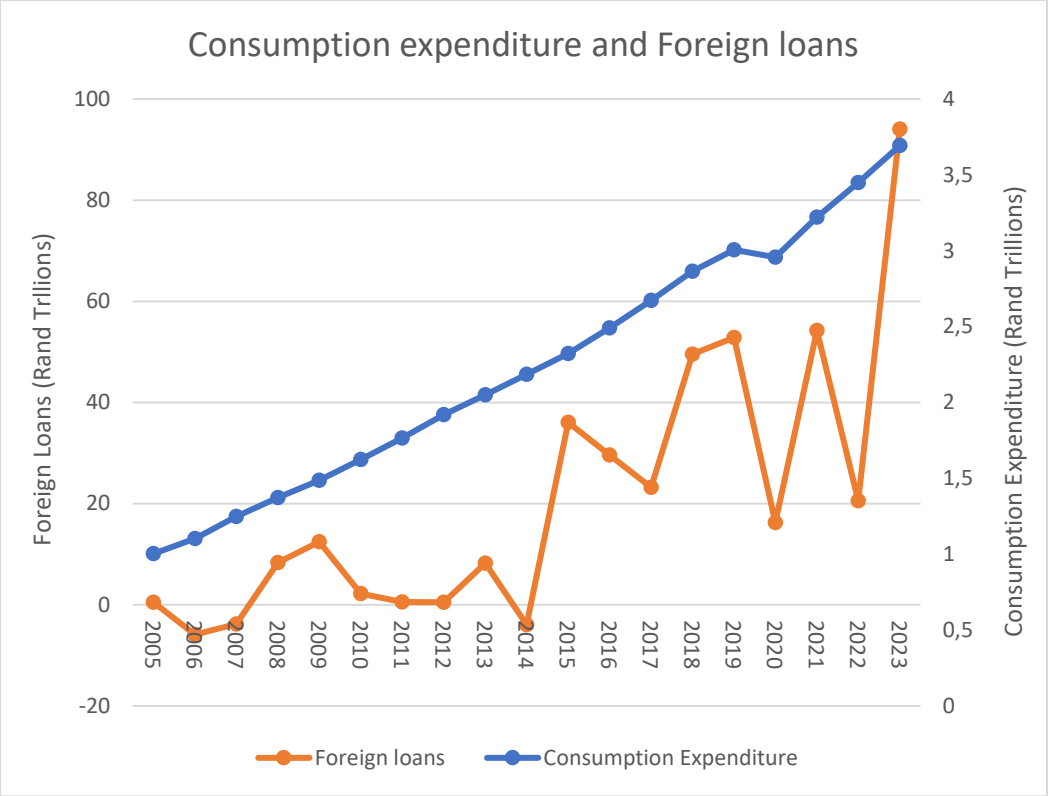


Figure 3.9: Consumption expenditure and foreign loans (2005-2023)
Source: Author (2025)

Figure 3.9 shows the stark difference between foreign debt and consumption expenditure. This leads the study to decide that the difference between debt and consumption expenditure is most visible with foreign loans, but more comparable with national government debt.

3.4 CONCLUSION

This chapter has discussed and unpacked several key economic crises from the past to the present. Section 3.2 discussed the Great Depression, the Oil Price Shock, the Asian Crisis, the Global Economic Crisis, COVID-19, and the Stock Market crash. All of these were unpacked and shown to have an adverse impact on the household and consumption expenditure. Section 3.3 of the chapter also discussed government debt, how it is categorised under foreign and national, as well as how it relates to consumption expenditure. Section 3.4 concluded this chapter.

CHAPTER FOUR

THEORETICAL AND EMPIRICAL LITERATURE

4.1 INTRODUCTION

The previous chapter gave an overview of economic crises, government debt and consumption expenditure. The following chapter will buttress this overview by discussing the theoretical and empirical framework of the study. The key sections include section 4.2, which details the theoretical literature on consumption theories, while section 4.3 discusses its empirical literature. Section 4.4 unpacks the theoretical literature on government debt, and section 4.5 follows with its empirical literature. Lastly, section 4.6 concludes the chapter.

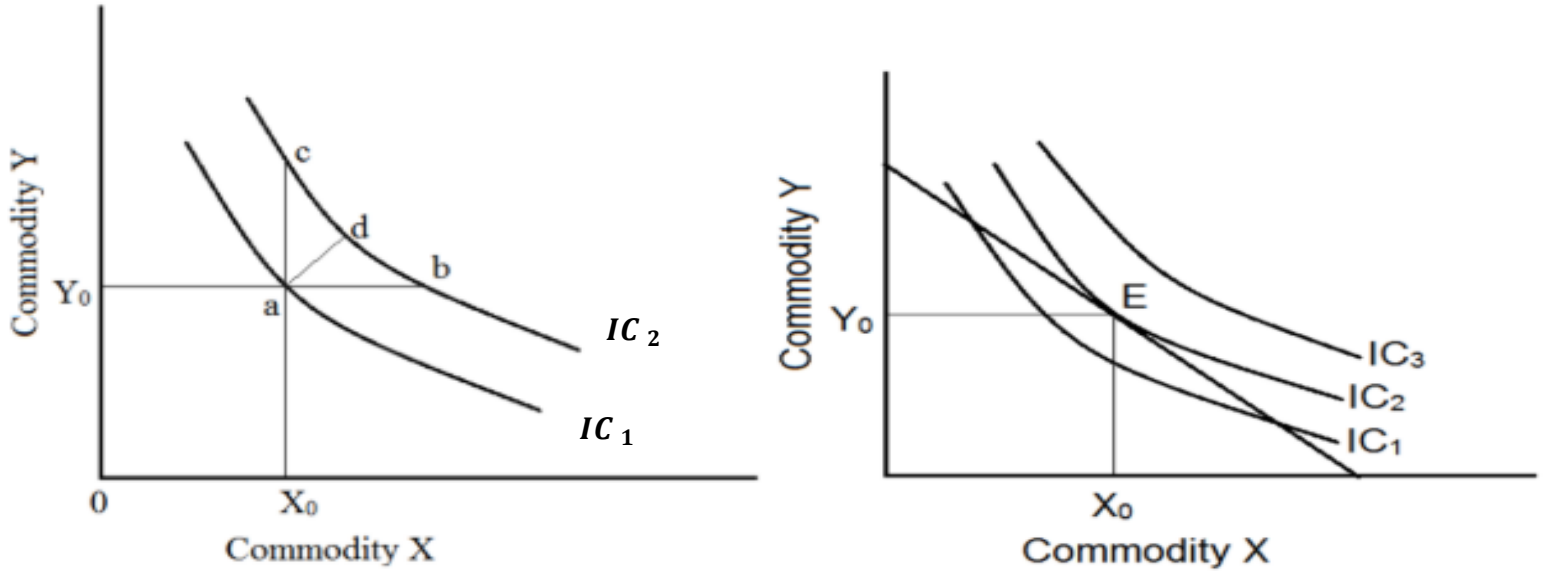
4.2 THEORETICAL LITERATURE: CONSUMPTION THEORIES

4.2.1 Utility theory

At the core of consumption theories are two main methodological and ideological differences in understanding the concept. There is the utility theory and the classical notions of consumption. The differences between these two methodologies and ideologies are an important guide to justify the method of choice for the study.

This section will discuss the utility theory. The concept of utility comes from utilitarian ideology, and the idea was first introduced by philosopher Jeremy Bentham (Mayer, 1972). It is subjective and subscribes to marginalist economics where a consumer is viewed as seeking maximum utility by pursuing their self-interest in the market. According to Mohr (2016) and Varian (2014), utility is a measure of satisfaction that expresses the degree to which a consumer or household is satisfied with a good or service. One's happiness can be quantified through various mathematical instruments.

The utility theory is grounded by microeconomic foundations and is more contemporary. It is mainly based on finding optimal outcomes in a highly mathematised background (Varian, 2014; Pindyck & Rubinfeld, 2013). There are two economic approaches to utility, that is, ordinal and cardinal utility. As regards ordinal utility, the emphasis is on ranking levels of utility through what is known as indifference curves, where an individual relies on their budget constraint and maximum utility when choosing their desired good or service.



a *b*

Figure 4.1: Indifference Curves

Source: Luenberger (1995)

Figure 4.1 shows two indifference curves on panel a, IC_1 and IC_2 which show the choice between two commodities, X and Y, where points a to d are known as consumption bundles. Utility theory posits that an individual's utility remains the same when he/she chooses any consumption bundle along the same indifference curve. That is to say, bundles b, c, and d all have the same utility (Varian, 2014).

Since utility theory emphasises the need to find the most optimal solution, point a is shown as the best choice of consumption for IC_1, where the individual consumes equal quantities of commodities X and Y. However, the higher the indifference curve, the more utility, so with access to a larger budget constraint, the individual would choose consumption bundles on IC_2 (Pindyck & Rubinfeld, 2013; Parkin et al., 2020). This is what is depicted on panel b, where IC_2 is preferred because it is along the available budget line and so point E becomes the optimal consumption bundle. On the other hand, the concept of cardinal utility emphasises utility in terms of magnitude, not relative preferences. This is known as total utility and marginal utility. In panel a of Figure 4.1, points a to d can also measure total utility, that is, the more you consume, the higher your utility. Following the earlier discussion of indifference curves, one can deduce that point d on IC_2 will supply the highest total utility. On the other hand, marginal utility can be positive or diminishing. With positive marginal utility, total utility increases while marginal utility also increases. However, with diminishing marginal utility, as total utility increases, marginal utility declines. Marginal utility is a comparison between two goods, which can be goods X and Y from Figure 4.1. For an optimal solution, the marginal utility derived from both goods should be equal. That is,

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y} \tag{4.1}$$

which states that the marginal utility of good X relative to its price must be the same as the marginal utility of good Y relative to its price. The utility theory is about quantifying consumption choices and measuring them from a subjective level, while that of Keynes (1936), Duesenberry (1949) and Friedman (1957) is based more on objectivity and social choices of consumption. The study chooses this stance of objectivity and social choices since Chapter 2 has shown that spending patterns are seldom mathematically calculated and rely on real needs and desires. Put differently,

there are not many people who will change their consumption patterns due to an increase or decrease in the interest rate (Keynes, 1936).

4.2.2 Classical schools of thought

As far as the abstract theories relevant to consumption and savings are concerned, Fisher (1983) in Dimand (2019) and Keynes (1936) are at the forefront. Irving Fisher's work was about consumers, but he conducted his analysis from a savings perspective. First, he focused on the rationality of households, which means households save purposefully. Second, he rejected that savings can be explained by current income alone. However, the crux of this study is to focus on the consumption aspect of household behaviour.

It could be said that as far as the theoretical soundness of economics is concerned, Keynes' theory of effective demand together with the quantitative adjustment of output rather than prices, is an impeccable contribution to macroeconomics (Snowdon & Vane, 2005:58). This is because his theory of output, when followed carefully, is both realistic and acknowledges the important role that government ought to play through its fiscus. By extension, Keynes' contribution also asserts that the national income depends on the volume of employment, and by extension, consumption expenditure, which can be created via government deficit (Keynes, 1937:247).

The principle of effective demand states that in a closed economy with spare capacity, the level of output (hence employment) is determined by aggregate planned expenditure, consisting of two components/ variables, consumption expenditure (C) by households and investment expenditure by firms (I) (Snowdon & Vane, 2005:58). The derivation of aggregate expenditure is a theoretical underpinning for several schools of thought. The standard equation is AE (Aggregate Expenditure) = C (Consumption) + I (Investment) (Keynes, 1937; Snowdon & Vane, 2005).

Keynes (1937) postulates that consumption expenditure is one of the main drivers of aggregate expenditure, which today we call economic growth. This foundational theory asserts that consumption is a positive linear function which is dependent on disposable as well as autonomous income, where consumers have a marginal propensity to

consume which is less than 1 (Bonsu & Muzindutsi, 2017; Snowdon & Vane, 2005; Ezeji & Ajudua, 2015).

The notion of consumption is closely associated with households whose theories were established as far back as the 1930s. Of these theories, there is the absolute income hypothesis; relative income hypothesis; and the life cycle hypothesis.

(i) Absolute income hypothesis

$$C = a + b\ Y_t \tag{4.2}$$

where C = consumption; a = autonomous consumption; b = marginal propensity to consume and Y_t = disposable income at time t, where time t can be a day, week, month, or year.

Modigliani (1949) and Duesenberry (1949) assert that one's consumption expenditure depends only on autonomous income and current disposable income, which is income at Y_t. Autonomous income allows for consumption when one has no disposable income which can be using credit, savings, or other financial products.

This theory is useful in introducing the basic determinants of consumption but in reality, it is more of an abstract idea than a practical incident. Consumption patterns have shown that disposable income and autonomous income are not the only determinants of consumption, and this is shown in the next theory.

(ii) Relative income hypothesis

$$C = a + bY_t + Y_{t-1} + x_1 + x_2 + x_3 + x_4 + \cdots + xk \tag{4.3}$$

The relative income hypothesis not only purports that one's consumption expenditure is dependent on one's current income at time t, but also other factors such as income at previous time periods, which is income at t-1, and other phenomena (Friedman, 1957). These phenomena are represented by variables x_1 to xk. These factors include any variables that may affect consumption, including but not limited to taxes, government debt, and even inflation. The study has therefore chosen this theory as its main motivation for using consumption expenditure as a dependent variable. This is because it accommodates the notion of the x variables being several factors which influence consumption expenditure. Furthermore, the marginal propensity to consume

does in fact cater for many determinants of consumption, which makes the theory all the more suitable for the study.

A theory closely related to the relative income hypothesis is the permanent income hypothesis. The pioneer of the theory was Milton Friedman (1957) whose theory closely follows Fischer's (1983) work in assuming perfectly rational behaviour. He goes further to say consumption depends on the interest rate as well as tastes and preferences. This is the origin of the previous sections on utility. The theory further postulates that a household has an infinite lifespan, and the consumption and needs of the household are consistent over time. It also asserts that rational households allocate their consumption so that the marginal rate of substitution this year and the next is equal to the discount rate. So, in the final analysis, the permanent income hypothesis takes into account future income while the relative income hypothesis only concerns itself with previous income (Mayer, 1972). However, the study still adopts the relative income hypothesis.

(iii) Life cycle hypothesis

Figure 4.2 : The Life cycle hypothesis curve

Source: Ketkaew, Sukitprapanon and Naruetharadhol (2020)

Ando and Modigliani (1963) cite the life cycle hypothesis as one of the ways to explain consumption expenditure. According to the scholars, their life stage is what governs how individuals undertake their consumption. Mayer (1972) also adds that the life cycle hypothesis is the only consumption theory which is not dependent on one's resources or wealth but subscribes only to an individual's time period, which is dependent on their entire lifespan. Figure 4.2 demonstrates this by showing that between the ages of 15 and 25, individuals consume more than they save, while between the ages of 25 and 65 they start to be cognisant of retirement and start to save. Thereafter, when they are over the age of 65, they dissave as they enjoy their retirement funds in their golden years. While Figure 4.2 depicts the life cycle hypothesis in three stages, Kooreman and Wunderink (2006) divide it into two life stages with the consideration of the interest rate as another relevant variable for consumption. They expand in the following way:

$$W_1 = (1 + r)W_0 + \mu_1 - p_1C_1 \tag{4.4}$$

$$W_2 = (1 + r)W_1 + \mu_2 - p_2C_2 \tag{4.5}$$

$$= W_0(1 + r)^2 + (\mu_1 - p_1C_1)(1 + r) + (\mu_2 - p_2C_2) \tag{4.6}$$

$$V(C_{1,}C_2) = U(C_1) + \left(\frac{1}{1+\delta}\right)U(2) \tag{4.7}$$

where W_0 is a consumer's initial wealth at t=0; C_1 and C_2 are the first and second periods of consumption respectively; μ_i is exogenous income at time 1, 2. p_i is the price level and time 1 and 2, while r is the interest rate. Equations 4.4, 4.5 and 4.6 explain the life cycle hypothesis. Equation 4.4 states that a consumer's wealth is dependent on their initial wealth, which is affected by the interest rate, exogenous income and the price of what they consume. Equation 4.5 shows the same information as 4.4, only for the second time period. Equation 4.6 is an expansion of 4.5 and reemphasises that your wealth at any point in time is dependent on your initial wealth. Equation 4.7 goes on to show the consumer's lifetime utility where δ is the individual's subjective rate of time preference. There are two assumptions that are critical to the validity of the life cycle hypothesis. First is the absence of estate so they save only for the purpose of their life span and not for future generations, and second, what is known as the proportionality hypothesis (Mayer, 1972). This is the allocation of consumption

over time which is independent of income, however this assumption can be relaxed, and the hypothesis will still hold (Mayer, 1972; Maringer, 1986).

4.3 EMPIRICAL LITERATURE FOR CONSUMPTION THEORY: RELATIVE INCOME HYPOTHESIS

It must be reiterated that the study has selected the relative income hypothesis as the most suited, and there are several empirical studies which buttress this. To elaborate, these studies support the stance that consumption expenditure is not only dependent on disposable income but several other factors. This aids the study in its use of its variables, which are government expenditure; GDP; Household Taxes; Value Added Tax; Fuel Levy; and inflation. A study by Tokoya et al. (2022) used an ARDL model to investigate the income and expenditure of households in Nigeria between 1986 – 2020. They found a positive relationship between consumption and income and a negative long run relationship between consumption and inflation. Bonsu and Muzindutsi (2017) use their ARDL model to find the determinants of household consumption expenditure in Ghana. Their study corresponds with that of Tokoya et al. (2022) regarding the associated long run relationship with inflation and they also find a positive long run relationship with GDP. Damane's (2018) ARDL model of Lesotho's annual data from 1982 – 2015 also finds a positive short run and long run relationship between consumption and income.

Another study which finds a negative relationship between consumption and inflation is by Nikbin and Panahi (2016) who conducted an ARDL model on Iran's annual data from 1978 – 2012. The other variables of their study include economic growth and interest rates.

An interesting Malaysian study by Ridzuan et al. (2014) captures economic crises in their ARDL model. They use dummy variables for the Asian crisis of 1997 – 1998 and the global economic crisis between 2008 – 2009. The variables in their model include domestic investment, government expenditure and economic growth. They find a positive long run relationship between consumption and the aforementioned variables. Sekantsi's (2016) study of Lesotho's consumption expenditure determinants between 1982 – 2013 finds a positive long run relationship between consumption and only income. This is after his ARDL model estimated a long run relationship between consumption, income, interest rates and inflation. While it is difficult to find a study

which includes the tax burden as a variable, Raut and Virmani (1989) find that the determinants of consumption expenditure do include taxes, along with permanent income, money supply and government expenditure. Furthermore, most studies tend to investigate the tax-growth nexus rather than the relationship between tax and consumption which further reiterates the research problem of the study (Amoh, 2019). One such is that of Koatsa, Paramaiah and Scona (2021) who use an ARDL model to model the relationship between taxes and economic growth in Lesotho using yearly data from 1988 – 2017.

A study by Garidzirai and Mapanga (2022) used an ARDL model to investigate the determinants of consumption expenditure in South Africa. Their study covered the sample period 1984 – 2021 where they used economic growth, interest rates, unemployment and inflation as their chosen variables. They found that unemployment, inflation and interest rates are detrimental to the consumption environment. The dynamic fixed effects models in the panel study by Adjei and Kajurová (2022) of 25 Sub Saharan countries during 2008 – 2013 show that past consumption has an effect on present consumption.

Table 4.1: Summary of empirical literature for consumption theory: Relative income hypothesis

Study	Sample	Methodology	Findings
Tokoya et al. (2022)	Nigeria 1986 – 2020	ARDL	The study supports the relative income hypothesis
Garidzirai and Mapanga (2022)	South Africa 1984 – 2021	ARDL	The study supports the relative income hypothesis
Damane (2018)	Lesotho 1982 – 2015	ARDL	The study supports the relative income hypothesis
Ridzuan et al. (2014)	Malaysia	ARDL	The study supports the relative income hypothesis
Sekantsi (2016)	Lesotho 1982 – 2013	ARDL	The study supports the relative income hypothesis
Nikbin and Panahi (2016)	Iran 1978 – 2012	ARDL	The study supports the relative income hypothesis
Bonsu and Muzindutsi (2017)	Ghana 1961 – 2013	ARDL	The study supports the relative income hypothesis
Khan (2014)	Pakistan: Household survey of 300 households in 2012	OLS Regression	The study supports the relative income hypothesis
Ishtiaq, Tauheed and Ishtiaq (2021)	Pakistan: 1986 – 2016	GMM, 2SLS, LIML, Box-Jenkins	The study supports the relative income hypothesis
Adjei and Kajurová (2022)	25 Sub Saharan countries: 2005 – 2018	Dynamic Effects Panel data	The study supports the relative income hypothesis

4.4 THEORETICAL LITERATURE: GOVERNMENT DEBT

There are several government debt theories, and they illuminate the importance of prudence when it comes to debt management by governments. The most pertinent of these theories are the Keynesian debt management theory (1936), the New Keynesian default risk theory and Ricardian Equivalence.

4.4.1 Keynesian Debt Management Theory

Keynesian debt management theory has always asserted that debt should be used for productive capacities. According to Gordon (1981), a weakening of the budget balance is sometimes necessary to improve the economy. That is, debt is not necessarily a bad phenomenon, only when it is used for productive capacities which will benefit the economy in future (Keynes, 1936). This is supported by Otaki (2015), who found in his study that public debt lowers the well-being of future generations. Appiah-Kubi et al (also adds that government borrowing is a double-edged sword where overborrowing and improper allocation of borrowed funds can lead to debt overhang. A productive capacity could be public capital expenditure, which is better known as infrastructure development (Nkosi, 2020). So, Keynes (1936) advocated debt accumulation for only a short period to benefit the economy in the long run. Keynes' notion on the impact and use of debt has been the fundamental principle of how other schools of thought understand or interpret government debt today. One such school is the New Keynesian school. It is also worth noting that Keynes had his own thoughts considering the possible influence of debt trajectories on the term structure of interest rates (Aspromourgos, 2018). This is interesting because it is known that one of the influences on consumption expenditure is the interest rate. And so Keynes reveals another channel through which government debt affects consumption, apart from taxation which has been the main thrust of the study.

4.4.2 New Keynesian Sovereign default risk Model

Post Keynesian theories of crisis have existed for a few decades. They are centred on the Minsky's financial instability hypothesis and Godley's stock-flow consistent approach (Keen, 2015). These theories are interesting and assert that private debt is what caused the global economic crisis of 2008. However, the theories do extend further. Arellano, Bai and Mihalache (2020) have pioneered a New Keynesian model

which factors in default risk and how that impacts the consumer. In this study, one of the variables is foreign debt, which puts forward the notion of the likelihood to default on debt. A unique stance that the model postulates is that the interest rate affects both the government and the consumer. This is because of the interest payments that come with borrowing and that the interest rate influences consumer spending behaviour (Blanchard, 2018). This is supported by Ndou and Gumata (2023), who find that government debt has a detrimental effect on household consumption due to a credit constraint brought about by the debt. As such, the study takes on this stance as far as government debt theory is concerned, as it expresses its crux.

While it is not one of the theories at the focal point, one can go further to introduce the notion that even debt overhang not only crowds out private investment but also has an adverse effect on private spending. Just as it reduces incentives to invest, it also does the same to the consumer when spending is concerned.

4.4.3 Ricardian Equivalence

There are other theories which explain the relationship between government debt and other economic variables, which in this case is consumption. One such theory is the Ricardian Equivalence. The government can support its expenditure through taxation or deficit financing (Hyman, 2011). According to Ricardian equivalence, the expansion of fiscal policy has no impact on the economy because consumers have myopic foresight (Barro, 1979). That is, when they note an increase in government debt, they adjust their spending accordingly and there is no adverse impact of the new debt level. Many studies, such as those of Sunge, Mufandaedza and Matsvai (2015), Osodiuru et al. (2018), and Wheeler (1999) refute the Ricardian Equivalence Hypothesis. And by extension, these studies support the notion that government debt is harmful to consumption expenditure. The study also refutes the hypothesis.

4.5 EMPIRICAL LITERATURE ON GOVERNMENT DEBT AND CONSUMPTION EXPENDITURE

Government debt has several implications on the economy and how it upholds its debt agreements has an influence on overall risk. Kim (2019) investigates the relationship between debt accumulation and default risk for the Eurozone during 2000 – 2015 using

dynamic OLS and fully modified OLS. He finds that the government has a tendency to default during the sovereign debt crisis and before the global economic crisis.

The impact of government debt on consumption is imperative to discuss. The study by Berben and Brosens (2007) found a non-linear relationship between government debt and consumption. In an ARDL model of the OECD countries from 1983 – 2003, they found that in countries with high government debt, an expansion in fiscal policy is crowded out by a fall in consumption. This firmly supports the New Keynesian default theory.

Pozzi, Heylen and Dossche (2002) also found that high government debt has the tendency to discourage private consumption because it tightens credit conditions. This corroborates the study by Ndou and Gumata (2023). Albuquerque and Krustev's (2018) study finds that indebtedness has a detrimental impact on consumption in 51 of the states of America using a panel regression from 1999Q1 – 2012Q4. In an empirical study by Hong, Wan, and Sun (2025), which uses panel data analysis, it is found that government debt significantly reduces consumption, where a 1% increase in government debt results in 0.22% decline in consumption. This was a Chinese study compiled through panel data analysis using data from 2012-2018. Another study by Lv and Zhang (2026) support these findings by noting that government debt also increases household consumption inequality. In Hayo and Neumier's (2017) study using a logit model, they also find that consumers make significant changes to their consumption after an increase in government.

Table 4.2: Summary of empirical literature on government debt: New Keynesian Default Theory

Study	**Sample**	**Methodology**	**Findings**
Arellano, Bai and Mihalache (2020)	8 Emerging Markets, 2004Q1 – 2019Q4	Panel regression	The study supports the New Keynesian default theory
Ndou and Gumata (2023)	South Africa, 2000Q1 – 2016Q1	VAR model	The study supports the New Keynesian default theory
Kim (2019)	Eurozone, 2000 – 2015	OLS and FOLS	The study supports the New Keynesian default theory
Berben and Brosens (2007)	OECD countries, 1983 – 2003	ARDL model	The study supports the New Keynesian default theory
Pozzi, Heylen and Dossche (2002)	19 OECD countries, 1990 – 99	Panel regression	The study supports the New Keynesian default theory
Albuquerque and Krustev (2018)	51 United States using a panel regression from 1999Q1 – 2012Q4	Panel regression	The study supports the New Keynesian default theory

4.6 CONCLUSION

This chapter has discussed the theoretical and empirical literature which concerns consumption expenditure and government debt. The chapter unpacked the utility theory as well as the consumption theories from the old school of thought. These theories include the absolute income hypothesis, the relative income hypothesis and the life cycle hypothesis. After a survey of all theories, the study asserts the relative income hypothesis as its stance. Amongst the government debt theories discussed, such as the Keynesian debt management theory and the Ricardian equivalence hypothesis, the study saw the New Keynesian default theory to be best suited for the study.

CHAPTER FIVE

RESEARCH METHODOLOGY

5.1 INTRODUCTION

The purpose of this chapter is to outline the estimation techniques which were used to generate the empirical results for this study. Section 5.2 starts by detailing the variables and the data sources. Section 5.3 discusses the definition of variables, while Section 5.4 discusses the pre-estimation diagnostics, where stationarity and unit roots will be outlined. Section 5.5 outlines the estimation techniques of the ARDL model, including bounds testing. Section 5.6 outlines the post-estimation diagnostic tests which were used on the ARDL while Section 5.7 concludes the chapter.

5.2 DESCRIPTION OF VARIABLES

Table 5.1: List of variables

The following table is a list of variables, their descriptions and their measurements. The table also provides the sources of the variables and their presentation in logarithm form.

Variable	Description	Measurement	Source / Calculation	Variables in Logarithms
Consumption expenditure	The quantifiable amount of spending attributed to individuals and households	ZAR million	Quantec Easy Data	LCE
Total foreign debt	Foreign government loans	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LTFD
Total national debt	Total gross loan debt	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LGD
Government expenditure	Comprises of government consumption and investment.	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LGEX
Income tax	Proxied as personal income tax.	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LIT
Fuel levy	A fee or fine for consumers of fuel. This applies to your major petroleum products, but in the study, it is more related to petrol and diesel, which motorists are charged.	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LFL
VAT	Value Added Tax is 15% of the price of any good. This 15% is then added to the final price. This tax applies to all purchases in South Africa	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LVAT
Government expenditure on social protection	Child Social Grants (CGS) are a proxy for social protection	ZAR million	South African Reserve Bank	LGEX_SP
GDP	Gross Domestic Product (GDP)	ZAR millions	Author's calculations from South African Reserve Bank (SARB) Online Statistical Query data	
Inflation	The general increase in the price level.	ZAR million	South African Reserve Bank (SARB) Online Statistical Query	LINF

Source: SARB (2025)

5.3 DEFINITION OF VARIABLES

The following section will describe the study's variables and justify their inclusion in the study.

Consumption Expenditure: This variable contains a wealth of data on South Africans' consumption expenditure. It includes both data on expenditure on durable, semi, and non-durable goods as well as expenditure on services (Raut & Vermani 1989; Maccheroni & Piccarreta, 2018). The durable goods include, but are not limited to, furniture, household appliances, computers, as well as recreation and entertainment. Semi-durable goods include, but are not limited to, motor car tyres, parts and miscellaneous goods. Lastly, non-durable goods include food, beverages, household power and fuel, as well as medical and pharmaceutical goods. With regards to expenditure on services, key services include rent, household services including domestic services, medical services, as well as transport and communication services.

Total Foreign Debt: This variable contains government debt which has been accrued outside of the country and is used as a proxy for economic crises. According to Gordon (1981), a weakening of the budget balance is necessary at times for the sake of improving the economy. That is, debt is not necessarily a bad phenomenon, only when it is used for productive capacities which will benefit the economy in future (Keynes, 1936). This variable includes a wide array of debts, but for the purpose of the study, foreign marketable bonds are what are used. This type of debt can be acquired from institutions such as the World Bank and IMF. This variable is also used as a proxy for economic crises**.**

National Government Debt: Total gross loan debt will be used as a proxy for national government debt. Amongst several definitions of government debt, the study has chosen this time series to illuminate how the government has funded its crisis recovery plans primarily from loan debt (Mothibi & Mncayi, 2019). Otaki (2015), and Keynes (1936) note again that debt is not necessarily a bad phenomenon; however, it must be used productively to reap its benefits

Personal Income Tax: This tax is one which has a long history of being levied on consumers. As such, it affects all income deciles and Living Standards Measurement (LSM) categories, apart from those taxpayers who are not required to do so. It is

administratively easy to collect because PAYE is collected by SARS through the employer on every monthly salary date. The purpose of personal income tax is to fund the state to cover its expenditures or pay for debt, whether national or foreign. Personal income tax accounts for the government's highest revenue collection. In the OECD in 2012, personal income tax accounted for 29% of government revenue (Zhang, 2017). As such, the study chose to use this variable. This variable will be proxied by the current taxes on the income and wealth of households (Steenekamp, 2016).

Government Expenditure and Government Expenditure on Social Protection: The category of government expenditure in the study: Consolidated general government expenditure, as well as that which is spent on social protection. The study has chosen this category of government expenditure because social protection is one way in which the government can relieve consumption expenditure; however, it is a burden for taxpayers (Hyman, 2011).

Gross Domestic Product (GDP): One of the key components of GDP is consumption. Thus, it is important for it to be included in this study's model to gauge the correlation and causality between the two variables (Mothibi & Mncayi, 2019).

Fuel Levy: The fuel levy is a form of tax that is paid by South Africans who consume fuel products. The levy applies to both petrol (93 and 95) as well as diesel. The main purpose of this levy is to contribute to road funding through the Road Accident Fund (Van Rensburg & Krygsman, 2020; Mabugu, Chitiga & Amusa, 2009). The tax is administered by the National Treasury, which later disburses the revenue to the Road Accident Fund. Habanabakize (2017) notes that the fuel levy is related to consumption expendituture through inflationary growth.

VAT: Value Added Tax is a type of tax that is applicable to all purchases and currently stands at 15% in South Africa. It is also a tax that is collected at the point of sale. One would say it is a regressive tax because it becomes less with more expensive purchases. VAT constitutes a large proportion of income for the poor versus the wealthy. The other reason why it is not equitable is because it charges at every stage of production, thereby causing added costs to the production process of goods and services. According to Adegbite (2018), VAT has a negative effect on household consumption expenditure in Nigeria. Using a General Method of Moments study of 15

European countries between 1961 – 2005, Alm and El-Ganainy (2013) also find an adverse impact of VAT on consumption expenditure.

Inflation: Inflation is the general increase in the price level. This study will use Consumer Price Inflation (CPI) as a proxy. The CPI is based on a calculation of the changes in how much an average basket of goods costs for a household. There are up to 40 items of goods included in the CPI formula, and apart from food, other goods include data costs, personal care items, as well as transport costs. Lastly, CPI is calculated by Statistics South Africa (StatsSA, 2025). Inflation plays a critical role as one of the determinants of consumption expenditure as it can decrease purchasing power, redistribute income and create uncertainty in the economy. The decrease in purchasing power and redistribution of income is primarily on individuals while uncertainty affects the entire economy.

5.4 PRE-ESTIMATION DIAGNOSTICS

The following section will discuss the pre estimation diagnostic tests which include the scatter plot; correlation matrix and descriptive statistics as well as unit root tests.

5.4.1 Scatter Plot

A scatter plot is useful for visually diagnosing any irregularities in the variables' trend. It can also show whether variables are following a random walk or are mean-reverting. It is important to use as the first point of enquiry and analysis of the data because it can relay important information about the data such as trends, outliers and correlations.

5.4.2 Correlation Matrix and Descriptive Statistics

Prior to commencing with any empirical analysis, it is important to run a correlation matrix (Mills, 1996). It is also important to establish the significance of independent variables with their dependent variables to avoid spurious regressions (Studenmund, 2014). A correlation matrix is a covariance analysis that indicates whether variables in the study have multicollinearity (Mills, 1996). It is important as it informs the researchers which variables to include in their study, even before estimation. Once the correlation matrix has been performed and significant variables have been identified, the next step is to conduct unit root tests. It is always prudent to do so as a researcher since there is no predictability when using data.

In data analysis, descriptive statistics give useful information about a study's variables. Descriptive statistics are important because they organize, summarise and present the data in a clear way. The statistics are used as a way to compare variables and identify outliers. They also assist in limiting the possibility of distorted results (Habanabakize, 2021). The mean is a useful statistic because it tells you the average value of the variable over the entire sample period (Studenmund, 2014).

$$\bar{y} = \frac{\sum_{t=1}^{T} y_t}{T} \quad \text{..... (5.1)}$$

The median shows the middle value of the variable, while the maximum shows the highest value of the variable. The Jarque-Bera (1987) statistic is a test for normality which analyses the statistical distribution of the variable by using kurtosis and skewness as part of its calculation. A graphical analysis of variables in the form of a scatter plot or line graph is often a good visual indication of how a series behaves (Asteriou & Hall, 2016).

5.4.3 Data generating processes, stationarity and unit root tests

This section discusses the data-generating processes, stationarity and unit root tests.

- ***Data-generating processes***

Economists are guided by economic theory when modelling data, even though the specifics of that data-generating process may be unknown. However, economic theory does not provide any evidence about the processes of adjustment, exogenous variables, or even whether the variables to be included in the model are relevant (Gujarati & Porter, 2004)

Therefore, in trying to characterise the statistical process involved, the study starts with Harris et al.'s (1995) simple stationary univariate model over a time period of t=1:

$y_t = \rho y_{t-1} + u_t$ where $|\rho| < 1$

or

$$(1 - \rho L) y_t = u_t \quad \text{..... (5.2)}$$

Where L is the lag operator, such that $Ly_t = y_{t-1}$

This statistical model states that the variable y_t is generated by its own past along with a residual term, u_t (Harris et al., 1995).

An extended version of 5.2, is:

$$y_t = \rho_1 y_{t-1} + \rho_2 y_{t-2} + \cdots + \rho_p y_{t-p} + u_t \quad \text{..... (5.3)}$$

This is known as a Markov autoregressive scheme or first order autoregressive scheme AR (1), where the 1 represents one lag.

The following model represents a moving average process, in this case MA (1):

$$y_t = \mu + u_t + u_{t-1} \text{..... (5.4)}$$

Equation 5.4 shows that the current dependent value of y_t is a weighted average of previous and current values of the error term (Ergün & Göksu, 2013).

Equation 5.4 and 5.5 can be combined to become an ARMA model, in which the variable y_t is generated by its own past, a residual term as a weighted average of previous and current values of the error term.

- ***Stationarity***

In time series, a stationary stochastic process is one in which the series is mean-reverting and has no tendency to drift. For stationarity to hold, the stochastic error term ε_t of the particular time series must fulfil the following statistical properties:

Its expected value of the mean is equal to zero: $E(\varepsilon_t) = 0$

Constant variance, which means there are no fluctuations around the mean: $E\left({\varepsilon_t}^2\right) = \sigma^2$

It is uncorrelated with its past residual terms: $E\left(\varepsilon_{t,}\, \varepsilon_{t-1}\right) = 0$

This is known as a white noise process where the series is stationary and mean-reverting. This is also known as a Gaussian white noise where the error term is normally distributed, and the series contains identically distributed random variables (IID) (Ergün & Göksu, 2013):

$$e_t \sim NIID\ (0, \sigma^2)$$

Conversely, a non-stationary stochastic process is considered to follow a random walk if the process has a constant mean, changing variance, and changing covariance over time. There are three types of random walk models, namely, 1) pure random walk, 2) random walk with drift, and 3) a random walk with drift and trend (Cuthbertson, Hall & Taylor, 1992):

$$y_t = y_{t-1} + u_t \ldots\ldots \quad (5.5)$$

(Pure random walk without drift = non-stationary)

$$y_t = \beta_1 + y_{t-1} + u_t \ldots\ldots \quad (5.6)$$

(Random walk with drift = non-stationary)

$$y_t = \beta_1 + \delta_t + y_{t-1} + u_t \ldots\ldots \quad (5.7)$$

(Random walk with drift and deterministic trend = non-stationary)

Non-stationarity is a nuisance in time series modelling because it can create spurious regressions. Spurious regressions, a concept first discovered by Yule (1926), are also called nonsense regressions because they produce false significant statistical relationships. The random walk model is a simple case of a class of integrated processes (Ergün & Göksu, 2013).

Differencing non-stationary variables is an effective measure to convert them to stationarity and to change their order of integration, often denoted as I (d), where d is the number of times the series has been differenced. Since non-stationarity is extremely common, most variables are adequate for modelling after they have been differenced once, I(1) or even twice, I(2).

The terms unit roots, non-stationary and random walk are synonymous. Therefore, when a series is non-stationary, one can also say it has a unit root. From equation 5.3, rho, (ρ) in the AR(1) indicates the presence of a unit root. If the absolute value of ρ is less than 1, the unit root process will forget its past errors and will have a constant mean, constant variance and constant covariance. However, if the absolute value of ρ is greater than or equal to 1, the series does not forget its past error and remains non-stationary, with a non-constant and non-finite mean, variance and covariance.

- ***Unit root tests***

Since the data-generating processes of the variables in this study are not known beforehand, unit root testing is an accurate method of detecting the presence of unit roots. In ARDL model, unit root testing is important to determine order of integration and underlying dynamics to avoid the modelling leading to incorrect conclusions.

There are six-unit root tests which have been established to deal with the problem of non-stationarity. They are the Augmented Dickey-Fuller test (ADF) by Dickey and Fuller (1979), the Phillips-Perron (PP) test of Phillips and Perron (1988), and the detrended Augmented Dickey-Fuller test developed by Elliot, Rothenberg and Stock (1996). This is better known as the Dickey-Fuller Generalised Least Squares (DFGLS) test. There is also the KPSS test by Kwiatkowski et al. (1992), the Elliott, Rothenberg and Stock Point Optimal test (1996), and the Ng and Perron (2001) test.

This study will use five unit root tests, the ADF, PP, DFGLS, Zivot-Andrews test and the Structural Breakpoint tests. All the unit root tests will be tested with the trend and intercept models. Dickey and Fuller (1979) developed the ADF test, which was further expanded by Said and Dickey (1984) to detect the presence of non-stationarity. The only limitation of the test is that it can only be used in an Autoregressive Integrated Moving Average (ARIMA) model, provided that the lag length in the AR increases with the sample size. This is why Phillips and Perron (1988) formulated an alternative test for non-stationarity, where the data is not required to fit a certain statistical distribution for the test to be carried out. The Dickey-Fuller Generalised Least Squares (DFGLS) test was also considered as a third alternative to unit root testing but was not applicable for this study because it only gives accurate results for a sample size of 50 and above.

The ADF test estimates the following regression (Studenmund, 2014)

$$\Delta y_t = \alpha_0 + \gamma y_{t-1} + \alpha_{2t} \sum_{i=1}^{m} \alpha_i \Delta y_{t-1} + \varepsilon_t \quad \text{..... (5.8)}$$

Where H_0: non-stationary, and H_1: stationary

Dolado, Jenkinson and Sosvilla-Rivero (1990) suggest equation 5.8 as the first model which should be estimated because it is the most generalised. This is because it contains α_0, which is the intercept term, as well as γ which is the deterministic trend.

The other two models suggest a test without trend, and without trend and intercept.

The choice of the three models is dependent on how a series behaves according to economic theory. The main advantage of the ADF test is its augmentation of the Dickey-Fuller test. This augmentation overcomes the problem of higher order serial correlation in the model by including lagged variables on the right-hand side and the error terms converge closer to zero (Asteriou & Hall, 2016). Thereafter, the MacKinnon and Magee (1990) critical values embedded in the tests will give an indication of whether there is still the presence of a unit root.

The Phillips-Perron (PP) test estimates the following model (Perron, 1989):

$\Delta yt-1 = \alpha_0 + \gamma yt-1 + \varepsilon t$ …….. (5.9)

Where H_0: non-stationary, and H_1: stationary

The PP test is considered a more powerful unit root test if compared to the ADF test because it uses non-parametric statistical methods to correct the t-statistic. Since the PP's t-statistic has the same asymptotic distribution as that of the ADF test, the MacKinnon and Magee (1990) critical values still apply to detect the presence of a unit root.

5.5 MODEL SELECTION FOR THE STUDY

The ARDL model is used to establish cointegration between a set of long-run variables. Equation 5.10 shows one such relationship between the variables that are being estimated. This estimation is conducted to determine whether the variables are cointegrated (Engle & Granger, 1987).

$$\boldsymbol{lnC_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \delta lnC_{t-1} + \sum_{i=1}^{p} \beta_2 \ln \Delta TFD_{t-1} + \sum_{i=1}^{p} \beta_3 ln\, \Delta NGD_{t-1} +}$$

$$\boldsymbol{\sum_{i=1}^{p} \beta_4 ln\, \Delta GDP_{t-1} + \sum_{i=1}^{p} \beta_5 ln\Delta GEX_{t-1} + \sum_{i=1}^{p} \beta_6 ln\Delta GEX\_SP_{t-1} +}$$

$$\boldsymbol{\sum_{i=1}^{p} \beta_7 ln\Delta ITAX_{t-1} + \sum_{i=1}^{p} \beta_8 ln\Delta VAT_{t-1} + \sum_{i=1}^{p} \beta_7 ln\Delta FL_{t-1} +}$$

$$\boldsymbol{\sum_{i=1}^{p} \beta_8 ln\Delta\, INF + \alpha_1 lnC_{t-1} + \alpha_2 lnTFD_{t-1} + \alpha_3 lnNGD_{t-1} + \alpha_4 lnGDP_{t-1} +}$$

$$\boldsymbol{\alpha_5 lnGEX_{t-1} + \alpha_6 lnGEX\_SP_{t-1} + \alpha_7 lnITAX_{t-1} + \alpha_8 lnVAT_{t-1} + \alpha_9 lnFL_{t-1} +}$$

$$\boldsymbol{\alpha_{10} lnINF_{t-1} + \mu_t}$$ …….. (5.10)

Where

C_t is consumption expenditure

C_{t-1} is the lag of consumption expenditure

TFD is total foreign debt

NGD is national government debt

GDP is gross domestic product

GEX is government expenditure

GEX_SP is government expenditure on social protection

$ITAX$ is income tax

VAT is Value Added Tax

FL is the fuel levy

The decision between choosing an ARDL and Johansen-Jullius model lies in the decision on Maximum Likelihood (Johansen, 1988; Stock & Watson, 1988). It tests for the presence of multiple cointegrating vectors. It also tests restricted versions of cointegrating vectors and speed of adjustment parameters. This step is crucial in making sure that results follow or at least correlate with economic theory. In order to find this correlation in the long run, the model uses Bounds testing where:

The null and alternative hypotheses of the model are as follows:

$H_0 : \beta_1 = \beta_2 = \beta_3 = \cdots \ldots . \beta_i = 0$ **(no integration)**

$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \cdots \ldots . \beta_i \neq 0$ **(fail to reject no integration)**

During bounds testing, a computed F-statistic is compared to the upper and lower bound critical values. If the computed F-stat is greater than the upper bound critical value, the study rejects the null hypothesis which means there is cointegration. If the computed F-stat is less than the lower bound critical value, then the study fails to reject the null hypothesis which means there is no cointegration (Pesaran, Shin &Smith, 2001). If cointegration has been established using the bounds test, it is presented as

equation 5.11 below, which includes the long run and short run parameters as well as the Error Correction Term.

$$lnC_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \delta lnC_{t-1} + \sum_{i=1}^{p} \beta_2 \ln \Delta TFD_{t-1} + \sum_{i=1}^{p} \beta_3 ln\, \Delta NGD_{t-1} +$$

$$\sum_{i=1}^{p} \beta_4 ln\, \Delta GDP_{t-1} + \sum_{i=1}^{p} \beta_5 ln\Delta GEX_{t-1} + \sum_{i=1}^{p} \beta_6 ln\Delta GEX\_SP_{t-1} +$$

$$\sum_{i=1}^{p} \beta_7 ln\Delta ITAX_{t-1} + \sum_{i=1}^{p} \beta_8 ln\Delta VAT_{t-1} + \sum_{i=1}^{p} \beta_7 ln\Delta FL_{t-1} +$$

$$\sum_{i=1}^{p} \beta_8 ln\Delta\, INF + \alpha_1 lnC_{t-1} + \alpha_2 lnTFD_{t-1} + \alpha_3 lnNGD_{t-1} + \alpha_4 lnGDP_{t-1} +$$

$$\alpha_5 lnGEX_{t-1} + \alpha_6 lnGEX\_SP_{t-1} + \alpha_7 lnITAX_{t-1} + \alpha_8 lnVAT_{t-1} + \alpha_9 lnFL_{t-1} +$$

$$\alpha_{10} lnINF_{t-1} + \alpha_1 ECM_{t-1} + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(5.11)}$$

Where

C_t is consumption expenditure

C_{t-1} is the lag of consumption expenditure

TFD is total foreign debt

NGD is national government debt

GDP is gross domestic product

GEX is government expenditure

GEX_SP is government expenditure on social protection

$ITAX$ is income tax

VAT is Value Added Tax

FL is the fuel levy

ECM is the error correction term

This Error Correction Term is useful in that it indicates the speed of adjustment in the long run for the economy to get back to its steady state (Pesaran, Shin & Smith, 2001). After equation 5.11 has been estimated, Granger causality will also be established between the variables to assess whether causality is one-directional or bidirectional.

5.6 POST-ESTIMATION DIAGNOSTIC TESTS

Table 5.2: Post-Estimation Diagnostic Tests

The following table is a presentation of the post estimation diagnostic tests which are associated with estimated an Error Correction Model of the said ARDL model. The table will provide tests for the violation of OLS assumption by testing for normal distribution, homoscedasticity, serial correlation, and misspecification.

OLS ASSUMPTION	OLS VIOLATION	DIAGNOSTIC TEST
Normal Distribution	Poisson distribution; X^2 distribution	Jarque-Bera (Jarque & Bera, 1987); CUSUM test
Homoscedasticity	Heteroscedasticity	White's Heteroskedasticity Test (White, 1980) ARCH-LM test (Gujarati & Porter, 2009)
No serial correlation	Autocorrelation	Ljung-Box Q statistic Breusch–Godfrey Test
Violation of one or more OLS assumptions	Misspecification	Ramsey RESET test (Ramsey, 1969)

Source: Author (2024)

The section below discusses some of the post-estimation diagnostic tests for the study's ARDL model.

5.6.1 Jarque-Bera Test

According to the central limit theorem, when a sample is large enough, the joint sampling distribution should follow a normal distribution. Jarque and Bera (1987) formulated an equation that tests residuals for normality, where the null and alternative hypotheses are as follows:

H_0: Residuals are normally distributed.

H_1: Residuals are not normally distributed.

Its test statistic is calculated using the formula in equation 5.12:

$$JB = \frac{N-k}{6}[S^2 + \frac{(K-3)^2}{4}] \quad \text{(5.12)}$$

Where $JB \sim x^2$

N = number of observations

k = number of estimated parameters

S = skewness of variable

K = kurtosis of variable

5.6.2 Ramsey RESET

The Ramsey (1969) RESET test seeks to investigate the probability of misspecification in the regression model. It does so by calculating an F-statistic which has been obtained from a regression on the estimated values of the model.

The F-statistic is calculated as follows:

$$F = \frac{(R^2{}_{new} - R^2{}_{old}) / number\ of\ new\ regressors}{(1-R^2{}_{new}) / number\ of\ parameters\ in\ new\ model} \quad \text{(5.13)}$$

As a result, the Ramsey RESET test investigates the relationship between the estimated residuals and estimated regression model.

5.6.3 Ljung-Box Q Test

According to OLS assumptions, the residual error terms of different observations should not be correlated (Gujarati & Porter, 2009). The Ljung-Box Q statistic tests for autocorrelation in the residuals to detect the presence or absence of white noise. The null and alternative hypotheses are as follows:

H_0: Residuals contain no autocorrelation up to any order k, residuals are white noise.

H_1: Residuals contain autocorrelation up to any order k, residuals are not white noise.

Its test statistic is calculated using the formula in equation 5.14:

$$Q_{LB} = T(T+2)\sum_{j=1}^{k}\frac{{r_j}^2}{T-j} \quad \text{(5.14)}$$

Where $Q_{LB} \sim x^2$

T = number of observations

K = the highest order of autocorrelation for which to test

${r_j}^2$ = the j-th autocorrelation

5.6.4 Breusch–Godfrey Test

The Breusch–Godfrey Test is also a test for serial correlation. This test is similar to the Ljung Box Q statistic, however, it does so through an augmented residual regression (Gujarati & Porter, 2009). It can also be applied whether lagged dependent variables are included or not.

The null and alternative hypotheses are as follows:

H_0: No autocorrelation up to the p-th order.

H_1: Autocorrelation exists up to the p-th order.

Where $LM_{BG} \sim x^2$

From $y_t = \beta X_t + \varepsilon_t$, the augmented regression for testing autocorrelation up to the p-th order is:

$$\hat{\varepsilon}_t = \hat{\beta}X_t + \alpha_1\hat{\varepsilon}_{t-1} + \alpha_2\hat{\varepsilon}_{t-2} + \cdots\cdots\cdots + \alpha_p\hat{\varepsilon}_{t-p} + \omega_t \quad \text{(5.15)}$$

Where

$\hat{\varepsilon}$ = the estimated residuals used to estimate the augmented regression

$\hat{\beta}$ = parameter of independent variable

α = parameters of lagged estimated residuals

ω_t = residual error term

While the aforementioned tests for autocorrelation are the more feasible method of checking this violation, there are also theoretical patterns of autocorrelation and partial correlation that can be viewed graphically over different types of models. These models include the AR (p), MA (p) as well as the ARMA (p,q) model.

5.6.5 Engle's Autoregressive Residuals Conditional Heteroskedasticity Lagrange Multiplier (ARCH LM) Test

Heteroskedasticity among residual error terms is a violation of the classical OLS assumptions. It is an instance where the error term's variance is not constant (Cuthbertson, Hall & Taylor, 1992). The skewness of the statistical distribution of the series can result in a non-constant variance of the error term. Incorrect data transformation, such as incorrect differencing, could also give rise to heteroskedasticity. This test investigates the presence of inconsistent variance among the residuals.

The null and alternative hypotheses are as follows:

H_0: No autoregressive conditional heteroskedasticity up to order q.

H_1: Autoregressive conditional heteroskedasticity exists up to order q.

Where $LM_E \sim x^2$

From $y_t = \beta X_t + \varepsilon_t$, the augmented regression for testing heteroskedasticity up to the q-th order is:

$$\hat{\varepsilon}_t = \alpha_1 \hat{\varepsilon}_{t-1} + \alpha_2 \hat{\varepsilon}_{t-2} + \cdots\cdots\cdots + \alpha_p \hat{\varepsilon}_{t-p} + \omega_t \quad \text{..... (5.16)}$$

Where:

$\hat{\varepsilon}$ = the estimated residuals used to estimate the augmented regression

α = parameters of lagged estimated residuals

ω_t = residual error term

5.6.6 White's Heteroskedasticity Test

White's Heteroskedasticity Test is another test for heteroskedasticity. According to White (1980), heteroskedasticity results in faulty inferences when testing statistical hypotheses. It is desirable that a model should be homoskedastic to guarantee the reliability of its estimates. The White's test uses the following null and alternative hypotheses:

H_0: No heteroskedasticity.

H_1: Presence of heteroskedasticity exists.

From $y_t = \beta_0 + \beta_1 X_t + \beta_2 Z_t + \varepsilon_t$, the augmented regression is calculated as follows:

$$\widehat{\varepsilon^2}_t = \alpha_0 + \alpha_1 x_t + \alpha_2 z_t + \alpha_3 {x^2}_t + \alpha_4 {z^2}_t + \alpha_5 x_t z_t + \omega_t \quad \text{..... (5.17)}$$

Where:

$\hat{\varepsilon}$ = the estimated residuals used to estimate the augmented regression

$\alpha_{1,2,3,4,5}$ = parameters of independent variables x_t and z_t; squared parameters of independent variables and the parameter for cross terms, $x_t z_t$

ω_t = residual error term

5.7 Granger Causality

The following equations is the model specification for testing Granger causality :

$$y_t = \alpha + \sum_{i=1}^{l} \alpha_i y_{t-1} + \sum_{j=1}^{l} \beta_j x_{t-j} + \varepsilon_t \quad (5.18)$$

$$x_t = \omega + \sum_{i=1}^{l} \gamma_i x_{t-1} + \sum_{j=1}^{l} \theta_j y_{t-j} + \varepsilon_t \quad (5.19)$$

Where y_t is consumption expenditure in the study and x_t represents all the other possible independent variables. There are several incidences of Granger causality, namely unidirectional from y_t to x_t; unidirectional from x_t to y_t; bilateral causality and

independence (Gujarati & Porter, 2009). In the study, these four incidences will be examined and reported on from the E-Views software.

5.8 Non-linear Autoregressive Distributed Model (NARDL) Model specification

The following models, 5.20 and 5.21 are empirical specifications of the NARDL (Shin, Yu and Greewood-Nimmo (2014). Model 5.20 Represents the theoretical equation while 5.21 represents that of the study.

$$\Delta y_t = \partial_0 + \rho y_{t-1} + \theta^+ x_{t-1}^+ + \theta^- x_{t-1}^- + \sum_{J=1}^{p-1} \partial_j \Delta y_{t-j} + \sum_{j=0}^{q-1} (\sigma_j^+ \Delta x_{t-j}^+ + (\sigma_j^- \Delta x_{t-j}^-) + \mu \quad (5.20)$$

$$\Delta C_t = \partial_0 + \rho C_{t-1} + \theta^+ NGD_{t-1}^+ + \theta^- NGD_{t-1}^- + \sum_{J=1}^{p-1} \partial_j \Delta C_{t-j} + \sum_{j=0}^{q-1} (\sigma_j^+ \Delta NGD_{t-j}^+ + (\sigma_j^- \Delta NGD_{t-j}^-) + \mu \quad (5.21)$$

Where $\partial_0; \rho; \theta^+; \theta^-; \sigma_j^+; \sigma_j^-$ are parameters;

the second term is the first lag of the dependent variable ;

the third and fourth terms are the partial sum of positive and negative change of national government debt

Fifth term are some lags for first difference of consumption expenditure

$$\Delta C_t = \partial_0 + \rho C_{t-1} + \theta^+ NGD_{t-1}^+ + \theta^- NGD_{t-1}^- + \sum_{J=1}^{p-1} \partial_j \Delta C_{t-j} + \sum_{j=0}^{q-1} (\sigma_j^+ \Delta NGD_{t-j}^+ + (\sigma_j^- \Delta NGD_{t-j}^-) + \mu \quad (5.19$$

Equation 5.19 shows the NARDL for the study where C is consumption expenditure and NGD is the national government debt

5.8.1 Symmetry Test

Asymmetric testing is important because it can provide information on the dynamics of a system over time. It is also imperative due to the bidirectional nature of some

variables such as government debt and government expenditure for instance. There are four steps to follow when testing for symmetry :

1. Estimate NARDL by choosing the option on E-Views
2. Examine if there are cointegrating relationships between y_t, x_t^+, x_t^-
3. Test for long run and short run symmetry using the Wald Tests
4. If symmetry is found then there should be a derivation of positive and negative dynamic multipliers

5.9 CONCLUSION

The chapter outlined the research methodology of the study. Section 5.2 started by detailing the variables and the data sources. Section 5.3 discussed the definition of variables, while Section 5.4 discussed the pre-estimation diagnostics, where stationarity and unit roots were outlined. Section 5.5 outlined the estimation techniques of the ARDL model, including bounds testing. Section 5.6 unpacked the post-estimation diagnostic tests, which were used on the ARDL while Section 5.7 concludes the chapter.

CHAPTER SIX

EMPIRICAL ANALYSIS

6.1 INTRODUCTION

Chapter 6 presents the empirical analysis of the study. Section 6.2 displays the study's descriptive statistics, section 6.3 shows the covariance analysis and section 6.4 conducts unit root testing. Structural breakpoint tests are run in section 6.5 and section 6.6 tests the model for Granger causality. The study uses two Autoregressive Distributed Lag (ARDL) models. The first is discussed in section 6.7 followed by its cointegrating results in section 6.8. The second ARDL model is presented in section 6.9 and the non-linear ARDL model is discussed in section 6.10. Section 6.11 concludes the chapter.

6.2 DESCRIPTIVE STATISTICS

The following table gives a summary of the descriptive statistics of the variables in the study. Some of the descriptions include the mean, which is the average, the skewness and the Jarque Bera statistic which represents a test for normality.

Table 6.1: Descriptive Statistics Results

	CE	TFD	NGD	GDP	GEX	GEX_SP	ITAX	VAT	FL	INF
Mean	1376096.	68897.64	679273.5	470591.8	75399.36	2572750.	227344.5	29717.75	141695.8	5.814286
Median	1172412.	68125.50	443617.5	310136.5	54593.50	2202122.	154729.0	20884.00	124407.5	5.585000
Maximum	2999507.	212754.0	2232980.	1305500.	222156.0	5625207.	628976.0	80175.00	346748.0	13.51000
Minimum	273247.5	1770.000	81895.00	68946.00	5460.000	480994.0	33992.00	7083.000	17516.00	-1.630000
Std. Dev.	895900.1	61805.41	602618.9	387970.8	65938.05	1719642.	183525.4	22109.41	104251.3	3.046960
Skewness	0.456828	0.714485	1.301718	0.851630	0.784377	0.441584	0.754027	1.017226	0.519532	0.121945
Kurtosis	1.864352	2.667448	3.555382	2.383495	2.351091	1.823702	2.294998	2.821710	1.928661	3.610402
Jarque-Bera	2.478541	2.511306	8.267381	3.828038	3.362416	2.524271	3.233133	4.865917	2.598655	0.504085
Probability	0.289595	0.284890	0.016024	0.147486	0.186149	0.283049	0.198579	0.087777	0.272715	0.777212
Sum	38530683	1929134.	19019658	13176570	2111182.	72037013	6365646.	832097.0	3967483.	162.8000
Sum Sq. Dev.	2.17E+13	1.03E+11	9.81E+12	4.06E+12	1.17E+11	7.98E+13	9.09E+11	1.32E+10	2.93E+11	250.6671
Observations	28	28	28	28	28	28	28	28	28	28

Source: Author's Computation from E-Views 13 (2024)

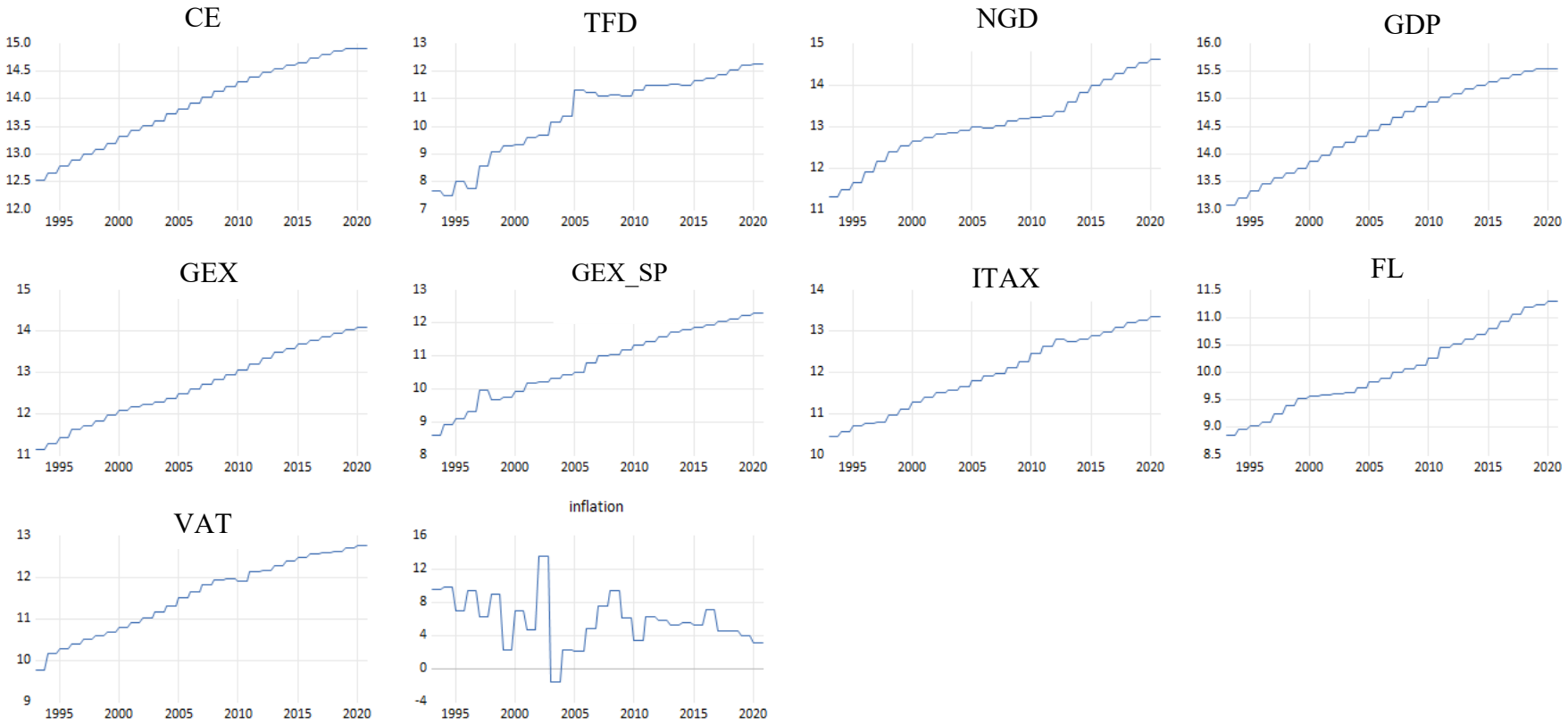


Figure 6.1 : Graphical analysis

Source: Author from E-Views 13 (2024)

The study's descriptive statistics provide interesting information about the variables during the sample period of 1993 – 2020 in South Africa. On average, consumption expenditures amounted to just over R1,37 trillion. This corroborates the study by Garidzirai and Mapanga (2022), which asserts that consumption contributed 75% to South Africa's GDP between 1960 and 2019. The maximum total foreign debt and national government debt amounted to R68 trillion and R13 trillion, respectively.

This can be attributed to various factors throughout the sample period, the most important of which are the economic crises. The global economic crisis is among these as well as COVID-19 (Hasan et al., 2021; Oravský, Tóth & Bánociová, 2020). All variables show a normal distribution apart from national government debt and VAT, which have some form of non-normality or degree of skewness (Jarque-Bera, 1987).

This section also shows a graphical analysis of the variables in the study. For the duration of the sample size, which is from 1993 – 2020, all variables have increased in percentage apart from inflation. Inflation has shown several peaks and troughs with its average being around 4%. Total foreign debt showed a significant increase in 2005. National government debt also had a notable increase from 2013 onwards. Government spending on social protection had a significant spike during 1996 – 1997. GDP, government expenditure, government expenditure on social protection, income tax, VAT and the fuel levy have all had an upward trend throughout the sample period (Black, Calitz & Steenekamp, 2016). Inflation has generally exceeded the SARB's target band of between 3% and 6% throughout the sample period, with its highest rate being approximately 13% in 2004.

6.3 COVARIANCE ANALYSIS

Table 6.2: Covariance Analysis Results

Covariance Probability	CE	TFD	NGD	GDP	GEX	GEX_SP	ITAX	FL	VAT	INFLATION
CE	0.548070 -----									
TFD	1.061931 0.0000	2.184076 -----								
NGD	0.633960 0.0000	1.222089 0.0000	0.778912 -----							
GDP	0.570994 0.0000	1.106971 0.0000	0.658203 0.0000	0.595157 -----						
GEX	0.650580 0.0000	1.236224 0.0000	0.765766 0.0000	0.676903 0.0000	0.782306 -----					
GEX_SP	0.783448 0.0000	1.511445 0.0000	0.912627 0.0000	0.815730 0.0000	0.932960 0.0000	1.131654 -----				
ITAX	0.665368 0.0000	1.273985 0.0000	0.771162 0.0000	0.692840 0.0000	0.795079 0.0000	0.950048 0.0000	0.814343 -----			
FL	0.523467 0.0000	0.987814 0.0000	0.624766 0.0000	0.544060 0.0000	0.634280 0.0000	0.751020 0.0000	0.643028 0.0000	0.519305 -----		
VAT	0.647232 0.0000	1.257178 0.0000	0.745758 0.0000	0.674769 0.0000	0.766749 0.0000	0.925909 0.0000	0.783850 0.0000	0.615979 0.0000	0.768442 -----	
INFLATION	-0.787906 0.0001	-1.908694 0.0000	-1.037985 0.0000	-0.805911 0.0002	-0.911524 0.0002	-1.127815 0.0001	-0.933529 0.0002	-0.735893 0.0002	-0.903859 0.0002	8.952396 -----

Source: Author from E-Views 13 (2024)

A covariance analysis shows the correlation between the independent variables and the dependent variables. The p-values of the variables are all significant at a 1% level of significance (Steiger, 1980), which shows that they are all suitable for inclusion in this study's model**.**

6.4 UNIT ROOT TESTING

The study uses the Augmented Dickey-Fuller Test (ADF) and the Phillips-Perron (PP) test (Dickey & Fuller, 1979; Phillips & Perron, 1988) to test for unit roots. The unit root testing is conducted only at levels and the first difference. This is because the ARDL model can only be estimated using the I(0) and I(1) variables. Once a variable becomes an I(2), the ARDL can no longer be used and a different estimation technique must be sought.

Table 6.3: Unit Root Tests

Variable	**Model**	**ADF**		**PP**	
		Level First Difference		**Level First difference**	
		t-statistic	**t-statistic**	**t-statistic**	**t-statistic**
CE	Trend & Intercept	2.062	-2.689	3.0934	-2.735
	Intercept	-6.144***	-0.391	-6.144***	0.487
	None	-0.151	-1.331	8.316	-1.397

TFD	Trend & Intercept	-1.399	-6.484***	-1.279	-6.532***
	Intercept	2.923	-5.829***	-1.595	-5.799***
	None	1.575	-4.074***	2.891	-4.155***
NGD	Trend & Intercept	-3.415*	-1.835	-2.009	-1.836
	Intercept	-0.889	-1.855	-0.988	-1.855
	None	1.370	-1.094	5.022	-1.135
GDP	Trend & Intercept	1.811	-2.588	-0.739	-21.151***
	Intercept	-2.242	-1.009	-3.143**	-15.525***
	None	0.402	-1.306	7.694	-11.753***
GEX	Trend & Intercept	-3.959**	-3.036	-1.768	-3.067
	Intercept	-1.519	-2.717*	-1.642	-2.610
	None	2.053	-1.059	11.202	-0.961
GEX_SP	Trend & Intercept	-3.532*	-5.319***	-3.518**	-14.848***
	Intercept	-1.897	-6.401***	-4.791***	-6.986***
	None	4.510	-0.926	5.205	-3.777***

ITAX	Trend & Intercept	-2.326	-3.801***	-1.789	-3.775***
	Intercept	-1.089	-3.791***	-1.013	-3.770***
	None	10.073	-1.533	10.072	-1.308
VAT	Trend & Intercept	-2.229	-6.222***	-2.337	-6.235***
	Intercept	-3.055**	-5.964***	-3.009**	-5.890***
	None	6.938068	-1.718*	5.952	-3.239***
FL	Trend & Intercept	0.3064	0.1587	0.1299	0.000***
	Intercept	0.9522	0.0448**	0.9758	0.000***
	None	0.9970	0.140	1.0000	0.000
INFL	Trend & Intercept	-5.527***	-9.989***	-5.5305***	-15.866***
	Intercept	-5.113***	-10.186***	-5.1132***	-15.820***
	None	-1.485	-10.310***	-1.8751*	-15.244***

Source: Author (2024) using E-Views 13

* Statistically significant at a 10% level

** Statistically significant at a 5% level

*** Statistically significant at a 1% level

All the variables used in the study are stationary either at levels or first difference, according to different models. Using the ADF and PP test at levels, consumption expenditure (intercept), national government debt (trend & intercept), government expenditure (trend & intercept), government expenditure for social protection (trend & intercept), VAT (intercept) and inflation (trend & intercept) all do not have a unit root. While using the ADF and PP tests at the first difference, we find that total foreign debt (trend & intercept), gross domestic product (trend & intercept), the fuel levy (trend & intercept) and income tax (trend & intercept) are stationary.

6.5 STRUCTURAL BREAKPOINT TESTS

Table 6.4: Standard Breakpoint Unit Root Test

	Structural Breakpoint Test			Zivot-Andrews Test		
Variable	t-statistic	p-value	Break point period	t-statistic	p-value	Break point period
Consumption Expenditure	-23.38***	P<0.01	1992Q1			
Government Expenditure	-4.44**	P<0.053	2016	-4.657***	P=0.042	2008
Government Expenditure on Social Protection	-6.802***	P<0.01	1993Q4	-3.093***	P=0.015	2004
Income Tax	-4.934***	P<0.04	1990Q4-2020Q1	-5.178***	P=0.0013	2007
Total Foreign Debt	-7.264***	P<0.01	2017Q4	-5.004***	P=0.014	2002
Total National Government Debt	-4.823*	P<0.08	2009Q3		P<0.08	2010
Fuel Levy	-2.793	P<0.203	1991Q2-2020Q4	-6.137	P=0.2586	2002
VAT	-5.718**	P<0.018	2011Q2	-4.19**	P=0.059	2005
Inflation	-4.015***	P<0.02	2007	-4.426***	P=0.009	2004

Source: Author from E-Views 13 (2024)

In any study, it is not only imperative to conduct unit root testing but also structural breakpoint testing. This test is critical to indicate structural breaks in the data along its sample period (Saikkonen & Lütkepohl, 1999). These breaks can influence some of the behaviour of the variable and thus the properties of the variable (Zivot & Andrews, 1992).

While data is a numerical or statistical variable, it is also influenced by macroeconomic events and, more so, political economy. The study has conducted two breakpoint tests, which are the standard Chow breakpoint test and the more robust Zivot-Andrews test (Zivot & Andrews, 1992; Chow, 1960). While the Chow test shows quarterly break point tests, the Zivot-Andrews test shows them per year. Significant breakpoint tests surrounding the global economic crises are for government expenditure, income tax and national government debt. This shows that there is an anomaly that influenced these variables.

According to the graphical analysis in the previous section, all these variables increased from 2007 onward. One can infer that an increase in national government debt was channelled into government expenditure, which was then paid for through an increase in income tax. A significant event that occurred during this time was the massive state guarantee which was issued to Eskom to continue with its building programme amidst persistent events of load shedding (Nkosi, 2020).

So, government expenditure was instrumental in creating infrastructure projects to accommodate this project. However, what is critical to note is that all these expenditures and borrowing translated into an increase in personal income tax, which places a burden on consumption expenditure (Zhang, 2017).

6.6 GRANGER CAUSALITY

Table 6.5: Granger Causality Results

1993Q1 2020Q4	Consumption expenditure → Total Foreign Debt
	Consumption expenditure → National Government Debt
	Consumption expenditure → GDP
	Consumption expenditure → Government Expenditure
	Consumption expenditure → Government Expenditure on Social Protection
	Consumption expenditure → Income Tax
	Consumption expenditure → VAT
	Consumption expenditure → Fuel Levy
	Consumption expenditure ← Inflation

Source: Author from E-Views 13 (2024)

Granger causality tests whether there is unilateral or bilateral causality amongst the variables of the study (Gujarati & Porter, 2009). It also tests whether there is independence. This implies that it tests whether a variable contains past values of another variable (Granger, 1969). The study's Granger causality test shows a unidirectional causality from consumption expenditure to all variables apart from inflation.

6.7 ARDL MODEL 1

The table below shows the long-run estimation output for the ARDL model.

Table 6.6: Long Run Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
TFD	0.005727	0.003535	1.620125	0.1090*
NGD	-0.036662	0.009223	-3.974888	0.0001***
GEX	0.102925	0.032500	3.166954	0.0022***
GEX_SP	0.011980	0.005598	2.139993	0.0353**
GDP	0.918835	0.038742	23.71669	0.0000***
ITAX(-4)	-0.051896	0.018292	-2.837056	0.0057***
FL(-4)	0.093177	0.026564	3.507612	0.0007***
VAT	-0.071309	0.017112	-4.167125	0.0001***
INFLATION	-0.001595	0.000298	-5.345989	0.0000***
C	-0.146549	0.111141	-1.318589	0.1909
R-squared	0.999965	Mean dependent var		13.94065
Adjusted R-squared	0.999954	S.D. dependent var		0.707627
F-statistic	97573.55	Akaike info criterion		-7.647750
Prob(F-statistic)	0.000000	Schwarz criterion		-7.026887
		Hannan-Quinn criterion		-7.396013

Source: Author (2024) using E-Views 13

* Statistically significant at a 10% level

** Statistically significant at a 5% level

*** Statistically significant at a 1% level

Table 6.6 shows that all the variables are statistically significant, and the F-statistic shows that the whole model and variables are jointly significant. Table 6.6 also shows the results for the long-run estimates of the ARDL model. It must be emphasised that in the empirical analysis, an increase in consumption expenditure is viewed as a burden on the consumer, and so the results will be interpreted as such.

- A 1% increase in total foreign debt will result in a 0.06% increase in consumption expenditure. This confirms the results of the study by Zulkifli and Haqeem (2022) and Schumacher (1985), who note that during the OPEC oil crisis, consumption expenditure increased in Arab countries, albeit due to the beneficial impact of the Yom Kippur war.

- A 1% increase in national government debt will decrease consumption expenditure by 0.037%. This finding is contrary to the study's stance, as government debt is a burden on consumers in the form of transferred taxes (Hyman, 2011).

- A 1% increase in government expenditure will result in a 0.103% increase in consumption expenditure, and a 1% increase in expenditure on social protection will result in a 0.012% increase in consumption expenditure. This is in line with studies by Marais (2011) and reports by SASSA (2024), which show that an increase in social spending places a burden on consumers who are paying taxes. Ridzuan et al. (2014) captured economic crises in their model, specifically that of the Asian crisis and global financial crisis. They find a positive relationship between government expenditure and consumption expenditure.

- A 1% increase in GDP will result in a 0.919% increase in consumption expenditure. Mothibi and Mncayi's (2019) study found a long-run relationship between government debt, inflation, real interest rates, real GDP and government expenditure. They arrive at this conclusion from their study of the South African economy between 1994 – 2017 using the ARDL model.

- A 1% increase in personal income tax will reduce consumption expenditure by 0.05%. This differs from the study by Damane (2018), Sekantsi (2016) and the

stance of the study where it is clearly asserted that personal income tax is a burden on the consumer.

- A 1% increase in the fuel levy will increase consumption expenditure by 0.09%. This is in line with the study by Mabugu, Chitiga and Amusa (2009), who posit that there are no welfare effects of increasing the fuel levy.

- A 1% increase in VAT will result in a 0.071% decrease in consumption expenditure. Although it is contrary to the stance of the study, this is supported by Obiakor, Kwarbai and Okwu (2015), who find positive sentiments about VAT as they postulate it has a significant positive effect on households in Nigeria. However, Alm and El-Ganainy (2013) find an adverse impact of VAT on consumption expenditure, as do Taiwo and Murufu (2016), who maintain that VAT necessitates an increase in consumption expenditure.

- A 1% increase in inflation will result in a 0.002% decrease in consumption expenditure, which supports the study by Tokoya et al. (2022) and Bonsu and Muzindutsi (2017) who find a negative relationship between the two variables but refute the stance of the study.

The results of the study corroborate the notion that consumption expenditure is not only dependent on the absolute income hypothesis but is rather dependent on several factors other than income (Raut & Virmani, 1989). This is echoed by Adjei and Kajurová (2022), who show in their ARDL study of 25 Sub-Saharan countries that consumption is dependent not only on present but also past consumption. These results prove that the relative income hypothesis by Friedman (1957) holds.

6.8 COINTEGRATING TEST RESULTS

The following test illuminates whether cointegration exists in the model.

6.8.1 Bounds F-Testing

A computed F-statistic is compared to the upper and lower bound critical values during bounds testing. If the computed F-stat is greater than the upper bound critical value, the study rejects the null hypothesis which means there is cointegration. If the computed F-stat is less than the lower bound critical value, then the study fails to reject the null hypothesis which means there is no cointegration (Pesaran, Shin & Smith, 2001). If cointegration has been established using the bounds test, it is presented in Table 6.7 below:

Table 6.7: Bounds F-Test Results

Test Statistic	Value		Test Statistic		Value	
	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Asymptotic	1.800	2.800	2.040	2.080	2.500	3.680

*** Finite sample critical values are valid up to 7 error-correction variables.

Source: Author (2024) using E-Views 13

Table 6.7 shows that cointegration amongst the variables of the study exists (Wooldridge, 2020). This is because the F-stat, which is 5.138, is greater than all the asymptotic values of the bounds test with a 10%, 5% and 1% level of significance.

6.8.2 Error Correction Model

Table 6.8: Error Correction Model Results

Variable	Coefficient	Std. Error	t-Statistic
COINTEQ*	-0.415180	0.052171	-7.958108
D(GEX)	0.102925	0.026981	3.814747
D(GDP)	0.918835	0.029712	30.92471
D(ITAX(-1))	0.051896	0.014810	3.504076
D(FL)	0.014804	0.020089	0.736956
D(FL(-1))	-0.093177	0.019865	-4.690479
D(INFLATION)	-0.001595	0.000223	-7.153377
R-squared	0.989567	Mean dependent var	0.022022
Adjusted R-squared	0.987997	S.D. dependent var	0.041244
S.E. of regression	0.004519	Akaike info criterion	-7.832936
Sum squared resid	0.001899	Schwarz criterion	-7.460417
Log likelihood	437.9785	Hannan-Quinn criterion.	-7.681893
F-statistic	630.0834	Durbin-Watson stat	1.479466
Prob(F-statistic)	0.000000		

*__Post Estimation Diagnostic Tests show__: No serial correlation (Breusch, 1978; Godfrey, 1978a, 1978b); No heteroscedasticity [ARCH-LM (Bera & Higgins, 1993)]; Normality (Jarque-Bera, 1987) and Stability (Ramsey Reset Test, 1969).

Source: Author (2024) using E-Views 13

Table 6.8 shows the error correction model which includes the ARDL's short-run dynamics. As expected, the error correction term is negative and statistically significant (Johansen, 1991; Hall & Asteriou, 2016). It also shows that the speed at which the economy will revert to the steady state is 42%.

- In the short run, a 1% increase in government expenditure will increase consumption expenditure by 0.102%. This reiterates the previous findings

which confirm that government expenditure is indeed a burden to the consumer (Ridzuan et al., 2014).

- A 1% increase in GDP increases consumption expenditure by 0.918%. GDP typically contributes to productivity in the economy and so its increase is not viewed as a burden but rather a benefit to the consumer.

- A 1% increase in personal income tax will increase consumption expenditure by 0.051%. This confirms that the personal income tax is a burden to consumers where the middle class pays a significant amount of tax and personal income tax accounts for the government's highest revenue collection (Visagie & Posel, 2013; Zhang, 2017).

- A 1 % increase in the fuel levy increases consumption expenditure by 0.014%, as expected, even though the variable is insignificant. However, Van Rensburg and Krygsman (2020) believe that increases in the fuel levy are justified as it can be associated with the user-pay principle. When the significant variable of the fuel levy is considered, it unexpectedly decreases consumption expenditure by 0.093%.

- A 1% increase in Inflation also shows a decrease in consumption expenditure of 0.001%. The study rejects the results as they do not conform to the literature or the study's stance, which states that taxes and inflation increase consumption expenditure.

6.9 ARDL MODEL 2

The study has included two ARDL models due to the inability of an NARDL being estimated from the first model. This is because the NARDL for the first model explodes when it is being estimated due to too many models being generated by the Akaike Information Criterion model selection criteria (MacKinnon, Haug & Michelis, 1999). Furthermore, a NARDL can only be run with a maximum of 6 variables which was a limiting factor since the study has 10 variables. Thus, the variables for ARDL model 2

had to be restricted and the impact of national government debt on consumption expenditure is now the new analysis whereas model 1 used total foreign debt.

Table 6.9: Long Run Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NGD	0.038857	0.013565	2.864439	0.0051
NGD(-1)	-0.033629	0.013725	-2.450098	0.0160
GDP	0.773398	0.031893	24.24967	0.0000
GDP(-1)	-0.643212	0.053692	-11.97961	0.0000
GEX_SP	0.027954	0.008561	3.265399	0.0015
GEX_SP(-1)	-0.025176	0.008679	-2.900936	0.0046
ITAX	0.088678	0.019013	4.664186	0.0000
ITAX(-1)	-0.083887	0.019553	-4.290182	0.0000
C	0.070957	0.070236	1.010267	0.3148
R-squared	0.999946	Mean dependent var	13.90220	
Adjusted R-squared	0.999941	S.D. dependent var	0.735374	
S.E. of regression	0.005662	Akaike info criterion	-7.424481	
Sum squared resid	0.003237	Schwarz criterion	-7.180380	
Log likelihood	422.0587	Hannan-Quinn criterion	-7.325457	
F-statistic	206195.2	Durbin-Watson stat	1.890938	
Prob(F-statistic)	0.000000			

Source: Author (2024) using E-Views 13

Table 6.9 shows the results for the long run estimates of ARDL 2. In the long run all the variables are statistically significant at a 1% level of significance apart from the lag of national government debt which is significant at a 5% level of significance. The F-statistic shows that the model is jointly significant.

- A 1% increase in the national government debt will increase consumption expenditure by 0.038%. Consumption expenditure increases as governments take on more debt during economic crises and it is not to the benefit of consumers but to their detriment. This is because, as more debt is acquired, it is later passed on to consumers in the form of tax thereby increasing their consumption expenditure (Zhang, 2017; Erero, 2022).

- A 1% increase in GDP will increase consumption expenditure by 0.77% which is expected as GDP is a strong driver for positively influencing consumption expenditure (Mothibi & Mncayi, 2019).

- A 1% increase in total expenditure on social grants will increase consumption expenditure by 0.027%. This is due to the fact that social grants are a burden on the tax-paying consumer (Ridzuan et al., 2014).

- When personal income tax is increased by 1%, consumption expenditure will increase by 0.088% (Visagie & Posel, 2013).

Table 6.10: ARDL Model 2 Error Correction Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CE(-1)*	-0.152186	0.054042	-2.816062	0.0058
NGD(-1)	0.005228	0.003365	1.553770	0.1234
GDP(-1)	0.130186	0.044197	2.945593	0.0040
GEX_SP(-1)	0.002778	0.005749	0.483275	0.6299
ITAX(-1)	0.004792	0.007458	0.642459	0.5220
C	0.070957	0.070236	1.010267	0.3148
D(NGD)	0.038857	0.013565	2.864439	0.0051
D(GDP)	0.773398	0.031893	24.24967	0.0000
D(GEX_SP)	0.027954	0.008561	3.265399	0.0015
D(ITAX)	0.088678	0.019013	4.664186	0.0000
R-squared	0.982351	Mean dependent var	0.021426	
Adjusted R-squared	0.980779	S.D. dependent var	0.040836	
S.E. of regression	0.005662	Akaike info criterion	-7.424481	
Sum squared resid	0.003237	Schwarz criterion	-7.180380	
Log likelihood	422.0587	Hannan-Quinn criterion	-7.325457	
F-statistic	624.6450	Durbin-Watson stat	1.890938	
Prob(F-statistic)	0.000000			

Post Estimation Diagnostics				
Test	Null hypothesis	Test statistic	P-value	Conclusion
Jarque Bera	Normality	888	0.00	Reject Null, Residuals not normally distributed.
ARCH LM Test	No Heteroskedasticity	0.221835	0.6386	Fail to reject null hypothesis, no heteroskedasticity
Breusch Godfrey	No serial correlation	0.421034	0.6575	Fail to reject null hypothesis, no serial correlation
Ramsey RESET Test	No misspecification	1.398365	0.2398	Fail to reject null hypothesis, no misspecification

Source: Author (2024) using E-Views 13

Table 6.10 shows the error correction model of the ARDL 2 (Asteriou & Hall, 2016; Johansen, 1988). All variables are significant in the short run; however, GDP is significant in the long run. The error correction term is negative and significant which is expected according to theoretical assumptions. It also indicates that the economy will return to its steady state at a slower speed of 0.15%. The table also shows the results of post estimation diagnostic tests such as no serial correlation (Breusch, 1978; Godfrey, 1978a, 1978b); no heteroscedasticity [ARCH-LM (Bera & Higgins, 1993)]; Normality (Jarque-Bera, 1987) and Stability (Ramsey Reset Test, 1969).

6.10 NARDL

Table 6.11: Nonlinear Autoregressive Distributed Lag model results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
CE(-1)	-0.155025	0.054974	-2.819967	0.0058
GDP(-1)	0.133988	0.045391	2.951876	0.0040
GEX_SP(-1)	0.003076	0.006096	0.504543	0.6150
ITAX(-1)	0.004865	0.007599	0.640210	0.5235
@CUMDP(NGD(-1))	0.004449	0.004041	1.100861	0.2737
@CUMDN(NGD(-1))	0.089057	0.232865	0.382442	0.7030
C	0.112401	0.089911	1.250137	0.2142
D(GDP)	0.783643	0.032352	24.22227	0.0000
D(GEX_SP)	0.031445	0.008802	3.572652	0.0006
D(ITAX)	0.089930	0.019012	4.730104	0.0000
@DCUMDP(NGD)	0.029144	0.014381	2.026568	0.0454
@DCUMDN(NGD)	0.928235	0.453537	2.046659	0.0434
R-squared	0.983008	Mean dependent var	0.021621	
Adjusted R-squared	0.981101	S.D. dependent var	0.040971	
S.E. of regression	0.005632	Akaike info criterion	-7.417880	
Sum squared resid	0.003109	Schwarz criterion	-7.123282	
Log likelihood	419.9834	Hannan-Quinn criterion	-7.298389	
F-statistic	515.4029	Durbin-Watson stat	1.892041	
Prob(F-statistic)	0.000000			

Source: Author (2024) using E-Views 13

Table 6.11 shows the results of the NARDL. The purpose of a NARDL is to test whether there is linearity between variables and whether a specific variable is suitable to be included in a model (Uche, Chang & Effiom, 2022). It is also used to test whether short-run and long-run impacts of a variable differ in their effect on the dependent variable, whether positive or negative. In this case, the study is referring to national government debt. The NARDL shows that in the long run, national government debt is insignificant. This causes the variable to be questionable about whether it should be included in the model. However, in the short run the variable shows itself to be significant which may lend itself to evidence of being suitable in the short run for this model. Nevertheless, a more precise way of determining this is by using what is known as a symmetry test.

Table 6.12: Symmetry Test Results

Variable	Statistic	Value	Probability
Long Run			
NGD	F-statistic	0.129511	0.7197
	Chi-square	0.129511	0.7189
Short Run			
NGD	F-statistic	3.849049	0.0526
	Chi-square	3.849049	0.0498
Joint (Long-Run and Short-Run)			
NGD	F-statistic	1.935297	0.1499
	Chi-square	3.870594	0.1444

Source: Author (2024) using E-Views 13

Table 6.12 shows the results for the NARDL's symmetry test, whose theoretical underpinning comes from the BDS test (Broock et al., 1996; Baum, Hurn & Lindsay, 2021). It shows that national government debt only has a short-run adverse impact on consumption expenditures.

Figure 6.2 Cumulative sum of Recursive Residuals

The following graph presents the recursive residuals of the NARDL. The model shows shows that the RSS path is stable initially but when it reaches the approximately the 14th and 20th time period, the path continues outside the confidence bands. This is

not suprising since the data showed several structural breakpoints when tests were conducted in section 6.5 even with the Chow Tests.

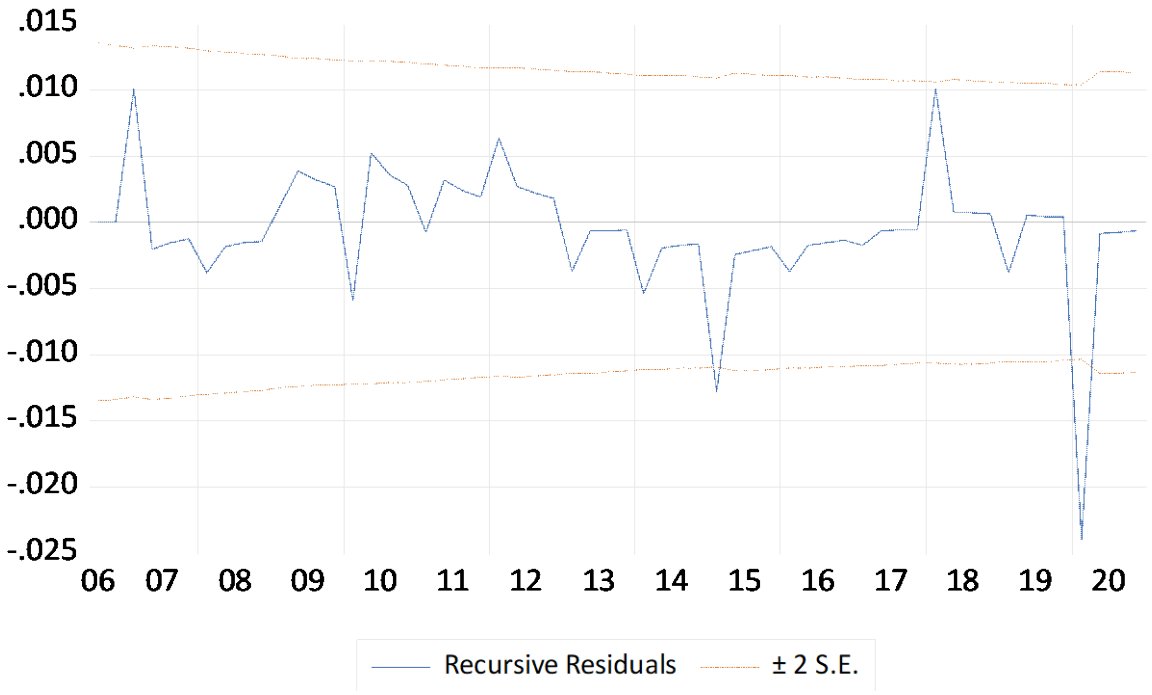


Figure 6.3 : Cumulative Sum of Squares

The same can be said Figure 6.3. The cumulative sum of squares also shows a structural breakpoint at approximately period 14 and 20.

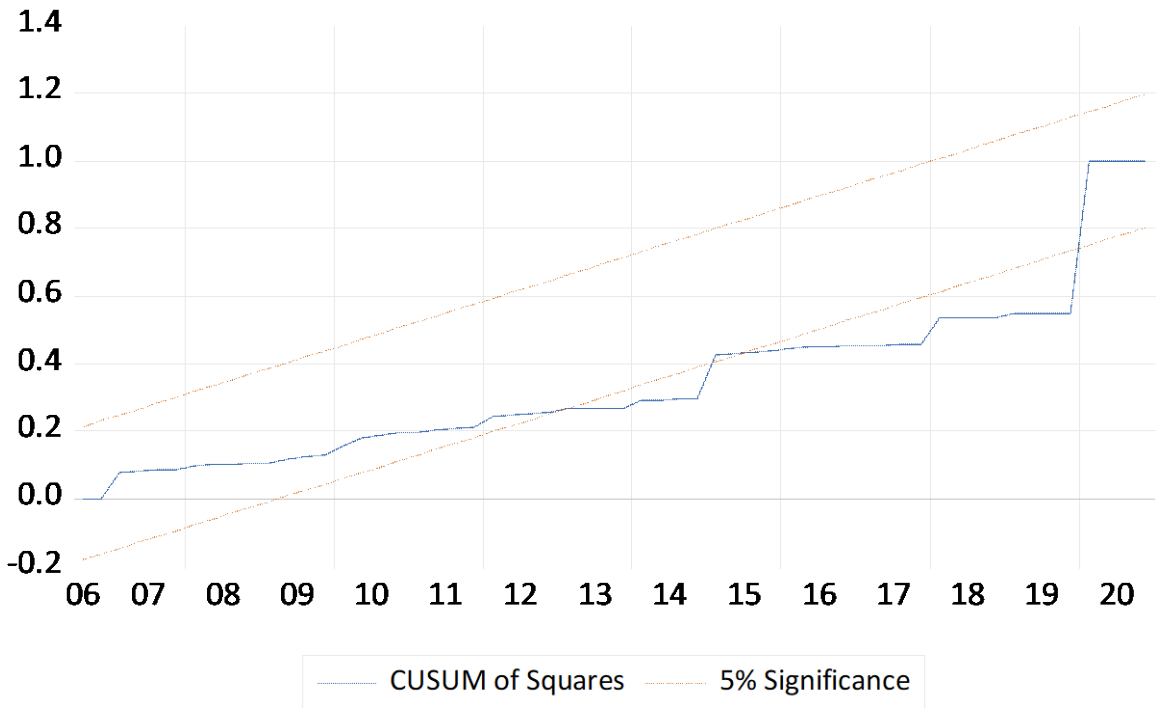
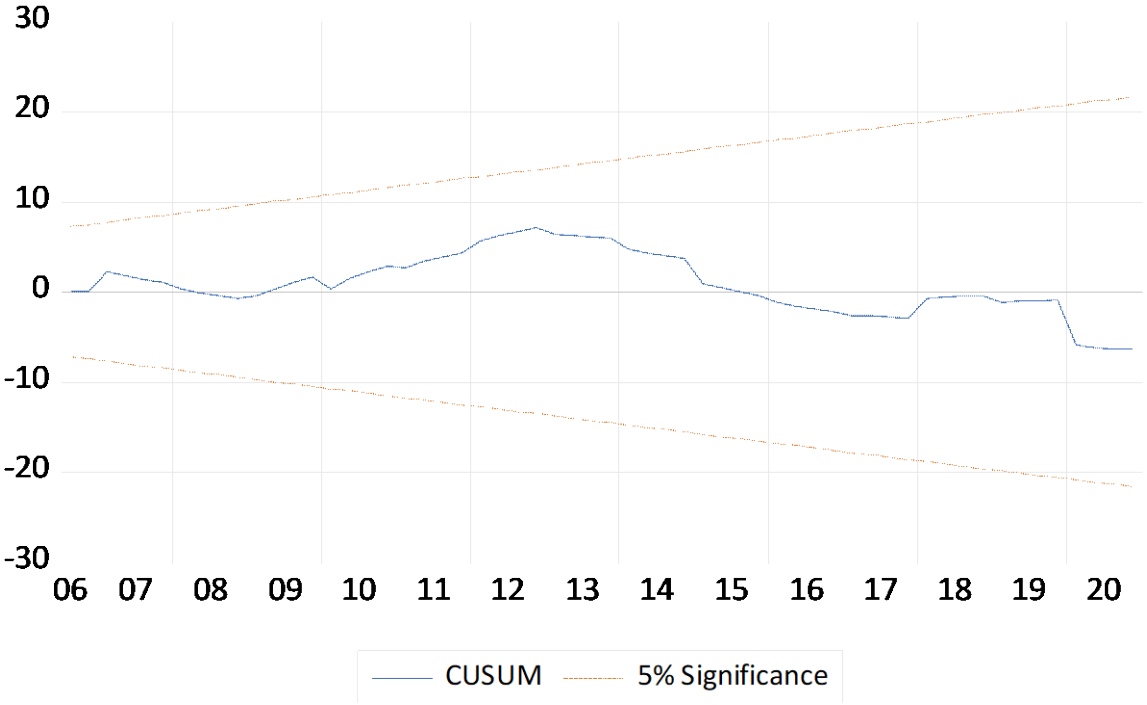


Figure 6.4 : CUSUM Test

The CUSUM Test below surprisingly shows that the pathway of the NARDL stays within the confidence bands. This is an unexpected result since the two previous figures indicated hints of instability. Nevertheless, this implies that the NARDL is stable in the long run.



6.11 CONCLUSION AND RECOMMENDATIONS

This study used two ARDL models to investigate the impact of economic crises and government debt on consumption expenditure between 1990 – 2020. The first model found that in the short run, the error correction model shows that all variables apart from inflation and the fuel levy cause an increase in consumption expenditure. It also shows that the economy reverts to its steady state at a speed of 0.415%. However, in the long run, as expected, it is found that the total foreign debt, government expenditure, and government expenditure on social protection, as well as the fuel levy, all increase consumption expenditure. It is recommended that the government should ease taxes such as income tax to ease the pressure on household consumption

expenditure. This will greatly assist in curbing the secondary effects of economic crises, which is that consumers end up having to pay for government debt.

The second ARDL Model showed all variables to be significant in the short run; however, GDP is insignificant in the long run. The error correction term is negative and significant. It also indicates that the economy will return to its steady state at a slower speed of 0.15%. The chapter also performed a NARDL which found that national government debt is insignificant in the long run but significant in the short run. This means government debt does increase the burden of consumption expenditure, but only in the short run.

Lastly, the chapter performed three tests of stability, namely the cumulative sum of recursive residuals, the cumulative sum of squares of recursive residuals and the CUSUM Tests. The first two pathways were outside the bounds of the tests while the CUSUM test showed stability.

CHAPTER SEVEN

CONCLUSION

7.1 INTRODUCTION

The following chapter will provide the study's conclusion. Section 7.2 will provide a summary of the study, and Section 7.3 will provide the empirical findings of the study. Section 7.4 will discuss each objective of the study. Section 7.5 will outline the recommendations of the study, while Section 7.6 will highlight areas for further research. Section 7.7 will outline the study's limitations, and the last section will conclude the study.

7.2 SUMMARY OF THE STUDY

This study's main aim was to investigate the impact of economic crises and government debt on consumption expenditure. The study achieved this main aim by focusing on the following objectives:

1. To address the impact of economic crises on consumption expenditure
2. To examine the impact of the tax burden on consumption expenditure
3. To investigate the impact of government debt on consumption expenditure
4. To investigate the impact of economic crises on government debt
5. To investigate possible remedies to reduce the tax burden.

The study identified a research problem which was the economic crises induce an increase government debt, the consequence of which is felt by consumers. The mechanism through which consumers are affected is called taxation. The study is significant in that it locates the South African economy within two economic crises and then analyses the impact of this localisation on consumption expenditure. The study is also significant because it can add to the scant literature on the topic as well as provide remedial measures. Key findings of the study include unidirectional causality between the dependant variable and explanatory variables. and it has been found that national government debt only has a short-run adverse impact on consumption expenditure.

The study then proceeded to conduct a thorough conceptual framework on consumption expenditure, where various aspects of the concept were discussed, such as definitions, components, and features. Consumption expenditure in different countries was unpacked for comparison with South Africa. The way in which consumption expenditure is affected by household debt was also discussed, as well as how it is impacted by government expenditure on social protection and taxation. The study proceeded to discuss economic crises and their impact on government debt and subsequently the consumer. The economic crises that were discussed were the Great Depression; the OPEC oil crisis; the Asian crisis; the global economic crisis, COVID-19 and the stock market crisis. The discussion then concluded with a discussion on government debt, including the differences between national and foreign government debt, its purpose, and graphical illustrations of where the aforementioned debts are sitting to date.

The study's theoretical and empirical literature review was centred on understanding consumption theories. Different theories were discussed, such as the absolute income hypothesis, the relative income hypothesis, and the life cycle hypothesis, of which the study adopted the relative income hypothesis. The emphasis of different schools of thought was directed towards the theoretical literature to illuminate the basis for adopting the relative income hypothesis. The utility theory was extensively highlighted and shown to view consumption as a measurement where the tools of analysis are indifference curves and calculating optimal outcomes. The study also discussed its empirical literature review. The main theory for analysing government debt was the New Keynesian debt management theory. However, the study found that the best theory to describe the relationship between economic crises and government debt was the New Keynesian Sovereign debt default risk model.

The research methodology of the study gave a comprehensive discussion on the chosen methodology, which is quantitative and econometric. The chosen methodology for the study was an ARDL and NARDL model. The study expounded on the different methods and techniques involved in this methodology. Specifically, the techniques included unit root testing, which is a test for stationarity. This is for detecting if variables do not follow a random walk. The unit root tests that were used were the ADF and Phillips-Perron tests. The model specification was also presented, where it was indicated that each model would produce long-run estimates and error correction

models. However, for the NARDL, an additional test for symmetry was also specified. The specifications for diagnostic tests were also included, where the tests detect any violation of the OLS assumptions, such as serial correlation, heteroskedasticity, and multicollinearity.

The study also engaged in data analysis and presented findings. These findings started with a graphical presentation of the variables to detect stationarity visually. There were also descriptive statistics performed to ascertain the statistical properties of the variables. Thereafter, the study conducted breakpoint testing, particularly the Chow test and Zivot-Andrews test. Granger causality was also run in the study to investigate whether there is bidirectional causality between variables. The study found a unidirectional causality from consumption expenditure to all the variables, apart from inflation.

Diagnostic tests were performed on both models' error correction models. The tests included the Jarque-Bera test for testing normality; the Ramsey RESET test for the model's stability; the ARCH-LM test for testing heteroskedasticity; and the Breusch-Godfrey test for diagnosing serial correlation.

7.3 EMPIRICAL FINDINGS OF THE STUDY

This study used two ARDL models to investigate the impact of economic crises and government debt on consumption expenditure between 1990 – 2020. The first model found that in the short run, the error correction model shows that all variables, apart from inflation and the fuel levy, cause an increase in consumption expenditure. It also shows that the economy reverts to its steady state at a speed of 0.415%. However, in the long run, as expected, it is found, that the total foreign debt, government expenditure and government expenditure on social protection, as well as the fuel levy all increase consumption expenditure.

The second ARDL Model showed all variables to be significant in the short run, however GDP is significant only in the long run. The error correction term is negative and significant. It also indicates that the economy will return to its steady state at a slower speed of 0.15%. The study also performed a NARDL, which found that national government debt is insignificant in the long run but significant in the short run, making it suitable for this model in the short run. Nevertheless, a more precise way of

determining this is by using what is known as a symmetry test. The symmetry found that in the short run, national government debt has an adverse impact on consumption expenditure. More specific discussions of the empirical findings are outlined under each objective.

7.4 OBJECTIVES OF THE STUDY

The study had five objectives, namely:

1. To address the impact of economic crises on consumption expenditure
2. To examine the impact of the tax burden on consumption expenditure
3. To investigate the impact of government debt on consumption expenditure
4. To investigate the impact of economic crises on government debt
5. To investigate possible remedies to reduce the tax burden

7.4.1 Objective 1

To address the impact of economic crises on consumption expenditure

The study did address this objective using literature which was dedicated to consumption expenditure and economic crises. It found that economic crises had an adverse impact on consumption expenditure, with significant decreases in household consumption in times of crisis such as the Great Depression, the Asian crisis, the global economic recession. Considering this objective, decreases in consumption expenditure are viewed as a negative impact as they have the capacity to reduce welfare gains. Thus, during crises such as the Asian crisis, Korea, Indonesia, and China all found themselves having to reduce their consumption and substitute away from luxury goods to more normal goods. This is supported by studies by Arapova (2018); Yang et al. (2022); Lardy (2019); Li, Huang and Chang (2023); as well as Lu and Lau (2015). Deshmukh and Vyavahare (2018), and Mishra (2011), also note that this is the case for India.

However, the empirical results of the study, which showed a 1% increase in total foreign debt, and which resulted in a 0.06% increase in consumption expenditure, also indicate an increase in consumption expenditure during economic crises, which, in terms of empirical analysis, is viewed as a burden on the consumer, i.e. the plight of the consumer. This result is supported by Zulkifli and Haqeem (2022) and Schumacher

(1985), who note that during the OPEC Oil crisis, consumption expenditure increased in Arab countries, albeit due to the beneficial impact of the Yom Kippur war.

7.4.2 Objective 2

To examine the impact of the tax burden on consumption expenditure

Using an ARDL model, the study did achieve this objective. The findings showed that a 1% increase in VAT will result in a 0.071% decrease in consumption expenditure. This is supported by Obiakor, Kwarbai and Okwu (2015). However, this is not in line with the stance of the study. The findings also report that a 1% increase in personal income tax will result in a 0.04% decrease in consumption expenditure. This is what is known as puzzling results because they refute the theory and literature of the study, such as that of Raut and Virmani (1989) and Koatsa, Paramaiah and Scona (2021). However, when the non-linear ARDL model was considered, a 1% increase in personal income tax did result in a 0.004865% increase in consumption expenditure. This result corroborates the studies by Zhang (2017) and Zhan, Liang and Yu (2025). A 1% increase in the fuel levy will result in a 0.09% increase in consumption expenditure. This is in line with this study as it asserts that an increase in taxes or levies will increase consumption expenditure (Mabugu, Chitiga and Amusa, 2009).

7.4.3 Objective 3

To investigate the impact of government debt on consumption expenditure

Using an ARDL model, the study has achieved this objective and found that a 1% increase in total foreign debt will result in a 0.06% increase in consumption expenditure. This confirms that as governments take on more debt during economic crises, consumption expenditure increases. This is corroborated in studies by Costa Junior, Garcia-Cintado and Junior (2021), Mothibi and Mncayi (2019), and Isah, Joseph and Dairo (2022). The study also used a non-linear ARDL and found that a 1% increase in the national government debt will increase consumption expenditure by 0.038%. This is due to the impact of the economic crisis of 2008 and COVID-19.

It was also found that due to economic crises, the South African government increased its debt, which had an adverse impact on consumption expenditure. Sharp decreases

in total household consumption were seen in 2008 and COVID-19 throughout the sample period.

7.4.4 Objective 4

To investigate the impact of economic crises on government debt

The correlation between economic crises and government is one which is relatively new but has a firm stance. The sparse literature has shown that whenever there is an economic crisis, governments increase their debt, and this was the case during 2008 and COVID-19 in South Africa. Studies by Yang et al. (2022), Heald and Hodges (2020), de Villiers, Cerbone and van Zijl (2020) and the National Treasury (2020) all showed the adverse effect of COVID-19 on government debt. Their studies included the impact of COVID-19 on government in South Africa, the USA, China and the UK. To highlight the fact that economic crises are correlated with government debt, the IMF pledged $110 billion in short-term loans to Thailand, Indonesia, and South Korea during the Asian crisis of 1997 (Ang, 2001). Holtfrerich et al. (2016) also note that the impact of banking crises amongst industrialised countries has led to the increase in debt to GDP ratios in the past 140 years.

7.4.5 Objective 5

To investigate possible remedies to reduce the tax burden

The study achieved this objective by giving an expansive discussion of the wealth tax. The study showed that South Africa has a long history of wealth taxes, such as the tax on estate duties, on donations, as well as on securities (Arendse & Stack, 2018; Evans, 2013). However, South Africa has not had a tax on wealth holdings, and this is the wealth tax which could result in more equity and a wider distribution of income. It would also certainly ease the burden on the taxpayer.

7.5 RECOMMENDATIONS

- The first recommendation is that the state should reduce its expenditure. These are the low-hanging fruits that could be easily and quickly achieved. These low-hanging fruits include benefits and salaries of state officials. There could be the option of supplying more benefits and a lower salary, or a higher salary with

fewer benefits. The state fleet and private security can also be limited to the higher echelons of the state officials and not to most.

- There has been a recent announcement of no increase in VAT in 2025. Such an increase would have severely affected the consumer's pocket and signalled an even greater struggle for the middle class. To ease the tax burden, the state could look more outside the country for tax receipts. The global minimum tax rate that multinational corporations pay has been made mandatory in all countries. The state could increase this tax for its global MNCs. Another option may be for the state to increase tariffs on international goods.
- A wealth tax would ease the burden on consumers and promote South Africa's agenda of a progressive tax system. The distribution of a wealth tax could also promote horizontal and vertical equity. In addition, a study by Nemalili and Robinson (2021) states that a wealth tax increases economic growth.
- Furthermore, the state could reduce the PAYE tax, thereby assisting consumers in their respective tax brackets to retain their purchasing power. This can be a type of personal income tax reform that can stimulate economic development. The impact of tax incentives on household consumption expenditure has been found to be positive in China, after they were implemented in 2018 (Zhan, Liang & Yu, 2025). There was a similar reform in the US which was implemented through the US Tax Cuts and Jobs Act (2017). The impact of the reform was a temporary increase in economic growth by 0.9% (Barro & Furman, 2018).
- The government could reduce borrowing because South Africa's debt stands at 76% of GDP and is increasing. The borrowing requirement is also what is keeping the country in debt.

7.6 AREAS OF FURTHER RESEARCH

- An area of further research could be to source or investigate other tax sources which do not severely affect households or individuals, and which can promote equity while achieving efficiency at the same time.
- Another area of research could be the impact of reducing government expenditure on social protection and how that will impact government debt. While it is certainly controversial, it could investigate the possibility of limiting

the child social grant to only 2 recipients. This could have a significantly positive impact on taxpayers as it would ease a very large tax burden.

7.7 LIMITATIONS

- Although the study has extensively covered the said topic, there are limitations in any study.
- Future studies could repeat the study and consider different time periods to compare the results with those of this study.
- The study also used two models, which were the ARDL and non-linear ARDL. In the second model, one had to exclude the foreign debt variable for the model to yield results because it can only take up to 6 variables, otherwise the model would explode. This is a limitation since the only debt variable used in this instance was national government debt.

7.8 CONCLUSION OF THE STUDY

The study attempted to investigate and understand the impact of economic crises and government debt on consumption expenditure. The study achieved this purpose by conducting a thorough literature review. The literature review conducted a discussion on understanding consumption expenditure and how it relates to government debt, economic crises and taxes. The study also unpacked in depth findings using quarterly data from 1993 – 2020 for the ARDL and non-linear ARDL models. The variables used in the study were foreign debt, national debt, personal income tax, VAT, fuel levy, GDP, and inflation.

The main theoretical underpinning of the study was the relative income hypothesis although other consumption theories such as utility theory, absolute income hypothesis, permanent income hypothesis and the life cycle hypothesis were also discussed. From an empirical perspective, the theory was centred on the New Keynesian sovereign debt fault theory. All the objectives of the study were achieved with areas of further research and limitations clearly stated.

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