THE EFFECT OF VALUE-ADDED TAX ON ECONOMIC GROWTH IN SOUTH AFRICA

by

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"The effect of value-added tax on economic growth in South Africa"

I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

<u>June 2023</u>

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ABSTRACT

The study investigated the effect of value-added tax on economic growth in South Africa using the Autoregressive Distributed Lag (ARDL) bounds tests approach for cointegration for the period 1991 to 2020. The results of the study showed that there was a long-run relationship between the variables when investment was used as the dependent variable. The results of the ECM showed that GDP growth had a significant and positive effect on investment, while VAT had a positive but non-significant effect on investment. The causality test results showed that GDP Granger-cause investment, and that a bi-directional causal relationship existed between VAT and investment. These results therefore prove that growth could be achieved in South Africa when government allocates the revenue raised through a well-designed value-added tax to productive expenditure, such as human capital, research and development and investing in infrastructure. In other words, the findings of the study confirms that VAT has the potential to impact economic growth when the increased revenue is allocated towards well-targeted investment. To mitigate the adverse effect of a VAT increase on the disadvantaged, this could be addressed by diverting the revenue back to the poor through increased spending on housing and health to reduce poverty and inequality.

Key terms: GDP, VAT, taxation, investment, autoregressive distributed lag, bounds test, cointegration, error correction model, endogenous growth.

ABSTRACT: SOUTHERN SOTHO

Patlisiso e batlisitse sephetho sa lekgetho la boleng bo ekeditsweng ho kgolo ya moruo Afrika Borwa ka ho sebedisa mokgwa wa diteko tsa mellwane tsa Autoregressive Distributed Lag (ARDL) bakeng sa kopanyo bakeng sa nako ya 1991 ho isa ho 2020. Diphetho tsa phuputso di bontshitse hore ho bile le nako e telele kamano pakeng tsa mefuta-futa ha matsete a ne a sebediswa e le phapang e itshetlehileng ka yona. Diphetho tsa ECM di bontshitse hore kgolo ya GDP e bile le phello e kgolo le e ntle ho tsetelo, ha VAT e na le phello e ntle empa e se ya bohlokwa ho tsetelong. Diphetho tsa diteko tsa causality di bontshitse hore matsete a GDP Granger-cause, le hore kamano ya mabaka a mabedi e teng dipakeng tsa VAT le matsete. Ka hona, diphetho tsena di paka hore kgolo e ka fihlellwa ka hara Afrika Borwa ha mmuso o abela lekeno le bokelletsweng ka lekgetho le hlophisitsweng hantle la boleng ba ditjeho tse hlahisang tlhahiso, tse kang bokgoni ba batho, dipatlisiso le ntshetsopele le matsete ho meralo ya motheo. Ka mantswe a mang, diphuputso tsa phuputso di tiisa hore VAT e na le bokgoni ba ho ama kgolo ya moruo ha lekeno le eketsehileng le abelwa matsete a rerilweng hantle. Ho bebofatsa phello e mpe ya keketseho ya VAT ho ba hlokisitsweng, sena se ka rarollwa ka ho kgutlisetsa lekeno ho ba futsanehileng ka ho eketseha ha tshebediso ya chelete matlong le bophelo bo botle ho fokotsa bofuma le ho se lekane.

ABSTRACT: AFRIKAANS

Die studie het die effek van belasting op toegevoegde waarde op ekonomiese groei in Suid-Afrika ondersoek deur gebruik te maak van die Outoregressiewe Verspreide Lag (ARDL) grenstoetsbenadering vir koïntegrasie vir die tydperk 1991 tot 2020. Die resultate van die studie het getoon dat daar 'n langtermyn was verband tussen die veranderlikes wanneer belegging as die afhanklike veranderlike gebruik is. Die resultate van die ECM het getoon dat ekonomiese groei 'n beduidende en positiewe uitwerking op investering gehad het, terwyl belasting op toegevoegde waarde 'n positiewe maar nie-beduidende uitwerking op investering gehad het. Die oorsaaklikheidstoetsresultate het getoon dat ekonomiese groei Granger investering veroorsaak, en dat 'n tweerigting-oorsaaklike verband tussen belasting op toegevoegde waarde en investering bestaan het. Hierdie resultate bewys dus dat groei in Suid-Afrika behaal kan word wanneer die regering die inkomste wat verkry word deur 'n goed ontwerpte belasting op toegevoegde waarde toewys aan produktiewe uitgawes, soos menslike kapitaal, navorsing en ontwikkeling en investering in infrastruktuur. Met ander woorde, die bevindinge van die studie bevestig dat belasting op toegevoegde waarde die potensiaal het om ekonomiese groei te beïnvloed wanneer die verhoogde inkomste aan goedgerigte belegging toegewys word. Om die nadelige uitwerking van 'n belasting op toegevoegde waarde verhoging op die benadeeldes te versag, kan dit aangespreek word deur die inkomste na die armes terug te lei deur verhoogde besteding aan behuising en gesondheid om armoede en ongelykheid te verminder.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	augmented Dickey–Fuller
AIC	Akaike information criterion
AR	autoregressive
ARDL	autoregressive distributed lag
CEE	Central Eastern European
CGE	computable general equilibrium
CGT	capital gains tax
CIT	company income tax
CPI	Consumer Price Index
CUSUM	cumulative sum
CUSUMSQ	cumulative sum of squares
ECM	error correction model
EU	European Union
FDI	foreign direct investment
GDP	gross domestic product
GEAR	Growth, Employment and Redistribution
GMM	generalised method of moments
GST	general sales tax
IDC	Industrial Development Corporation
LAC	Latin American Countries

LM	Lagrange multiplier
NDP	National Development Plan
OECD	Organisation for Economic Co-operation Development
OLS	ordinary least squares
PIT	personal income tax
PP	Phillip–Perron
PPT	petroleum profit tax
R&D	research and development
RCK	Ramsey–Cass–Koopmans
RDP	Reconstruction and Development Programme
SA	South Africa
SAA	South African Airways
SACU	Southern African Customs Union
SAM	social accounting matrix
SARB	South African Reserve Bank
SARS	South African Revenue Service
SBC	Schwartz Bayesian criterion
SOE	state-owned enterprise
SRD grant	social relief of distress grant
StatsSA	Statistics South Africa
STC	secondary tax on companies

TIPS	Trade and Industrial Policy Strategies
VAR	vector autoregressive
VAT	value-added tax
WTI	World Tax Index
ZAR	South African Rand

CHAPTER ONE: BACKGROUND OF THE STUDY

1.1. INTRODUCTION

In the field of public finance, taxation is regarded as an important instrument, which the government uses to raise revenue. Given its significant contribution to the provision of public goods within the state, tax reforms are often proposed and implemented with the aim of realising economic development and growth. According to Ebrill, Keen, Bodin and Summers (2001), in the past, countries mainly relied upon the direct income taxes, such as personal income tax (PIT) and company income tax (CIT) with PIT contributing a major share of the total tax revenue in many parts of the world. On the other hand, indirect taxes, such as excise and trade taxes, have shown a relatively insignificant contribution to total revenue collected (see Figure 1.1). However, the introduction of the value-added tax (VAT) and its adoption in many countries have resulted in increased indirect tax revenue surpassing that of CIT; thus, making it the second most important source of revenue in some of the countries with VAT. Ebrill et al. (2001) defines VAT as a broad-based tax on consumption of goods and services levied at multiple stages of production while providing firms registered for VAT in different sectors with a tax credit for tax paid on production inputs sold at the final stage as outputs.
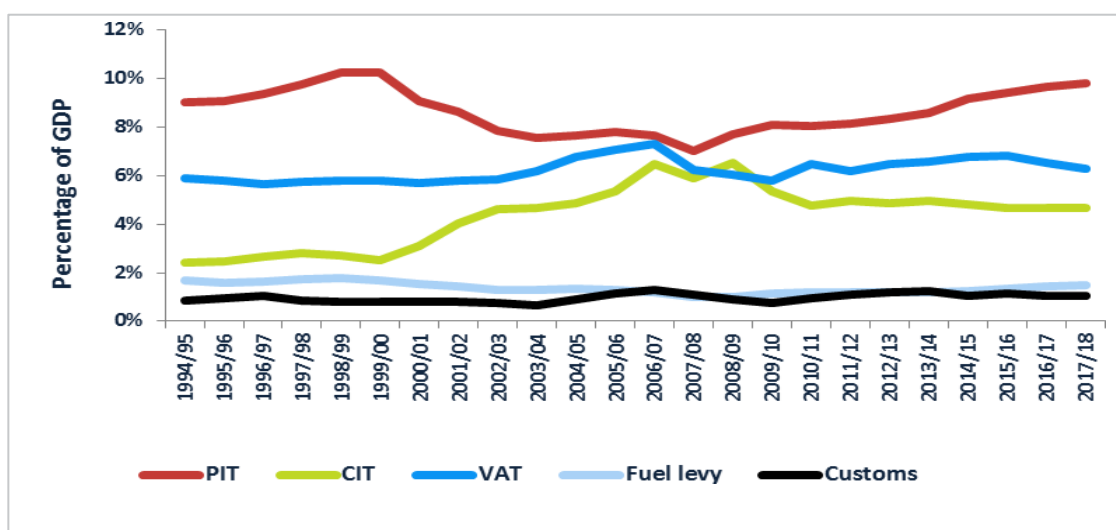
Figure 1.1: Main revenue sources as a percentage of GDP, (1994/95 - 2017/18): Source Adapted from Stats SA (2018)

VAT was first introduced in France in 1954, and saw its prominence growing, however limited to only a few countries until the late 1960s before growing rapidly again in the 1970s (Cnossen, 1998). The rise of VAT can be attributed largely to its merits of simplicity, neutrality, efficiency, and administrative ease in comparison to alternative taxes (Ebrill et al., 2001). Over the years, adoption of VAT has been observed in several countries, mainly in Latin American and various African countries. During its infancy, the adoption of VAT was dominated by Western Europe and Latin America. According to Ebrill et al. (2001), at the time of their research there were over 160 countries that have adopted VAT since its introduction, with those without or with low absorption of VAT mainly being the small islands and countries, which are relatively abundant in natural resources and therefore exhibiting high reliance on mineral resource revenues. Insofar as VAT is regarded as an important source of revenue and given its merits, studies such as those by Tanzi and Zee (2000), Jalata (2014) and Yusuf, Abidin, Bakar and Musibau (2018), also emphasise the importance of literacy and capacity of tax administration officials in making the system to be consistently efficient with regard to the implementation of tax reforms. Moreover, Tanzi and Zee (2000) point out that, at the time, developed countries tended to raise more tax revenue to GDP, and to have high literacy rates compared to developing countries with low literacy rates.

The literature on studying the relationship between taxation and economic growth has been covered focusing mainly on the effect of direct taxes. As per the World Bank (2023) definition, economic growth is measured by change in the volume of its output of its residents. According to Myles (2009) economic growth is attained by the accumulation of both physical and human capital and innovations, which lead to technical progress. It is through accumulation and innovation that the productivity of inputs can be raised, and the level of output increased. The link between taxation and economic growth can be understood from the effect tax policy has on economic decisions. It is argued that tax creates adverse results when it reduces the potential return on capital investment, both in the physical and human state (Myles, 2009). Some positive aspects attached to tax can be explained by its importance in raising government revenue, which assists government in providing public goods, such as education and health care as well as infrastructure (South African Revenue Services

[SARS], 2021). Imposing lower rates on direct taxes and increasing those of consumption type tax, such as VAT, have non-distortionary effects while increasing the revenue. VAT could therefore provide the means to finance these expenditures and, indirectly, could contribute to an increase in the growth rate, when the imposition of higher rates on PIT and CIT are not economically feasible.

The effectiveness of VAT in raising adequate revenue and facilitating growth also depends to some extent on the policy design that forms the entire VAT system. For instance, the zero rating of necessities and exemptions available to some commodities will also determine the effect VAT will have on all sectors of the economy, and therefore the percentage of VAT revenue to total revenue the government is able to raise (National Treasury, 2011a). Many countries – both developed and developing – have designed their VAT system in such a way that it zero rates and exempts some commodities to mitigate the regressiveness of VAT better (Gcabo et al., 2019).

In South Africa, for example, commodities that make a greater percentage of consumption among poor households are zero-rated to lessen the regressivity of VAT. Although many countries have implemented VAT with zero ratings and exemptions to meet the equity criteria of tax, studies, such as those by Bird (2009) and Cnossen (2015), have raised concerns citing that these concessions benefit the rich more than the poor despite most literature stating that the poor spend relatively more on food products than the rich. Furthermore, Cnossen (2015) mentions some of the problems associated with VAT, such as –

- complicating the administration process when allocating inputs that are taxable and those that are exempted from tax.
- harming export.
- distorting input choice; and
- encouraging tax avoidance.

According to Cnossen (2015), the concessions of zero rating and exempting goods and services consumed by the lower-income group in most African countries are not well targeted to mitigate the VAT burden on them. The revenue raised under VAT proves to be significant to the state budget serving as an advantage of adopting this consumption tax (National Treasury, 2011a).

The presence of zero rating and the exemptions on some goods and services however reverse the benefit of adopting VAT, turning it into an economic cost when the tax administration is involved in an expensive refunding process (National Treasury, 2011a).

1.2. PROBLEM STATEMENT

When evaluating how well tax revenue collection has performed, it is important to consider the tax buoyancy ratio as this ratio measures tax revenues responsiveness in relation to economic growth. A tax buoyancy ratio that is greater than 1 indicates that tax revenues are growing faster than economic growth and indicates that the fiscal policy is sustainable over the long term. (National Treasury & SARS, 2020). During the 2008/09 global financial crisis which was marked by difficult economic conditions, tax revenues remained buoyant in South Africa. However, during the 2016/17 financial year, the total tax revenue growth was well below economic growth and showed a tax buoyancy ratio of 0.94 but recovered again in the 2017/18 period when the tax revenue generation matched the rate of economic growth (National Treasury & SARS, 2020). The total tax revenue buoyancy declined to 1.18 during 2019/20 from a buoyancy ratio of 1.20 during the 2016/17 and this was due to the growth in tax revenues not being on par with economic growth (National Treasury & SARS, 2020). The PIT contribution to total tax revenue had shown a steady increase between 2015 to 2020 while the CIT contribution to tax revenue declined. Looking at the VAT collection, its contribution to total tax revenue decreased slightly from 26.2 percent to 24.5 percent between 2015/16 and 2017/18 financial years before increasing to 25.2 percent in the period 2019/20 (National Treasury & SARS, 2020).
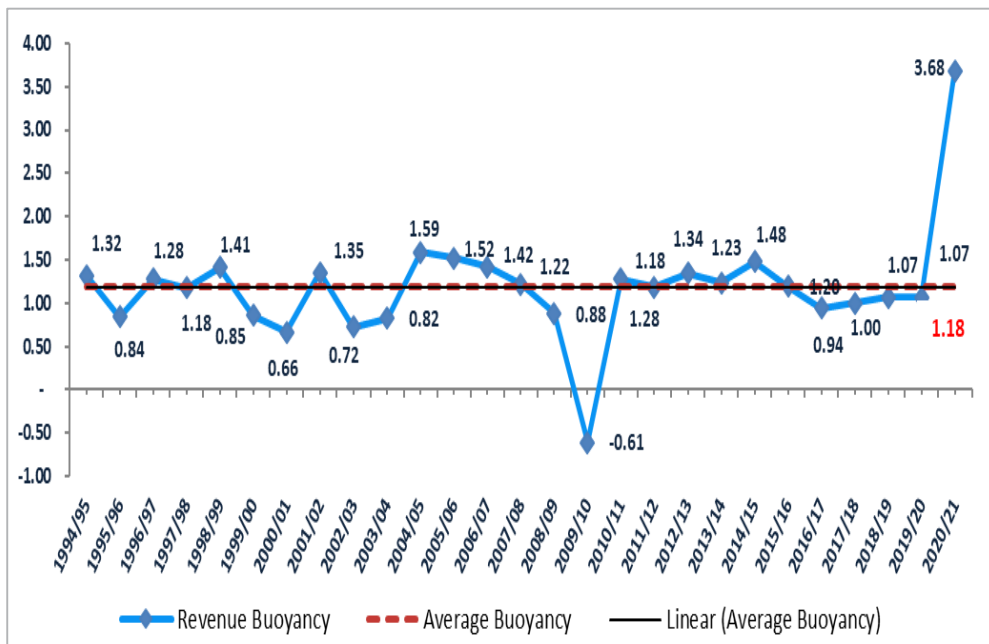
Figure 1.2: Revenue Buoyancy, (1994/95 - 2020/21): Source Adapted from Stats SA (2021)

On average, the long-term tax buoyancy ratio since 1994/95 was at 1.18. This value indicates that South Africa is characterised by a tax system that is highly responsive to changes in the tax base (National Treasury & SARS, 2022). Both the PIT and VAT contributions to tax revenue declined during the 2021/2022 period while the CIT increased in the same period. Furthermore, because of the measures taken during the COVID-19 lockdown and the effects thereof on individuals and businesses, tax revenue growth contracted by almost 5 times more than the contraction observed in economic growth (National Treasury & SARS, 2022).

Although revenue increased over the period of 2015/16 to 2019/2020, however the tax-to-GDP ratio declined. Moreover, weaknesses in the tax administration were also identified as the contributing factor to poor tax collection towards the PIT and CIT collection during the 2018/19 financial year. As a result of a shortfall in revenue accompanied by expanded fiscal commitments such as the increased expenditure in the education through the fee-free higher education, this led to an increase in taxes. Taxes including the PIT, VAT, and capital gains tax were all increased between the period 2015/16 and 2018/19. To mitigate the negative effects of these taxes to

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economic growth, fiscal policy plans avoided further increases in this regard during the 2019/2020 period (National Treasury, 2019).

Turning to the growth trends, South Africa experienced economic prosperity in the period between 2000 and 2010 which saw the government increasing government spending to a greater extend because of accelerating economic growth and a presence of commodity boom coupled with favourable interest rates and low inflation (Frankel et al., 2016). This economic prosperity enabled the government to increase expenditure for the provision of infrastructure development, law and order, education, health and social protection. The government experienced a budget surplus even after increasing expenditure within those sectors due to the growing economy and tax revenue buoyancy (Sachs, 2021). The phase of accelerating growth however came to an end in 2011 which required the government to adjust its existing fiscal commitments (Sachs, 2021). As a response to slow growth, the government reduced expenditure and relied on generating more tax revenue to avoid a large deficit (Sachs, 2021). While tax revenue collection increased, most of it was devoted to servicing the cost of debt thus pushing the budget balance into a deficit with the result being less spending on essential services like health and security services.

South Africa's public debt levels have been increasing, raising concerns about debt sustainability. The public debt-to-GDP ratio increased from 26 per cent during the 2008/09 period to 82 percent in the period 2020/21 (Burger, 2020). High levels of public debt can limit the government's fiscal flexibility and increase debt-servicing costs. Without a sustainable economic growth, it will be impossible for the country to avoid persistent deficit or to stabilise the public debt. For a more balanced budget, the government needs to explore other sources of funding to deliver on their fiscal commitments which may include increasing taxes. However, careful consideration also needs to be applied on the effects of individual taxes on economic growth. Given that most of the literature points to PIT and CIT being amongst the taxes that are more detrimental to growth than VAT, this motivated the study to investigate the potential impact of VAT on economic growth especially when South Africa is still on a slow growth trajectory and faced by persistent government deficit and debt.

In South Africa, VAT remained unchanged at 14 per cent from 1993 until April 2018 when it increased by 1 per cent to 15 per cent (National Treasury, 2019). Having remained unchanged for over two decades, VAT has been observed as mildly regressive (Go, Kearney, Robinson & Thierfelder, 2005). South African VAT is considered low when compared to that in Organisation for Economic Co-operation Development (OECD) countries. Turning to its African counterparts, such as Kenya, Madagascar, Tanzania, Tunisia, the VAT rate in South Africa is still relatively low. According to tax statistics by the National Treasury & SARS (2018), the revenue raised from VAT for the 2017–2018 tax year was 24.5 per cent of total revenue, coming second to PIT, which contributed 38.1 per cent and surpassing that of CIT, which contributed 18.1 per cent of total revenue. The current study argued that, given such a positive performance, the gains of VAT provide enough motivation for increasing it above the 14 per cent threshold or broadening the tax base even more to take full advantage of the potential revenue it could raise if it were better designed.

However, it is argued that the design of a VAT with many zero-rated goods and exemptions reverses this positive effect of the VAT (National Treasury, 2018). According to the National Treasury (2011a), the delay in increasing the VAT rate in South Africa could be attributed to the political challenge of implementing such a tax reform due to the popular belief that it is regressive and could harm the poor to a greater extent. This error in judgement can be rectified by clarifying the purpose of VAT. VAT is not imposed for the purpose of income redistribution or to reduce wealth inequalities, as the purpose of such tax is expected with other progressive direct taxes. The delay in shifting the focus from income tax to consumption tax in turn delays economic growth.

1.3. RESEARCH QUESTIONS

This study aims to address the following questions.

- What is the effect of VAT on economic growth in South Africa?
- What impact will an increase in the VAT have on economic growth?
- How can the additional revenue as a result of a VAT increase promote spending on investment and different expenditure programs?

1.4. OBJECTIVES OF THE STUDY

The main objectives of the study were as follows.

- to investigate the effect of VAT on economic growth following a VAT increase; and
- to identify the expenditure programs that will enhance economic growth in South Africa.

1.5. HYPOTHESIS STATEMENT

The hypotheses stated were:

- H_0: There is no relationship between VAT and economic growth in South Africa
- H1: There is a relationship between VAT and economic growth in South Africa

1.6. METHODOLOGY OF THE STUDY

The current study employed the time series technique using data obtained from the world development indicators, the South African Revenue Service (SARS), and the South African Reserve Bank (SARB) for the period 1991–2020 to examine the effect of VAT on economic growth in South Africa using the autoregressive distributed lag (ARDL) co-integration technique.

The first step was to test whether the underlying variables had unit root followed by co-integration analysis, which was performed to test for the existence of the long-run relationship and the resulting error correction model (ECM) (Pesaran & Shin, 1999). Unit root testing is important to be performed first to avoid the ARDL model crash when there are variables that are integrated of order I (2) (Shrestha & Bhatta, 2018). For unit root testing, two tests namely the augmented Dickey–Fuller (ADF) test, and the Phillip–Perron (PP) test were done.

1.7. SIGNIFICANCE OF THE STUDY

Several studies such as Johansson, Heady, Arnold, Brys, and Vartia (2008); Macek (2015); Korkmaz, Yilgor and Aksoy (2019) found the PIT and CIT to be more detrimental to growth while the VAT has been found to be either negative or positive

to growth. The VAT in South Africa has not gone through a lot of tax reforms when compared to the other two major sources of tax revenue, having been increased only twice in the year 1993 and 2018 since its inception in 1991. A lack of tax reform in relation to the VAT is due to the argument that it is seen as a regressive tax and that it harms the poor the most than the rich (National Treasury, 2011b). However, the lack of reform in the VAT in South Africa delays the opportunity to increase the much-needed revenue. The South African economy has been experiencing slow growth and increasing the PIT and CIT rate could lead to even less or negative economic growth. This current study's contribution will be to determine the relationship between VAT and economic growth in South Africa and how the increase in the VAT could impact growth. Most authors have mainly limited their studies on how a change in the VAT could affect growth, however, this current study will also contribute to knowledge by identifying the linkages through which the VAT could impact economic growth and vice versa.

The point made in this study, is that the relationship between VAT and economic growth can be observed through the mechanisms of sound tax administration by institutions such as SARS, and the efficient use of tax revenue collected from VAT by the state. When there is economic growth, this feeds through to increased consumer spending and demand which then stimulates production and business activities. These supply and demand side responses increases the overall consumption including government consumption on which VAT is levied. With a boost in revenue due to VAT, government can allocate funds to those productive expenditure programs that in turn fosters growth and the improvement in the living conditions of all citizens. These mechanisms are discussed further in the conceptual framework in Chapter 4.

1.8. STUDY OUTLINE

Chapter One provided a background to the study. Chapter Two focuses on VAT and economic growth trends in South Africa. Chapter Three provides the theoretical and empirical literature review. The methodology of the study follows in Chapter Four. Chapter Five provides the estimation of the model and results. Chapter Six concludes the thesis.

CHAPTER TWO: ECONOMIC AND TAX REVENUE TRENDS IN SOUTH AFRICA

2.1. INTRODUCTION

This chapter provides an analysis of SA tax policy and its contribution to the way tax revenues from the three major taxes, namely PIT, CIT and VAT have performed in relation to economic growth, and the way revenue has helped finance important expenditure items. Given that the focus of this study was mainly on VAT, an in-depth analysis of VAT – since its inception – can be expected to remain central to this chapter. Fiscal policy in South Africa has been revised over the years, and tax reforms that resulted have since shaped the existing tax policy. The current chapter is therefore organised as follows. Section 2.2 explains how the SA tax policy has evolved before and after democratisation in 1994. Section 2.3 provides an overview of the SA economy. Section 2.4 provides tax revenue trends of the two major taxes in South Africa namely PIT and CIT. Section 2.5 presents an overview of the indirect taxes with special emphasis on VAT. Total revenue performance and government expenditure breakdown follow in Section 2.6 and 2.7 respectively. Section 2.8 concludes this chapter.

2.2. THE EVOLUTION OF TAX POLICY IN SOUTH AFRICA

The SA tax system has evolved over time to improve the overall tax equity and efficiency and for tax policy to remain consistent with growth levels. Prior to 1994, the country experienced a period marked by political and structural events. When South Africa became democratic in 1994, the fiscal policy framework was revised, resulting in changes in tax policy. Tax policy can therefore be divided into two periods: the policies of the period before 1994 and those of the period after 1994.

2.2.1. Tax Policy Reforms before 1994

To ensure a well-functioning state, a country's tax policy needs to be efficient and should provide support to the fiscal policy to attain positive economic performance (Tanzi & Zee, 2000). Prior to 1994 and under the apartheid government, high tax rates were levied on mainly individuals and companies through PIT and CIT (Koch, Schoeman & Van Tonder, 2005). Significant amounts of revenue collected was often

used to fund the expenditure on defence, which in turn was used to maintain order and stability in the country during a series of riots in the late 1960s throughout the early 1990s (Mabugu, Fofana & Chitiga-Mabugu, 2015). The way in which the government handled its fiscal policy raised concern as to whether the tax mix and therefore the tax policy implemented at the time promoted economic growth (Mabugu et al., 2015). A review of the tax policy was therefore proposed leading to the appointment of the Franzsen Commission in 1968. In its report, the Franzsen Commission (1970) stated that the tax policy at the time was constraining to economic growth. In addition, it highlighted the limitations of the tax policy based on efficiency grounds and emphasised the need for a tax policy to be oriented towards broadening the tax base (Franzsen Commission, 1970).

A policy direction that seeks to broaden the tax base by not relying too much on direct income from individuals and companies but rather a tax policy that strives to shift towards a balanced tax mix comprising both direct and indirect taxes resulting in greater tax efficiency (Mabugu et al., 2015). Reform to tax was evidently needed as expressed in the views of the commission; the recommendations of the Franzsen Commission (1970) therefore, called for less progressivity in direct taxes to reduce the tax burden on individuals given its adverse impact on them and consequently on the economy. Turning the focus to indirect taxes, government relied on sales duties before replacing it with the general sales tax (GST) in 1978 at a rate of 4 per cent (National Treasury, 2011a). With the introduction of GST, policymakers were presented with the opportunity to broaden the indirect tax base while at the same time reducing the marginal PIT rates faced by individuals (National Treasury, 2011a).

Following the first tax commission was the appointment of the Margo Commission, which assumed its role in 1987, a period marked by high inflation, low foreign direct investment (FDI), and international political pressure against apartheid (Koch et al., 2005). The Margo Commission (1987) echoed the views of the Franzsen Commission and recommended two other two major tax reforms (Koch et al., 2005). Firstly, GST was dropped and replaced by an invoice-based VAT in 1991. Secondly, the tax burden on companies was reduced as the CIT rate was lowered. The result of the reduction in CIT was a reduction in the total tax revenue. However, during the same period in 1993, secondary tax on companies (STC) was introduced to mitigate the effect of the relinquished revenue attributed to low CIT rates (Black, Calitz & Steenekamp, 2012).

The STC – defined as a tax on distributed profits – levied on firms was introduced with the aim of encouraging firms to reinvest their profits and thereby promote economic development (Koch et al., 2005). However, in 2012, STC was replaced by the dividend tax, which is a tax imposed on shareholders upon receipt of dividends (Black et al., 2012).

2.2.2. Tax Policy Reforms after 1994

The year 1994 marked a new political era as South Africa transitioned into democracy. Consequently, new and inclusive policies had to be formulated and implemented to provide the country with new opportunities of achieving economic prosperity for all citizens. Further fiscal policy reform as well as a comprehensive tax policy was therefore needed, and this was made possible through the appointment of another tax commission, the Katz Commission in 1994 (Koch et al., 2005). The previous tax commissions had already provided the direction into which SA tax policy should be heading, as reflected in their tax recommendations (Black et al., 2012). Continuing from and building its propositions on what the previous tax commissions recommended, the Katz Commission (1994) provided the tax recommendations, which enabled the fiscal policy authorities to achieve a broadened tax base. This tax base was not only limited to a tax mix design but also promoted tax efficiency, equity, and neutrality, and notably, was expected to enhance economic growth (Black et al., 2012).

Other tax reforms proposed and introduced by the Katz Commission after 1994 included the establishment of the South African Revenue Services (SARS) as an independent and separate government department in 1997 (Black et al., 2012). In addition, the number of tax brackets for PIT was reduced and a single rate structure was introduced as well as capital gains tax (CGT). To extend the tax base even further, government introduced the foreign dividend tax, and in 2001, source-based income was replaced with the residence-based income (Koch et al., 2005). The Katz Commission contributed to a modernised tax system as an electronic filling of tax returns by individuals and businesses registered as taxpayers was introduced soon after the commission's tenure (Mabugu et al., 2015). Subsequent to the significant changes and recommendations made by the Katz Commission, SA tax policy and administration were proving to be competitive (Mabugu et al., 2015).

To maintain such a stance of international tax competitiveness, the tax policy required continuous reforms to match the tax reforms taking place in other countries in response to the effects of globalisation and the 2008–2009 economic crisis (Mabugu et al., 2015). Furthermore, the sluggish economic growth and the triple challenge of persistent unemployment, poverty, and inequality prevalent in South Africa provided justification for even further review of the tax policy Parliamentary Monitoring Group [PMG], 2016). Specifically, the tax policy reform needed to meet the objectives of the fiscal policy framework to address the socio-economic challenges (PMG, 2016). As a result, the Davis Tax Committee (DTC) was appointed in 2013 to review the tax policy framework, and to provide a supportive role in ensuring that the objectives of inclusive growth, employment, development, and fiscal sustainability were reached (PMG, 2016). After its appointment, the DTC proposed an increase on capital income, the PIT marginal rate, and indirect taxes. Also recognising the high inequality levels in the country and therefore the skewed wealth distribution, the DTC was expected to provide guidance on wealth tax (PMG, 2016).

To mitigate the issue of skewed wealth distribution, the DTC's wealth tax report (2018), proposed estate duty to be used as a tool for redressing inequality in the absence of a comprehensive wealth tax. Targeting estate duty tax as an instrument for tackling inequality provided the fiscal authorities with an opportunity to maintain a progressive tax system whilst minimising the impact of the increase in VAT, especially on poorer households. The DTC recommended that a 20 per cent estate duty tax be levied on the dutiable value of the first 30 million and 25 per cent applied in excess of the dutiable amount (National Treasury, 2019).

2.3. ECONOMIC GROWTH TRENDS

South Africa was already facing economic challenges at the start of democracy as the running of the economy was fundamentally based on apartheid policies (Mabugu et al., 2015). This gave rise to high poverty and inequality, unemployment, slow economic growth and low investment, skills shortages, and a workforce with education of low or poor quality (Industrial Development Corporation [IDC] 2013). When the democratic government came into power, it inherited a significant amount of domestic debt resulting in a high and unsustainable budget deficit (IDC, 2013). During the 1980s, the domestic debt was at an average of 3 per cent of the GDP, and the budget

deficit was considered to be at a sustainable level. However, the combination of slow growth and high government expenditure observed from the 1990s onward meant that the deficit increased sharply to 7.3 per cent in 1993, with the aggregate public debt standing at 69 per cent of the GDP in 1994 (IDC, 2013). The high level of domestic debt and government expenditure made it difficult for the democratic state to focus on addressing the backlogs in infrastructure investment and service delivery (IDC, 2013).

Over the past decade (2010–2020), SA economic growth rate has been increasing well below the rate of population growth thus translating into a declining per capita income (Stats SA, 2019). There has been a slightly positive trend in the GDP per capita since 1993, except in 1998 (World Bank, 2018). In 2006, the GDP per capita was at its highest since 1994 at 4.2 per cent according to the World Bank (2018). However, the GDP per capita income declined sharply to -2.89 per cent in 2009 and again increased to 1.72 per cent in 2011.This negative trend has however continued since 2012 reaching a level of -1.06 per cent in 2016 and -8.14 per cent in 2020, indicating that the average South African is becoming poorer (Stats SA, 2019). According to the Statistics South Africa (Stats SA) poverty and inequality trends survey (Stats SA, 2019), income inequality has remained persistently high with the Gini coefficient ranging from 0.72 per cent in 2006 to 0.67 per cent in 2015 (Stats SA, 2019). A further breakdown of the aggregate inequality is related to inequality in earnings with half of the inequality reported to be the result of high levels unemployment in South Africa (Stats SA, 2019). The unemployment rate increased by 2.7 per cent from 24.8 in 2011 to 27.5 per cent in 2017 (Stats SA, 2019). The SA unemployment rate rose sharply in the last quarter of 2020 to reach 32.5 per cent, a level recorded as the highest since 2008 (Stats SA 2019).

South Africa has experienced prolonged periods of weak growth mainly due to domestic constraints as reflected in the declining real per capita income, high unemployment, and low levels of private investment (World Bank, 2018). Considerable efforts have been made by government to improve the economic welfare of its citizens since its transition to democracy; however, progress has been limited in the last decade and a half (i.e. 2005–2020). Throughout this period, the SA government tried to eliminate poverty and reduce inequality while simultaneously attracting investment that would foster growth through different policy documents such as the –

- Accelerated and Shared Growth Initiatives for South Africa (AsgiSA) (2006);
- New Growth Path (2010); and
- National Development Plan (NDP) (2012) (IDC 2013).

Figure 2.1 below depicts the GDP growth performance in relation to different financial crises between 1991 and 2020 Following negative growth observed between 1990 and 1992, South Africa experienced positive growth from 1994 to 2012 with the economy growing at an average of 3.2 per cent year on year (IDC, 2013). It was during this time that the country first experienced growth lasting for considerably long periods when compared with the years before 1994 (IDC, 2013). The periods of weaker growth experienced after 1994 observed – specifically 1997–1998, 2001–2002 and 2009–2010 – were triggered by external events and developments within the global economy (IDC, 2013). These international developments included:

- the East Asian financial crisis, which took place in 1998–1999;
- the stock market bubble or the dot.com crisis in 2001–2002; and
- the global financial crisis in 2009–2010 (IDC, 2013).
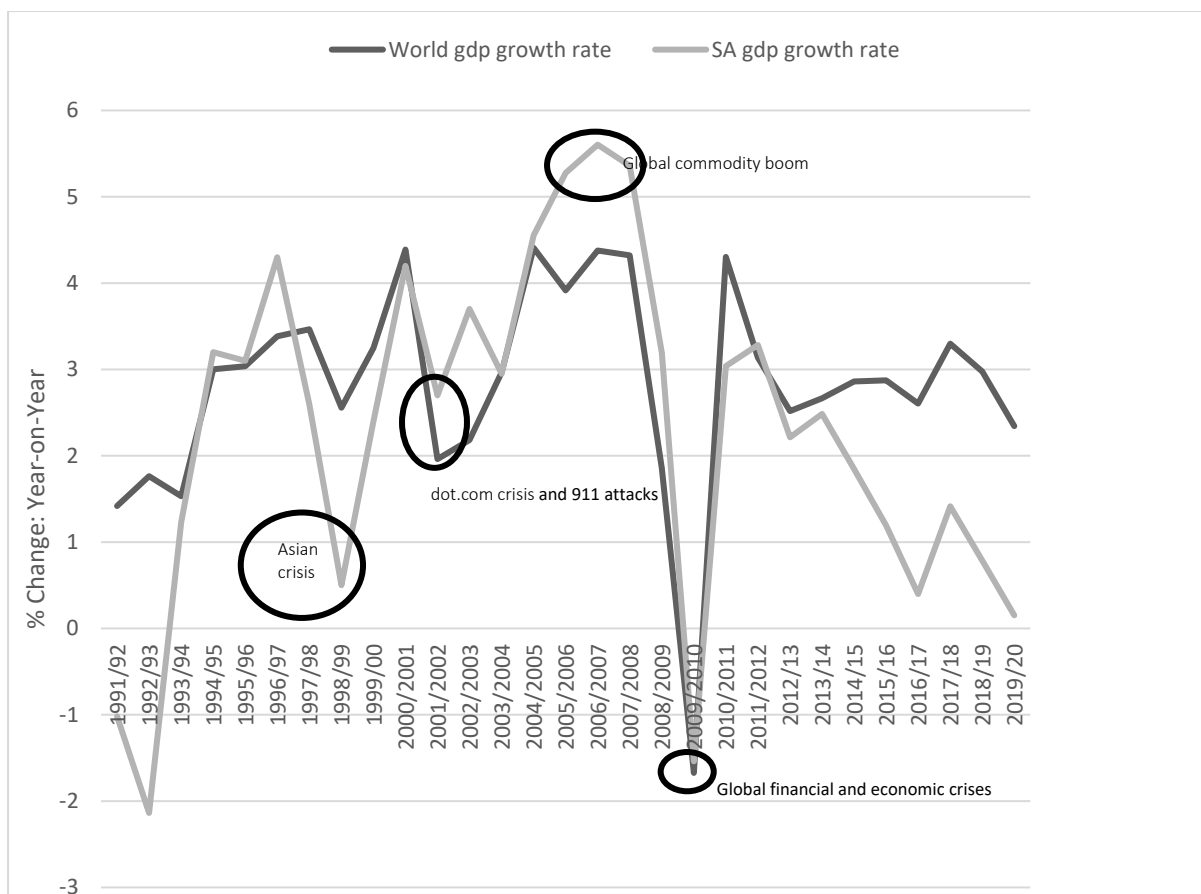
Figure 2.1: GDP growth (1991–2020) Source: IDC (2013) and World Bank (2021)

Despite the SA economy having been adversely affected by the above-mentioned global developments, the weak economic growth could have also been precipitated by other domestic issues, such as –

- the insufficient electricity supply;
- the political environment;
- slow infrastructure development;
- low private investment; and
- constrained government revenue (World Bank, 2018).

In 2012–2013, the country began experiencing slow and weaker growth in the annual GDP rate until 2019–2020, with a marginal year-on-year growth only seen in 2017–2018. This however remained stubbornly low below the 2 per cent level in the subsequent periods (i.e. 2014–2015 and 2019–2020) (National Treasury, 2020). The GDP growth declined from 0.8 per cent in 2018–2019 to 0.2 per cent in 2019–2020 (National Treasury, 2020).

At the onset of democracy, the budget deficit and the debt levels were not sustainable, and government required sound fiscal policy in 1994 (Koch et al., 2005). Prudential fiscal management therefore prevailed after 1994 to improve the budget balances and to return the debt and budget deficit to sustainable levels. The budget deficit was consequently reduced from 4.8 per cent of the GDP in 1994 to 0.5 per cent in 2005 (IDC, 2013). This prudential fiscal management therefore led to a budget surplus, which lasted until 2007, which, in turn, resulted in increased government expenditure on budget programmes that would later drive the country to the desired economic position without having to increase borrowings (IDC, 2013). In the same period, there was also a budget surplus due to an increase in the tax revenue collected (IDC 2013).

In order for poverty, inequality and employment to be reduced, a positive and a higher GDP growth rate is needed as this will also create more scope for the government to collect more revenue to spend on the economic activities that can lead to growth (World Bank, 2018). In addition, with economic growth, private investment and employment is expected to increase as positive and long-term growth is a sign of a healthy economy (National Treasury, 2019). Since taxes are imposed on economic activity, an increase in the size and value of the tax base is certain to increase following high GDP grow rates (National Treasury, 2019).

2.4. DIRECT TAX REVENUE TRENDS

The tax revenue trends of the three main taxes contributing the largest tax revenue in South Africa are analysed in this section focusing on PIT, CIT and VAT trends over the years.

2.4.1. Personal Income Tax

Following the views expressed by the previous tax commissions, such as the Franzsen Commission (1970), the Margo Commission (1987), the Katz Commission (1994), and the Davis Tax Committee the scrutiny of the tax policy showed that the SA tax system needed a well-designed tax policy that would also focus on broadening the tax base. The high PIT rates that prevailed in the 1990s also meant that a better tax mix of direct and indirect taxes had to be explored to decrease the tax burden on individuals (Mabugu et al., 2015). As a result, tax relief was provided to individuals between 1995

and 1999 through tax cuts, the reduction in tax rates, and the number of tax brackets from ten to six to reduce the tax burden on working people (Steenekamp, 2012).

From the year 2000, tax relief was often provided to those in the lower tax brackets. The proposed changes to PIT ensured that taxpayers were protected from adverse effects of inflation on income (National Treasury, 2017). Although the tax measures provided to individuals resulted to in a loss of revenue, the tax relief also avoided a situation where individuals would get pushed into a higher tax bracket without their income changing in real terms known as a fiscal drag. One other major tax proposal to PIT was a new tax rate of 45 per cent from 2017 onwards for the top tax bracket, i.e. those with taxable incomes above R1.5 million (National Treasury, 2017). A higher tax rate for the wealthy therefore seeks to maintain the progressivity of the tax system and helps to narrow the income inequality gap, which is one of the key objectives of government (National Treasury, 2017).

2.4.2. Company Income Tax

Regardless of the size of the business, both small and big companies contribute much to the economy of this country, and it is important to create favourable conditions for them to continue with their entrepreneurial activities (National Treasury, 1999). The CIT rate was reduced by only 2 per cent from 50 per cent in 1990–1991 to 48 per cent in 1991–1992. This rate was regarded as too high according in terms of global standards and detrimental to economic growth (Department of Finance, 1993). The tax rate levied on companies therefore, had to be re-evaluated, as a high CIT rate has the potential to discourage private investment and make it difficult for SA companies to compete in the global economy (National Treasury, 1999). There has been a downward trend in the tax rate charged on companies within the global space to which South Africa became increasingly integrated (National Treasury, 2014).

To respond to these developments – especially within the international space – the SA government considered the effect of high CIT rates on growth. As a result, tax measures were proposed in 1991 when the CIT rate was reduced for the first time in a decade (Department of Finance, 1993). In 1993, a dual tax system on companies was implemented, comprising CIT and secondary tax on companies (STC), which applied to all income distributed by companies in the form of dividends (National Treasury, 2015). These changes encouraged companies to exploit investment

opportunities and to use undistributed income to finance itself. CIT was further reduced in 1994 resulting in an estimated revenue loss of R1 .1 billion for 1994–1995 (Department of Finance, 1994). To mitigate the loss of revenue that came with a significant tax rate reduction in CIT, the STC tax rate was therefore increased from 15 per cent to 25 per cent in 1994. This was however phased out and replaced by the dividend tax in 2012 (Black et al., 2012). According to budget reviews by the Department of Finance (1993) and the National Treasury (2008), it was clear that further reductions in CIT were applied in South Africa in the years between 1993 and 2008. Such changes to CIT enabled small and medium businesses to develop and succeed, enhance job creation, and attract domestic and foreign investment, which is what a country needs to stimulate growth (National Treasury, 2008). The contribution of PIT, CIT and VAT as a percentage of total tax revenue is shown in Figure 2.2.
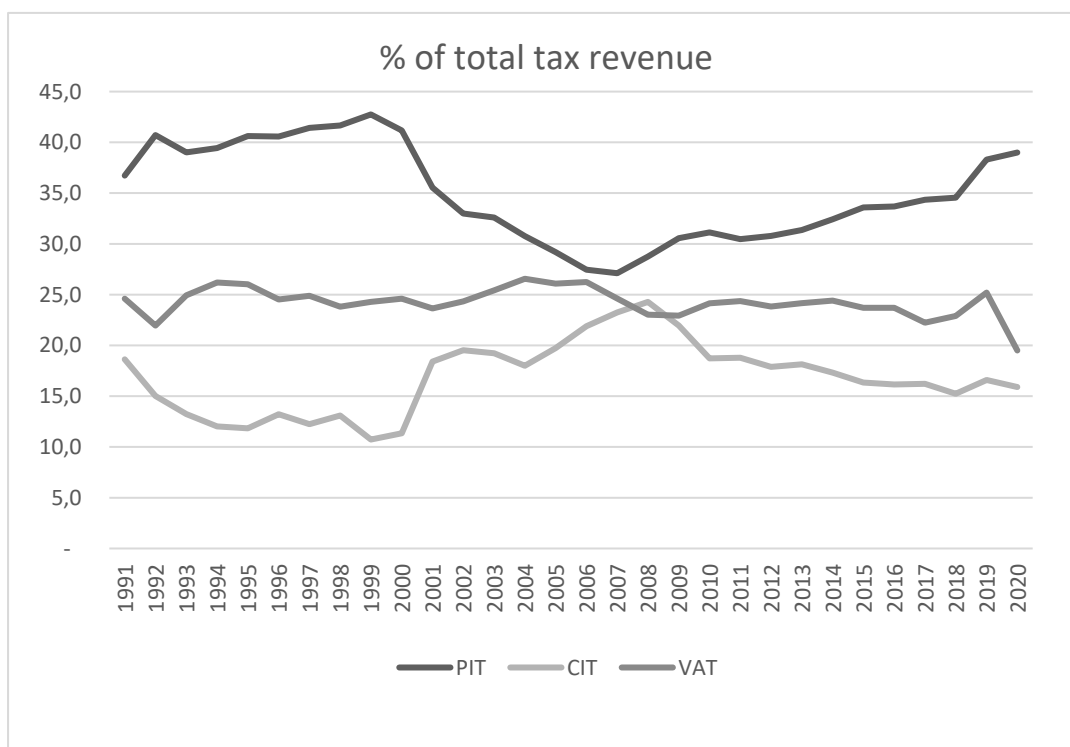
Figure 2.2: Percentage share of total tax revenue (1991–2020) Source: World Bank (2021)

2.5.   TRENDS IN MAIN INDIRECT TAXES

This section provides an analysis of the tax trends focusing on the two indirect taxes, namely GST and VAT, and their significance in shaping the tax policy in South Africa.

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2.5.1. General Sales Tax

When GST was first implemented in 1978, it was levied at 4 per cent, and in 1982, the GST rate increased to 5 per cent, and to 6 per cent within a few months (National Treasury, 2011a). The short-term changes to GST continued as it was increased further and again twice in 1984 to 7 and later 10 per cent with the final change to GST made in 1985, then levied at 12 per cent (National Treasury, 2011a). Furthermore, under GST, credit certificates were issued to allow businesses to buy goods GST-free if the goods were for resale or used as inputs for the production of final goods. However, these GST credit certificates were often abused however, raising tax evasion concerns, and this propelled the SA government to implement an alternative indirect tax, such as VAT to prevent the short-term adjustments seen with GST (National Treasury, 2011a). The Margo Commission (1987) provided a recommendation for GST to be replaced with a VAT system. The decision to replace GST was the result of concerns raised regarding the potential for tax evasion under GST and the extent to which the sales tax base could be eroded given the general exemption of food and the exclusion of most services as well as the inefficiencies related to short-term tampering with the GST rate (National Treasury, 2011a).

2.5.2. South African VAT Design

VAT was introduced in South Africa in 1991 under the Value-Added Tax Act (No. 89 of 1991) (National Treasury & SARS, 2008). VAT is defined as an indirect tax charged on the consumption of goods and services in the economy (SARS,2021). That is, VAT is charged by a vendor or a registered business to a purchaser of goods or services in South Africa and is also charged on the importation of goods or services into South Africa (National Treasury & SARS, 2015). A business whose total value of taxable goods or services is more than R1 million in a twelve-month period, is expected to register for VAT with SARS or a business may also register for VAT voluntarily if its income in the preceding twelve months is less than R1 million but exceeded R50 000 (National Treasury & SARS, 2008). In South Africa, VAT is a destination-based consumption tax, which follows a subtractive or credit input method. With the input credit method, a vendor is allowed to deduct the tax incurred on inputs used to produce final goods from the tax levied on goods supplied by the vendor (National Treasury & SARS, 2012). In the event that the vendor's input tax exceeds output tax, SARS

refunds the difference to the vendor (National Treasury & SARS, 2012). There is therefore an element of self-assessment by the registered companies as businesses act as both agents of the revenue services in collecting VAT and determining their own tax liability (National Treasury & SARS, 2015).

VAT in South Africa is charged on most supplies, but there is a limited range of supplies of goods or services that are either exempt, or which are subject to tax at a zero rate, for instance, exports, illuminating paraffin and farming inputs are taxed at 0 per cent VAT (National Treasury, 2011b). As a result of VAT often being seen as regressive and creating a burden on especially the poor, any proposed changes to VAT have always been met with considerable attention and opposing views based on efficiency and equity grounds (National Treasury, 2011b). When the VAT Act (No. 89 of 1991) was promulgated, no provisions were made to zero-rate any goods or services; however, brown bread and maize were later included in the list of goods levied at 0 per cent of VAT (National Treasury, 2011a). Following lengthy public protests, eight additional foodstuffs were added to the zero-rated list when the first VAT rate of 10 per cent was implemented in 1991 (National Treasury, 2011a). In 1993, VAT was increased to 14 per cent with nine additional basic foodstuffs added to the zero-rated list (National Treasury, 2011a). VAT in South Africa has therefore increased only twice since its inception in 1991. In 2018, it was increased by 1 per cent to 15 with 19 basic food items levied 0 per cent VAT, and in 2019 two more basic food items – white bread flour and white cake flour – were added to the list (National Treasury, 2019). Pressure for a higher VAT rate on luxury items resulted in the *ad valorem* excise duty for luxury goods being extended to items such as cell phones, video cameras, domestic dishwashers, air conditioners (National Treasury, 2011a). The *ad valorem* tax was further extended to motor vehicles through the application of a progressive *ad valorem* duty formula, which excluded lower-end vehicles from the imposition (National Treasury, 2011a).

Apart from VAT on domestic and services, there are other indirect taxes charged separately on goods imported into the country, and tax on non-essential goods, namely import VAT and custom duties (National Treasury & SARS, 2010). Import VAT is charged on a selected number of goods with the purpose of protecting local producers (National Treasury & SARS, 2009). In addition, custom duties comprising excise duties and *ad valorem* tax are also charged on certain imported goods and on

similar goods that are produced locally (National Treasury & SARS, 2009). A large share of revenue from import VAT and custom duties is derived from vehicles, aircraft, vessels, machinery and mechanical appliances, electrical equipment, textiles, beverages, spirit, prepared foodstuff and tobacco (National Treasury & SARS, 2010).

Along with Botswana, Lesotho, Namibia and Swaziland (now eSwatini), South Africa is a signatory to the Southern African Customs Union (SACU) agreement (National Treasury & SARS, 2011). These countries all apply similar legislation as far as the implementation of import and custom duties goes. That is, they impose a similar tariff, charge excise duties on imported and locally manufactured goods, as well as the same import VAT on imported goods (National Treasury & SARS, 2017). The revenue once collected is pooled and distributed among the SACU member countries based on a specific formula (National Treasury & SARS, 2017). This task is administered by South Africa, which then makes quarterly payments to the SACU members (National Treasury & SARS, 2017).

2.5.3.   VAT Revenue Performance

The decision to adopt VAT was based, amongst other things, on the fewer distortionary effects of this type of tax on production and consumption decisions, and the less detrimental effect on the economy when compared to PIT or CIT. Prior to the introduction of VAT in 1991, recession had been running for about two years resulting in VAT revenue performing poorly (Department of Finance, 1993). Over and above this, looking at VAT revenue performance after almost two years of VAT being implemented, it is evident that the rate at which VAT was introduced was too low to maintain the revenue standard of its predecessor. A VAT increase from 10 to 14 per cent between 1991 and 1993 was therefore justifiable given the loss of revenue due to tax concessions on a number of basic foods items and given the already high share of direct taxes to total tax revenue at the time. PIT and CIT were not suitable candidates to push revenue to acceptable levels (Department of Finance, 1993). VAT however had performed positively despite a negative trajectory observed between 1991 and 1993. When looking at the revenue contribution of VAT to total tax revenue, VAT has surpassed CIT since its inception, except in 2008–2009 when CIT was at its peak, making VAT the second most important source of revenue after PIT (National Treasury, 2002).
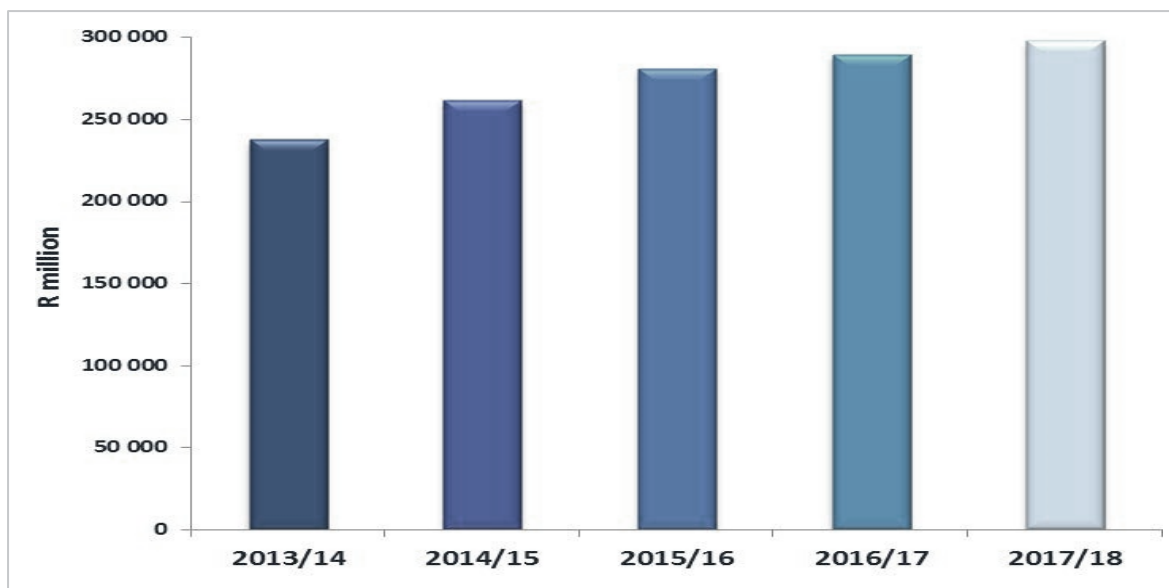
Figure 2.3: Value-Added Tax (VAT), (2013/14 - 2017/18) Source: Adapted from Stats SA (2018)

On average, net VAT accounted for 25.9 per cent of total tax revenue from the 2007–2008 to 2016–2017 fiscal years (National Treasury & SARS, 2018). Figure 2.4 presents the VAT payments by economic activity. The financial intermediation, insurance, real estate, and business service sector remained the largest contributors to VAT and accounted for 40 per cent of all VAT-registered vendors (National Treasury & SARS, 2018). The VAT contribution of the sector increased from 39 per cent to 42.5 per cent between 2007–2008 and 2016–2017 with the VAT refunds due to the sector decreasing from 25 per cent to 20 per cent for the same financial years (National Treasury & SARS, 2018). The VAT revenue for 2019–2020 showed a moderate growth rate, increasing by 5.4 per cent compared to the double-digit growth rate seen for 2018–2019 as a result of a percentage point increase in VAT in 2018 (National Treasury & SARS, 2018). The modest growth rate in VAT in the period 2019–2020 was attributable to low VAT revenue collection due to low consumer confidence, a rise in unemployment, rising debt levels, and slow growth (National Treasury & SARS, 2020).
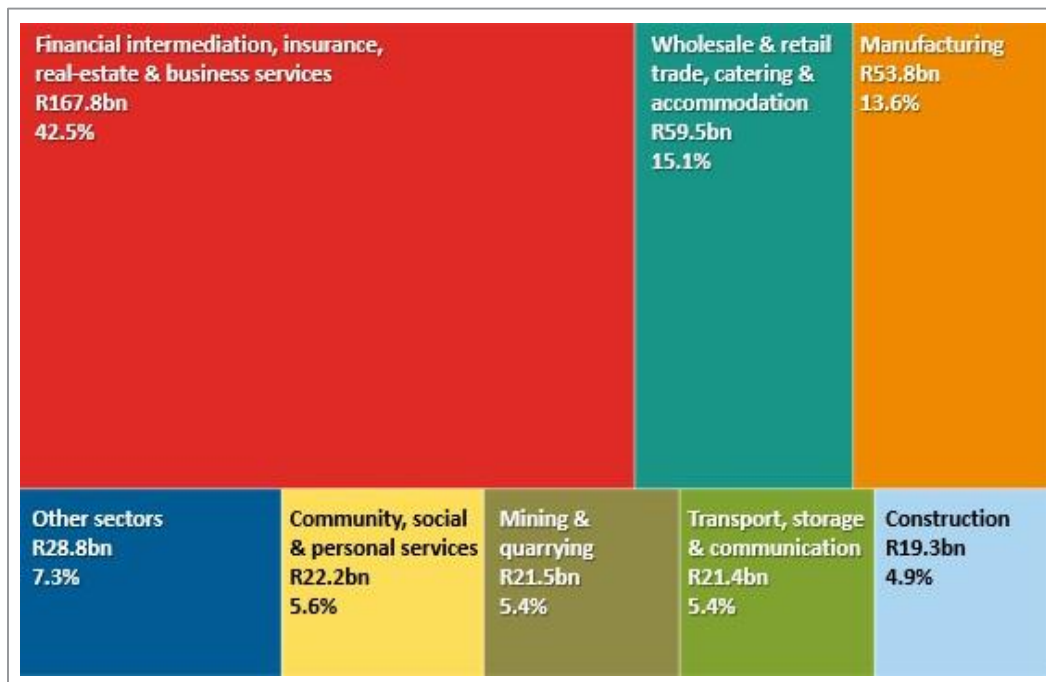
Figure 2.4: VAT payments by economic activity (2020/21) Source: Adapted from Stats SA (2021)

Considering the revenue performance from 2007–2008 and 2011–2012, any deviation from the acceptable revenue levels was the result of the global financial crisis, which had an adverse effect on the economy (National Treasury & SARS, 2012). The SA overall performance on trade taxes therefore decreased by 23.6 per cent in import VAT collection in 2009–2010 following a growth rate of 16.5 per cent in 2007–2008 and 18.1 in 2008–2009 (National Treasury & SARS, 2010). With respect to the custom duties, a growth of 11.7 per cent in 2007–2008 was observed followed by a decrease of 14 per cent in 2008–2009 and again in 2009–2010 (National Treasury & SARS, 2010). The reason behind the negative revenue performance for both taxes was a result of decreasing import levels of the main contributors to the import and custom duties, namely vehicles, aircraft and vessels, and machinery and electronics, as both categories saw a decline of more than 20 per cent in 2009–2010 (National Treasury & SARS, 2010). However, these categories of products recovered in 2010–2011 and 2011–2012 after experiencing a growth rate of 30 per cent and 10 per cent in each financial year (National Treasury & SARS, 2011).

Import VAT grew by 2.7 per cent compared to 14.7 per cent in 2018–2019 with custom duties increasing only marginally by 0.8 per cent compared to 11.8 per cent in 2018–2019 (National Treasury & SARS, 2019). The slow growth rates for 2019–2020 were due to difficult economic conditions and low levels of investment, domestic demand, and household consumption exacerbated by the impact of the Covid-19 pandemic mainly on the manufacturing and trade sectors (National Treasury & SARS, 2020). The import VAT and custom duties accounted for 13.3 per cent and 4.1 per cent respectively. As a percentage of the GDP, the share of the two trade taxes increased slightly from 4.5 per cent in 2018–2019 to 4.6 per cent in 2019–2020 (National Treasury & SARS, 2020).

2.6. TOTAL TAX REVENUE PERFORMANCE SINCE 1991

The tax-to-GDP ratio declined from 24 per cent in 1990–1991 to 22.9 per cent in 1991–1992 (Department of Finance, 1993). Of the three major taxes, PIT continued to increase its share to total tax revenue having contributed 38.4 per cent in 1991–1992 by virtue of the fiscal drag (Department of Finance, 1993). CIT and VAT however decreased further between the period 1990–1991 and 1992–1993 (Department of Finance, 1993). The decline in revenue could be ascribed to the long recession, which lasted from 1989 to 1991. Furthermore, the lower tax rate of 10 per cent levied on VAT when it was first implemented (in 1991) as opposed to GST, which it replaced at 13 per cent, resulted in a lower contribution of VAT to total revenue (Department of Finance, 1993). The share of GST to total revenue was 6.1 per cent in 1990–1991 with VAT to total revenue recording 5.5 per cent (Department of Finance, 1994).

A total revenue of R87 billion was recorded for the period 1993–1994 representing an increase of 16 per cent when compared to the period 1992–1993 (Department of Finance, 1993). The increase in revenue was due to the economy recovering from recession in the period 1993–1994 (Department of Finance, 1994). The revenue growth saw a significant increase in 1994–1995 at the beginning of democracy in South Africa as shown in Figure 2.5. However, a sharp decrease was also observed during the 2009–2010 financial year in both the GDP and revenue growth due to the global financial crisis that occurred in 2007. Total tax revenue as a percentage of GDP was estimated at 21.9 per cent in 1993–1994. PIT contributing marginally lower than 1992–1993 at 8.5 per cent in 1993-1994 and CIT declining from 15.8 per cent to 11.9

per cent in 1993–1994 (Department of Finance, 1994). VAT, on the other hand, increased by 6 per cent as a percentage of GDP when the tax rate was levied at 14 per cent (Department of Finance, 1994).
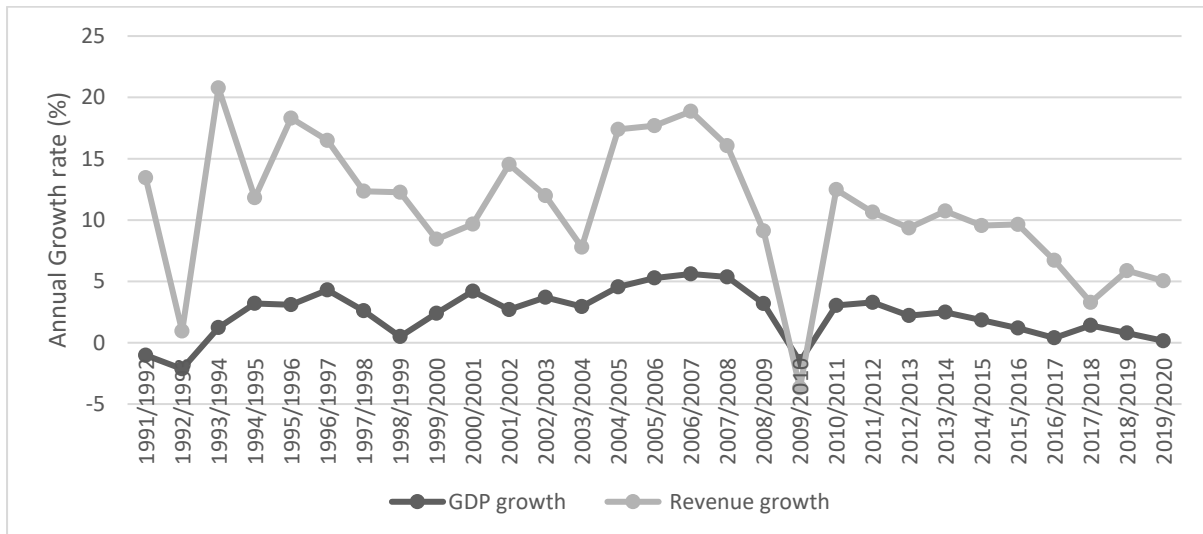
Figure 2.5: GDP growth and revenue growth (1991–2020) Source: World Bank (2021)

Strong revenue performance was observed from 2004–2005 and again from 2007–2008 as a result of high commodity prices, economic growth, and – notably – the improvements in the effectiveness and efficiency of tax administration (National Treasury & SARS, 2010). PIT increased from 31.5 per cent in 2004–2005 to 28.4 per cent in 2006–2007 as a percentage of total tax revenue, and in 2009–2010, it increased to 34.3 per cent (National Treasury & SARS, 2010). CIT as a percentage of total tax revenue increased from 19.9 per cent in 2004–2005 reaching its peak at 26.5 per cent in 2008–2009, however declined again to 22.5 per cent in 2009 (National Treasury & SARS, 2010). Although the CIT tax rate was reduced from 35 per cent in 1994–1995 to 28 per cent in 2008–2009, the nominal revenue contributed by CIT increased over the same period. VAT reached 28 per cent in 2004–2005, its highest level as a percentage of total tax revenue since its inception in 1991 but declined thereafter until 2008–2009 (National Treasury & SARS, 2010). VAT revenue peaked again in the period 2014-2015 reaching 26.3 per cent of the total tax revenue. For the period 2018-2019, VAT as a percentage of the total tax revenue declined to 25.2 before increasing only slightly to 25.6 for the period 2019-2020.

The three main taxes have kept a steady growth from 2004–2005 and again from 2008–2009 with PIT, CIT and VAT showing an increase as a percentage of GDP of 8.4, 7.2, and 7.3 per cent respectively (National Treasury & SARS, 2009). However, tax revenue from these main taxes as a percentage of GDP declined in 2009–2010 with the exception of PIT. CIT declined to 5.5 per cent with VAT declining to 6.1 per cent in 2009–2010 (National Treasury & SARS, 2010). From these trends, it is clear that the economic conditions that prevailed from 2008–2009 and again from 2009–2010 presented challenges for tax revenue collection due to instability of financial markets. Owing to the global economic crisis in 2009, SARS could not meet its revenue targets (National Treasury & SARS, 2010). Tax revenue for the period 2014–2015 increased by 9.6 per cent from 2013–2014 and amounted to R986.3 billion (National Treasury & SARS, 2015). The growth in revenue was due to a strong performance of PIT and VAT with the two taxes increasing by 13.9 per cent and 9.9 per cent respectively. Despite the country having registered positive growth for 2014–2015, government had to adapt to slower revenue growth due to many businesses struggling to maintain profitability coupled with the issue of high unemployment (National Treasury & SARS, 2015). Tax revenue collected for 2019–2020 grew by 5.3 per cent year on year to R1 355.8 billion, and attributed to mainly PIT, which registered a growth of 7.2 per cent. The tax-to-GDP ratio increased only marginally from 25.9 per cent in 2015–2016 to 26.3 per cent in 2019–2020 supported by increased contributions from PIT and VAT (National Treasury & SARS, 2020).

2.7. GOVERNMENT EXPENDITURE BREAKDOWN

Figure 2.6 below shows the breakdown of general government expenditure for the 2019–2020 financial year. In the figure, it can be seen on which components within the total consumption expenditure government was spending most of its revenue. The highest spending, that is, R469 billion, R392 billion, and 293 billion, was spent on general public services, which included items, such as interest payment on public debt, executive and legislative services, and research, followed by education and social security services respectively (Stats SA, 2021).

Within the general public services, 10 per cent of the allocated budget was spent on interest payment on public debt (Stats SA, 2021). The executive and legislative services also received 10 per cent of the allocated budget. However, only 0.4 per cent

was spent on research and development (R&D) (Stats SA, 2021). The education sector allocated R117 billion and R112 billion to primary education and tertiary education respectively (Stats SA, 2021). With the social security grants comprising 15 per cent of the total spending, old age grant took the lead followed by the family and children expenditure item which comprises of the social security grants the child and foster care social grants (Stats SA, 2021).
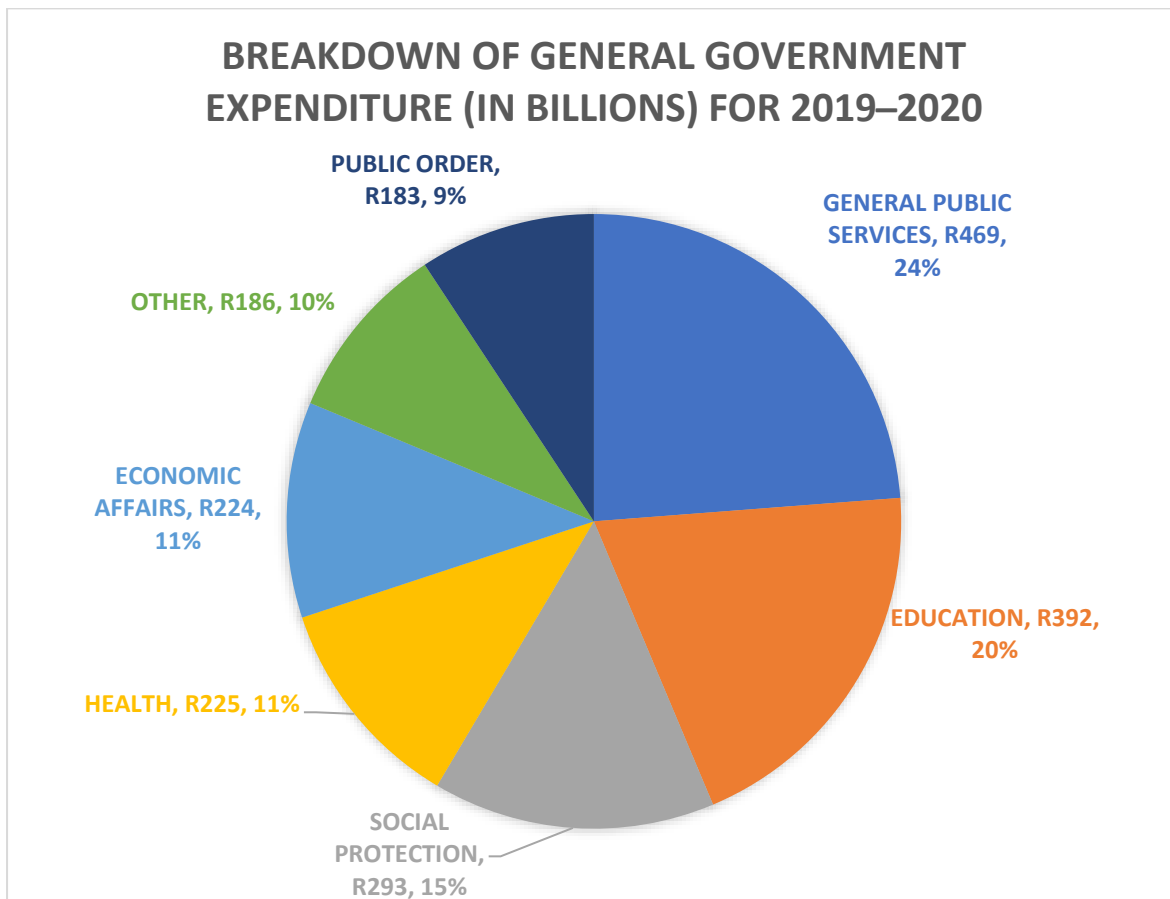
Figure 2.6: General government expenditure (2019–2020) Source: Adapted from Stats SA (2021)

Turning to **health**, of the R225 billion allocated to this sector, most of the money was spent on hospitals equating to R129 billion, which was 7 per cent of the allocated budget, with public health receiving R72 billion or 4 per cent of the budget (Stats SA, 2021). **Transport** services – including roads and rail infrastructure – with spending of R79.4 billion, was the expenditure item with the highest spending within the economic affairs component (Stats SA, 2021). Within the **public order** component, out of the allocated budget of R183 billion, R140 billion went to police services. Under the component categorised as **'other'**, the housing services expenditure item took the

lead with a total of R73 billion spent on this item, 3 per cent of the allocated budget went to **defence** and 1 per cent to **environmental protection** (Stats SA, 2021).

According to data provided by Stats SA (2021), there was a spending of R182 billion more in 2019–2020 compared with 2018–2019. The biggest changes were seen within the **economic affairs** category, which increased by R49.7 billion, followed by R27.9 billion on **social protection** (Stats SA, 2021). **General public services**, which included expenditure items such as interest payment on public debt, executive and legislative services, and R&D, increased by R27.9 billion (Stats SA, 2021). Other increases recorded were R7.3 billion for **public order and safety**, R3.2 billion for **recreation**, **culture** and **religion**, followed by R1.2 billion for **education**, and R3.8 billion for **defence** (Stats SA, 2021). Some minor downward changes were however observed for **housing** and **health** expenditure items. The connection between tax revenue and components of the general expenditure is discussed in detail in Chapters Three and Four of the current study.

2.8. CONCLUSION

This chapter discussed the trends in tax revenue and economic growth in South Africa. The chapter began with Section 2.2 by providing a discussion on how tax policy in South Africa has evolved by focusing on the tax reforms recommended under a number of tax commissions before and after 1994 when the country first became a democratic state. Section 2.3 discussed the trends of the SA economy. PIT, CIT and VAT were reported as the three main taxes contributing to the total tax revenue, with VAT being the second largest source of tax revenue as a percentage of the total tax revenue having surpassed CIT. Therefore, a discussion of the direct income tax revenue trends namely PIT and CIT was presented in Section 2.4. Section 2.5 provided a discussion of the indirect tax revenue trends with a special focus on VAT. A discussion of these trends showed how the appointment of different tax commissions over the years have influenced the tax policy in South Africa to be more equitable and efficient in order for the tax structure to remain as progressive as possible. Furthermore, it was also evident from the discussion how the design of the overall tax policy in the country has been mindful of international tax trends, especially the effect of different taxes on growth with the evident tax shift from income tax to indirect taxes in a number of countries. As a result, SA has seen a similar shift from

income taxes to indirect taxes, such as VAT, to increase revenue while minimising the negative effect on long-term growth.

Although VAT has contributed significantly to total tax revenue, there is a challenge in terms of the implementation of a good VAT design. In SA, VAT is characterised by a number of tax concessions and exemptions, which hamper the potential VAT revenue that could be collected if fewer tax exemptions were implemented. A breakdown of government expenditure was presented in Section 2.7 of the chapter to present an overview of where most of the recent tax revenue was allocated. Lastly, the discussion in Section 2.8 showed that SA needs to rethink its revenue avenues and spending priorities if long-term growth is to be achieved.

CHAPTER THREE: LITERATURE REVIEW

3.1. INTRODUCTION

In this chapter, a review of literature on taxation and economic growth is presented. The chapter is divided into two sections, namely the theoretical literature review and the empirical literature review. The theoretical literature review provides a discussion of growth models and the role of taxation within the endogenous growth theory. The models of endogenous growth to be discussed are the physical capital AK model developed by Romer (1986), the human capital model popularised by Lucas (1988), government spending in a simple model of endogenous growth developed by Barro (1990), innovation, and learning-by-doing based on Schumpeter's (1934) creative destruction theory. The second section comprises a review of selected empirical literature and reports on studies analysing specifically the effect of VAT on economic growth.

3.2. THEORETICAL LITERATURE REVIEW

The theory of endogenous growth was mainly popularised by the work of Romer (1986) and Lucas (1988). They argued that the process of sustained growth for nations was determined internally and not exogenously by forces that cannot be controlled, as suggested by the exogenous growth theory pioneered by (Solow, 1956). The studies by Romer (1986) and Lucas (1988) led to the emergence of a body of literature on endogenous growth in the early 1990s, which also provided an insight through which internal factors could have an effect on long-term growth. Prior to the development of literature supporting the foundations of endogenous growth theory, it was mainly the models of exogenous theory growth that were popular, which modelled growth within the exogenous technical progress through the ideas of (Solow, 1956). That is, within the exogenous growth theory, and as postulated by Solow (1956), policy was considered less effective in contributing to growth than in the endogenous growth theory. Due to the limited literature on the effect of policy on growth, the development of the endogenous growth theory was developed. The proponents here were Romer (1986), Lucas (1988), Barro (1990), Barro and Sala-i-Martin (1992), who modelled growth through several growth processes and, in turn, traced how policy through taxation could affect growth (Myles, 2007).

3.2.1. The AK Model

The AK model is considered the simplest model within the endogenous growth theory, and has only one input for production, namely capital (Myles, 2009). Developed by Romer (1986), this AK model rejected the findings of the neoclassical models of economic growth by Ramsey (1928), Cass (1965), and Koopmans (1965) also known as the Ramsey–Cass–Koopmans (RCK) model (Romer, 1986). The RCK model assumes that the savings rate is exogenously determined and that there is a presence of diminishing returns. Furthermore, the RCK model predicts that countries will converge in the absence of technological change, thus predicting zero growth. Romer (1986) however argues that the savings rate is endogenously determined and there are increasing returns in the production function. According to Romer (1986), long-term growth rate is possible and non-convergence of countries could be driven further by the influence of private agents within individual countries resulting in large countries continuing to grow faster than smaller countries due to technological change in each country. Given that capital is the only input in the model, the variable considered to be of relevance is that of the savings rate, as the level of saving determines the amount of capital available for investment purposes (Myles, 2009).

In addition, there are tax implications to be considered, as the economic choice to consume now or to save today for future consumption is not only linked to the interest rates but also to taxes as these could affect the net result differently through their distortionary effects (Romer, 1986). From this, it then follows that growth can be realised from a policy that raises the level of saving. According to Cnossen (1998), consumption tax, although it reduces future consumption, does not reduce the net rate of return on savings in the same way income tax does. That is because income tax reduces the net return on savings, as it taxes both the amount saved and the interest earned (Cnossen, 1998). If the decision to save is therefore based on a higher net rate of return on savings, consumption tax is more effective and efficient in promoting growth in comparison to income tax (Cnossen, 1998). If the level of saving is not responsive to changes in the interest rate, this will render the policy that seeks to raise the level of saving inefficient, as would lead to limited potential effects of the policy (Myles, 2009).

Although the Romer (1986) AK model of growth attempts to present how the effect of taxation could generate growth through its impact upon saving, it mainly focuses on physical capital and fails to capture the important role of human capital (Myles, 2009).

3.2.2. Human Capital Model

The human capital theory developed by Lucas (1988) is an extension of the simple model of growth developed by Romer (1986), with addition of physical capital input, namely the human capital. According to Myles (2007), human capital is considered the most important variable in endogenous growth theories as presented by models, such as that of Uzawa (1965), Trostel (1993) and (Heckman, Lochner & Taber, 1998). Studies that modelled the influence of human capital – represented by education and training – include the work pioneered by Uzawa (1965), and Lucas (1988), followed by Romer (1990b), Barro (1991) and Mankiw, Romer and Weil (1992) who measured the level of human capital through the enrolment in educational programmes.

A study by Trostel (1993) provided a model of investment in human capital as represented by educational choice. According to Trostel (1993), human capital is obtained through time invested in education and training, and by investing in goods that are relevant to education. Furthermore, the process of investing in those goods could be acquired either through the firm or from outside the firm with each approach having its own tax implications (Trostel, 1993). Acquiring human capital through the firm, the goods will be subsidised by the tax system, as they would be subjected to a tax deduction, which also translates into a lower income from which a payment is made by the firm to fund the human capital cost (Trostel, 1993). Alternatively, if the purchase of the goods relevant to education is not from the firm, the human capital will be subsidised by government (Trostel, 1993). A study by Heckman et al. (1998) extends on the ideas of Davies and Whalley (1991) who assumed human capital as not only general skills that can be applied to different sectors and firms but as a skill that could be job-specific or only relevant to a specific firm. Heckman et al. (1998), however, assume multiple skills while allowing for heterogeneity in age, abilities, skills, and economic background. The assumption of this model is that there are several levels of human capital as represented by different skills sets from which individuals make a selection (Myles, 2007). Heterogeneity is thus reflected in the selection of different human capital levels made by different individuals. Central to the model by Heckman

et al. (1998) was the comparison of a progressive labour income tax with flat income and consumption taxes. The Heckman et al. (1998) model suggests that a move from a progressive tax to a less distortionary tax or flat tax would encourage skill accumulation since it increases the incentive to strive for a higher income. On the other hand, consumption tax is said to encourage physical capital accumulation since this tax is not subjected to a tax on interest income (Heckman et al., 1998).

A number of studies, such as by Bils and Klenow (2000) and Blankenau and Simpson (2004), caution on conclusions made on how different taxes would have an impact on the accumulation of human capital – without evidence of data. In the study by Bils and Klenow (2000), an endogenous growth model with a schooling choice was observed. The study by Bils and Klenow found that there is a bi-directional causality. That is, the attainment of education through schooling increases human capital which in turn leads to growth as more people have the knowledge and skill needed in the economy. Studying the relationship from the direction of growth, the effect of growth on education is the return to education to the owners of the human capital, in the form of employment opportunities and increased wages, and this also leads to an increase in investment in education. However, according to the results of the calibrated model used to prove the arguments made by Bils and Klenow (2000), the effect of schooling on growth only showed a marginal increase in growth, while the effect of growth on schooling showed a significant increase (Myles, 2007). A similar caution is echoed by Blankenau and Simpson (2004). According to Blankenau and Simpson (2004), the human capital model merely suggests a positive relationship between human capital and growth accumulation without stating which tax instrument would create less or (more) distortions in the economy; thus, leading to positive or (negative) outcomes on growth. It is therefore important for government to specify a suitable financing mechanism to fund public education, as choosing a tax with greater distortions would offset the positive effects on growth (Blankenau & Simpson, 2004). The importance of human capital in the endogenous growth theory can be observed from the incorporation of human capital input into the simple capital model, as the interaction of the two inputs could explain the role of taxation and its influence on growth (Myles, 2009).

3.2.3. Government spending in a simple model of endogenous growth

Another model, through which endogenous growth could be explained, relates to the role of government spending or expenditure. In Barro's (1990) model relating to government spending in a simple model of endogenous growth, the assumption is that endogenous growth could arise when the existing levels of physical capital and human capital are augmented by additional inputs in the production (Barro, 1990). In other words, technological progress takes place when the new inputs are introduced in the production function without the old ones being disregarded. According to Barro's (1990) simple model of endogenous growth, the relationship between government policy and economic growth is found when the additional input is a public good financed by taxation. This in turn will provide a positive role for public expenditure and a direct tool through which policy could affect growth (Barro, 1990).

In addition to the provision of public capital goods through taxation, government expenditure is used to finance services or consumption. According to endogenous growth literature, the models of Barro (1990), Barro and Sala-i-Martin (1992), Stokey and Rebelo (1995) and Mendoza, Milesi-Ferretti and Asea (1997), present a mechanism through which policy can determine output and growth rate. From these endogenous growth models, predictions are derived by classifying taxes as distortionary or non-distortionary, and expenditures as either productive or non-productive (Kneller, Bleaney, & Gemmell, 1999). A number of studies in the field of public finance (see Johansson et al., 2008; Macek, 2015; Korkmaz et al., 2019) suggest that distortionary taxes (including CIT and PIT) often have a negative effect on growth, while non-distortionary taxes, such as VAT and other indirect taxes, sometimes have a negative (or positive) effect on growth. Similarly, unproductive expenditures are reported to have a negative effect on growth with expenditure items such as social transfers being associated with this class of expenditures (Kneller et al., 1999).

Furthermore, endogenous growth literature is in support of higher government spending on public goods through higher taxes collection (Chan, Ramly, & Karim, 2017). Increased expenditure through increased tax revenue is reported to have a long-run growth effect. This is especially the case when the tax collected is allocated to public infrastructure, education, health care, and national security (Chan et al.,

2017). According to Scully (1996), the decision to increase expenditure by imposing high taxes should also be backed by empirical evidence on what is considered an optimal level of expenditure and of the tax rate. Furthermore, Scully (1996) points out the inefficiencies that often occur when resources are allocated in the political market. The problems of rent seeking, and collective choice all have an impact in the way certain expenditure items end up being prioritised without the consideration of them being optimal (Scully, 1996). Although the role of taxation is seen to be promoting growth when targeting especially productive expenditure, a certain tax rate could however result in a negative effect on growth (Myles, 2007).

An increase in taxation up to the optimal tax rate has the potential to increase growth significantly, and increases growth at a decreasing rate (Scully, 1996). However, increasing the tax rate beyond the optimal level reduces growth at an increasing rate (Scully, 1996). This means that imposing a tax rate that is far below the optimal level is therefore increasing growth; however, the growth that might be achieved would be less than what would have been achieved if the optimal tax rate were known and implemented (Scully, 1996). Likewise, a tax rate beyond the optimal level would have a smaller or even negative effect on growth (Barro, 1990). Government expenditure is important in achieving economic growth; however, the issue of optimal tax is equally important when a public good is financed through taxation in order to maintain long-term growth (Barro, 1990). Barro's (1990) government spending model, although simple, demonstrates that taxation used to finance productive government expenditure could have a positive effect on economic growth (Kneller et al., 1999).

3.2.4. Innovation and Learning-By-Doing Model

Endogenous growth models that base their theory on innovation and knowledge capital, are those of Romer (1990), Grossman and Helpman (1991), and Aghion and Howitt (1992). All these models – Romer (1990), Grossman and Helpman (1991), and Aghion and Howitt (1992) – base their ideas on Schumpeter's (1934) theory of creative destruction. In Schumpeter's (1934) theory, the assumption is that an increase in aggregate output is due to the continuous improvement in the quality of goods that eventually replace old or existing products with advanced ones due to the decision to innovate. In Romer's (1990a) model, growth is assumed to be achieved by driving the technological change that takes place when profit-maximising agents make decisions

to investment in innovations. Romer (1990a) also assumes that firms are driven to innovate in order to take advantage of the monopoly position that comes with the ownership of the latest technology and innovations. On the other hand, Grossman and Helpman (1991) demonstrate technological progress as taking place when there is continuous improvement in the quality of products being produced by individual sectors. Secondly, Grossman and Helpman (1991) claim that technological progress also takes places when there is improvement in factor inputs, and therefore inputs productivity, which leads to a continuum of quality products over time. According to Grossman and Helpman (1991), industry success is linked to expenditure on R&D that is targeted to innovate and develop new and advanced products with the equilibrium taking the form of innovations of all industries in aggregate. In another study, Aghion and Howitt (1992) analysed the growth effects of technological progress and innovation.

In their study, Aghion and Howitt (1992) examined the channel of innovation in the endogenous growth theory, and subsequently introduced the concept of obsolescence. They argue that, with more innovation, new products will reduce the less advanced products to an obsolete state. While the models of Romer (1990a) Grossman and Helpman (1991) and Aghion and Howitt (1992) established how growth can be achieved through technological progress and innovation, the focus for policy analysis would be the effect of taxation on the incentive to innovate (Myles, 2007). This is because tax on profit increases the cost of firms, which in turn is expected to reduce the incentive for innovation, while an increase in subsidy of research and development (due to increased expenditure on R&D activities), reduces the cost of innovation.

Arrow's (1962) model expounded the idea that there are externalities between firms, which operate through learning by doing. The assumption of the model is that new knowledge and techniques are acquired as a result of investment decisions of a firm, thus causing a parallel improvement in the productivity of labour (Arrow, 1962). In Arrow's (1962) model, acquisition of knowledge is therefore viewed as a learning process. In another knowledge-based growth model (see Romer, 1986), knowledge is assumed to be an input in production with increasing marginal productivity. Increased knowledge acquired through learning by doing, as an input in production, also means knowledge is a public good, as learning spills over into other firms over time (Romer,

1987). Furthermore, the study by Romer (1987) argued that increasing returns arise from the accumulation of knowledge, the spill-over effect, and specialisation. The positive role of taxation on R&D and innovation can therefore be identified by relating the level of government expenditure on the productive input and human capital to tax revenue (Myles, 2007).

3.3.   THE ECONOMICS OF VAT

According to an independent panel of experts for the review of zero rating in South Africa (see Woolard et al., 2018), the popular argument often passed against the implementation of VAT, or a VAT rate increase is that the indirect tax burden falls relatively more on the poorer households than on the rich, and VAT is therefore regressive. Further objections to VAT include its effect on the redistribution of income, equity, inflation and, most importantly, economic growth. However, on the issue of income redistribution, Woolard et al. (2018) argue that VAT should not be judged in isolation from other components of the fiscal policy, including expenditure, but rather on the entire tax system. For purposes of redistribution, it is evident that tax reform of an increased VAT rate can be politically difficult to implement at times. However, Faridy and Sarker (2011) state that the progressivity of a tax is not all that matters when one evaluates the tax system, because the administrative efficacy and the effectiveness of raising revenue to finance government expenditure are also important when considering the overall efficacy of the tax system. Although there is a consensus that VAT is regressive and thus hurts the poor, it is also important not to allow temporary economic structural disturbances to delay the implementation of reform to the tax system. Faridy and Sarker (2011) argue that any major revenue raising tax reform is always expected to raise the tax liability of the people directly or indirectly.

Although VAT is viewed as a regressive tax on its own, a more appropriate analysis should be based on the tax system as a whole and together with public spending policies that significantly promote poverty reduction (National Treasury, 2011a). The regressive nature of VAT should not be the cause for the fiscal structure to be seen as anti-poor on grounds of fairness and equity (National Treasury, 2011a). Taxation is always a matter of politics and economics, and while economics is often concerned with efficiency, politics, on the other hand, is often more concerned with the issue of fairness and distribution and less with the issue of economic efficiency (Martinez-

Vazguez & Bird 2010). This goes to show that the arguments for or against a VAT increase stems from opposing views relating to the politics and economics of VAT (Martinez-Vazquez & Bird, 2010).

In general, not many taxes are well suited to address the issue of equity while having little distortions and being economically efficient (Ebrill et al., 2002). In this regard, expenditure policies are often a better approach to achieve fairness and equity than high taxes. The revenues collected by way of VAT could therefore, be allocated to productive expenditure programmes targeting the poor in order to address the issue of regressivity (see Ebrill et al., 2002). In an effort to reduce the tax burden of VAT on the poor, the regressivity issue could therefore be addressed either through VAT itself or through other taxes and expenditure measures (Gcabo et al., 2019). Focusing on VAT itself, the essential consumer items that are disproportionately used by the poor could be taxed at a rate lower than the standard rate or it could even be zero-rated. Alternatively, a higher tax than the standard VAT rate could be imposed on luxury items consumed by the rich (National Treasury, 2011b). However, there are strong arguments against the VAT system characterised by multiple tax rates under VAT. Multiple VAT rates without certainty often lead to the opposite of the desired effect, as the rich generally benefits twice as much as the poor (Cnossen, 1992). VAT with many zero-rated items ends up becoming a less efficient instrument in maximising tax revenue as large amounts of revenue collected have to be returned to the traders producing zero-rated goods (Tait, 1988). As a result, multiple VAT rates have become less effective in addressing the regressiveness of VAT than a tax system with a single VAT rate. (National Treasury, 2011a).

Cnossen (2015) states that VAT should only be used to raise revenue, which then can be used to finance programmes, such as education and basic health care, which benefit those who are most affected by VAT. Similar views are shared by Erero (2015) who points out that a VAT increase does not adversely affect poor households if the revenue raised from VAT is redirected back to the poor through government spending. More direct action beyond the tax system might include increased public spending targeting the poor, such as an increase in social transfer. The literature focusing on the relationship between taxation and growth however advises against unproductive government spending, as increased spending on social security items has adverse effects on growth (Cnossen, 1992). Another reason why some countries are not in

support of VAT adoption or an increase in the VAT rate (in countries already imposing VAT) is the issue of inflation. The argument is that tax on consumption would result in undesired effects in the system, including price and wage increases. In other words, VAT is most likely to be inflationary (Kizito, 2014).

In comparison to income taxes or other taxes, VAT is relatively more efficient as it cause fewer distortions in the economy (Martinez-Vazquez & Bird, 2010). Martinez-Vazquez and Bird (2010) further argue that VAT, if designed and administered properly, could raise more revenue than other indirect taxes. Moreover, the efficiency of VAT could be linked to its effect on savings and investment, as it has a less negative effect on savings than income taxes (Martinez-Vazquez & Bird, 2010). Given its relatively less negative effect on the economy in general – through its effect on savings, investment decisions, and revenue-maximising capabilities when designed and administered with limited zero-rated and exempted consumer items –choosing VAT to finance public spending targeting the poor could be considered a pro-growth choice (Keen & Ligthart, 2002).

3.4. EMPIRICAL LITERATURE REVIEW

This section reviews studies covering both developed and developing countries to gauge whether the empirical evidence agrees with the foundations of the endogenous growth theory. A list of empirical studies reviewed in this section is presented in Table 3.1 at the end of this chapter.

In section 3.2 the theoretical literature presented different channels through which tax could influence growth. The review of the theoretical literature also emphasised that direct income taxes are the most harmful to growth in comparison to indirect taxes, such as the consumption tax, more specifically VAT. Moreover, the simple model of endogenous growth (see Barro,1990) has gone further to suggest how VAT could increase revenue, which could in turn be used to increase expenditure on more productive components to promote growth than unproductive expenditure. While such a fiscal structure can be said to be based mainly on theory and not on empirical evidence, the positive relationship between growth and the consumption tax, VAT, seems to be visible within developed regions with countries exhibiting a reliance shift from income taxes to consumption taxes. For those developed countries that indicate

a negative relationship between VAT and growth, the effect is reported as mostly not significant or only present in the short run.

3.4.1. Empirical Evidence in Developed Countries

Macek (2015) evaluated the impact of individual taxes, such as CIT, PIT, VAT, social security contributions and property taxes for OECD countries for the period 2000–2011 using the pool data method. The approach of Macek's study was followed by integrating the impact of taxation into growth models and focusing on the growth variables, such as capital accumulation and investment, human capital, and technology. The study found CIT, followed by PIT and then social security contributions to be the most harmful to growth. The negative effect of VAT on growth was not confirmed when the tax quota was utilised; therefore, the approximation of the tax by its quota failed. When the World Tax Index (WTI) was used as a measure of VAT, a negative relationship between VAT and growth was confirmed but was not significant (Macek (2015). In effort to stimulate growth, Macek (2015) suggests that government and tax authorities in OECD countries should lower the tax burden of CIT and PIT. The loss of revenue from these income taxes should be compensated by a growth in tax revenues from indirect taxes, such as VAT.

Focusing on three countries, namely Australia, Canada, and New Zealand (Bolton & Dollery, 2004) provided an empirical comparison of the countries, and analysed the macroeconomic effects of the introduction of tax on goods and services. Bolton and Dollery (2004) focused on the period 1980–2003 and concluded that not only did the revenue increase due to the introduction of the tax, but GST also had a positive effect on the macroeconomic variables, namely growth, price effect, current account, and the effect on the budget balance.

Elshani and Ahmeti (2017) investigated the effect of progressive tax on economic growth for 20 OECD countries using panel data regression analysis over the period 2002–2014, focusing specifically on the effect of PIT, CIT, and VAT. The study found a negative but non-significant effect of PIT on economic growth for the countries. A positive relationship with economic growth from two taxes was observed, namely CIT and VAT, both taxes also had a significant effect on growth. Other tax revenues, such as social security contribution and property taxes, showed no effect on growth. Elshani and Ahmeti (2017) suggest that all OECD countries applying progressive tax should

put more reliance on CIT and VAT as they have a positive impact on growth than on PIT, social security contribution and property taxes.

Ayoub and Mukherjee (2019) investigated the role of VAT on the economic growth of China using annual time series data for the period 1985–2016. The study employed the ARDL technique to analyse the data. A positive relationship between GDP and VAT in both the short term and in the long term was found.

Miki (2011) used panel data models and the random effects method, and the Hausman test to determine the effect of a change in VAT rate on aggregate consumption and its economic growth in 14 developed countries covering the period from the second quarter of 1980 to the third quarter of 2010. After observing 53 cases where the VAT rate had changed, the results of the study showed that the aggregate consumption and economic growth exhibited three kinds of trends following a change in the VAT rate (Miki, 2011):

- the first trend observed was that of aggregate consumption and economic growth increasing (or decreasing) before an increase (or reduction) in the VAT rate; therefore, implying a positive relationship.
- the second trend showed that aggregate consumption and economic growth indicated an inverse relationship with an immediate implementation of the increase (or reduction) in VAT; and
- the last trend indicated that, after the aggregate consumption and economic growth rapidly decreasing (or increasing), these began to increase (or decrease) gradually (Miki, 2011).

A study by Johansson et al. (2008) investigated the design of the tax structure to promote economic growth in OECD countries. Using the bottom-up approach, the impact on the performance of the main taxes was analysed over the period 1975–2006. The study found CIT followed by PIT to be harmful to growth Furthermore, a decline in the revenue share of goods and services tax was observed; however, there seemed to be a shift towards a general consumption tax in most OECD countries. The study recommends a tax reform that would see a shift of revenue base from income taxes to less distortive taxes, such as the property tax or consumption tax (Johansson et al., 2008).

In their study, Simionescu and Albu (2016) studied the impact of standard VAT on economic growth in five Central Eastern European (CEE) countries namely Bulgaria, the Czech Republic, Hungary, Poland, and Romania. Using the different types of panel data models, namely the random effect model, the dynamic panel, and the panel vector autoregression (VAR) over the period 1995–2015, the study showed a positive influence of VAT rate on economic growth. In addition, Simionescu and Albu (2016) analysed the countries individually using the Bayesian approach and the results showed a positive impact of VAT on GDP for Hungary, and a negative impact of VAT on GDP in the four other countries. According to Simionescu and Albu (2016), an increase in the VAT rate positively influenced economic growth in the long run in all five countries while in the short run, VAT influenced GDP negatively as a result of low collection efficiency.

Guran and Cataramă (2015) focused on 28 European Union (EU) member states and analysed the influence of VAT on economic growth using the ordinary least square (OLS) technique for the periods 2000–2013/2014. The researchers found similar results as other scholars who concluded that VAT has relatively fewer distortions on the economy since it discourages production and savings to a lesser extent than income direct taxes. Furthermore, Guran and Cataramă (2015) found a negative effect by other taxes on growth, while the negative effect of VAT on economic growth was not found to be significant. According to the authors, budget revenues are directly linked to GDP growth given the strong dependence between GDP and consumption on which tax is levied. The consumption in the participating EU member states was found to have increased as a result of consumption itself and not because of the VAT rate at the time, suggesting that most EU member states still had the opportunity to increase VAT even further as there were no restrictions in doing so as in relation to the Laffer curve (Guran & Cataramă, 2015).

Ormaechea and Morozumi (2019) examined whether VAT may have different effects on long-term growth depending on whether it is raised though the standard rate or thorough C-efficiency, which measures VAT collection efficiency from a perfectly enforced single rate on all consumption. The study focused on 30 OECD countries and employed the pooled mean group, mean group, and ARDL to analyse the data for the period 1970–2016. According to Ormaechea and Morozumi (2019), the results of the study were two-fold:

- Firstly, a reduction in income tax offset by an increase in VAT, promotes growth only when VAT is raised through C-efficiency.
- Secondly, the results of the study showed that, for a given VAT revenue, an improvement in C-efficiency offset by a reduction in the standard rate also promotes growth.

Ormaechea and Morozumi (2019) suggest that the OECD countries should strive to broaden their VAT base by implementing fewer tax concessions, such as zero rate and exemptions, as such VAT design is conducive to higher long-term growth than a rise in VAT rate.

3.4.2.   Empirical Evidence in Developing Countries

Koch et al. (2005) examined the relationship between total taxation, the tax mix, and economic growth from 1960–2002 in South Africa. The study used an analytical model applying data envelopment analysis and found that a reduction in higher taxes is associated with increased growth potential. Koch et al. (2005) believe action by government would set in motion further positive effects within the economy. They therefore support attempts from government to reduce the tax burden to increase growth. Contrary to theory, Koch et al. (2005) found a negative relationship between indirect taxes and growth.

In another similar study, De Wet and Koch (2005) analysed SA data using the OLS technique. The study estimated the impact on growth due to changes in the fiscal policy through increased government expenditure, including direct and indirect taxation over the period 1960–2003. The results of the study show a negative relationship between economic growth and the size of government as reflected in government expenditure and direct tax revenues. However, a relationship between growth and indirect taxes was not found. As a result, De Wet and Koch (2005) suggest that, with fiscal policy improvement and changes to government spending, government fiscal policy could influence economic growth.

Using the ARDL model and the Engle–Granger two-step procedure Ilaboya and Mgbame (2012) investigated the relationship of VAT and economic growth in Nigeria for the period 1980–2011. They found a non-significant negative relationship between the variables. A recommendation was made to the Nigerian government to rely less on indirect taxes and instead focus on direct taxes to drive the economy of Nigeria.

Also in Nigeria, Afolayan and Okoli (2015) examined the impact of VAT on the Nigerian economy for the period 2005–2012 using the OLS technique. The different sectors of the economy were also analysed to assess how they contribute to the VAT revenue in order to get a perspective on how these in turn contribute to growth. The findings of the study indicated a positive but insignificant correlation between VAT revenue and the real GDP. According to Afolayan and Okoli (2015), the data did show VAT to be contributing considerably to revenue, however, and the authors therefore concluded that some systemic issue existed, which seemed to be inhibiting its potency at the time. The findings confirmed a unidirectional relationship, with causality coming from the direction of the GDP toward VAT revenue. Afolayan and Okoli (2015) further argue that policymakers should enhance all factors that determine growth in order for VAT to make a significant contribution. The researchers emphasise the importance of identifying the problems within the tax system to inform sound tax administration in order for VAT to contribute significantly to growth, with the effect of tax reform in VAT expected be felt after a period of four years.

Bacarreza, Vazquez and Vulovic (2013) evaluated the effect of PIT, CIT, and general tax on goods and services, and other sale taxes as well as tax from natural resources for Latin American Countries (LAC), namely Argentine, Brazil, Mexico and Chile for the period 1990–2009 using the VAR technique. The study found a positive relationship between PIT and economic growth in Latin America given a relatively small income tax base. For CIT, Bacarreza et al. (2013) found a marginal effect of CIT on economic growth for individual countries, such as Argentine, Mexico, and Chile. A positive and significant relationship was found between VAT and economic growth for the LAC in general. As investigated by Bacarreza et al. (2013), tax on natural resources for the countries under study showed no contribution to growth. Reducing tax evasion and improving tax administration for collecting CIT revenue was therefore recommended for LAC to boost economic growth.

Yusuf et al. (2018) examined the causality between VAT and economic growth in Nigeria. For the purpose of the study, an ARDL technique was employed for the period spanning 1980–2016. The results of the study showed that VAT, trade openness, and domestic investment had a positive effect on the real GDP. Yusuf et al. (2018) demonstrated the corruption index, which showed a negative and significant effect in the long term. The results of the study by Yusuf et al. (2018) showed a negative but

non-significant relationship between past VAT and real GDP, suggesting a convergence to the long-run causality that existed between GDP and VAT at the time. Yusuf et al. (2018) therefore recommended enhancement of the tax administration to design a better tax system given the VAT significant relationship with growth.

Poor tax administration and effective VAT design seem to be the major constraints delaying the potential revenue that could be generated in most African countries. In the study by Jalata (2014), covering the period 2003–2012, the role of VAT on the growth of Ethiopia was analysed using descriptive and multiple regression. The study found that, in comparison to sales tax, VAT had a positive effect on growth for the period under review, although the regressiveness of the sales tax continued to be observed. Jalata (2014) reports that strong tax administration and taxpayers' cooperation are required to increase the efficiency of VAT.

Lalarukh and Chowdhury (2013) analysed the relationship between VAT and GDP in Bangladesh for the period 1991–1992 to 2011–2012. The study used the Johansen co-integration technique to examine the relationship and found that VAT contributes significantly to the economy. The researchers thus concluded that, at the time, a positive relationship existed in Bangladesh between VAT and growth (Lalarukh & Chowdhury, 2013). According to Lalarukh and Chowdhury (2013), this result reveals important information, such as indices, for instance national income and national output, as these incomes reflect the consumption behaviour of economic agents, as the Bangladesh government could use this information to make policy decisions. Lalarukh and Chowdhury (2013) further state that the results of the study could assist the Bangladesh government to use VAT as a tool for revenue generation. Given that, at the time of the study, the economy of Bangladesh was characterised by a large informal sector, a good VAT design and administration could be expected to lead to an increase in welfare and to contribute to the growth (Lalarukh & Chowdhury, 2013).

Gatawa, Aliero and Aishatu (2016) examined the effect of VAT on the level of economic activities in Nigeria. Using the Johansen co-integration test and quarterly data spanning 1994–2014, Gatawa et al. (2016) found a positive and significant effect of VAT on economic growth. A positive relationship was also observed in other government revenues, such as the mineral and oil revenues in Nigeria (Gatawa et al., 2016). The study recommended closing all identified loopholes within tax administration for VAT to generate sustainable revenue for the country. Gatawa et al.,

2016, A call for more transparency is required on the site of policymakers for all sources of government revenue.

By utilising the generalised method of moments (GMM) panel, Kolahi and Noor (2016) examined the effect of VAT on economic growth in 19 developing countries over the period 1995–2010. The study also examined the effect of VAT through the channel of saving on the capital accumulation and productivity (Kolahi & Noor, 2016). The results of study showed a negative effect of VAT on capital accumulation. A positive effect of VAT on economic growth is suggested to have come through other channels and not as a result of increased savings and its effect on capital accumulation (Kolahi & Noor, 2016).

A study by Njogu (2015) focused on Kenya and examined the effect of VAT on the Kenyan economy. Using data from 1990–2014, the study employed a causal study using Poisson and negative binomial regression models to determine the effect. The findings of the study indicated a negative relationship between VAT and economic growth. More precisely, the results showed that a 1 per cent decrease in VAT leads to a 7 per cent increase in the GDP. Njogu's (2015) advice was that the tax authorities in Kenya should strive for a reduction of the VAT rate or maintain the low VAT rate to promote the level of growth in Kenya.

Korkmaz, Yilgor and Aksoy (2019) performed a study in Türkiye to investigate the existence of a long-run relationship between economic growth and direct and indirect taxes. The study used a bounds test to co-integration within the ARDL model using quarterly data from 2006–2018. A positive and significant relationship between indirect taxes and economic growth was found. As expected, a negative and significant relationship of direct taxes on economic growth was found in both the short-run and the long-run (Korkmaz et al., 2019). The effect of PIT and CIT indicates that these direct taxes had a harmful effect on the economy of Türkiye at the time, and therefore reduced the disposal income of the economic agents (Korkmaz et al., 2019). On the other hand, VAT and excise duties have a positive effect on growth due to the taxes revenue-generating capability. Korkmaz et al. (2019) argue that shifting the tax burden from direct taxes to indirect taxes would significantly reverse the negative effect of direct taxes on economic growth.

Rahman and Skar (2021) analysed the role of VAT on the economic growth in Bangladesh. The study utilised the OLS technique to analyse the data covering the period 1991–1992 to 2018–2019 and found a positive relationship between VAT and GDP. According to Rahman and Skar (2021), the results suggest that VAT promotes economic growth when compared to the sales tax that was implemented before the country adopted VAT in 1991.

For Kosovo, Shala (2017) reports that revenue from VAT makes it the main tax contributing to government tax revenue in the country. Using the OLS technique to analyse the data covering the period 2005–2015, Shala found that VAT had a positive effect on GDP in Kosovo at a 1 per cent significant level. The relationship between the two variables (GDP and VAT) is strong, positive, and significant; thus, a unit percentage change in VAT will increase the GDP quite significantly (Shala, 2017).

Roos et al. (2020) evaluated the economy-wide and regional impact of increasing VAT and allocating the increased revenue to government to be used in terms of education and health in South Africa. The study employed a recursive dynamic multi-regional model and focused on the period after the implementation of the VAT increase, that is from 2018–2019. The findings of the study suggest that VAT contributed to the high cost of living through the consumer price index (CPI). Long-term outcomes were observed at industry and regional level for the capital with evidence of a lower capital/labour ratio (Roos et al., 2020). The study reported that government spending improved in the long run, which was evident on increased spending on education and health. Low levels of investment were also observed due to low levels of capital (Roos et al., 2020).

Sectoral differences were found with the education and health sectors performing well given the VAT increase, while those relying on the demand-side of the economy by selling to consumers and investors, performed poorly (Roos et al., 2020). Most regions in South Africa, showed a negative effect on GDP in the long run, except for Limpopo, which had a positive but not significant growth (Roos et al., 2020). Roos et al. (2020) however did not demonstrate the effect of the VAT increase on government spending, showing:

- how the increased revenue spent on productive expenditures, such as technology, would have contributed to the quality of education of workers;

- the effect on R&D, which have the potential to increase productivity and capital through the creation of advanced machinery; and

- the effect of the VAT increase on infrastructure development, such as roads and telecommunications.

In a study by Erero (2015), the effects of a VAT increase in South Africa were analysed using the dynamic computable general equilibrium (CGE) model using a social accounting matrix (SAM) for 2010. Furthermore, Erero (2015) performed five different simulations analysing a VAT increase, ranging from 1 per cent to 5 per cent over the period 2013–2018. The study found that a VAT increase resulted in a marginal increase in the GDP. A simulation of a 1 per cent change in VAT resulted in an increase in GDP of 0.02 per cent in 2013 and 0.12 per cent in 2018. For simulations 1 and 5, the results showed that the tax revenue increased by 10.8 per cent and 3.2 per cent respectively (Erero, 2015). The increase in VAT led to an increase in government spending that might have been used for spending for redistributive purposes and for alleviating poverty (Erero, 2015). According to Erero (2015), the standard of living among the middle- and high-income earners improved with the low-income households benefitting due to increased government revenue through social services. Erero (2015) claims that any policy measure intended to stimulate economic growth, employment, and redistribution of income could consider an increase in VAT.

Hassan (2015) examined the relationship between VAT revenue and economic growth in Pakistan over the period 1991–1992 to 2011–2012. Using the OLS regression technique, Hassan (2015) found a significant and positive impact of VAT revenue on the GDP in Pakistan. Furthermore, the results of the study by Hassan (2015) showed that a 1 per cent increase in the growth in VAT revenue leads to a 0.24 per cent increase in the GDP. Granger causality confirmed the existence of a short-run relationship between VAT revenue and GDP in Pakistan (Hassan, 2015).

Nguyen (2019) employed the OLS regression method to study the effect of direct and indirect tax on economic growth in Vietnam in the period 2003–2017. Nguyen (2019) confirmed a differing and unexpected effect of taxes on economic growth. The study found that, at the time, indirect tax had a positive effect on growth and no effect on growth from direct taxes. According to Nguyen (2019), the Vietnam government should restructure its tax mix in such a way that there is a shift from direct taxes to indirect

taxes and expansion of the base. Nguyen (2019) further recommends that environmental taxes as well as tax on natural resources should increase, including increasing VAT and excise tax.

Ahmad and Sial (2016) investigated the relationship between indirect taxes and economic growth in Pakistan to find whether a long-run or a short-run relationship existed between the two variables using the ARDL bounds testing approach and covering the period 1974–2010. During that period, indirect taxes contributed most of the tax revenue and significantly more than direct taxes in Pakistan. Ahmad and Sial (2016) found that indirect taxes had a negative and significant effect on economic growth in the long run, while the results showed insignificant results for the short run. Ahmad and Sial (2016) argue that indirect tax should be reduced with the loss of revenue financed by an increase in direct taxes.

Despite increasing tax revenue, the economic growth of Pakistan remained low over for a number of years due to revenue spent on unproductive expenditures instead of productive expenditures. Ahmad and Sial (2016) therefore advised the government to reform the tax system urgently by broadening the tax base as relatively fewer people are paying taxes because of a limited tax base, corruption, poor tax administration and tax evasion among other things, and forcing the government to rely strongly on foreign finance to fund expenditures in the country. Given that taxes in Pakistan have a negative effect on economic growth in totality due to a considerable share of indirect taxes relative to direct taxes, Ahmad and Sial (2016) recommend that indirect taxes be reduced in order to see a positive effect on growth.

Owino (2019) analysed the effect of custom and excise duties on economic growth in Kenya for the period 1973–2010. The Johansen co-integration method was used to estimate the model. The results showed that in Kenya, a positive and significant relationship existed between the custom duty and excise duty, and a positive but non-significant relationship existed between VAT and economic growth at the time (Owino, 2019).

Kizito (2014) examined the link between the Nigerian tax structure and economic growth over the period 1980–2011 using the Engle-Granger causality test. According to Kizito (2014), CIT, VAT and petroleum profit tax (PPT) have no influence on economic growth. In contrast, the study revealed that custom duties had a noteworthy

influence on economic growth. With specific reference to VAT, Kizito (2014) cited this type of tax as having contributed to a weakening economy since its imposition, which resulted in an increase in the price of goods and services in the manufacturing sector. Kizito (2014) therefore argues that VAT could lead to inflation. The author further mentions that VAT reduces the final real income of consumers, which reduces their purchasing power and the aggregate demand in the economy (Kizito, 2014).

Kearney (2003) investigated the possibility of restructuring VAT by either increasing revenue through higher taxes and maintaining incentives for growth or promoting equitable distribution of income while restructuring existing taxes. Kearney (2003) analysed the effect of a change in the VAT rate on the economy, and the CGE method was applied using the South African SAM 2002–2003 as data source over the period 1991–2001. A number of simulations were performed including lowering the VAT rate from 14 per cent to 12.6 per cent, zero-rating food, and zero-rating financial services. Kearney (2003) found that lowering the statutory VAT rate might generate growth and employment; however, such a policy implementation would result in a more inequitable redistribution of income and wealth than when direct income taxes are increased. To offset the negative effect, Kearney (2003) says income taxes can be raised for top income groups to maintain the progressiveness of the overall tax structure.

Asllani and Statovci (2018) analysed the effect of the change in the VAT rate for certain goods on the fiscal stability of Kosovo using the OLS technique and the comparative analysis of their data for the period 2013–2016. After calculating the influence of a change in the VAT rate on the budget, economic growth, and economic development, Asllani and Statovci' (2018) results indicated that reducing the VAT rate on basic products from 16 per cent to 8 per cent had a positive effect on revenue and growth of the GDP. On the other hand, a change in the VAT rate on non-necessities from 16 per cent to 18 per cent resulted in similar effects on budget revenue and GDP despite the tax increment. Asllani and Statovci (2018) therefore recommend that there should be an increase in the VAT rates on luxury items and that the tax base should be broadened by reducing the VAT threshold in order to allow the system to enable the taxing of more VAT payers.

Hakim (2020) studied 51 countries and used a dynamic panel GMM estimation to investigate the effects and consequences of both direct and indirect taxes on economic growth and total taxes revenue. The investigation was done over the period

1992–2016, and the results indicated that direct taxes were significant and negatively correlated with economic growth. In contrast, Hakim's (2020) findings showed a positive and non-significant effect of indirect taxes on growth. Hakim (2020) mentions that, despite direct taxes having a negative effect on growth, they contribute most to the total revenue, and therefore are still regarded as efficient in collecting revenue overall.

Ufier (2014) performed a survival analysis and propensity score matching to compare the results of adopter and non-adopters of VAT, focusing on a sample of 192 countries over the period 1967–2012. Ufier (2014) analysed the revenue trends by modelling VAT in those countries that have adopted this type of tax. Ufier (2014) consequently claims that using regression methods in analysing the effect of VAT policy results in biased estimates, given that the decisions involving VAT are country-specific and endogenous. Ufier (2014) found that the decision to adopt VAT in the participating countries was associated with an increase in growth, investment, as well as lower inflation and government spending as a share of GDP.

The manner in which countries differ in their response to the effects of consumption taxes on growth also seems to be influenced by their level of development, as reported in Hakim, Karia and Bujang (2016), Adhikari (2020), and Chan, Ramly and Karim (2017). Hakim et al. (2016) focused on a number of countries comprising both developed and developing countries over the period 2005–2012, Hakim et al. (2016) utilised the GMM estimation method to examine the effect of GST on economic growth in 70 countries. Hakim et al.'s (2016) main objective was to analyse the mixed effects of GST on growth in the two groups of countries (developed and developing). In their study, Hakim et al. (2016) found a negative relationship between GST and growth in developing countries, and a positive and significant correlation between GST and economic growth in developed countries. For developing countries, Hakim et al. (2016) argue that GST is inefficient in stimulating growth, increasing revenue, and reducing debt due to the presence of a relatively large informal economy found in such countries. Hakim et al. (2016) conclude that there is a lower per capita income growth in developing countries as a result of the GST burden. According to Hakim et al. (2016), this also translates into a reduction in purchasing power of middle-income earners and consumption despite an already lower average GST rate than in developed countries.

As suggested by Hakim et al. (2016), GST is not a solution to increase revenue and reducing public debt without causing a downward effect on purchasing power and the level of consumption in developing countries. The study by Hakim et al. (2016) therefore suggests a GST system with differentiated rates, i.e., a lower GST rate on essential items consumed especially by the poor, and a higher GST rate on luxury items consumed by wealthier households. This, according to the Hakim et al. (2016), has the potential to generate more revenue from GST without burdening the middle-income earners in developing countries. In their efforts to boost consumption and increase aggregate expenditure, developing countries should instead lower the tax burden for middle-income earners by reducing PIT, as this would increase their purchasing power and consumption while contributing to positive growth (Hakim et al., 2016).

Adhikari (2020) reports employing a synthetic control method to analyse the effect of replacing sales and turnover tax with VAT on economic efficiency. Adhikari (2020) used data for 167 countries that spanned from 1950–2010. The study found a positive and significant effect of the adoption of VAT on the real GDP per capita. Adhikari (2020) also points out that the positive effect was conditional on the level of development in a specific country. There was thus a strong correlation between VAT and level of development, with high-income nations showing more positive results from adopting VAT than low-income countries. The policy implications from Adhikari's (2020) study are two-fold. Firstly, there was a correlation between the positive effects of VAT and the developmental level of a country, with the state of development gauged by factors such as tax evasion, tax capacity, and the size of the informal economy, which could undermine the efficiency of VAT. Secondly, VAT can be considered an alternative financing mechanism for increasing government spending and replacing distortionary taxes, especially in developing countries (Adhikari, 2020).

Using the generalised method of moments, Chan et al. (2017) examined the effect of the efficiency of government spending on economic growth of 115 countries for the period 1984–2014. Chan et al. (2017) examined the moderating role of the VAT system on the relationship between the efficiency of public spending and economic growth. Based on their results, Chan et al. (2017) suggest that efficient tax administration, higher tax revenue as a result of VAT, and efficient government spending promote economic growth in a country. Chan et al.'s (2017) results are also

consistent with growth theories in their confirmation that the VAT system improves revenue collection and government spending directed at the productive sectors, which then brings about a positive effect on economic growth. The role of VAT on the link between the efficiency of government spending and economic growth was found to be more prominent in developed countries than in developing countries (Chan et al., 2017). Such a characteristic is attributed to the relatively more efficient tax administration found in developed countries, which contributes to the efficient redistribution of the revenue from VAT (Chan et al., 2017).

Erero (2021) assessed the impact of a 1 percent VAT increase on the South African economy. This was after the VAT rate increased from the long-standing 14 percent imposed since 1993 to 15 per cent implemented since April 2018. The two simulations performed by the author was applied using the CGE analysis to model the results which found that the VAT increase sent an immediate response as a result VAT policy shock. The first simulation maintained the 14 per cent VAT rate while the second simulation analysed the shocks of the new VAT rate of 15 per cent. In the second simulation, the 1 percent increase in the VAT led to a decline of 0.0002 per cent in GDP during the same period of 2018. The net indirect tax declined by only 0.0017 per cent and the consumption declined by 0.0168. The increasing trend in GDP was observed further into 2021 with the VAT collection forecast expected to average around R3.2 billion (Erero, 2021).

The main takeaway from the study is that the net indirect tax and GDP continued to increase over the long run indicating that VAT revenue growth is important for economic growth. Secondly, the study contributed to the current debate surrounding the regressivity and adverse effects of the VAT. The findings of the study confirms that the welfare of all households, whether poor or wealthy, benefit from the VAT when consuming mostly the zero-rated basic food items. Instead of a pro-poor stance through the tax exemptions and zero-rated items that are also benefiting the wealthier groups, (Cnossen,2021) proposes that for a well-balanced fiscal policy, a combination of an efficient regressive tax and well-targeted expenditure programs such as social transfers, is efficient in reducing a inequality. According to (Cnossen, 2021) in modernising the VAT, countries should implement pro-poor and pro-growth policies that are dominated by changes in expenditures plans such as increased spending in

healthcare, education, and infrastructure instead of pro-poor policies that rely on tax holidays and exemptions.

In his book titled modernising the VATs in Africa, Cnossen (2021) submit solutions that attempt to expand on the foundations of the historic VAT design and encouraging countries with a VAT system to have the characteristics of a modern VAT. The author distinguishes the role of the VAT from the role of other taxes within the overall tax system of a given country. According to Cnossen (2021), the function of the VAT is to raise revenue in an efficient and predictable manner. In other words, the VAT is not measured by the ability to distort people's choices as with the excise tax. Furthermore, the role of the VAT differs from that of the import duties which its primary function is to support international trade. And more importantly the author highlights that the role of the VAT should not be seen as the primary instrument to be used to redistribute income or to stimulate business activities through investment incentives as is the case with the PIT and CIT respectively. Cnossen (2021) submit that VAT is a more favourable tool amongst other revenue sources to finance expenditure programs that can help ease the financial difficulties of lower income groups. Another proposition by (Cnossen, 2021) in terms of VAT, is that a uniform rate should be imposed on all goods and services consumed within a country to lessen the economic distortions. Cnossen (2021) suggest that exemptions should be limited to items that are deemed necessary on the purpose of tax administration grounds as zero-rate and exemptions on several goods hinders efficient tax collection.

It is evident from the vast amount of literature that countries have experienced revenue from either direct and indirect taxes or even both categories with developed countries performing well in terms of revenue collection in most tax categories. It is also clear that more effort is still needed to improve tax administration especially in developing countries as the lack to transparency and institutional strength and stability hinders efficient tax collection. Given that the PIT and CIT revenues in developing countries is still to a greater extent constrained given the relatively smaller tax base in these countries, an opportunity to improve tax revenues exist for those that are yet to realise the full potential of VAT to increase revenue and growth. Although the regressive nature of the VAT and its negative effects on largely the poor households, has been debated extensively in the discourse, there is a consensus that the VAT primary role is not that of income redistribution, but rather to raise revenue.

Given the on-going debate on the VAT, empirical literature does go on to prove that with a balanced fiscal policy comprising of an efficient VAT system and a well-target expenditure programs finance by VAT amongst other sources of revenue, a country can still be pro-poor and pro-growth as a result of a boost in revenue through the VAT. Although the impact on VAT on economic growth for different countries has been found to be either positive, negative or have no impact, many studies did not clearly indicate the mechanisms through which this impact on growth was seen. This study therefore focuses on this identified research gap and will investigate whether in a South African context the potential impact feeds through to VAT from economic or vice versa. Table 3.1 below provides a summary of the empirical studies reviewed in this section.

Table 3.1: Summary of empirical studies reviewed.

AUTHOR(S)	COUNTRY(S)	PERIOD	METHOD	RELATIONSHIP BETWEEN VAT AND GROWTH
Macek (2015)	OECD member countries	2000–2011	Pooled data	• Inconclusive when tax quota is used. • Negative effect when the WTI was used
Bolton and Dollery (2004)	Australia, Canada New Zealand	1980–2003	Comparative analysis	Positive effect
Elshani and Ahmeti (2017)	20 OECD member countries	2002–2014	Panel data regression analysis	Positive effect
Ayoub and Mukherjee (2019)	China	1985–2016	ARDL	Positive effect
Miki (2011)	14 developed countries	1980–2010	Random effects method, and the Hausman test	• Positive effect before the implementation of a VAT rate change • Inverse relationship with immediate implementation • Negative effect after implementation
Johansson et al. (2008)	OECD	1975–2016	Bottom-up approach	Positive effect
Simionescu and Albu (2016)	5 central Eastern European countries	1995–2015	Random effect model, dynamic panel, and panel VAR	Positive effect

AUTHOR(S)	COUNTRY(S)	PERIOD	METHOD	RELATIONSHIP BETWEEN VAT AND GROWTH
Guran and Cataramă (2015)	28 EU member states	2000–2013 and 2000–2014	OLS technique	Positive effect
Ormaechea and Moruzumi (2019)	30 OECD countries	1970–2016	Pooled mean group, mean group, and ARDL	Positive effect
Koch et al. (2005)	South Africa	1960–2002	Analytical model through the data envelopment analysis	Negative effect
De Wet and Koch (2005)	South Africa	1960–2003	OLS technique	Inconclusive
Ilaboya and Mgbame (2012)	Nigeria	1980–2011	ARDL model and the Engle–Granger	Negative effect
Afolayan and Okoli (2015)	Nigeria	2005–2012	OLS technique	Positive effect
Bacarreza et al. (2013)	Argentine, Brazil, Mexico, and Chile	1990–2009	VAR technique	Positive effect
Yusuf et al. (2018)	Nigeria	1980–2016	ARDL technique	Positive effect
Jalata (2014)	Ethiopia	2003–2012	Descriptive and multiple regression techniques	Positive effect

AUTHOR(S)	COUNTRY(S)	PERIOD	METHOD	RELATIONSHIP BETWEEN VAT AND GROWTH
Lalarukh and Chowdhury (2013)	Bangladesh	1991–2012	Johansen co-integration test	Positive effect
Gatawa et al. (2016)	Nigeria	1994–2014	Johansen co-integration test	Positive effect
Kolahi and Noor (2016)	19 developing countries	1995–2010	Panel GMM model	Positive effect.
Njogu (2015)	Kenya	1990–2014	Poisson and negative binomial regression models	Negative effect
Korkmaz et al. (2019)	Türkiye	2006–2018	ARDL model	Positive effect
Rahman and Skar (2021)	Bangladesh	1991–2019	OLS technique	Positive effect
Shala (2017)	Kosovo	2005–2015	OLS technique	Positive effect
Roos et al. (2020)	South Africa	2018–2019	Recursive dynamic multi-regional computable general equilibrium (CGE) model	• Negative effect in eight provinces • Positive effect in Limpopo
Erero (2015)	South Africa	2010	Dynamic CGE model	Positive effect
Hassan (2015)	Pakistan	1991–2012	OLS technique	Positive effect
Nguyen (2019)	Vietnam	2003–2017	OLS technique	Positive effect

AUTHOR(S)	COUNTRY(S)	PERIOD	METHOD	RELATIONSHIP BETWEEN VAT AND GROWTH
Ahmad and Sial (2016)	Pakistan	1974–2010	ARDL	Negative effect
Kizito (2014)	Nigeria	1980–2011	Engle–Granger causality	Inconclusive
Kearney (2003)	South Africa	1991–2001	CGE model	Negative
Asllani and Statovci (2018)	Kosovo	2013–2016	OLS technique and comparative analysis	• Negative effect with a VAT increase on basic food items • Positive effect with a VAT increase on luxury items
Hakim (2020)	51 countries	1992–2016	Dynamic panel GMM	Positive effect
Ufier (2014)	192 countries	1967–2012	Survival analysis and propensity score matching	Positive effect
Hakim, et al. (2016)	70 countries	2005–2012	GMM method	Negative effect in developing countries, and a positive effect in developed countries
Adhikari (2020)	167 countries	1950–2010	Synthetic control method	Positive effect
Chan et al. (2017)	115 countries	1984–2014	Generalised method of moments	Positive effect
Erero (2021)	South Africa	2018	Dynamic CGE Model	Positive effect

3.5. CONCLUSION

The effect on growth of VAT as an indirect tax was found to be mostly positive, as suggested by both theory and empirical studies. The theoretical literature demonstrated how taxation could influence growth through a number of endogenous growth channels. The one-sector capital model, namely the AK model first developed by Romer (1986) is of the view that the level of saving determines the amount of capital available for investment. It then follows, as reported by Cnossen (1992), that growth can be realised from a policy that raises the level of saving, such as VAT. Although VAT reduces future consumption, it does not reduce the net rate of return on savings in a similar manner as income tax; therefore, VAT is relatively more pro-growth in relation to savings.

The human capital model, pioneered by Uzawa (1965) and Lucas (1988) followed by Romer (1990b), Barro (1991), and Mankiw et al. (1992) assumes that growth could be influenced by investment in education and training. Under this channel, Blankenau and Simpson (2004) emphasise the importance of specifying a suitable financing mechanism to fund public education, as choosing a tax with greater distortions would offset the positive effects on growth. The importance of human capital in the endogenous theory can be observed in the incorporation of human capital input into the simple capital model, as the interaction between the two inputs could explain the role of taxation and its effect on growth. Within the government expenditure channel, endogenous growth could be explained with specific reference to Barro's (1990) model. The assumption of this model is that growth arises when existing levels of physical and human capital are augmented by additional inputs in production. The relationship between government policy and economic growth therefore develops when the additional input is a public good financed by taxation. This in turn will provide a positive role for public expenditure and a direct tool through which policy could affect growth (Barro, 1990). Furthermore, from the endogenous growth models of Barro and Sala-i-Martin (1992), Barro and Sala-i-Martin (1995), and Mendoza et al. (1997), predictions were derived by classifying taxes as distortionary and non-distortionary, and expenditures as either productive or non-productive (Kneller et al., 1999). It is also widely reported in the public finance field that distortionary (or non-distortionary) taxes are often negative (or positive) to growth (Scully, 1996). Similarly, unproductive expenditures are claimed to have a negative effect on growth with expenditure items,

such as social transfer, being associated with this class of expenditures (Chan et al., 2017).

The channel of innovation and learning by doing demonstrates that technological change arises from investment decisions by profit-maximising agents in promoting innovation Romer (1990a) and research and development Romer (1987). The focus for policy analysis suggested by literature through this channel is the effect of taxation on the incentive to innovate. Tax on the corporate sector reduces the profit of firms, which in turn reduces the incentive for innovation. A positive role of taxation in terms of research and development and innovation can be identified by relating the level of expenditure on the productive input and human capital to tax revenue (Myles, 2007).

The chapter also touched on the economics of VAT, and how the regressiveness of VAT, its redistribution of income, and equity issues could be addressed to limit the negative effect of VAT on poorer households. A few studies, such as by Ruebling (1973), Tait (1988), Cnossen (1992), and Kizito (2014) indicate that there is no clear evidence on the inflationary effect of VAT, since the effect of VAT changes is reported to be only temporary and not long lasting (Ruebling, 1973).

Although there are opposing views on the effect on VAT on economic growth, a number of studies, mainly by Ufier (2014), Simionescu and Albu (2016), Elshani and Ahmeti (2017), and Ayoub and Mukherjee (2019) show that, at the time of the studies, many countries observed a positive relationship. According to Chan et al. (2017) and Adhikari (2020), the relationship between most indirect taxes or more specifically VAT and growth is reported to be dependent on the level of development, with many developed countries experiencing more significant and positive effects than developing countries. The state of a country and its response to the changes in VAT also relate to the quality of tax administration in the country, the design of VAT in relation to the entire tax system, and the size of the informal sector (Lalarukh & Chowdhury, 2013). Although several developing countries experience a positive effect on growth as a result of VAT, the results of some studies, such as Lalarukh and Chowdhury (2013) and Chan et al. (2017), focusing on developing countries, found that more opportunity still exists for these countries to take full advantage of VAT as a revenue-generating tax. Ebrill et al. (2001), Jalata (2014), and Yusuf et al. (2018), argue that, if many countries could improve their tax administration and collaborate with government authorities in developing policy that would help reduce the size of the

informal sector in developing countries, the positive effect on growth could be felt more (Tanzi & Zee, 2000). Not many studies on VAT and growth exist in Africa, which was a motivation for this study.

CHAPTER FOUR: CONCEPTUAL FRAMEWORK, DATA ANALYSIS AND METHODOLOGY

4.1. INTRODUCTION

In this chapter, the conceptual framework, methodology and data analysis are presented. The conceptual framework is provided in section 4.2. Section 4.3 present the analysis of data used in the current study. A discussion of the methodology and econometric technique used follows in section 4.4. Section 4.5 concludes the chapter.

4.2. CONCEPTUAL FRAMEWORK

The conceptual framework presented on Figure 4.1 suggests positive feedback where economic growth leads to increased VAT revenue, which, in turn, allows the government to invest in public services, fostering further economic development. The linkages showing the relationship between economic growth and VAT can be explained as follows:

I. **Economic Growth:**

- One variable central to this study is the economic growth and is the starting point of the diagram presented.

II. **Increased Consumer Spending and Demand:**

- Given that a VAT is a consumption tax, an increase in consumer spending will contributes to economic growth. This will in turn lead to higher VAT revenue for the government.

III. **Boosted Production and Business Activities:**

- An increase in consumer demand will stimulate productivity and business activities.

- Furthermore, when businesses produce more goods and services, this will lead to more positive economic growth.
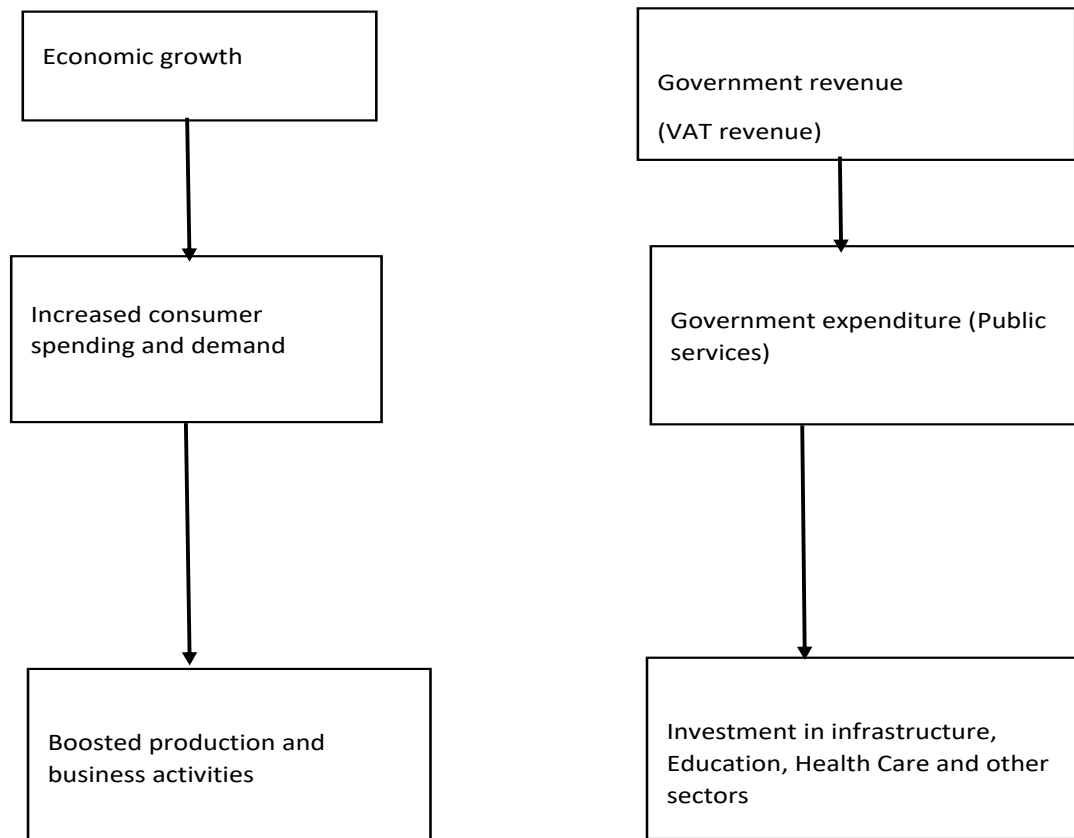
Figure 4.1: Diagrammatic model linking economic growth and VAT.

IV. **Government Revenue (VAT Income):**

- When business activities increase and the economy is expanding, the revenue collected through VAT increases due to higher consumption.

V. **Government Expenditure (Public Services):**

- The increased VAT revenue will enable the government to allocate the funds for the public services such as infrastructure development, education, healthcare, and other sectors.

VI. **Investment in Infrastructure, Education, Healthcare, and Other Sectors:**

- The decision by government to increase spending in these productive expenditures further stimulate economic growth by creating a conducive environment for businesses.

- As a result of a growing economy and a healthy environment for businesses, the well-being of the population will improve.

In the current study, the conceptual framework influenced the decision of the selected variables to examine the relationship between economic growth and VAT. Investment was measured by gross domestic investment as a driving force for economic growth in endogenous growth models. VAT as a tax levied on consumption, was the central point of the current study and because VAT is sometimes seen as inflationary, which, in turn, could have an adverse effect on price stability and affecting real incomes, inflation was included as a variable. Income tax on individuals, profits and capital gains is used to measure the tax burden in the country and the effectiveness of the overall tax system. The focus on VAT in this study and not on income taxes is due to its non-distortionary effect on the economy and its revenue-raising ability. Therefore, the revenue generated from VAT and its potential impact on growth was investigated in order to find out if VAT can be regarded as an efficient tool in South Africa for influencing government spending on productive expenditure items such as healthcare, education, social protection, and infrastructure to achieve long-term economic growth.

4.3. DATA ANALYSIS

To examine the effect of VAT on economic growth, the current study used annual time series data over the period 1991–2020. The data was obtained from the World Bank (2021). With VAT being the second largest source of tax revenue in South Africa, the current study expressed the SA hypothesised growth model as follows:

$$GDP = f(VAT_t, TAX_t, INV_t, CONS_t, INFL_t)$$ (4.1)

where –

- GDP growth (annual percentage growth rate) = gross domestic product growth. According to the World Bank (2021), in this case, the GDP at market prices based on constant local currency using 2015 prices (World Bank, 2021).
- VAT = an indirect tax on the consumption of goods and services in the economy as a share of revenue. This type of tax is only charged on taxable

supplies made at either the standard rate, 15 per cent at the time of writing, or 0 per cent (i.e., zero rate) (SARS, 2021).

- TAX = excludes VAT and includes taxes on income, profits and capital gains as a percent of total revenue that are imposed on the net incomes of individual, corporations and on capital gains (World Bank, 2021). This study used the *TAX* variable in a context of both policy decisions (income redistribution and tax rates) and institutional factors (effectiveness of tax administration and legal structure of the tax system) as a proxy for the tax burden in South Africa.

- INV = Gross Domestic Investment as a share of GDP and represents the total value of investments made within a country during a specific period. It includes both the replacement of depreciated capital (gross fixed capital formation) and additions to the existing capital stock. GDI encompasses all types of investments, including investments in buildings, machinery, and other capital goods (World Bank, 2021).

- CONS = private consumption, which represent the market value for all goods and services including durable products consumed by households.

- INFL = Inflation rate, which is measured by the consumer price index (CPI). Inflation reflects the annual percentage change in the cost to the average consumer of acquiring of basket of goods and services that may be fixed or charged at specified intervals, such as yearly (World Bank, 2021).

4.4. METHODOLOGY

The adopted framework was analysed using the autoregressive distributed lag (ARDL) co-integration technique or the bounds co-integration technique developed by Pesaran and Shin (1997) and Pesaran, Shin and Smith (1999; 2001). The current study employed the ARDL as the technique for the econometric model, which according, to the empirical literature, is more appropriate when the data consists of variables integrated of different orders. Moreover, the ARDL co-integration techniques in the literature are reported to be more robust when there is a single long-run relationship between the variables in a relatively small sample size. Several studies, such as Ormaechea and Morozumi (2019), Yusuf et al. (2018), Korkmaz et al. (2019),

and Ahmad and Sial (2016), applied the ARDL technique to answer the question of whether a long-run relationship exists between the variables of interest, or not.

To avoid the ARDL model crashing, the unit root test was performed. This was followed by the three main steps needed to be followed to conduct the ARDL co-integration approach as suggested by Pesaran et al. (2001):

- Firstly, the bounds test procedure was conducted to determine the existence of a long-run relationship by computing the bounds F-statistics.
- Once co-integration had been confirmed, the second step involved choosing the appropriate lag length and then estimating the long-run coefficients of the selected ARDL model.
- Following this, the reparameterisation of the ARDL model into the error correction model (ECM) was carried out.

Several diagnostic tests were also conducted to ensure that the model was reliable and stable. Sub-section 4.4.1 provides a detailed discussion of the procedures mentioned here.

4.4.1. Unit Root Analysis

The ARDL technique developed by Pesaran and Shin (1997), and Pesaran et al. (1999; 2001) can be employed when dealing with variables that are integrated of different orders. These are variables that are stationary at levels or of order I (0), and those that are stationary after being differenced only once I (1) or a combination of both; however, ARDL cannot be employed with variables that are integrated of order I (2). To avoid the ARDL co-integration technique crashing because of series that are I (2), it is therefore advisable to perform a unit root test before running the model. The current study utilised the augmented Dickey–Fuller (ADF) (1979) test and the Phillips and Perron (1988) (PP) test to perform the unit root or stationarity tests. Prior to conducting the two tests, the researcher also constructed a graphical plot of the time series under consideration to observe the trend. Using the ADF test for unit root, if the computed ADF value is less than its critical value, it means that the series is not stationary. It is considered stationary if the ADF value its greater than the critical values. The null hypothesis under ADF test is that $p = 0,$ against the alternative hypothesis of $p < 0.$ Accepting the null hypothesis, this means the series is non-

stationary, whereas the rejection of the null hypothesis means the series is stationary (Nkoro & Uko, 2016). The ADF test equation is stated as follows:

$$\Delta Y_t = \alpha_0 + p_1 Y_{t-1} + \sum_{i=1}^{k} \alpha_1 \Delta Y_{t-1} + \mu \qquad (4.2)$$

To verify the results of stationarity under the ADF further, the PP test was conducted. The main difference between the two tests is that the PP test is a non-parametric test and corrects the statistic to consider the autocorrelation and heteroscedasticity issues (Shrestha and Bhatta 2018). Irrespective of whether the underlying variables are I(0), I(1) or a combination of both, and with the exception I(2), the ARDL model can be specified. For unit root testing with the PP test, the equation is stated as:

$$\Delta Y_t = \alpha_0 + \beta Y_{t-1} + \mu \qquad (4.3)$$

4.4.2.   Autoregressive Distributed Lag (ARDL) Approach

The ARDL model proposed by Pesaran and Shin (1997) and Pesaran, Shin and Smith (1999; 2001) is an OLS-based model, which is applicable for both non-stationary time series as well as for time series with a combination of variables integrated of different orders. In other words, the ARDL model affords flexibility regarding the order of integration of the variables, as it can be employed with I (0), I (1) or variables with mixed order. It is therefore considered the best economic method in comparison to other methods in this regard, as it can pursue the co-integration test without the limitation of dealing with variables that are strictly I (0) or I (1) only (Pesaran et al., 1999; 2001). The assumption of the ARDL model is that the dependent variable is also a function of its lag as in a lagged dependent variable (Pesaran et al., 1999; 2001). In equation (4.4), Y_t and X_t are the current values of both dependent and independent variables respectively; Y_{t-1}, is the value of y in the previous period (Pesaran et al., 1999; 2001). Additionally, the dependent variable y is a function of current and past value of the independent variable x (Shrestha & Bhatta, 2018). The model is then called then distributed lag model, which is a dynamic model, since the effect of the regressor (x) on the dependent (y) happens over time and not only in the same level time x (Shrestha & Bhatta, 2018).

$$Y_t = f(Y_{t-1}, X_t, X_{t-1}) \qquad (4.4)$$

Within the ARDL model, each underlying variable stands as a single equation; thus, making endogeneity less of a problem Pesaran and Shin (1997). The ARDL is therefore, free of residual correlation, i.e., all variables are assumed endogenous. The generalised ARDL (p, q) model is specified as

$$Y_t = \Upsilon_{0i} + \sum_{i=1}^{p} \delta_i Y_{t-i} + \sum_{i=0}^{q} \beta_i X_{t-i} + \varepsilon_{it} \qquad (4.5)$$

$$Y_t = \Upsilon_{0i} + \sum_{i=1}^{p} \delta_i Y_{t-i} + \sum_{i=0}^{q1} \beta_i X_{t-i} + \ldots + \sum_{i=0}^{qk} \Omega_i X_{kt-i} + \varepsilon_{it} \qquad (4.6)$$

Equation (4.5) assumes there is one explanatory variable, while equation (4.6) assumes there are k explanatory variables. In both the equations:

- Y_t is a vector, and the variables in X_t are allowed to be purely I(0), I(1) or cointegrated;
- β, δ and Ω are coefficients.
- Υ is the constant.
- i = 1..., k;
- p and q are lag orders for the dependent variable and the independent variable respectively; and
- ε_t is a vector of the error terms, which is an unobservable zero mean white noise vector process that is serially uncorrelated or independent.

With Y_t being a vector, this means that all variables that make up the model can also be used as dependent variables. The ARDL models used in this study are therefore specified as follows:

$$gdp_t = \alpha_0 + \beta_1 lnvat_t + \beta_2 ltax_t + \beta_3 linv_t + \beta_4 lcons_t + \beta_5 infl_t + \varepsilon_t \qquad (4.7)$$

$$lvat_t = \alpha_0 + \beta_1 gdp_t + \beta_2 ltax_t + \beta_3 linv_t + \beta_4 lcons_t + \beta_5 infl_t + \varepsilon_t \qquad (4.8)$$

$$ltax_t = \alpha_0 + \beta_1 gdp_t + \beta_2 lnvat_t + \beta_3 lninv_t + \beta_4 lcons_t + \beta_5 infl_t + \varepsilon_t \qquad (4.9)$$

$$linv_t = \alpha_0 + \beta_1 gdp_t + \beta_2 lnvat_t + \beta_3 ltax_t + \beta_4 lcons_t + \beta_5 infl_t + \varepsilon_t \qquad (4.10)$$

$$lcons_t = \alpha_0 + \beta_1 gdp_t + \beta_2 lvat_t + \beta_3 ltax_t + \beta_4 linv_t + \beta_5 infl_t + \varepsilon_t \tag{4.11}$$

$$infl_t = \alpha_0 + \beta_1 gdp_t + \beta_2 lvat_t + \beta_3 ltax_t + \beta_3 linv_t + \beta_4 lcons_t + \varepsilon_t \tag{4.12}$$

In the above individual models:

- in period t, **gdp** is the GDP;
- **lvat** is the natural log of VAT;
- **ltax** is the natural log of income taxes;
- **linv** is the natural log of gross domestic investment;
- **lcons** *is* the natural log of gross domestic investment.
- **infl** is the inflation as measured by the CPI.

With the identification of a single long-run relationship, the ARDL approach can distinguish between dependent and independent variables. In other words, the assumption under the ARDL technique is that only a single reduced form equation relationship exists between the dependent variable and the explanatory variables (Pesaran & Shin, 1997; Pesaran et al., 2001). While the other co-integration methods, such as that of Johansen and Juselius (1990) estimates an equilibrium relationship with a multi-equation framework, the ARDL model assumes a single reduced form equation (Pesaran & Shin, 1997; Pesaran et al., 2001).

4.4.3. Co-integration Analysis

The second step in the ARDL approach to co-integration involves two stages. The first stage involves selecting the appropriate lag length, while the second stage involves conducting the bounds F-statistics. In other words, before conducting the ARDL bounds test to check whether co-integration exists among the variables, or not, it was important to use the optimal lag order of the vector autoregressive (VAR) model for the selection of the appropriate lag order (Chandio, Jiang & Rehman, 2019). To confirm that the lag length was chosen appropriately, the current study employed the appropriate model order selection criteria, such as the Akaike information criterion (AIC) and the Schwartz Bayesian criterion (SBC). it is important to find the appropriate lag length for each variable included in the ARDL first, because there should be a presence of standard error terms (Shrestha & Bhatta, 2018). That is, the error terms

should not suffer from autocorrelation, heteroscedasticity, and non-normality. As mentioned earlier about the two-stage process, following the selection of the appropriate lag order, the co-integration test is conducted.

The current study conducted the bounds test to establish whether there exists a long-run relationship between the variables under investigation by employing the bounds F-statistics (bounds test for co-integration). The bounds F-statistics through the Wald test is carried out on each single equation where all variables are treated as endogenous while other variables are treated as exogenous (see Pesaran & Shin, 1997). When one cointegrating vector exists, the ARDL approach to co-integration or bounds co-integration test proposed by Pesaran et al. (2001) becomes imperative to explore whether the variables are I (0), I(1) or of mixed orders. In such a case, the application of the bounds co-integration tests approach will give realistic and efficient estimates. Given the endogenous variable, the bounds test procedure therefore helps to establish whether the variables included in the model are cointegrated, or not (Pesaran et al., 2001). As a result, the ARDL (p, q_1, q_2,… qk) approach to co-integration testing of this study is stated as follows:

$$\Delta gdp_t = \alpha_{01} + \Phi_{11} gdp_{t-1} + \Phi_{21} lvat_{t-1} + \Phi_{31} ltax_{t-1} + \Phi_{41} linv_{t-1} + \Phi_{51} lcons_{t-1} + \Phi_{61} infl_{t-1}$$

$$+ \sum_{i=1}^{p} \delta_{1i} \Delta gdp_{t-i} + \sum_{i=1}^{q} \delta_{2i} \Delta lvat_{t-i} + \sum_{i=1}^{q} \delta_{3i} \Delta ltax_{t-i} + \sum_{i=1}^{q} \delta_{4i} \Delta linv_{t-i} + \sum_{i=1}^{q} \delta_{5i} \Delta lcons_{t-i} + \sum_{i=1}^{q} \delta_{6i} \Delta infl_{t-i}$$

$$+ e_{1t} \tag{4.13}$$

$$\Delta lvat_t = \alpha_{02} + \Phi_{12} gdp_{t-1} + \Phi_{22} lvat_{t-1} + \Phi_{32} ltax_{t-1} + \Phi_{42} linv_{t-1} + \Phi_{52} lcons_{t-1} + \Phi_{62} infl_{t-1}$$

$$+ \sum_{i=1}^{p} \delta_{1i} \Delta lvat_{t-i} + \sum_{i=1}^{q} \delta_{2i} \Delta gdp_{t-i} + \sum_{i=1}^{q} \delta_{3i} \Delta ltax_{t-i} + \sum_{i=1}^{q} \delta_{4i} \Delta lcons_{t-i} + \sum_{i=1}^{q} \delta_{5i} \Delta infl_{t-i} + e_{2t} \tag{4.14}$$

$$\Delta ltax_t = \alpha_{03} + \Phi_{13} gdp_{t-1} + \Phi_{23} lnvat_{t-1} + \Phi_{33} ltax_{t-1} + \Phi_{43} linv_{t-1} + \Phi_{53} lcons_{t-1} + \Phi_{63} infl_{t-1}$$

$$+ \sum_{i=1}^{p} \delta_{1i} \Delta ltax_{t-i} + \sum_{i=1}^{q} \delta_{2i} \Delta gdp_{t-i} + \sum_{i=1}^{q} \delta_{3i} \Delta lvat_{t-i} + \sum_{i=1}^{q} \delta_{4i} \Delta linv_{t-i} + \sum_{i=1}^{q} \delta_{5i} \Delta lcons_{t-i} + \sum_{i=1}^{q} \delta_{6i} \Delta infl_{t-i}$$

$$+ e_{3t} \tag{4.15}$$

$$\Delta linv_t = \alpha_{04} + \Phi_{14} gdp_{t-1} + \Phi_{24} lvat_{t-1} + \Phi_{34} ltax_{t-1} + \Phi_{44} linv_{t-1} + \Phi_{54} lcons_{t-1} + \Phi_{64} infl_{t-1}$$

$$+ \sum_{i=1}^{p} \delta_{1i}\Delta linv_{t-i} + \sum_{i=1}^{q} \delta_{2i}\Delta gdp_{t-i} + \sum_{i=1}^{q} \delta_{3i}\Delta lvat_{t-i} + \sum_{i=1}^{q} \delta_{4i}\Delta ltax_{t-i} + \sum_{i=1}^{q} \delta_{5i}\Delta lcons_{t-i} + \sum_{i=1}^{q} \delta_{6i}\Delta infl_{t-i}$$

$$+ e_{4t} \tag{4.16}$$

$$\Delta lcons_t = \alpha_{05} + \Phi_{15}gdp_{t-1} + \Phi_{25}lnvat_{t-1} + \Phi_{35}ltax_{t-1} + \Phi_{45}linv_{t-1} + \Phi_{55}lcons_{t-1} + \Phi_{65}infl_{t-1}$$

$$+ \sum_{i=1}^{p} \delta_{1i}\Delta lcons_{t-i} + \sum_{i=1}^{q} \delta_{2i}\Delta gdp_{t-i} + \sum_{i=1}^{q} \delta_{3i}\Delta lvat_{t-i} + \sum_{i=1}^{q} \delta_{4i}\Delta ltax_{t-i} + \sum_{i=1}^{q} \delta_{5i}\Delta linv_{t-i} + \sum_{i=1}^{q} \delta_{5i}\Delta infl_{t-i}$$

$$+ e_{5t} \tag{4.17}$$

$$\Delta infl_t = \alpha_{06} + \Phi_{16}gdp_{t-1} + \Phi_{26}lnvat_{t-1} + \Phi_{36}ltax_{t-1} + \Phi_{46}linv_{t-1} + + \Phi_{56}linv_{t-1} + \Phi_{66}infl_{t-1}$$

$$+ \sum_{i=1}^{p} \delta_{1i}\Delta infl_{t-i} + \sum_{i=1}^{q} \delta_{2i}\Delta gdp_{t-i} + \sum_{i=1}^{q} \delta_{3i}\Delta lnvat_{t-i} + \sum_{i=1}^{q} \delta_{4i}\Delta ltax_{t-i} + \sum_{i=1}^{q} \delta_{5i}\Delta linv_{t-i} + \sum_{i=1}^{q} \delta_{6i}\Delta lcons_{t-i}$$

$$+ e_{6t} \tag{4.18}$$

P and q are the ARDL model maximum lag orders, while *b* and δ are the coefficients of the lagged variables, and α is the constant (Pesaran & Shin, 1997). Testing the relationship using the ARDL model leads to hypothesis testing of the long-run relationship among the underlying variables. The F-statistic was thus carried out in the joint null hypothesis that the coefficients of the lagged variables ($\Phi_i X_{t-1}$ $\Phi_1 Y_{t-1}$ or $\Phi_1 Y_{t-1}$ $\Phi_i X_{t-1}$) were zero. The coefficients (Φ_1–Φ_6) corresponded to the long-run relationship, while (δ_1–δ_6) represented the short-run dynamics of the model. The null hypothesis of no existence of a long-run relationship against the alternative hypothesis that the coefficients of the lagged variables are zero is defined by:

H_0: $\Phi_1 = \Phi_2 = \Phi_3 = \Phi_4 = \Phi_5 = \Phi_6 = 0$ (null, i.e., the long-run relationship does not

exist)

H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq 0$ (alternative, i.e., the long-run relationship exists)

Under the ARDL technique, the hypothesis is tested by means of the F-statistics (i.e., the Wald test). Furthermore, the critical values of the bounds F-statistics relating to K number of variable under the ARDL model containing an intercept and/or trend can be found in the bounds F-test critical values table (see Pesaran et al., 2001). Two sets of critical values are given with one set assuming that all the variables are I (0) (Pesaran et al., 2001). In this case, a lower critical bounds assumes all the variables are I (0),

meaning there is no co-integration among the variables (Pesaran et al., 2001). Another set of critical values assumes that all the variables in the ARDL model are I (1), in this case, the upper critical bounds, assumes all the variables of the model are I(1), meaning the variables are cointegrated (Pesaran et al., 2001). When the model is applied, there is a set of critical values covering all the possible categories of the variable into I(0) and I(1) (Pesaran et al., 2001). If the computed F-statistics for the joint significance of the level variable in each of the equations (4.13–4.18), Φ_1, to Φ_6 lie outside this band, a conclusive decision can be made. In other words, when the computed F-statistics are found to be greater than the upper bounds critical value, then the null hypothesis is rejected, and a conclusion is made that the variables are cointegrated. If the F-statistics is below the lower bounds critical value, then the null hypothesis cannot be rejected, i.e., a conclusion of no co-integration among the variables can be made. The ARDL model cannot be applied when there is a presence of multiple long-run relationships, as in this case, the Johansen and Juselius (1990) approach becomes the alternative.

4.4.4.   Error Correction Model (ECM)

When the bounds test to co-integration establishes that there exists a single long-run relationship or that there is one cointegrating vector, the ARDL model further allows the identified cointegrating vector to be estimated as an ECM (Pesaran & Shin, 1997; Pesaran et al., 2001). The ARDL is a dynamic model, since it is defined in the same form as the ECM and a distributed lag model in that it includes the unrestricted lag of the underlying variables in a regression function (Pesaran et al., 2001). However, given that the regression function only provides information on the short-run relationship between the regressors, the ECM becomes imperative, as it gives information on the long-run relationship between the variables under study (Shrestha & Bhatta, 2018). That is, the ECM integrates the short-run and the long-run dynamics without losing any long-run information while avoiding issues of spurious results emanating from time series data that is non-stationary (Shrestha & Bhatta, 2018).

To obtain the short-run dynamics and the long-run relationship of the cointegrating vector, the ARDL model, as stated in equation (4.5 and 4.6) can thus be re-parameterised in terms of the lagged values and the first difference of the regressors, which then define the ECM as follows:

$$\Delta Y_t = \Upsilon_{0i} + \sum_{i=1}^{p} \Delta\delta_i Y_{t-i} + \sum_{i=0}^{q1} \Delta\beta_i X_{t-i} + \dots + \sum_{i=0}^{qk} \Delta\Omega_i X_{kt-i} + \lambda ECT_{t-i} + \varepsilon_{it} \qquad 4.19$$

$$\Delta GDP_t = \Upsilon_{0i} + \sum_{i=1}^{p} \delta_i GDP_{t-i} + \sum_{i=0}^{q} \beta_i lVAT_{t-i} + \sum_{i=0}^{q} \beta_i lTAX_{t-i} + \sum_{i=0}^{q} \beta_i lnINV_{t-i} + \sum_{i=0}^{q} \beta_i lCONS_{t-i} +$$

$$\sum_{i=0}^{q} \beta_i INFL_{t-i} + \lambda ECT + \varepsilon_{it} \qquad\qquad 4.20$$

The first part of the equation (4.19 and 4.20) reflects the differenced (Δ) regressors, which represent the short-run estimates. The second part, λECT, represents the long-run behaviour of the model. The λ is the coefficient or the parameter of the speed of adjustment (adapted from Pesaran & Shin, 1997). ECT is the error correction term and can also be written as $= Y_{t-1} - \theta X_{t-1}$, with θ in this case simply representing the long-run parameter. The expression of ECT therefore shows the extent to which the disequilibrium of the previous period is being corrected in the Y_t (Chandio, Jiang & Rehman, 2019). With the estimation of ECM, a negative ECT value means that there is convergence to long-run equilibrium while a positive value means that the model is explosive, and that there is divergence away from the long-run equilibrium (Chandio, Jiang & Rehman, 2019). The δ, β, and Ω, are short-run dynamic coefficients of the model (adapted from Pesaran & Shin, 1997).

4.4.5. Diagnostic Tests

To ensure that the estimated model was robust and that it did not suffer from bias, the current study determined the goodness of fit of the model and further conducted some diagnostics tests. This involved examining how much of the variance in the identified regressed function is explained by the exogenous variables and, even more importantly, the residual diagnostics. The residual diagnostic process is important in that it provides the opportunity to examine whether the residuals are independently distributed, and to minimise these residuals or errors when running regression models. The tests performed were the Jaque–Bera test for normality (see Jaque & Bera, 1980), the Breusch–Godfrey Lagrange multiplier (LM) test for serial correlation by Breusch (1978) and Godfrey (1978), and the Breusch–Pagan–Godfrey heteroscedasticity test by Breusch and Pagan (1979) to confirm that the errors were white noise (Nasrullah et al., 2021). In addition, the inverse roots of autoregressive (AR) characteristic polynomial graph were used to confirm the appropriate lag order with the stability diagnostics performed to examine whether the model was reliably stable through the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests. Finally,

the Granger (1969) causality test was conducted to justify the inclusion of variables in the model and to validate and confirm the direction of the relationship between the underlying variables.

4.4.5.1 Jaque–Bera test

The Jaque–Bera test determines the goodness of fit of the model that establishes whether the data sampled have skewness and kurtosis form that match that of a normal distribution, or not. Skewness is a measure of the asymmetry of the probability distribution of the variable around its mean, while kurtosis measures the degree of the peak of the data with respect to the probability distribution. The null hypothesis of the test is that the data is normally distributed, while the alternative hypothesis is that the data is not normally distributed (Jaque & Bera, 1980). The Jaque–Bera test statistic is thus stated as follows.

$$JB = \frac{N}{6}\left(S^2 + \frac{(k-3)^2}{4}\right)$$
4.18

In (4.18), N is the sample number, S is the sample skewness and K is the sample kurtosis. The rejection criterion of the test is that, if the probability value that corresponds to the test statistics is less than some level of significance, then the null hypothesis of normality will be rejected.

4.4.5.2 Breusch–Godfrey test for serial correlation

The Breusch-Godfrey test is performed for serial correlation in the errors in a regression model. It is also known as an autocorrelation test or the LM test for serial correlation (Breusch, 1978; Godfrey, 1978). Serial correlation or autocorrelation occurs when the error terms are correlated and show the degree of similarity between a given time series and a lagged version of itself over successive time intervals (Shrestha & Bhatta, 2018). The null hypothesis is that there is no serial correlation, while the alternative hypothesis says there is serial correlation. If the probability value that corresponds to the test statistics, which also follow the chi-square distribution, is less than a certain significance level then the null hypothesis can be rejected, and a conclusion can be made that serial correlation exists among the residuals at some order less than or equal to *p*.

4.4.5.3 Breusch–Pagan–Godfrey heteroscedasticity test

One of the classic assumptions under linear regression suggests that the variance of the residuals should be constant or distributed with equal variance (Studenmund, 2014). This assumption is known as homoscedasticity. The Breusch–Pagan test (Breusch & Pagan, 1979) is thus used to determine whether heteroscedasticity is present in a regression model, or not. According to this test, the null hypothesis is that there is no heteroscedasticity, i.e., there is homoscedasticity (Nasrullah et al., 2021). The alternative hypothesis is that there is heteroscedasticity meaning the residuals are not distributed with constant or equal variance (Nasrullah et al., 2021). If the p-value that corresponds to the chi-square test statistic with p degrees of freedom is less than some level of significance, then the null hypothesis is rejected, and the presence of heteroscedasticity is concluded (Nkoro & Uko, 2016).

4.4.5.5 Inverse roots of AR graph

In addition to selecting the appropriate lag length, the current study also used the polynomial graph to confirm the optimal lag length observed under the vector autoregression (VAR) approach further (Nasrullah et al., 2021). The polynomial graph confirms the stability of the model when all roots lie inside the circle (see Figure 5.1) (Chandio, Jiang & Rehman, 2019). In other words, when one or more roots lie outside the circle, the graph indicates that the model is unstable. This could lead to invalid results of the ARDL model or ECM. Once all the relevant diagnostic tests have been performed and the goodness of fit of the model explaining the relationship between the underlying variables has been validated, the stability check processes can be conducted. This comprises the CUSUM of recursive residuals and the CUSUMSQ tests, which are important in investigating the stability of long-run and short-run coefficients (Pesaran et al., 2001). To complement the results of the current study the causality test was performed (see section 4.4.7).

4.4.6.   Stability Tests

To check whether the model was stable, the current study used the CUSUM and the CUSUMSQ tests to assess the stability of the short-run and long-run coefficients (see Pesaran et al., 2001).

These two stability tests use some level of significance to confirm the stability and goodness of the fit of the ARDL model. The CUSUM test identifies systematic changes

in the regression coefficients, while the CUSUMSQ test detects those changes that takes place randomly or which occur suddenly and, as a result, cause the regression coefficients to divert from a constant state (Ravinthirakumaran, Selvanathan, Selvanathan & Singh, 2015). When the plots of the CUSUM and CUSUMSQ statistics fall or remain inside the critical bounds of a certain confidence interval of parameter stability, this suggests the absence of instability in the regression coefficients.

4.4.7. Granger Causality Test

The Granger (1969) causality test shows a pairwise relationship, which may be unidirectional or bidirectional, or there may be no relationship. When variables are cointegrated, it may also be important to determine how the variables individually relate to one another, and whether one variable causes the other, or not. Granger (1969) developed the causality test method to determine these relationships. The null hypothesis of the Granger causality test is that X does not Granger-cause Y and vice versa. The rejection or non-rejection of the null hypothesis is based on the F-statistics (Shrestha & Bhatta, 2018). If the p-value corresponding to the test statistics is less than a certain level of significance, the null hypothesis fails to get rejected; thus, confirming a causal relationship between the variables (Shrestha & Bhatta, 2018).

4.5. CONCLUSION

This focus of this chapter was to present the conceptual framework and the methodology adopted in the current study. Section 4.2 of the chapter explained the conceptual framework and provided an understanding of how tax policy can influence growth. In addition to the conceptual framework, this study adopts the Barro's (1990) endogenous growth model, which strengthens the argument of the current study in its emphasis on how productive expenditure funded through non-distortionary taxes could lead to long-term growth. With special reference to VAT, as a relatively less distortive tax, the link between expenditure and growth through a well-designed VAT was discussed with reference to the adopted conceptual framework.

Data analysis followed in section 4.3, discussing the variables of the current study chosen based on literature. In section 4.4, the adopted methodology of the current study was presented by first explaining the logic behind unit root testing. Unit root

testing and the importance of working with time series that are stationary was emphasised by referring to the augmented Dickey–Fuller and the Phillips–Perron tests selected as the main tests for checking for the presence of unit root in the data. The construction of the ARDL model then followed along with co-integration analysis. The bounds test to co-integration was used to determine whether a long-run relationship existed between the variables in the current study. To ensure that the study produced reliable and valid results, the main diagnostic tests undertaken such as the normality, serial correlation, heteroscedasticity. In addition to this, stability tests of the CUSUM and CUSUMSQ were explained to validate the stability of the ARDL model and the ECM further. Finally, the chapter touched on the Granger causality test to justify the inclusion of the chosen variables in the model.

CHAPTER FIVE: MODEL ESTIMATION AND RESULTS

5.1. INTRODUCTION

This chapter presents the discussion of the results and the findings of the estimated model. Section 5.2 presents results from the augmented Dickey–Fuller and Philips–Perron unit root tests. The results of the lag order criteria using the VAR method is presented in section 5.3. Section 5.4 presents the results from the bounds test of co-integration with the model estimated under the ARDL to determine whether there was co-integration between the underlying variables. Section 5.5 provides an analysis of the long-run and short-run dynamics through the ECM estimation. The results from diagnostic tests and stability checks are analysed and presented in section 5.6 and 5.7 respectively while the pairwise Granger causality test to complement the current study is presented in section 5.8.

5.2. UNIT ROOT ANALYSIS

The assumption of the ARDL as mentioned in Chapter Four (sub-section 4.4.1) is that the series must be stationary either at levels I(0), after first difference I(1), or it should contain variables that are integrated of different orders, i.e. both I(0) and I(1) and not have variables integrated of order 2, I(2). For more reliable results, two unit root tests were therefore conducted, namely the ADF and PP tests. The results of the two tests are presented in Table 5.1 and reveal that the variables of the model were integrated at different orders. The inflation rate was stationary at levels I(0), while the rest of the variables, i.e., GDP, VAT, government expenditure, and investment were stationary after differencing them once I(1). With the stationarity of the variables validated, the determination of co-integration could be performed.

Table 5.1: Results of unit root tests

Variable	Model	H0: non-stationary in levels		H0: non-stationary in first	
		ADF statistic	PP statistic	ADF statistic	PP statistic
Gdp	Intercept	-1.674834	-1.753024	-4.499025***	-4.300309***
	Trend and intercept	-1.784485	-1.010539		
	None	-1.407462	-1.010539		
Ivat	Intercept	-2.485875	-2.597515	-4.546288***	-6.287977***
	Trend and intercept	-3.837299**	-3.301721*		
	None	-0.160230	-0.300623		
Itax	Intercept	-3.563256**	-3.045195**	-4.378308***	-8.049063***
	Trend and intercept	-3.479288*	-2.874800		
	None	-0.237474	-0.507883		
Iinv	Intercept	-1.165086	-1.165086	-4.073906***	-4.032091***
	Trend and intercept	-0.830423	--1.038921		
	None	-0.852336	-0.845258		
Icons	Intercept	-2.142623	-2.138867	-4.492959***	-5.345318***
	Trend and intercept	-3.131164	-2.585194		
	None	-0.462533	-0.940149		
Infl	Intercept	-3.740679***	-3.987336***		
	Trend and Intercept				
	None				

Notes: *, **, ***, denote the 10, 5 and 1 per cent levels of significance respectively.

Source: Author's own calculation using E-views

5.3, LAG LENGTH CRITERIA

To produce unbiased results and before employing the ARDL bounds test, it is necessary to confirm the appropriate lag length. Therefore, the current study used the VAR model to select the appropriate lag length. As presented in Table 5.2, the Akaike Information Criterion (AIC) (see sub-section 4.4.3) was used to choose the appropriate lag length for employing the ARDL bounds test, as it showed more robust results when compared to the Schwarz information criterion (SIC) and the Hannan–Quinn information criterion (HQ). The results of the VAR therefore confirm that the model provided better results when lag 1 was selected. Moreover, for confirmation of the appropriate lag length, the polynomial graph under the VAR method was used, as shown in Figure 5.1.

Table 5.2: VAR lag order

VAR lag order selection criteria						
Lag	LogL	LR[a]	FPE[b]	AIC	SC	HQ
0	-53.54196	NA	4.144851	4.252997	4.538470	4.340269
1	-51.75806	2.675855	3.935165*	4.197004*	4.53005*	4.298821*
2	-51.68101	0.110072	4.226652	4.262929	4.643559	4.379292

Notes: [a]LR = sequential modified LR test statistics (each test at 5% level). [b]FPE = final prediction error. * Denotes the lag order selected by the criterion.

Source: Author's own compilation using E-views
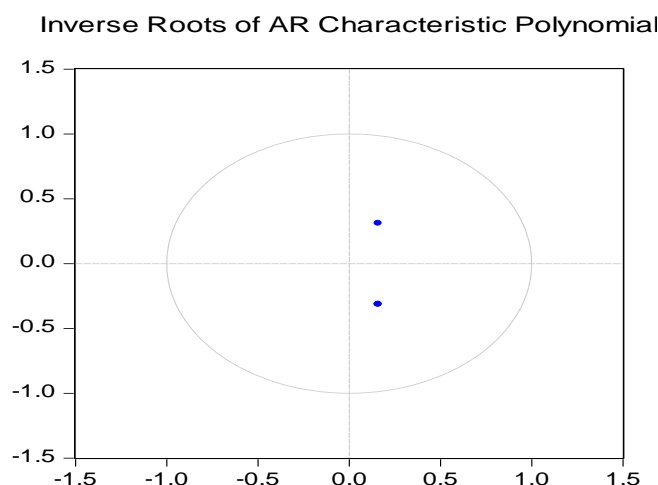
Figure 5.1: AR roots graph Source: Author's own compilation using E-views

5.4.   BOUNDS TEST RESULTS FOR CO-INTEGRATION

To establish whether there was a long-run relationship among the variables, the current study used the bounds F-statistics or the bounds test for co-integration, which involved comparing the computed F-statistic with the lower and upper bounds critical values. The bounds test for co-integration in this study was employed by estimating an ARDL equation and using equations (4.13–4.18), with each variable in the current study model equations (4.7–4.12) treated as a dependent variable to compute the F-statistic.

When Gross domestic investment (GDI) was taken as a dependent variable for South Africa, the computed F-statistic of 7.211 was higher than the upper bounds critical value of 4.68 at the 1 per cent significance level, as presented in Table 5.3. When the rest of the variables in the model were treated as dependent variables (see Tables 5.4–5.7), the computed F-statistics was lower than the lower bounds critical value of 3.41 at the 1 per cent significance level. The results from the bounds test for co-integration suggested that the null hypothesis of no co-integration had to be rejected for South Africa, since there was evidence that there existed a long-run relationship between investment (GDI) and its determinants. This means the test has established that the GDP growth, VAT, tax (income taxes), investment, household consumption, and the inflation rate were cointegrated only when the investment was treated as the dependent variable.

As shown in Table 5.3, the results from the bounds F-statistic confirmed that there was no long-run relationship when the rest of the underlying variables were taken as dependent variables. The current study therefore failed to reject the null hypothesis of no co-integration when GDP growth, VAT, tax, household consumption, and the inflation rate were treated as dependent variables.

Table 5.3: Bounds test for co-integration results

Model	F-statistics	90% level	95% level	99% level	Decision
		I(0) I(1)	I(0) I(1)	I(0) I(1)	
GDP	2.685	2.26 3.35	2.62 3.79	3.41 4.68	Accept
VAT	3.161	2.26 3.35	2.62 3.79	3.41 4.68	Accept
LTAX	3.035	2.525 3.560	2.62 3.79	3.41 4.68	Accept
LINV	7.211	2.525 3.35	2.62 3.79	3.41 4.68	Reject
LCONS	2.905	2.57 3.35	2.62 3.79	3.41 4.68	Accept
INFL	2.951	2.57 3.35	2.62 3.79	3.41 4.68	Accept

Source: Author's own compilation using E-views

5.5. LONG-RUN AND SHORT-RUN ANALYSIS

This study confirmed the long-run relationship between GDP growth and its determinants from the ARDL bounds test when investment was used as the dependent variable. The long-run results are presented in Table 5.4. The current study estimated the long-run elasticity using equation (4.10). In the long run, the effect of GDP growth is positively related to investment at the 5 per cent significance level. An increase of 1 per cent in GDP growth will boost investment by 0.02 per cent. The effect of household consumption on investment is negative and highly significant at the 5 per cent level of significance. A 1 per cent increase in household consumption will lead to a decrease of 1.8 per cent in investment.

Table 5.4: Long-run estimates

Dependent variable: LINV		
Explanatory variables	Coefficient	t-statistics
C	7.718618	1.686248
GDP	0.021778**	2.635735
LNVAT	0.406051	0.858435
LTAX	-0.206980	-0.320098
LCONS	-1.850652**	-2.289070
INFL	0.004064	0.778979
R^2	0.750265	
Adjusted R^2	0.682155	
Durbin–Watson	1.837955	
F-statistics	0.271074***	
Jaque–Bera normality test	9.114248 (0.010492)	
Serial correlation LM test	0.271074 (0.7653)	
Heteroscedasticity test	0.8098 (0.7560)	

Note: **, ***, denote the 5 and 1 per cent significance level respectively.

p-values are presented in parentheses.

Source: Author's own compilation using E-views

The policy and institutional variable which is the tax burden as represented by the income tax on individuals, profits on corporates, and capital gains has a negative effect on investment. A 1 per cent increase in the tax burden leads to a reduction of 0.21 per cent in investment, and this is non-significant at all levels. VAT is however positively

related to investment, and a 1 per cent increase in the VAT revenue will lead to 0.41 per cent in investment and the effect is non-significant in the long run.

Similar results were also echoed by (Kneller et al., 1999) and (Ormaechea, & Morozumi, 2019). According to (Kneller et al., 1999), switching from income taxes to non-distortionary taxes such as the VAT has growth enhancing effects when the revenue generated from a VAT rate increase is allocated to productive expenditure such as infrastructure, education and healthcare. Furthermore, financing unproductive expenditures with a non-distortionary tax has a negative effect on growth. On other hand, in their study (Ormaechea & Morozumi, 2019) found that a VAT increase financed by a fall in income taxes, could lead to growth if raised through C-efficiency. C-efficiency measures the performance of a perfectly enforced VAT as a result of an efficient tax structure and administration (Ormaechea & Morozumi, 2019). That is when VAT is well designed and enforced, and with the actual revenue being collected, then the revenue raised through this tax can be directed to those government investment expenditures that help accelerate economic growth.

On the other hand, undesirable conditions for investment crowd out private sector investment. Spicer (2016) argues that the relationship between the public and private sectors in South Africa is dysfunctional, and it is characterised by distrust due to corruption, while the National Treasury (2016) points out uncertainties arising from policy progress and, in some cases, extended legal action because of these policy changes. Furthermore, the low returns on investment for state-owned entities (SOEs), such as Eskom, South African Airways (SAA), and Transnet, indicate that greater public-private partnerships (PPPs) are needed to foster long-term growth, especially given the inefficiencies within public sector investment. Public investment growth averaged 8.6 per cent between 2012 and 2015 but contracted to an average of 5.8 per cent in the first half of 2016 (National Treasury, 2016). The contraction was due to declining revenue growth, general delays, and the deteriorating balance sheet of some state-owned companies. According to the trade and industrial policy strategies [TIPS], (2022), in 2018 GDP growth stood at 0.8 per cent and public investment expenditure fell for most of the year while household and government consumption increased slightly. The decline was a result of reduced public investment which significantly contributed to the decline in the GDP (TIPS, 2022). The South African GDP growth was 0.2 per cent in 2019. The significant low growth was a result of demand side

factors led by the slow growth globally, and the country's position on fiscal and monetary policy as well as the supply side factors such as the implementation of loadshedding by Eskom (TIPS, 2022). In 2020, GDP growth declined sharply by 7 per cent due to the implementation of lockdowns during the COVID-19 pandemic. However, public investment showed a strong growth during the last quarter of 2020 (TIPS, 2022).

The results for South Africa can be further explained through the Armey curve popularised by Armey (1995), which is an inverted U-shaped curve correlating government expenditure and the GDP growth rate. According to the Armey curve, when there are low levels of government expenditure, the public sector may only be forced to increase expenditure further in the absence or limited participation of the private sector. However, high levels of expenditure require more tax which is difficult in the South African context given a relatively smaller tax base and high unemployment rate. Higher tax rates will reduce the incentive for individuals and businesses to invest and produce given the amount of tax revenue required to finance the rising level of expenditure and critical investment (Armey, 1995). The government should therefore try to create a conducive environment for the private sector to participate in growing the economy. This is because the opportunity for South Africa to increase the economic growth rate further up on the Armey curve still exist since the country has not yet surpassed the optimal point as per the Armey curve. As such, it means the government should increase investment through raising taxes that have a less negative effect on growth.

When applied to South Africa, the Armey curve foundations prove to be relevant to the SA environment, which is characterised by a lack of competition, corruption, and a government that corrects market failures by continuously injecting taxpayer's money and using debt to bail out some of the failing state-owned companies.

The short-run elasticities are estimated using equation (4.16) and are presented in Table 5.5. The error correction term, ECT_{t-1}, is negative and statistically significant, which confirms with certainty the existence of co-integration among variables. Moreover, the error correction terms show that the series is non-explosive and that there is convergence to long-run equilibrium. In other words, the ECT_{t-1} measures the speed of adjustment in long-run equilibrium after any short-run shocks in the system. The ECT coefficient for investment for South Africa is -1.05 per cent, and it is

significant at the 1 per cent level of significance. The coefficient of the ECT suggests that any deviations emanating from the short-run equilibrium between explanatory variables and investment can be corrected in each period at 1.05 per cent in the long run, as shown in Table 5.5. This ECM term coefficient implies that the deviations from the long run equilibrium happens almost instantly which might seem unrealistic. However, the results confirm the study findings of a dynamic CGE model by (Erero, 2021). According to (Erero, 2021), in 2018 a change in the VAT sent an immediate effect in growth as GDP declined in 2018, the same year the VAT rate was increased. Furthermore, the study showed that GDP increased again in 2019 and continued to do until 2019. In the short run, the effect of GDP growth on investment is positive and significant. A 1 per cent increase in GDP growth boosts investment by 0.02 per cent at the 5 per cent level of significance. On the other hand, the effect of VAT on investment is positive and significant. An increase of 1 per cent in the VAT revenue will increase investment by 1.10 per cent and is significant at the 10 per cent level of significance.

Table 5.5: Short-run estimation

Dependent variable: ΔLINV		
Explanatory variables	Coefficient	t-statistics
C	0.00.4439	0.380083
ΔGDP	0.020347**	2.730556
ΔLVAT	1.102873*	2.053086
ΔLTAX	0.009619	0.011866
ΔLCONS	-1.175743	-1.209686
ΔINFL	0.011223	1.618466
ECT (-1)	-1.057653	0.0048
R^2	0.595398	
Adjusted R^2	0.453787	

Durbin–Watson	1.440849
F-statistics	4.204472***
Jaque–Bera normality test	26.29240 (0.000002)
Serial correlation LM test	0.152748 (0.8594)
Heteroscedasticity test	0.169304 (0.988711)

Note: *, **, ***, Denote 10, 5 and 1 per cent significance level respectively.

p-values are presented in parentheses.

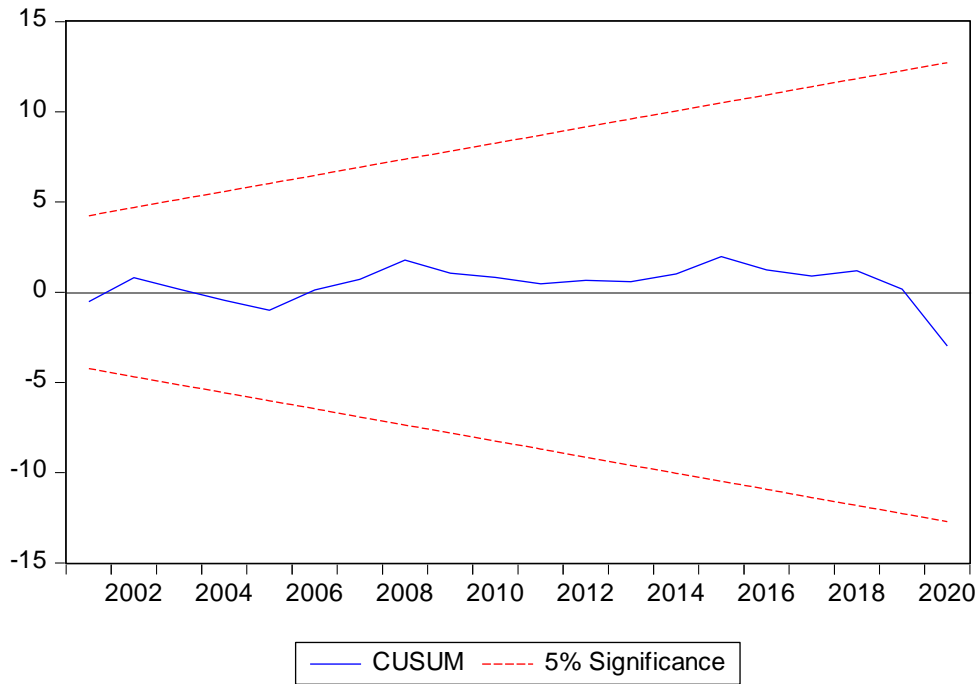Source: Author's own compilation using E-views

5.6. DIAGNOSTIC TESTS

The short-run model was subjected to a few diagnostic tests, namely the normality, serial correlation, and heteroscedasticity tests and have been shown on the same along with the long and short run estimates (See Table 5.4 and 5.5). The current study found no evidence of abnormality, which means the model passed the Jaque–Bera normality test suggesting that errors are normally distributed. No evidence was found of serial correlation and heteroscedasticity in the disturbance of the error term. To confirm the stability of the model, the AR roots graph shows that all the roots had a modulus of less than 1 and the roots lay within the circle. The results of these diagnostic tests therefore confirm the goodness of the fit of the model.

5.7. STABILITY CHECK

To check whether the model was stable, the current study conducted the CUSUM and CUSUMSQ tests to investigate the stability of the long-run and short-run coefficients, as suggested by Pesaran and Shin (1999). The plots of the two graphs indicating the stability of the coefficients are presented in Figures 5.2 and 5.3 and show the CUSUM and CUSUMSQ tests respectively. For both stability tests, the graphs confirm that the investment lay between the critical boundaries at the 5 per cent level of significance. Following all the diagnostic tests passed by the model, the stability checks further confirmed the good fit of the ARDL model and the accuracy of the long-run and short-run coefficients, which had an effect on investment for period 1991–2020.

Figure 5.2: Plot of cumulative sum of recursive residuals
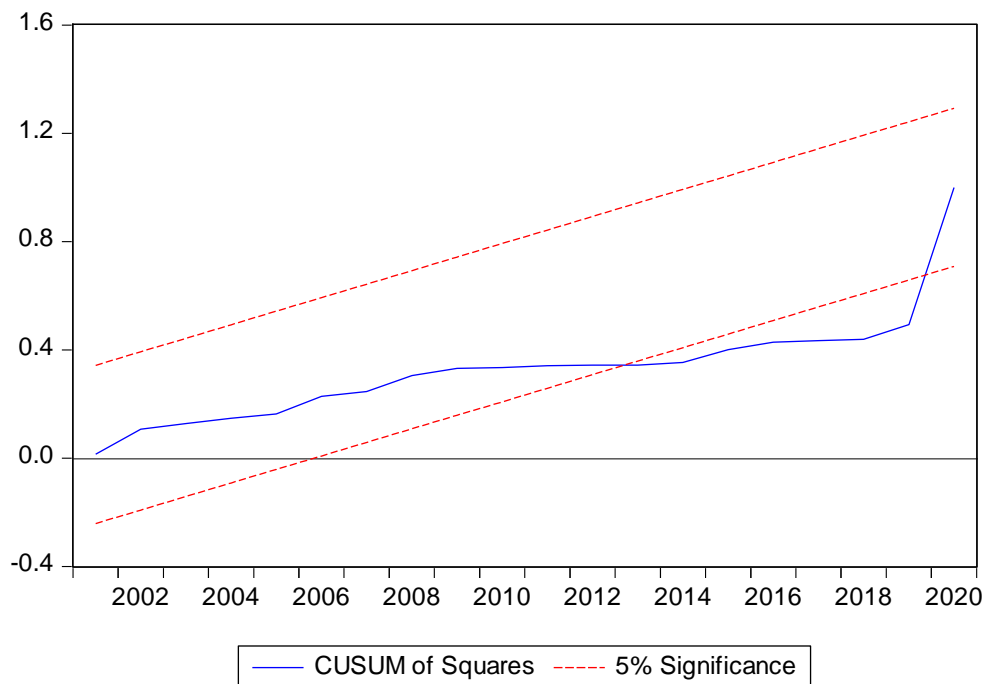
Figure 5.3: Plot of cumulative sum of squares of recursive residuals Source: Author's own graph using E-views.

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5.8.   GRANGER CAUSALITY TEST

To validate the co-integration relationship and understand the direction of the relationship, the pairwise Granger causality test was also conducted to complement other tests conducted in the current study. The results of the Granger causality test are presented in Table 5.7. For South Africa, the results indicate that GDP does Granger-cause INV and that there is a one-way causal effect from GDP growth to investment. The one-way causal effect of GDP growth to INV is in line with what the conceptual framework discussed in Section 4.2. There is also evidence of a bi-directional Granger causality between investment and VAT. This confirms that, when VAT revenue is raised efficiently, the increased revenue could be used to target growth-enhancing investment expenditure, which in turn will have a positive effect on economic growth and lead to more revenue being collected when consumption also increases.

Table 5.6: Granger causality tests

Pair	Null hypothesis	p-value	Results
1	LTAX does not Granger-cause GDP	0.6617	Only H_1 was rejected. This shows that GDP has a unidirectional relationship with TAX.
	GDP does not Granger-cause LTAX	0.0060	
2	LINV does not Granger-cause GDP	0.2535	Only H_1 was rejected. This shows that GDP has a unidirectional relationship with INV.
	GDP does not Granger-cause LINV	0.0015	
3	LINV does not Granger-cause VAT	0.0126	Both H_0 and H_1 was rejected. This shows that there is a bi-directional relationship between INV and VAT.
	LVAT does not Granger-cause LINV	0.0359	
4	LCONS does not Granger-cause LVAT	0.5634	Only H_1 was rejected. This shows that VAT has a unidirectional relationship with CONS.
	LVAT does not Granger-cause LCONS	0.0108	
5	INFL does not Granger-cause LCONS	0.2216	Only H_1 was rejected. This shows that CONS has a unidirectional relationship with INFL
	LCONS does not Granger-cause INFL	0.0295	

Source: Author's own compilation using E-views

5.9. CONCLUSION

This chapter provided a discussion of the empirical results of the impact of VAT on economic growth in South Africa. Section 5.2 of the chapter provided an analysis of the unit root tests results derived from the augmented Dickey–Fuller and Phillips–Perron tests. The results of both tests revealed that the model used variables that were cointegrated of mixed orders, with only inflation being stationary at level and the rest of the variables stationary only stationary after differencing them once. After determining the order of the variables, the lag length criteria results were provided in section 5.3. Section 5.4 of the chapter provided the estimation of the ARDL model and the co-integration results from the bounds test. The bounds test for co-integration revealed that there was co-integration when investment was taken as the dependent variable, and no co-integration when the rest of the model variables were treated as dependent variables.

The long-run and short-run analyses were provided in section 5.5 together with a detailed discussion of the results. With the existence of co-integration found between investment and its determinants, the ECM was estimated to get the long-run and short-run dynamics. The results of the ECM showed that GDP growth had a significant and positive effect on investment, while VAT had a positive but non-significant effect on investment. Following this analysis, the results of the diagnostics tests were reported in section 5.6 and revealed that the residuals of the estimated ARDL models were constant, confirming the goodness of fit of the model. Following this, the stability check results were provided in section 5.7, and it was indicated that the model lay within the critical bounds value of 5 per cent and was stable. Finally, the Granger causality test was performed, and revealed that there was a one way causality from GDP to investment. Furthermore, a bi-directional causality between VAT and investment was observed, proving that indeed VAT has the potential to impact growth through investment when the revenue raised form VAT is used by government to investment in economic sectors such as infrastructure development, education and healthcare.

CHAPTER 6: CONCLUSION AND POLICY IMPLICATIONS

6.1.   INTRODUCTION

This chapter presents the conclusion and policy implications derived from the current study. The chapter comprises three sections. Section 6.2 provides a summary of all the chapters in the dissertation followed by a discussion of policy implications and recommendations in section 6.3. Section 6.4 present the limitations of the study and areas for further research.

6.2.   SUMMARY OF THE STUDY

The purpose of the current study was to investigate the effect of VAT on economic growth in South Africa for the period 1991–2020. The motivation for undertaking the study is that there is a growing shift from income taxes to consumption taxes such as the VAT, however, there seem to be a lack of understanding of the role of the VAT within the country's overall tax system and its potential to impact growth is not adequately covered by empirical studies especially around Africa as a continent.

An analysis of trends in economic growth and tax revenue was provided with PIT, CIT, and VAT reported to be the three main sources of tax revenue in South Africa. VAT was found to be the second largest source of revenue after PIT having surpassed CIT since the inception of VAT in 1991 except in 2008–2009 when CIT was at its peak. This proves that VAT significantly contributes to total revenue even with limited tax reforms taking place in terms of VAT. Recent trends in government expenditure were also analysed to get a view of how revenue is being utilised in meeting the needs in the country.

The current study adopted the Barro's (1990) endogenous growth model to show the link between taxation, public spending, and economic growth. The conceptual framework demonstrated that VAT could affect growth through government expenditure. The ARDL was employed as an econometric technique for the current study with the bounds F-test for co-integration applied to get a sense of how VAT could potentially be growth-enhancing.

For unit root testing, the augmented Dickey–Fuller and Phillips–Perron tests were performed. These tests confirmed a mixed order of variables. Most variables –

including GDP, VAT, tax (proxy for the tax burden), investment and consumption – became stationary after being differenced once with only inflation being stationary at levels. Following the necessary steps to apply the ARDL technique, all model variables were treated as a vector, in other words, they were treated as both independent and dependent variables.

The bounds F-test for co-integration was employed in terms of the estimated ARDL models to determine whether there exists a long-run relationship among the variables for the current study. The results of the bounds test for co-integration revealed that there was a long-run relationship only when the investment was used as a dependent variable. With a single long-run equation, the current study further specified and estimated the ECM to get the long-run and short-run dynamics. The results of the estimated long-run model showed that GDP had a positive long-run relationship with investment. All the diagnostic tests conducted proved that the ARDL models were normal and stable.

6.3. POLICY IMPLICATIONS AND RECOMMENDATIONS

The tax revenue trends have shown that revenue growth has remained constrained and slow while the expenditure breakdown analysis indicated increased expenditure growth. The three main taxes reported to in their tax recommendations, previous and recent tax commissions have emphasised the importance of long-run growth and have revealed a shift in the tax base away from direct income tax to indirect taxes. The effect of direct taxes on economic growth is widely researched with most scholars in consensus with the view that they are the most harmful to economic growth. On the other hand, several empirical studies have found VAT to be relatively less detrimental to growth than PIT and CIT. The results of the current study revealed that in South Africa VAT has the potential to affect growth through investment. In other words, this proves that a well-designed VAT within an efficient tax system with limited tax concessions and increasing the VAT rate have the potential to raise the much-needed revenue to increase spending on more productive expenditures than on unproductive expenditures. As a way of minimising the adverse effect of this indirect tax, government could direct the revenue raised back to the poor by investing in human capital and public infrastructure development as well as by increasing spending on housing and health expenditure in order to reduce poverty and inequality.

On the other hand, government cannot achieve the desired level of efficient tax use and investment without involving the private sector. However, the public–private sector relationship in South Africa is argued to be dysfunctional and characterised by the lack of a free market in areas where government investment is not efficient. This was evident from the results of this study having observed a negative effect of expenditure and investment on growth. The lack of competition in the electricity and transport markets, backlogs in infrastructure investment and maintenance, as well as poorly managed state-owned companies, cause the public sector to be unable to take full advantage of the productivity benefits in the above areas. With a more efficient public sector and increased participation by the private sector, the economic costs reflected in the balance sheets of state entities could be greatly reduced, as the effect of this public–private partnership would lead to efficiency gains to the rest of the economy leading to more growth.

While government has reached its investment spending capacity and is unable to increase investment further, private sector participation should be encouraged so that value for money can be realised through private sector involvement. Moreover, dealing with corruption will further prevent public and private resources from being wasted, discourage rent seeking and reduce transaction costs and uncertainty. Efficient use of tax resources and an optimal level of general government expenditure are important in achieving long-term growth. Some SOEs in South Africa have shown to be unsustainable but have been kept operating through a number of bailouts provided for from the fiscus, proving to be inefficient for the economy and unviable for entrepreneurs, since the state continuously injects financial resources to correct market failures in order to avoid major losses experienced by failing state companies. South Africa should therefore determine its optimal expenditure level and increase its capacity, especially in electricity supply, transport, and infrastructure development by allowing the private sector to take on further investment in areas where it is no longer efficient for the state to provide some public goods without increasing the debt levels and/or taxes of the country.

Inasmuch as the country needs to increase productive expenditure – more especially in education and health – and to invest increasingly in electricity and general infrastructure to contribute to growth, government is still faced with the pressure to also introduce new sustainable programmes. These programmes should be within the

social security component to deal with the high unemployment rate and poverty levels among the economically active section of the population who do not receive any social transfers. In 2020, government introduced a temporary social relief of distress grant (SRD grant) for qualifying unemployed people. However, caution must be exercised, as spending large amounts on such unproductive expenditures indirectly leads to a crowding-out effect in the long run as increased spending on these budget items may force government either to increase borrowings or to increase taxes necessary to finance them. This, in turn, will have an adverse effect on individuals and companies, and ultimately affect growth.

According to the views by Marica and Piras (2018) on the endogenous growth model, fiscal policy influences long-term economic growth rate through a decision by government in terms of both taxes and expenditure. This is because the way in which tax policy is implemented, and the way revenue is spent on general expenditure items and investment spending ultimately affect the decisions of the private sector to invest in human capital, knowledge or research development. Within the endogenous growth framework, these are considered the engine of growth. For South Africa to realise economic growth, the findings of the study revealed that investment should be well targeted and other sources of revenue and needed considering the persistent debt and deficits level in the country. Therefore, South Africa may have to increase VAT further introduce new sources of tax revenue such as the wealth tax that have the potential to increase revenue significantly while being mindful of the effect such taxes would have on economic growth.

6.4.   LIMITATIONS OF THE STUDY

The limitations of this study were the availability of empirical studies on VAT in developing countries. This limited the review of the studies on the effects of VAT on growth in developed and developing countries. For future research, the impact of VAT on health as an individual expenditure item could be explored, especially as a funding mechanism for the national health insurance (NHI) towards universal health coverage in South Africa.

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