AN INVESTIGATION OF THE RELATIONSHIP BETWEEN TAX REVENUES AND ECONOMIC GROWTH: THE CASE OF NAMIBIA

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ABSTRACT

This study empirically investigated the relationship between tax revenue and economic growth in Namibia using the annual data for 1981-2020. The time series on GDP, net tax, private consumption and gross capital formation were extracted from annual national accounts tables available on Namibia Statistics Agency's web site. The ARDL bound test confirmed no cointegration between tax revenue and GDP growth hence, the short-run ARDL was employed. The results of the short-run ARDL revealed a positive and significant contemporaneous relationship between taxation and economic growth. It is therefore, inferred that Namibia conforms to the hypothesis that economic growth and tax revenue reinforce each other In the same vein economic growth is significantly and negatively affected by the some historical values (lags) of net tax.. Moreover, the Granger causality test divulged neither unidirectional nor bidirectional causal relationship between tax revenue and GDP growth. In the final analysis, it is recommended that tax policies should be concurrently implemented with accelerated supply side policies such as business financing, product cost subsidization, entrepreneurial skill acquisition, especially in growth-driving sectors and eventually broaden the tax base. In other words, the results of the study implies that growth policies should be supplemented by a strong tax system so as to optimize revenue collection. The consistence of the findings of this study with the optimal tax theory implies that excessive taxation can distort economic activity, therefore, slow down production.

Key words: Tax revenue, Gross Domestic Product, Private Consumption, Gross Capital Formation, Fiscal Policy

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LIST OF ABBREVIATIONS AND ABBREVIATIONS

BoN	: Bank of Namibia
ECOWAS	: Economic Community of West African States
FY	: Fiscal Year
GDP	: Gross Domestic Product
GRN	: Government for the Republic of Namibia
IMF	: International Monetary Fund
ITAS	: Integrated Tax Administration System
LICs	: Low Income Countries
LMICs	: Lower Middle Income Countries
NamRA	: Namibia Revenue Agency
NPC	: National Planning Commission
NSA	: Namibia Statistic Agency
SACU	: Southern African Customs Union

DECLARATIONS

I, Lukas Kumonika hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.

Name of Student _____ Signature_____ Date _____

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This study sought to investigate the relationship between tax revenues and economic growth, the case of Namibia. This chapter opens by presenting the background of the study and the statement of the problem. The chapter goes on to present the objectives of the study, and the significance of the study. The study will close by presenting the limitation and delimitations of the study.

1.1 Background of the study

Tax revenue is generally regarded as the dominant source of revenue for many government units (International Monetary Fund, 2018). Equally important, Szybowski (2018) claims that low taxes and other public revenues are among the causes of public debts and budget deficits. In other words, adequate tax revenue has the potential to reduce national debt and lower the budget deficit Namibia possesses a high ratio of tax revenue to Gross Domestic Product (GDP) when compared to other Sub-Sahara African (SSA) countries (Kostiainen, 2018). Namibia's revenue-collecting capacity is reportedly declining. According to Shiimi (2022), the total revenue for the year 2021/2022 was 55.4 billion dollars compared to 57.8 billion dollars collected in the year 2020/20 representing a decline of 4.3 percent. Nakale, Sikanda, and Mabuku (2015) assert that an improved tax administration and collection contributes to public revenue growth. Likewise, Rademacher (2011) argues that fiscal policy influences economic growth through its impact on progress in technical production and the accumulation of productive resources

such as human capital. However, the relationship is not as regular as theory states, hence further examination is needed.

Total revenue comprises of both tax and non-tax revenue, with tax revenue being the largest and most significant revenue source (NPC, 2018). Sheefeni et al (2019) claim that the current reduction in donor funding, the global economic crises, and the reduction in SACU revenue, hence Namibia needs to mobilise more revenue domestically to avail funds for developmental projects and to address the socio-economic challenges facing the country. In the other quarters, there is a need to increase domestic economic activity to increase the domestic tax base (Organisation for Economic Co-operation and Development (OECD)).

According to Heritage (2020), Namibia's GDP growth had been moderately good for five years before 2018. Heritage (2020) further notes that Namibia's GDP dipped in 2018 because of lower government spending and less demand for Namibian exports in South Africa. The domestic economy registered a slow growth of just above 1.0 percent growth in 2016 attributable to a decline in primary and secondary industries production as well as slow growth in the tertiary industry (NPC, 2018). Additionally, the latter reported that the contributions of primary, secondary, and tertiary sectors to GDP were 17.6%, 17.4%, and 57.9% respectively. This corresponds to the growth in total tax revenue of 28.6 in 2016. Namibia's economy has continued to face significant downward spiral, with real output contracting by a further 1.4% in 2019, an average of 5.3% between 2010 and 2015. The economy entered a recession in 2016 and has since struggled to grow (World Bank, 2020).

Figure 1.1 below shows the components of government revenue for the fiscal year 2011/12 to 2016/17. On one hand, it can be observed from the graph that income tax on individuals is the most consistent and stable source of government revenue in Namibia. Income tax on individuals fluctuated between 16.7 percent of GDP and 40.9 percent of GDP. On the other hand, "tax on international trade and transactions" and company tax demonstrated the highest levels of instability as it portrayed an irregular up and down pattern. In addition to that, the highest level of revenue growth of 28.6 percent was recorded in the fiscal year 2011/12.

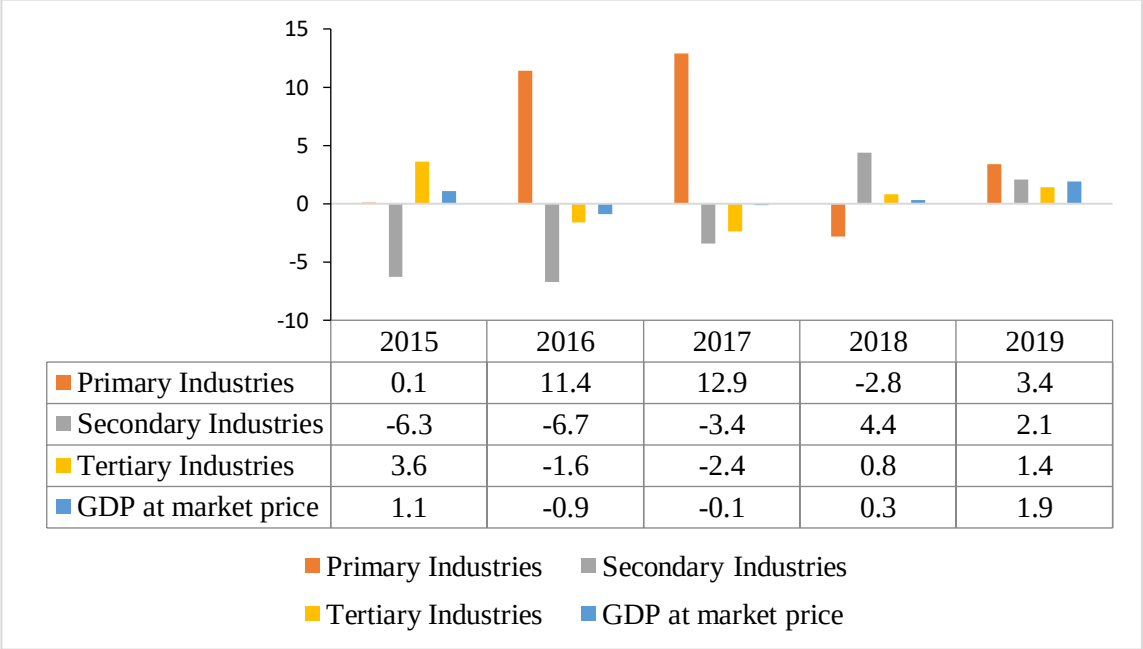
Figure 1.1: Composition of tax revenue in percentage share

	2011/12	2012/13	2014/15	2015/16	2016/17
Tax on international trade and transaction	17.7	82.6	23.7	28.2	-22
Income tax on individual	21.1	19.3	16.7	31.9	40.9
Company tax	5.1	14	-41.1	29.8	48.3
Domestic tax on goods and services	41.3	-18.5	79.9	13.9	43
Non-tax revenue	3	1.2	1.5	2.6	-14.6
External grants	2.4	-2	6.7	-2.3	0.8
Others	-0.6	3.5	12.6	-4.2	3.5
Total revenue growth	28	27	10.3	28.6	8.4

Source: Author's analysis from NPC data

The economy consists of three main sectors namely, primary, secondary, and tertiary sectors. The primary sector consists of agriculture forestry and fishing, mining and quarrying industries. The secondary sector comprises of manufacturing, electricity, gas, steam and air conditioning, water supply, sewerage, waste management, remediation activities and construction. Moreover, the tertiary sector is made up of wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities, information and communication, finance and insurance activities, real estate and other service-related activities.

Figure 1. 2: Namibia's Real GDP growth by industry (2015-2020)



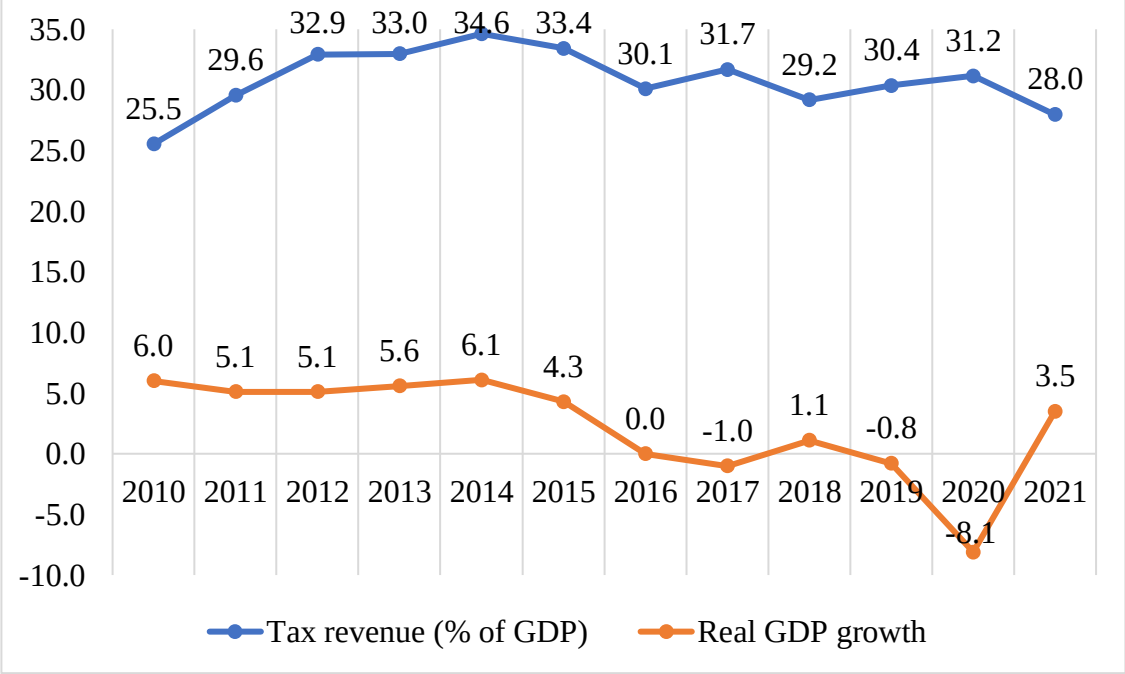
	2015	2016	2017	2018	2019
Primary Industries	0.1	11.4	12.9	-2.8	3.4
Secondary Industries	-6.3	-6.7	-3.4	4.4	2.1
Tertiary Industries	3.6	-1.6	-2.4	0.8	1.4
GDP at market price	1.1	-0.9	-0.1	0.3	1.9

Source: *Author's analysis from BoN data*

The primary industry is the backbone of the economy in terms of contribution to real GDP. However, a decline of 2.8 percent was reported in the sector in 2018. The secondary industry registered a negative real GDP growth in 2015 (6.3%), 2016 (6.7%) and 2017 (3.4%).

In 2019, the sector posted a rise of 2.1 percent, a drop when compared to 4.4 percent reported in 2018. In the tertiary sector of the economy, a decline of 1.6 percent and 2.4 percent was reported in 2016 and 2017 respectively. The same sector posted a growth of 3.6 percent in 2015, better-off when compared to a rise of 0.8 percent recorded in 2019.

Figure 1. 3: Real GDP growth and tax revenue as a percentage of GDP



Source: *Author's composition from IMF data*

During the period depicted in Figure 1.3, the peaks in terms of tax revenues (% of GDP) and real GDP growth were recorded in 2014 (34.6% and 6.1 respectively). However, results were not consistency in terms of the lowest levels recorded. For of tax revenues (% of GDP), the lowest (25.5%) was recorded in 2010, while the lowest economic growth level (-8.1%) was reported in 2020. The association between tax revenue and GDP growth cannot be automatically inferred from the statistics as concluded from asymmetric patterns in Figure 1.3.

Table 1.1: Tax revenue (% of GDP) for SACU member states

Country Name	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Botswana	23.9	24.0	28.0	26.7	27.1	26.3	21.6	23.9	21.7	21.1	22.3	22.2
Lesotho	30.3	30.2	38.1	35.9	36.3	33.8	29.3	33.0	31.8	31.9	34.9	32.4
Namibia	25.5	29.6	32.9	33.0	34.6	33.4	30.1	31.7	29.2	30.4	31.2	28.0
South Africa	22.5	22.9	23.3	23.8	24.4	25.0	24.8	24.8	25.0	24.9	23.3	25.9

Source: SACU

Namibia did relatively better in terms of tax revenue as a percentage of GDP. For the periods presented in Table 1.1, Namibia outperformed all other member states expect Lesotho. Namibia recorded the tax revenue (% of GDP) of 30.1 higher than the one for Lesotho (29.3) in 2016. The members have recorded tax revenue (% of GDP) above 15% which is considered by World Bank to be a key ingredient for economic growth and, ultimately, poverty reduction. for all years under consideration.

1.2 Statement of the problem

High tax revenues are seen as sufficient evidence of high economic growth rates engineered through the government multiplier process (Canicio & Zachary, 2014). However, this is seemingly not the case in Namibia. According to the OECD (2020), Namibia's tax-to-GDP ratio has been higher than the average of 30 African countries. On the other hand, the GDP growth rate appears to be unfavorable, particularly in 2016 and 2017 where negative growth rates of 1.1 percent and 0.9 percent respectively were recorded (NSA, 2017).

In the same vein, different theories contradict one another when it comes to the relationship between economic growth and government tax revenue. To be specific, theories like the endogenous growth theories claim that fiscal instruments have an impact

on economic growth. On the other hand, the optimal tax theory asserts that excessive tax distorts economic activity, hence lowering economic growth. Despite government efforts such as the introduction of ITAS and NamRa, to strengthen the tax system, Namibia continues to record unstable economic growth. Likewise, there is controversy in terms of empirical findings. For instance, scholars such as Olabode and Abraham (2020) and Iriqat and Anabtawi (2016) found contradicting results in their studies in Nigeria and Palestine, respectively. Similarly, there is a need to further investigate the relationship between tax revenue and GDP growth to inform policy formulation through recommendations based on the findings of the study. The purpose of this study is, therefore, to examine the relationship between tax revenue and GDP growth.

1.3 Objectives

The main objective of the study is to examine the relationship between taxation and economic growth. More specifically the study sought.

- To find out whether there is a long-run and/or short-run relationship between tax revenue and real GDP
- To examine whether there is a causal relationship between tax revenue and GDP growth.

1.4 Hypotheses

The two sets of hypotheses were tested to meet the set objectives. The first set of hypotheses assisted in establishing whether there is a relationship between tax and economic growth in the long run. Whereas the second set was used to establish the nature of the causal relationship between the two variables. The hypotheses are specified below.

Ho: There is no long run/and or short run between real GDP and tax revenue.

H1: There is a long run/and or short run between real GDP and tax revenue.

Ho: There is no causal relationship between real GDP and tax revenue

H1: There is a causal relationship between real GDP and tax revenue.

1.5 Signification of the study

The findings of this study are useful for informed decision-making in terms of implementing tax policies. It is important to have a clear understanding of the effect that changes in taxes are likely to have on economic growth in order to make informed decisions. Likewise, the contribution of this study to the existing literature cannot be trivialised. The findings of this study will add to the body of knowledge on the subject on the causal relationship between real GDP and tax revenue. Although there are studies done on a similar matter such as Kaakunga (2006) and Sheefeni and Nkhalamo (2017), this study is still relevant as a different method and extended period were employed to find out whether the findings from the previous study still apply.

1.6 Limitations of the study

The study intends to cover 41 years to fulfill the Central Limit Theorem which states that the number of observations should be more than 30 observations to attain a normal distribution. However, data may not be available for some years. This will be mitigated through the imputation of missing values. The finding of this study may not be inferable to other economies and hence only applicable to the Namibia economy.

1.7 Delimitations of the study

Tax revenue was looked at on an aggregated level but not disaggregated into different components. The study focused on Namibia for the period 1980 to 2020. This is because the study intends to reveal whether taxation in general has an impact on the country's level of output. Furthermore, the controlled variables such gross fixed capital formation and private consumption were also analyzed at a national level rather than at disaggregated level. Moreover, consumption was also examined at the macro level but not at the economic entity level.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter will be a presentation of the review of literature on the relationship between tax revenues and economic growth. The chapter will focus on the theoretical and empirical reviews.

2.1 Theoretical Review

Both neoclassic and Keynesian economists attempted to provide theoretical explanations about taxation and economic growth. The earlier believed in the supply side hypothesis while the later believed in demand side hypothesis (Sheefeni, 2017). These hypotheses are similar in a manner, in that they both acknowledged that tax cuts lead to economic growth. According to Mazerov (2018), the neoclassic economists believe that production is the driver of economic growth, hence, they advocated for tax cuts on firms' incomes as opposed to consumers' income. This theory was criticized by Sheefeni (2017) claiming that it results in the rich getting richer, and the poor getting poorer as tax cuts go to the wealthy. On the other hand, Keynesian economists are of a notion that economic growth is demand driven (not supply driven), thus support the stimulation of demand through cuts on direct taxes (Garfinkle, 2005).

There are other principles of taxes such economic principle which postulates that taxation should be settled without causing any economic distortions or market failure. Moreover, according to the principle of justice (equability), tax payments are necessitated by the need for protection of citizens by the states or to ensure political, social insurance (Sinkuniene,

2005). On top of that, the benefit principle of taxation, holds that the taxes paid by an agent should reflect the feed benefit that they receive from the mix of goods and services supplied by the state (Neill, 2000)

Mak, Pradhan, and Mahendhiran (2021) explained the four possible hypotheses that are possible explanations for the nexus between tax revenue and economic growth. Firstly, tax revenue led economic growth hypothesis suggests that tax revenue affects economic growth. In other words, higher tax revenues can possibly lead to high revenues available for initiatives that ensure growth. Inversely, high tax revenues could imply a higher tax burden hence, reducing private consumption, and eventually GDP. Secondly, the economic growth - led tax revenue hypothesis suggests that economic growth causes tax revenue increases. Economic growth has a possibility of increasing corporate earnings, disposable income, goods and services tax, value-added taxes, excise taxes eventually raise aggregate tax revenue. The third hypothesis suggests that tax revenue and economic growth reinforce each other. The final hypothesis is the neutrality hypothesis which suggests that there are no links between the two variables.

The endogenous growth theory asserts that temporary government spending policies have a positive effect on output but have a zero effect on permanent spending shock (Padda & Akram, 2010). Moreover, this theory claims that economic growth is an explainable endogenous outcome of an economic system, not the result of forces that impinge from the outside. This model is based on the notion that economic growth is a result of capital accumulation that ensures productivity. Government spending policy is believed to have an impact in the short run only.

Furthermore, Gbato (2017) postulates that endogenous growth models state that taxation can have a negative effect (by reducing retained income and investment) and a positive effect on the growth rate (through tax-financed spending on public goods such as infrastructure, education, and public health).

The neoclassical theory states that permanent changes in government policies do not have a permanent effect on the growth of output. This implies that changes in a country's tax structure should have only a transitory impact on its long-run economic growth. This means that changes in the tax structure do not automatically have a long-lasting impact on the output of the economy. The optimal taxation theory posits that the tax system should be designed in a manner that distortions and inefficiencies are minimised in the economy (Maganya, 2020). In other words, income tax collection should be reasonable to allow high disposable income and eventually private consumption. Likewise, too high-profit tax collection reduces retained profit and investment for businesses. Moreover, it is worth noting that high tax rates may incentivize tax avoidance and tax evasion. All in all, an optimal tax rate maximises revenue collection while simultaneously allowing for private spending and investment in the economy.

The Solow Growth Model postulates that long-term changes in output are not caused by the government's fiscal policy actions but rather by key factors of production such as labor, capital, and technological progress. This means that fiscal stimuli is not a permanent remedy to a recession, but the economy should be revived through investment and labor productivity during times of depression. To conclude, output growth should not be assumed by fiscal policy implementations but rather by investment policy.

A study by the OECD (2010) suggests that taxes on residential property are likely to be best for growth because they could contribute to the usage of underdeveloped land. This is because most OECD countries provide various tax preferences for owner-occupied housing (such as the deductibility of interest on house loans and exemptions from capital gains tax), which result in a misallocation of capital towards housing, away from other investments. Page (2017) states that tax policies can affect the overall economy in three main ways, that is by altering demand for goods and services or changing incentives to work, save and invest, and by raising or lowering the budget deficit. Page (2017) further explains that a tax cut boosts disposable income, resulting in higher consumption expenditure and eventually raising demand for goods and services. Additionally, firms respond to the increased demand by expanding production which is likely to increase investment.

2.2 Empirical Literature

The preceding theoretical literature section explains the existing theories on the relationship between taxation and economic growth. On the other hand, this section critically reviews the existing pragmatic studies on the relationship between taxation and economic growth. Gurdal, Aydin and Inal (2020) studied the relationship between tax revenue, government expenditure, and economic growth for Canada, France, Germany, Italy, Japan, the UK, and the USA (the G7 countries) using annual data from 1980 to 2016. The study used the time domain panel causality and frequency domain causality tests. The domain panel causality test found no causal relationship between economic growth and tax revenue.

Several studies attempted to examine the effect of tax cuts and exemptions implemented in the Kansas economy in 2012 and 2013. DeBacker et al. (2017), Turner and Blagg (2018), Rickman and Wang, (2017) investigated using the multistate county fixed effect model and country border matching approaches to identify tax effect. Their study also used the synthetic control method. Despite the use of different methods, all studies reached the consensus that cutting taxes does not improve state economic performance. Simply put, tax cuts neither yield an increase in establishments nor an increase in employment.

Mak, Pradhan, and Mahendhiran (2021) studied the interaction between government expenditure, tax revenue, and economic growth in low-income countries (LICs) and lower middle-income countries (LMICs) for the period 2005 to 2019. The study used a single temporal causal model. The findings of the study revealed endogenous links between economic growth and tax revenue. Since this study was limited to LICs and LMICs, there was need to investigate the same matter in terms of upper middle-income countries. This current study will use the case study of Namibia which is an upper middle-income country to examine how results differ across different income groups.

Another study done by Al-Abbadi and Khaliq (2017) examined the causal relationship between economic growth and general sales tax revenue in Jordan during the period 1998-2015 using the Johansen co-integration technique. The study revealed that the relationship between general sales tax and GDP growth is co-integrating in nature and the former Granger causes the latter but not vice versa. Even though this study was done in the upper middle-income category, where Namibia falls, Jordan is situated in a different region (Middle East). There are regional factors that may influence the results; hence it was still

necessary to carry out the study in Namibia which is in the Sub-Saharan Africa to see if the results differ across regions.

In another study, Iriqat and Anabtawi (2016) investigated the causality relationship between Gross Domestic Product and its components such as consumption and investment with tax revenues for the period 1999 -2004 in Palestine using the OLS models. The study found that tax revenue has no causal effect on variables such as GDP, government spending, consumption, investment, and balance of trade. Another study by Pusat, Badan and Kementerian (2019) examined the relationship between tax revenue and economic activity in Indonesia, using quarterly data from 2010 to 2017. The co-integration test found a long-lasting relationship between tax revenue and GDP, investment, and consumption. According to the study, the causality test indicated that economic variables (GDP, investment, and consumption) Granger cause in taxes. In other words, the study confirmed the economic growth led tax. Another study by Heady et al. (2009), made a cross-country study on the effects of the tax mix on long-run GDP per capita for 21 OECD countries over the period 1970 to 2005 using a baseline model. The study revealed that recurrent taxes on immovable properties were most beneficial for long-run GDP per capita, followed by consumption taxes (and other property taxes), personal income taxes, and corporate income taxes.

In another study, Canicio and Zachary (2014) employed a Granger Causality test and a vector error correction model to investigate the correlation between tax revenue and economic growth in Zimbabwe from 1980 to 2012. The study revealed an independence between the two variables. Simply put, there is no relationship between tax revenue and economic growth. In the same vein, Popoola et al. (2017) examined the significant

differences between the effects of oil and non-oil tax revenue on economic growth in Nigeria for a period of three decades, using time series data from 1986 to 2015. The study utilised both descriptive and Paired Sample T-tests with the aid of Statistical Package for Social Science (SPSS). The findings showed that oil and non-oil tax revenue were positive and strongly correlated with real Gross Domestic Product.

In the same vein, Khobai Dladla (2018) studied the impact of taxation in South Africa for the period of 1981 to 2016 using the Auto-Regressive Distributed Lag (ARDL) approach. The findings of the study revealed a negative relationship between taxes and economic growth. The study also revealed some co-integration between the two variables. On the other hand, Gbato (2017) did the same study in 36 sub-Saharan African countries and found no effect of taxation on long-term growth.

Mustapha, et al. (2021) analysed the effects of tobacco taxation on economic growth in 36 African countries using the system of generalised methods (GMM) regression as the estimation techniques. The study covered the periods from 2008 to 2018. The study revealed that tobacco taxation enhanced economic growth in both the short and long run periods. This study did not meet the central limit theorem as the number of observations were less than 30. Likewise, the study was limited to tax on tobacco and cannot be inferred to other tax components. The current study focuses on tax in general without a disaggregation thus can be inferred.

Equally important, Ose et al. (2018) analysed the impact of tax revenue on the economic growth of ECOWAS countries, using the Seemingly Unrelated Regression Estimate (SURE) analysis for five selected Economic Community of West African States (Nigeria, Ghana, Sierra Leone, Benin, and Burkina Faso) using data from 2000-2015.

The study found that total tax revenue had a positive and significant effect on economic growth. In another study, Sheefeni and Nkhalamo (2017) empirically examined the relationship between taxation and economic growth in Namibia for the period 2001 to 2015 using a co-integration test, impulse response function, and variance decomposition. The result showed that tax shocks have an immediate negative effect on economic growth and tax is responsible for moderate fluctuation in economic growth in Namibia. The study was limited to only two variables (bivariate) hence the current study is still relevant as it employed more than two variables (multivariate).

On top of that, Kaakunga (2006) examined the impact of fiscal policy on economic growth in Namibia for the period 1980 to 2002 using the ordinary least squares (OLS) regression method. The study discovered tax revenue (among other fiscal variables) positively affects economic growth. Simply put, output or GDP grows as tax revenue increases and the opposite is true as well.

Although those studies were carried out in Namibia, the current study differs slightly in terms of the period covered. It is important to test the consistency of findings over time as the economy may have undergone structural changes hence results may differ with time. In addition to that, the study employed a different method to test for the consistency of results as the methodology changes. Therefore, the undertaking of this study was still justifiable despite the existing literature on the subject at hand in Namibia.

2.3 Chapter Summary

Based on the literature reviewed, four outcomes are anticipated; economic growth led tax, tax led economic growth, neutrality, and feed. Likewise, the findings of the literature review could imply that tax policies should be designed and implemented with caution. The next chapter will be a presentation of the research methodology that was utilized in this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter will present the methodology that was utilized in this study. The chapter will present the design, the sources of data used in the study, and the models which were used for the study.

3.1 Research design

The study followed a quantitative approach. The natural log of real GDP growth (a proxy for economic growth) and tax revenue were the variables of interest. Moreover, private consumption and gross fixed capital formation were used as controlled variables. The design was selected based on its ability to meet the objectives of the study. To be specific the long-run relationship between two variables of interest was tested using the ARDL Bound test for co-integration. Likewise, the casual relationship was investigated using the Granger Causality test.

3.2 Data and Data Source

The annual data on all the economic variables used particularly on economic growth and tax revenue were collected from the Namibia Statistics Agency (NSA) for processing and analysis**.** The data covers the period of 41 years (1980 to 2020). Benoit (2011) postulates that using the logged form makes effective relationships non-linear, while preserving the linear model and transforming highly skewed variables into one that is more

approximately normal. Hence the model was transformed to circumvent the skewed distribution of data. All the tests were done using E-view 9.

3.3 Model Specification

To investigate the relationship between tax revenue and GDP, the study employed the model specified by Olabode and Abraham (2020). The model was modified by adding gross fixed capital formation K to assimilate the Solow Growth Model.

$$GDPf(NT, PC, K) = Y_t = \alpha_0 + \alpha_1 NT_t + \alpha_2 PC_t + \alpha_3 K_t + \mu t \quad \ldots\ldots 3.1$$

Where; Y_t is GDP, NT_t represents Net taxes, PC_t is the private consumption in million N$ and K_t refers to gross capital formation,t is the time trend and μ denotes the error term.

Additionally, variables were transformed into logarithm form as indicated in equation 3.2

$$lnY_t = \alpha_0 + \alpha_1 lnNT_t + \alpha_2 \ln PC_t + \alpha_2 \ln K_t + \mu_t \quad \ldots\ldots 3.2$$

3.4 Estimation Procedures

This study investigated the causal relationship between tax revenue and economic growth. The study employed the natural log of GDP as a proxy of economic growth (LNGDP) while net tax (NT) denoted taxation. Equally important, the study employed a three-step procedure to examine the relationship between tax revenue and GDP growth, and the steps followed are stipulated below.

Step 1: Unit root test

The unit root tests for stationary were examined on the levels and first differences for all variables using the Phillips-Perron (PP) and Augmented Dickey Fuller (ADF) models. Although both tests are suitable in cases of shorter time series as stated by Markéta and Darina (2016), the same source acknowledged the gaps for both the ARDL model and PP model. Hence there was a need to employ both methods to examine the consistency.

The process of testing for stationarity started with the 3.3, as stipulated in Gujarati (2003)

$Y_t = \rho Y_{t-1} + u_t$……………………………………………….....3.3

Where $-1 \leq \rho \leq 1$, meaning ρ is between -1 and 1 inclusively

Which is then manipulated into equation 3.4

$Y_t - Y_{t-1} = \rho Y_{t-1} - Y_{t-1} + u_t = (\rho - 1)Y_{t-1} + u_t$……………3.4

Equation 3.4 can be alternative be expressed as 3.5

$\Delta Y_t = +\delta Y_{t-1} + u_{t.}$ … ..3.5

Where $\delta = (\rho - 1)$ and Δ is the first-difference operator.

Hence the unit root test for the (null) hypothesis that δ = 0. If δ = 0, then ρ = 1, that is there have a unit root.

Step 2: Co-integration and ARDL Dynamics

Auto-regressive Distributed Lag (ARDL) Bound Test for Co-integration

This was used to test whether there is a long-run relationship between economic growth and tax revenue. This test was justified by its appropriateness in cases of both mixed and unknown orders of integration as observed by Sam, McNown, and Goh, (2019). More importantly, other co-integration techniques, the ARDL test gives realistic and efficient estimates in irrespective of whether the underlying variables are I(0), I(1) or a combination of both and it also allows for the identification of integrating vector(s) (Emeka & Aham, 2016). Similarly, Pesaran, Shin and Smith (1999) affirmed that the ARDL is a consistent test.

The null hypothesis of this test was no co-integration 'among the variables. The bound test procedure was based on the F-test for investigating the presence of the long-run linkage and it tests for the joint significance of lagged level variables involved. The decision rule was to reject Ho if the calculated F-Statistic is greater than the critical value for the upper bound. ARDL bounds test equations are specified below.

$$lnY_t = \alpha_0 + \alpha_1 + \sum_{i=1}^{m} \alpha_{2i} \Delta lnY + \sum_{i=1}^{n} \alpha_{3i} \Delta lnNT_{t-i} + \sum_{i=1}^{M} \alpha_{4i} \Delta \ln K_{t-i} +$$

$$\sum_{i=1}^{M} \alpha_{4i} \Delta \ln PC_{t-i} + \alpha_4 ❑_{t-1} + \alpha_5 + \alpha_6 lnK_{t-1} + \alpha_7 lnPC_{t-1} + \varepsilon_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6$$

$$\Delta lnNT = \beta_0 + \beta_1 + \sum_{i=1}^{m} \beta_{2i} \Delta lnNT_{t-i} + \sum_{i=1}^{n} \beta_{3i} \Delta y_{t-i} + \sum_{i=1}^{M} \beta_{4i} \Delta K + \sum_{i=1}^{M} \beta_{5i} \Delta lnPC +$$

$$\beta_4 lnNT_{t-1} + \beta_5 Y_{t-1} + \beta_6 lnK_{t-1} + \beta_7 lnPC_{t-1} + \varepsilon_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.7$$

Where Δ is defined as the first difference operator, $t$is the time trend, Y is GDP, $lnNT$ is the natural log of net tax (taxes – subsidies), lnK denotes the natural log of gross fixed capital formation, $lnPC$ is the natural log of private consumption α_{2i} to α_{4i} and β_{2i} to β_{5i}

are short coefficient while α_4 to α_7 and β_4 to $\beta_4$are long run coefficient. The nature of the ARDL model also allowed for the test of the short-run dynamics of the variables.

Short and Long Run ARDL

After determining the nature of the relationship among the variables using the bounds test approach, the estimation of the long run and short run coefficients will be done depending on the results thereof. Simply put, the presence of co-integration warrants the performance of the Error Correction Model, or else only short run coefficients are presented.

Step 3: Granger causality Test

This study adapted the model specification used by Canicio and Zachary (2014). Their model used the Granger causality test (well known as joint F-test) to examine the causal relationship between government tax revenue and economic growth.

$$\Delta lnY_t = \sum_{i=1}^{n} \alpha_i lnNT_{t-i} + \sum_{j=1}^{n} \quad \beta lnY_{t-j} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.8)$$

$$\Delta EG_t = \sum_{i=1}^{n} \gamma_i lnNT_{t-i} + \sum_{i=1}^{n} lnY_{t-j} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.9)$$

Where $lnNT$denotes the natural log of net tax and $lnGDP$ represents economic growth (as measured by GDP growth).

3.5 Chapter Summary

The quantitative approach was employed as the research design for this study. Data were collected from NSA and the three-step estimation procedure that involves unit root, ARDL, and Causality tests was explained theoretically in this chapter. Lastly, post-diagnostic tests such as normality, heteroscedasticity, autocorrelation, and model stability were also elucidated. The next chapter will be a presentation and analysis of findings.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF EMPIRICAL RESULTS

4.0 Introduction

This section presents the results of the model proposed in Chapter Three. All models were run using E-Views 9. The results assisted in crafting the conclusion and policy recommendations. Models run includes Phillips-Perron for unit roots, ARDL bound test for co-integration, and the short run ARDL. In the same vein, some diagnostic tests on stability and normality were carried out and presented in this section.

4.1 Descriptive statistics of data

The descriptive statistics table presents the summary of the data of all variables used in the model. It is crucial to view summarized data as it allows one to visualize and simply interpret data.

Table 4. 11: Descriptive statistics results

Measure	PC	NT	K	Y
Mean	51,466	5,971	15,818	84,278
Median	38,698	5,018	10,986	72,241
Maximum	116,198	11,842	47,668	146,169
Minimum	21,150	2,508	3,805	44,129
Std. Dev.	28,748	3,034	11,955	36,389
Skewness	1.0	0.6	1.0	0.5
Kurtosis	2.6	1.9	3.2	1.8
Jarque-Bera	7.2	4.1	7.6	4.3
Probability	0.0	0.1	0.0	0.1
Observation	**41.0**	**41.0**	**41.0**	**41.0**

Table 4.1 presents different measures such as measures of central tendency (mean and median) and measures of spread (standard deviation).

The average GDP (Y) was N$84,278 million. This means that if the sum of GDP for 41 years were to be divided equally, then that is the amount of expenditure a year. The highest level of GDP of N$146,169 million was recorded in 2018.

On the other hand, the lowest level of GDP (Y) of (N$44,129 million) was reported in 1984. On the side of net taxes on production, the highest revenue of N$11,842 million was collected in 2016 while the lowest (N$2,508 million) was collected in 1985. Thus, recording a peak in national output does not automatically guarantee a peak in tax revenue on production.

It is worth noting that GDP is more spread than net tax since the standard deviation (std. dev.) is higher in the case of GDP. This means that the level of GDP recorded in many years is far different from the mean or average.

Table 4. 12: Optimum lag selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1416.6	NA	2.22E+29	78.9	79.1	79
1	-1267.7	256.4	1.39e+26*	71.5	72.4*	72.0*
2	-1258.1	14.4	2.05E+26	71.9	73.5	72.4
3	-1234.6	30.1*	1.48E+26	71.5	73.8	72.3
4	-1216.1	19.5	1.56E+26	71.3	74.3	72.4
5	**-1195.6**	**17.1**	**1.72E+26**	**71.1***	**74.8**	**72.4**

The stars in Table 4.3 imply the number of lags that are to be selected by the corresponding criterion. This study used 5 as the optimum number of lags to be used in the ARDL model as indicated by the Akaike information criterion (AIC). AIC is superior when a small sample has 60 or fewer observations and minimizes the chance of underestimation (Khim-Sen Liew, 2006). The optimum lag results were determined with the VAR model.

4.3 Unit root test

This test was necessary to determine the characteristics of data for all variables in terms of stationarity. Likewise, it is important to know the level of integration before deciding on the type of co-integration to be used. The results of the unit root test for both Phillips–Perron (PP) and Augmented Dickey-Fuller (ADF) are presented in Table 4.3

Table 4. 13: Unit root test

Phillips–Perron (PP) Test								
At Level					At First Difference			
	PC	NT	K	Y	d(PC)	d(NT)	d(K)	d(Y)
t-Statistic	2.143	0.866	-0.383	2.475	-4.971***	-5.749***	-3.889***	-1.829*
Prob.	0.991	0.893	0.54	0.996	0.000	0.000	0.000	0.065
Augmented Dickey-Fuller (ADF) Test								
t-Statistic	2.347	-1.203	-1.146	0.12	-1.755*	-1.008	-3.043***	-1.829*
Prob.	0.995	0.206	0.224	0.715	0.075	0.276	0.004	0.065

Note: *, ** and *** denote 1%, 5% and 10% levels of significance

Source: Author's E-view analysis from NSA data

Table 3 shows the result of the Unit root. The null hypothesis was rejected at 1% for private consumption (PC), net tax (NT), and gross fixed capital formation (K), while it was rejected at 10% for the gross domestic product (GDP). Hence, all variables are stationary at first difference. According to Phillips–Perron (PP) test then the use of the ARDL test is still appropriate. The results imply that all variables are integrated of order one, I (1), hence, the ARDL bound test was used to test for co-integration because it is not restrictive in terms of order of integration. To put it differently, the test is appropriate in cases of mixed and/or one integration.

4.4 ARDL Bound Test for Co-integration

The ARDL Bound test was applied to analyse the long-run and short-run dynamic interactions among the variables. This test was selected due to its appropriateness in cases of mixed or one level of co-integration. The first difference in co-integration for all variables was confirmed by Phillips–Perron (PP) test for unit root.

This test was of crucial importance as it assisted in achieving one of the objectives of this study, which was to confirm the level of relationship between taxation and economic growth. The ARDL bound test was employed due to its advantage of suitability in both cases (mixed and single order of integration

Table 4. 14: ARDL Bound Test for Co-integration

Test Statistic	**Value**	**K**
F-statistic	1.61	3
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	2.72	3.77
5%	3.23	4.35
1%	4.29	5.61

Source: Author's E-view analysis from NSA data

The null hypothesis for this test was that there is no long-run relationship between tax and economic growth. The research failed to reject the null hypothesis (Ho) of no long-run relationship. The failure to reject Ho at 5% was on the basis that the F-statistics of (1.61) is lower than the lower bound, I (0) critical value of 3.23. Similarly, Ho was still rejected at 10 % and 1% as the lower bound of 2.72 and 4.24 respectively were still lower than F-statistics. This implies, there is no long-run relationship between taxation and economic growth. This means that taxes on production and GDP growth do not move together in the long run. The absence of co-integration justified the use of the short-run ARDL model as opposed to the long-run model. The results of the ARDL are depicted in Table 4.5

4.5 ARDL Short-run Models

Since the variables were found not to be co-integrated, the short-run ARDL model was employed to test the relationship between tax on production and economic growth. The

failure to establish the co-integration among variables under consideration made it imperative to work with variables in differences as recommended by Nkoro and Uko (2016). Hence the re-parameterization of the ARDL Model into the Error Correction Model was required.

4.5.1 ARDL Short-run Models: LNGDP as a target variable

Equation 4.1 was used to examine the effect of taxation (as represented by $lnNT$) on economic growth (as represented by lnY). It consists of the short-run terms and tests for the short-run dynamic interactions among variables (GDP (Y), net tax (NT), gross fixed capital formation (K), and private consumption (PC)).

$$\Delta lnY_t = \alpha_0 + \alpha_1 + \sum_{i=1}^{m} \alpha_{2i} \Delta lnY + \sum_{i=1}^{n} \alpha_{3i} \Delta lnNT_{t-i} + \sum_{i=1}^{M} \alpha_{4i} \Delta \ln K_{t-i} +$$

$$\sum_{i=1}^{M} \alpha_{4i} \Delta \ln PC_{t-i} + \varepsilon_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 4.1$$

The results that capture the effect of net tax on economic growth are shown in Table 4.5. The target variable in this case is the log of GDP (which is the proxy for economic growth). Economic growth is explained by its lags and the lags of net tax, gross fixed capital formation, and private consumption.

Table 4. 15: ARDL Model: Short run dynamics (target variable: LNY)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DLNY(-1)	0.285	0.289	0.986	0.345
DLNY(-2)	-0.451	0.250	-1.804***	0.099
DLNY(-3)	-0.031	0.264	-0.116	0.910
DLNY(-4)	0.270	0.251	1.076	0.305
DLNY(-5)	-0.475	0.239	-1.986***	0.073
DLNT	0.129	0.065	1.989***	0.072
DLNT(-1)	-0.097	0.093	-1.050	0.316
DLNT(-2)	0.033	0.084	0.392	0.702
DLNT(-3)	-0.207	0.084	-2.478**	0.031
DLNT(-4)	-0.214	0.093	-2.308**	0.041
DLNT(-5)	-0.028	0.094	-0.295	0.773

DLNK	0.042	0.036	1.165	0.269
DLNK(-1)	0.047	0.039	1.215	0.250
DLNK(-2)	0.078	0.033	2.328**	0.040
DLNK(-3)	0.001	0.048	0.022	0.983
DLNK(-4)	0.097	0.041	2.360**	0.038
DLNK(-5)	0.047	0.035	1.325	0.212
DLPC	0.140	0.074	1.909***	0.083
DLPC(-1)	0.040	0.065	0.617	0.550
DLPC(-2)	0.001	0.074	0.012	0.990
DLPC(-3)	0.079	0.071	1.106	0.292
DLPC(-4)	0.100	0.075	1.332	0.210
DLPC(-5)	-0.011	0.079	-0.137	0.894
C	0.032	0.013	2.476**	0.031
R-squared	0.876	**Mean dependent var**		0.032
Adjusted R-squared	0.617	**S.D. dependent var**		0.034
S.E. of regression	0.021	**Akaike info criterion**		-4.696
Sum squared resid	0.005	**Schwarz criterion**		-3.630
Log likelihood	106.181	**Hannan-Quinn criter.**		-4.328
F-statistic	3.383	**Durbin-Watson stat**		1.617
Prob(F-statistic)	0.020			

Note: *, ** and *** denote 1%, 5% and 10% levels of significance

Source: Author's E-view analysis from NSA data

The second and fifth lag of GDP had a negative and significant effect on the current value of GDP. This is consistent with the theory of intertemporal choices which proposes a trade-off between current consumption and future consumption (Chabris, Schuldt, & Laibson, 2007). This implies that higher past consumption leads to lower contemporaneous consumption as little was saved for the subsequent periods. Furthermore, the third and fourth lag of the log of net taxes (as a proxy for taxation) was significant at 5% and 10%. The effect of those lags is negative, this means that the higher level of tax in the previous period could lead to low GDP in the current period. This is consistent with the optimum taxation theory, and it is indeed true that excessive taxes

reduce consumption and investment and eventually aggregate output. The findings of this study concurred with those of Sheefeni and Nkhalamo (2017). The results are contrary to the findings of Ose et al. (2018) and Kaakunga (2006). Possibly the deviation of the findings of the current study from those of Ose et al. (2018) (which was done in West Africa) could be attributed to regional difference. Although the latter and the current study were done in the same economy (Namibia), the differences in the results obtained might be explained by economic structural changes as the studies used different time series.

4.5.2 ARDL Short-run Models: LNT (taxation) as a target variable

While the previous equation captured the short-run effect of tax on of net tax on economic growth, the equation captures the short-term effect of economic growth on tax

$$\Delta lnNT = \beta_0 + \beta_1 + \sum_{i=1}^{m} \beta_{2i} \Delta lnNT_{t-i} + \sum_{i=1}^{n} \beta_{3i} \Delta lnY_{t-i} + \sum_{i=1}^{M} \beta_{4i} \Delta K + \sum_{i=1}^{M} \beta_{5i} \Delta lnPC + \varepsilon_{2t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 3.7$$

Table 4. 16: ARDL short-run dynamics (target variable: LNT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DLNT(-1)	-0.295	0.377	-0.783	0.450
DLNT(-2)	-0.093	0.336	-0.276	0.788
DLNT(-3)	0.274	0.407	0.672	0.515
DLNT(-4)	0.345	0.437	0.789	0.447
DLNT(-5)	-0.102	0.374	-0.272	0.791
DLNY	2.049	1.030	1.989***	0.072
DLNY(-1)	-0.137	1.202	-0.114	0.911
DLNY(-2)	0.480	1.125	0.427	0.678
DLNY(-3)	0.639	1.036	0.617	0.550
DLNY(-4)	-0.917	1.014	-0.904	0.385
DLNY(-5)	0.580	1.096	0.529	0.607
DLNK	-0.087	0.150	-0.583	0.572
DLNK(-1)	0.063	0.164	0.385	0.708
DLNK(-2)	-0.228	0.147	-1.546	0.150
DLNK(-3)	0.172	0.182	0.945	0.365
DLNK(-4)	0.013	0.201	0.064	0.950

DLNK(-5)	-0.080	0.150	-0.533	0.605
DLPC	-0.047	0.338	-0.140	0.891
DLPC(-1)	-0.082	0.261	-0.315	0.759
DLPC(-2)	-0.335	0.275	-1.217	0.249
DLPC(-3)	-0.094	0.298	-0.317	0.757
DLPC(-4)	-0.307	0.310	-0.990	0.344
DLPC(-5)	0.088	0.315	0.279	0.785
C	-0.017	0.064	-0.269	0.793
R-squared	0.746	Mean dependent var		0.036
Adjusted R-squared	0.216	S.D. dependent var		0.094
S.E. of regression	0.083	Akaike info criterion		-1.931
Sum squared resid	0.075	Schwarz criterion		-0.865
Log likelihood	57.794	Hannan-Quinn criter.		-1.563
F-statistic	1.407	Durbin-Watson stat		1.866
Prob(F-statistic)	0.283			

Based on the results presented in Table 4.5. 2, the coefficient of the contemporaneous term of economic growth (DLNY) is positive and significant at 10%. This implies that economic expansion allows for more tax to be collected. In other words, higher current GDP compared to past GDP means that more taxes are collected given a progressive tax system in Namibia. Practically speaking, the production tax is positively related to economic growth, hence, as the output increases or more goods and services are produced more revenue is collected by the fiscal authority. However, it is worth noting that this may only be true when there is tax compliance or issues such as tax evasion and tax avoidance are addressed. The results are approbated to the finding of a paper by Popoola et al. (2017) carried out in Nigeria.

4.6 Granger causality test

The pairwise Granger causality test was applied to find out if there is a causal relationship between tax revenue and economic growth. Since the variables are integrated of order one and there is no co-integration, the required transformation of differencing the variable was done as suggested by Ghosh (2002). Therefore, the causality test was applied to the differenced variables.

Table 4. 17: Granger causality results

Null Hypothesis:	Obs	F-Statistic	Prob.
DLNY does not Granger Cause DLNT	35	1.014	0.431
DLNT does not Granger Cause DLNY		2.076	0.104
DLNK does not Granger Cause DLNT	35	2.436***	0.064
DLNT does not Granger Cause DLNK		0.878	0.511
DLNC does not Granger Cause DLNT	35	0.161	0.974
DLNT does not Granger Cause DLNC		1.376	0.268
DLNK does not Granger Cause DLNY	35	0.986	0.447
DLNY does not Granger Cause DLNK		1.318	0.290
DLNC does not Granger Cause DLNY	35	0.648	0.665
DLNY does not Granger Cause DLNC		1.797	0.152
DLNC does not Granger Cause DLNK	35	2.265***	0.080
DLNK does not Granger Cause DLNC		1.494	0.229

Note: *, ** and *** denote 1%, 5% and 10% levels of significance

Source: Author's E-view analysis from NSA data

The results of the causality test are presented in Table 4.6. The null hypothesis (Ho) for this test was that one variable does not Granger cause the other. The null hypothesis that DLNK does not Granger Cause DLNT was rejected at 10% hence concluding causality running from gross fixed capital formation to net taxes. Similarly, there is an unidirectional causality from running gross fixed capital formation (DLNK) to consumption (DLNC) There is no evidence of causality between net taxes and GDP. This

result is consistent with the findings of Iriqat and Anabtawi (2016) who found no causal relationship between tax revenue and GDP.

4.7 Diagnostic Test

This subsection presents the results for tests such as normality, heteroscedasticity, autocorrelation, ARDL model specification and model stability.

4.7.1 Normality Test

The Jarque-Bera statistic was employed to test for normality. The null hypothesis was that the residuals are normally distributed while the alternative hypothesis was that the residuals are not normally distributed. The probability value of 0.62 is greater than the significant level of 0.05. Hence, the null hypothesis was that the residuals normally distributed could not be rejected and the conclusion was that there is normality.

4.7.2 Heteroscedasticity

The Breusch-Pagan-Godfrey test examined the consistency of the variance of residual. The null hypothesis that there was homoscedasticity was rejected since a p-value of 0.29 is greater than the select significance level of 5%. Hence, there is evidence of consistency in variance of residual.

Table 4. 18: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.338919	Prob. F (21,13)	0.2983
Obs*R-squared	23.9341	Prob. Chi-Square (21)	0.2963
Scaled explained SS	2.989487	Prob. Chi-Square (21)	1

4.7.3 Serial Correlation

The Breusch-Godfrey Serial Correlation LM Test was carried out to find out whether the residual is correlated with its lagged values. This test is based on the null hypothesis that

residuals are not serially correlated. The p-value (0.43) is in favour of the null hypothesis, thus concluding there was no serial correlation.

Table 4. 19: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.097072	Prob. F (5,8)	0.4309
Obs*R-squared	14.23675	Prob. Chi-Square (5)	0.0142

4.7.4 Linearity Test

The Ramsey Regression Equation Specification Error Test (RESET) test based on the null hypothesis that there is linearity was used to investigate whether the model was correctly specified and there is a linear relationship between variables included in the model. Evident from the table below shows that the p-value of 0.47 is greater than 5%, hence the conclusion that there is linearity, and the model is correctly specified.

Table 4. 20: Ramsey Regression Equation Specification Error Test

	Value	df	Probability
F-statistic	1.018654	(5, 8)	0.466
F-test summary	Sum of Sq.	df	Mean Squares
Test SSR	0.001876	5	0.000375
Restricted SSR	0.004823	13	0.000371
Unrestricted SSR	0.002947	8	0.000368

4.7 Chapter Summary

It is evident from Table 4.5 that tax has a non-negative contemporaneous effect on GDP growth as the coefficient is significant at 10%. On the other hand, the effect of tax on economic growth became negative in the 3rd and 4th year, thus implying the crowding out effect on the GDP by high tax collected in the past. Table 4.6 shows that economic growth has positive contemporaneous effect on taxation. This means that high GDP allows government to collect more taxes in the current period. There is no evidence of lag effects running from GDP to tax as the past values are all insignificant. The Engel Granger causality proved that the no causal relationship between tax and economic growth.

CHAPTER FIVE

CONCLUSIONS, POLICY IMPLICATIONS, AND RECOMENDATIONS

5.0 Introduction

This section presents the main findings and their implications on the policies for Namibia. The results of the current study revealed that contemporaneous GDP growth is negatively and significantly affected by past values of tax. Thus, it is critical to bring out or recommend tailored policies that achieve equity or income redistribution (via tax) without compromising on the future ability of firms to boost production through retained profit or investment. Low production means low GDP.

5.1 Summary of findings and implications

The main finding of this study was that there is no long-run relationship between tax revenue and GDP growth. This is indicated by the result of the ARDL bound test for co-integration (Table 4.4). The results imply that tax revenue and economic growth have no common trend that combines them in the long run. This simply means that the success and progress of the fiscal authority in terms of tax collection may not be concluded from GDP expansion and vice versa.

Furthermore, the evidence of no co-integration between net tax and GDP prompted the utilization of the short-run ARDL model. The first equation generated from the short-run ARDL model indicated that net tax revenue (particularly the third lag) has a negative effect on economic growth. This means that heavy tax on production reduces retained profit and investment and eventually decreases aggregate output. Hence, the fiscal authority needs to implement tax rates that are optimum to mitigate the crowding-out

effect. Moreover, the Granger causality results in Table 4.6 proved that there is no causality between variables of interest (LNGDP and LNT). These findings imply that there is no causal relationship between economic growth and taxation in Namibia. Hence, none of the variables contain information that is useful in predicting the other variable.

5.2 Conclusions

The main objective of this study was to investigate relationship between tax revenue (as a proxy for taxation) and GDP (as a proxy for economic growth). The findings of the ARDL bound test revealed that there is no long relationship between economic growth and tax revenue. Tax revenue has a short-term negative effect on economic growth while economic growth has non-negative effect on tax revenue.. It was concluded from the findings of this study that neither tax revenue granger causes economic growth nor economic growth granger cause the tax revenue. Hence there is no causal relationship between the two variables.

5.3 Recommendations

Based on the findings of a positive significant effect of economic growth on tax, it is recommended economic growth should be boosted by increasing productivity (supply side policy) and increasing spending (demand side policy). The supply-side policies include increasing access to finance for businesses and subsidizing the cost of production, especially in growth-driving sectors. Strengthen training programs, particularly in the areas of entrepreneurship and the country's priority industries such as mining and agriculture.

This increases production activities, tax base, and eventually tax revenue collection. Moreover, provided the negative significant effect of tax on economic growth, tax imposed on both businesses and households should be reasonable/optimum. High tax rates reduce income available for both household spending and investment expenditure. Although it is believed more tax revenues increase aggregate expenditure through government spending, excessive taxes can possibly reduce aggregate demand through a decline in private consumption and investment. It is recommended that the tax rate should not be too high to allow for high investment and economic growth.

5.4 Directions for further research

In the final analysis, the study focused on net tax, yet it is known there are various components of government revenue such as direct tax and non-tax revenue which may provide evocative results. Thus, there is room for the extension of the study in the future by focusing on the different components of tax. In other words, an investigation can be made on how results change when each tax type, say income tax, corporate tax, and property tax are treated as stand-alone variables in the model. In the same vein, there is a potential to disaggregate production into sectors such as primary, secondary, and tertiary; to observe changes in findings. Probably, tax is mainly collected in one sector than other sectors hence tax revenue is only linked to the production in that sector. Likewise, production can be further subdivided into economic activities such as mining, fishing, retailing, etc. to investigate changes in results.

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ETHIC STATEMENT

Since this research involved secondary data, it was required that an exemption from ethical clearance is granted prior to the commence commencement of data collection. The researcher applied for exemption and the exemption letter (see appendix one) was awarded by the University of Namibia through the Faculty of Commerce, Management and Law Decentralized Ethics Committee (DEC).

APPENDIX ONE

ETHICS CLEARANCE: EXEMPTION LETTER

University of Namibia, Private Bag 13301, Windhoek, Namibia
340 Mandume Ndemufayo Avenue, Pioneerspark
☎ +264 61 206 3111; URL.: http//www.unam.edu.na

UNAM
UNIVERSITY OF NAMIBIA

Approval for Exemption from Ethical Clearance

Ethical clearance exemption reference N0: DEC FOC/ 38/ 11

Review Date: 09/11/2023

Title of Project: **AN INVESTIGATION OF THE RELATIONSHIP BETWEEN TAX REVENUES AND ECONOMIC GROWTH: THE CASE OF NAMIBIA**

Student Name: **LUKAS KUMONIKA**
Student Number: **201409729**

Supervisor(s): **DR SAKARIA KALUMBU**

Dear Sir/Madam.

This letter certifies that the application for the procedure stated above has been reviewed by the Faculty of Commerce, Management and Law Decentralized Ethics Committee (DEC). The Ethics Committee has given due consideration and concludes that the said proposal be exempted from review as it does not involve direct contact with human participants and in addition your study relies on secondary data which does not require ethical clearance. This is aligned to the University research ethics policy on ethical exemptions page no.16 (C1.3). Please note that any changes to the procedure must be brought to the notice of the DEC. The DEC must determine whether the requested procedure changes alter the risks.

Please contact the DEC office if you have any questions. Any correspondence with the DEC office regarding this action should mention the allocated Ethical clearance exemption reference number indicated at the top of this letter.

The ethics committee wishes you the best in your research.

Regards,

Dr Kalumbu (Decentralized Research Ethics Committee)

Prof. Davis Mumbengegwi ((Head, Multidisciplinary Research)

APPENDIX TWO

PROOF OF LANGUAGE EDITING

P.O. Box 4005, Ongwe Street, Ongwediva, kchingwe2@gmail.com, +264814061983

Date: 3 November 2023

To whom it may concern.

REF: CERTIFICATE OF LANGUAGE EDITING

This serves to confirm that the mini-thesis titled "**An investigation of the relationship between tax revenues and economic growth: The case of Namibia**" by Lukas Kumonika (201409729) has been proof- read and language edited by Dr. Shuvai Chingwe. Dr. Shuvai Chingwe is an independent researcher who holds a Doctor of Philosophies Degree in Development Studies and a Master's Degree in Public Administration. Dr. Shuvai Chingwe has vast experience in research supervision, proof reading and language editing of post-graduate research projects and other corporate documents.

We guarantee language accuracy in the text as edited and delivered to the author on the 3rd of November 2023. We make no claim as to the substantive matter covered by the paper and have not altered the intent or research content drafted by the author.

Yours Faithfully
Shuvai Chingwe