

THE IMPACT OF IMPORTED SERVICES ON VAT REVENUE IN MALAWI

MASTER OF ARTS (ECONOMICS) THESIS

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UNIVERSITY OF MALAWI

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MASTER OF ARTS (ECONOMICS) THESIS

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UNIVERSITY OF MALAWI

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DECLARATION

I, the undersigned, hereby declare that this thesis is my own original work which has not been submitted to any other institution for similar purposes. Where other people's work has been used, acknowledgement has been made.

PRINCE MICHAEL KAPANGE

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Signature

Date

CERTIFICATE OF APPROVAL

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with their approval.

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DEDICATION

I dedicate this thesis to my lovely wife Dyles.

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ABSTRACT

Malawi's national budgets show that the country relies heavily on tax revenue. Malawi enforces the Taxation Act (1964), the Customs and Excise Act (1969) and the VAT Act (2005) to collect both direct and indirect taxes for financing both recurrent and capital expenditure. Despite such enforcement of tax laws, the country collects less revenue than what is required leading to budget deficits. Consequently, the government is compelled to resort to borrowing. Given that government borrowing has undesirable consequences, there is an urgent need to expand the tax base and widen the tax net for increased tax revenue. Imported services constitute a potential source of huge VAT revenue for Malawi. This is due to increased international trade in services resulting from great technological advancements that have made the world a global village. Unlike in the past, people nowadays find it easy to import both digital and non-digital services into the country. The potential of imported services to produce huge VAT revenue may face stumbling blocks considering that the VAT Act (2005) requires importers of these services to compute VAT on the value of imported services and remit it to MRA. This provision in the law is likely to encourage most importers of services to evade VAT on the services. As a result, the country is likely to suffer tax revenue losses leading to an exacerbation of budget deficits and, by extension, government borrowing. Therefore, the current study set out to assess the impact of imported services on VAT revenue in Malawi. The study employed GDP, exports, foreign exchange rate and inflation rate as control variables. Considering the nature of time-series data, the study employed the zivot-andrews unit-root test. Furthermore, the study employed the Gregory-Hansen co-integration test in order to test for long-run relationships while accounting for structural breaks in the data. Results of the zivot-andrews unit-root test led to the ARDL model being adopted for the study. ARDL model regression results show that while imported services have a significant impact on VAT revenue in the short run, they have no impact on VAT revenue in the long run. This is a sign of inefficiencies in strategies employed to collect VAT on imported services. Therefore, as a policy recommendation, government should amend the VAT Act (2005) to require foreign companies exporting services to Malawi to register for VAT in Malawi.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARDL	Auto-Regressive Distributed Lag
DF	Dickey-Fuller
GDP	Gross Domestic Product
IMF	International Monetary Fund
MK	Malawi Kwacha
MP	Member of Parliament
MRA	Malawi Revenue Authority
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
PAYE	Pay As You Earn
VAR	Vector Auto-Regressive
VAT	Value-Added Tax
VEC	Vector Error Correction

CHAPTER 1

INTRODUCTION

1.1 Motivation of the Study

Each and every government across the world needs revenue in order to run its operations. Government revenue consists of both tax and non-tax revenue. Examples of taxes levied worldwide include income tax, value added tax, excise tax and customs duties whereas examples of non-tax revenue are dividends, profits, interest, licence fees and grants. Golit (2008) observes that tax revenue increasingly accounts for a larger proportion of total government revenue and most third-world countries are intensifying efforts aimed at designing tax systems that are capable of generating sufficient revenue to finance public expenditure. According to OECD et al.(2021), revenue statistics for 2019 show that out of 31 selected African countries, non-tax revenue exceeded tax revenue in only 3 of them whereas the rest mobilised more tax revenue than non-tax revenue. The components of non-tax revenue in the study included grants, returns on government market investments, rents on the extraction of resources from public land, sales of government-produced goods and services, and the collection of fines and forfeits. The finding above underlines how significant tax revenue is to most governments.

Collecting taxes is the most fundamental way for countries to generate public revenues that make it possible to finance investments in human capital, infrastructure and the provision of services for citizens and businesses. Many countries are struggling to collect sufficient revenues to finance their own development. As a result, they run budget deficits which they finance through borrowing. Borrowing by governments is not desirable as it has its own problems. As Yusuf & Mohd (2021) note, government deficit financing through domestic and external borrowing may result in increased interest rates, lower disposable income and

higher wages all of which reduce the profitability of businesses and by extension private investment.

Like most other countries, Malawi is heavily dependent on tax revenue for government operations. According to the 2022/2023 budget statement, total revenues and grants for the 2022/2023 fiscal year were estimated at MK1.956 trillion, of which MK1.528 trillion or 78 per cent was estimated to be tax revenue. This huge need for tax revenue calls for robust tax collection strategies in the country.

Recent technological advancements leading to globalisation have enabled international trade in services to flourish. Amador et al. (2019) observe that the progress in information and communication technologies has been key to increasing trade in services both within and among countries. The World Trade Organisation (2019) observes that, since the year 2000 and especially after 2011, the expansion of trade in services has outpaced that of trade in goods. According to Knoema (2022), Malawi's imported services increased from 221 million US dollars in 2002 to 591 million US dollars in 2021 growing at an annual rate of 7.21%. The country's imported services for 2021 mainly consisted of transportation, other business services, business and personal travel, insurance services, computer and information services, and royalties and licence fees.

Generally, imports of services consist of both digital and non-digital services. A distinction needs to be made between imported digital services and imported non-digital services. Digital Services is a term that refers to the electronic transfer of information including data and content over the internet. Examples of digital services include games, e-books, cloud-based software and video streaming.

As can be seen from the definition of digital services above, consumers can order services online while in the comfort of their homes. For example, a company in Malawi can choose to purchase software from Microsoft online. Another example of a digital service is streaming videos on Netflix.

With regard to imports of non-digital services, a consumer can engage a foreign supplier to supply a service to the consumer in the consumer's country with the supplier having to travel. For example, a Malawian bank can engage a South African consultant to provide consultancy services in Malawi. In essence, this Malawian bank has imported a service from

South Africa. The above scenario constitutes a digital service if the foreign consultant chooses to offer the service virtually.

The increase in international trade in services has created huge potential for Malawi to collect more VAT on imported services. According to the VAT Act (2005) of Malawi, imported services are subject to VAT at 16.5 %. The focus, therefore, of this research is to assess the impact that imported services have on VAT revenue collection in Malawi.

1.2 Statement of the Research Problem

Malawi has been struggling to raise enough revenue for both recurrent and capital expenditures leading to huge budget deficits that are financed using loans and grants. These budget deficits have led to a rise in national debt, higher interest payments resulting in crowding out of private investment, among others. According to the 2020-2021 mid-year public debt report by the Ministry of Finance (2021), as at end-December 2020, Malawi's Total Public Debt stock amounted to MK4.76 trillion or 54 percent of rebased GDP, up from MK4.13 trillion or 47 percent of rebased GDP, in June 2020. This represents an increase of 15 percent or 7 percentage points of GDP between the two periods.

Fortunately, the public debt problem may be solved by increased VAT collection on imported services for Malawi owing to increased globalisation caused by innovations in information and communications technologies. A report by the World Trade Organisation (2019) states that trade in services has been expanding at a faster pace than trade in goods since 2011. The report further observes that services currently account for around three quarters of GDP in developed economies, up from 40 per cent in 1950, and many developing economies are becoming increasingly services-based. In addition, in some cases, this is occurring even more rapidly than in developed economies.

This increase in services trade creates huge potential for more VAT being collected on services imported into Malawi. However, since the imported services are invisible and importers are required to charge themselves VAT and remit it to MRA, the revenue potential may not be reached. In Malawi, no research has been conducted to assess the impact of imported services on VAT revenue collection.

1.3 Significance of the Study

Public knowledge of the impact of imported services on VAT revenue collection in Malawi is of paramount importance as it can inform tax policies for the country. For instance, VAT law governing current strategies for VAT collection on imported services may be amended depending on the results of the study.

Considering that imported services are invisible and reverse charge is in use, an increase in imported services may not lead to an increase in VAT revenue. An importer of a service may choose to not subject the service to VAT. This would lead to loss of much-needed tax revenue for government.

This is the first study in Malawi assessing the impact that imported services have on VAT revenue. Therefore, this study is justified because it will fill the huge knowledge gap on the subject.

1.4 Objective of the Study

The VAT Act (2005) requires VAT to be charged on imported services. This implies that every importer of services is under obligation to operate reverse charge. The main focus of this research is to assess the impact of imported services on VAT revenue collection in Malawi.

1.5 Study Hypothesis

The research will test the following null hypothesis:

- a. Imported services do not have a significant impact on VAT revenue.

The hypothesis will be used to evaluate Malawi's strategies for collection of VAT revenue on imports of services.

1.6 Organisation of the Thesis

The thesis is organised as follows:

Chapter 2 presents an overview of the VAT system in Malawi.

Chapter 3 is a review of both theoretical and empirical literature on VAT revenue for the analysis of the findings of this study.

Chapter 4 looks at the methodology that is used to assess the impact of imported services on VAT revenue. Included in this chapter are sources of data, variables used, expected signs of coefficients, unit root tests, co-integration tests, model specification and diagnostic tests.

Chapter 5 focuses on presentation and interpretation of results.

Last but not least, chapter 6 is an outline of summary and policy recommendations. In this chapter, the paper also gives a description of an area for further research.

CHAPTER 2

AN OVERVIEW OF THE VAT SYSTEM IN MALAWI

Malawi uses three Acts for collection of taxes namely the Taxation Act (1964), the Customs and Excise Act (1969) and the VAT Act (2005). The taxation of income from individuals and businesses is governed by the Taxation Act (1964), the collection of customs duties and excise tax is administered under the Customs and Excise Act (1969) while the collection of VAT is administered under the VAT Act (2005). These Acts have undergone several amendments over the years since their enactments.

Upon gaining independence in 1964, Malawi inherited the British tax system which heavily relied on direct taxes collected from individuals and business entities. Personal taxes were collected from individuals working in the public sector and large firms and had four categories: minimum taxes (head tax) levied on income less than graduated tax and all males above 18 years were required to pay them, graduated tax was levied on income above specified amounts and had five brackets, assessed tax for self-employed in farming and petty trading, and PAYE (Macha et al 2018).

Soon after independence, the government realized the full extent of the resource constraint it faced considering the high expectations among Malawians for better lives. Shalizi et al (1990) observe that in a four-year period from 1978 to 1982, servicing of external debt doubled to 28 percent of current expenditures and defence spending also grew as a result of the unrest in Mozambique. This led government to reform the tax system with a view to generating adequate revenues to finance the ever-growing public expenditures. Surprisingly, the reforms implemented did not achieve the intended result of more revenue generation. Chafuwa et al. (2014) note that the tax reforms were taken on an ad-hoc basis as they lacked long-term vision, in-depth macroeconomic analyses and proper coordination leading to a deterioration of the tax system and severe distortions in the economy. As a result, the

Government of Malawi sought the assistance of the International Monetary Fund and the World Bank to reform the tax system in the mid-1980s under the Structural Adjustment Programmes. The objectives of reforming the tax system were to increase revenue generation, improve efficiency and equity of the tax system and enhance the country's international trade competitiveness. Largely, the tax policy reforms emphasized the need to expand the tax base by incorporating other forms of income in the tax fold, reviewing the tax rates, sealing loopholes, discouraging tax evasion, reducing exemptions and changing the tax administrative structures (Chafuwa et al., 2014).

According to Chipeta (1998), Government introduced a form of indirect taxes known as surtax in 1970 under Bill 38 of 1970 as part of reforms to broaden the tax base. This tax was enforceable under the Customs and Excise Act (1969). The surtax rate was set at 5 percent and was applied on sales of domestically manufactured goods and imports. Exports, capital goods, manufacturers' raw materials and low-income basic consumer goods were all exempt from this tax. One of the features of surtax was called ring system. Under the ring system, all registered manufacturers were treated as a ring and sales made within the ring were exempted from surtax while sales made to customers outside the ring were subjected to surtax.

Some years after the introduction of surtax, Malawi made a number of surtax reforms. In 1971, Government raised the surtax rate from 5 % to 10 % and later in 1977, it raised the rate to 15 %. In 1979, Government increased the rate of surtax on domestic transactions from 15 % in 1977 to 17 %. Later in 1980, the rate went further up to 20 %. The surtax rate on imports also rose to 20 % in 1979 and 25 % in 1980. In 1988, further surtax reforms were made and their focus was on restructuring the rates to five categories which were 0 %, 10 %, 35 %, 55 % and 85 %. In 1993, Government streamlined the surtax rates of most products to a standard rate of 20 % so as to improve compliance among surtax operators, simplify the administration of surtax and further boost production and consumption. In 1989, surtax was extended to services such as repackaging, advertising, repair, bottling, financing and assembling. Between 1991 and 1999, surtax was further extended to goods and services such as electricity, telecommunication services, some professional and business services, hotel and restaurant services, imported fruits, photocopying services and rental of registered conference halls. Government continued to rationalise surtax rates on products with the objectives of putting an end to product misclassification, simplifying tax

administration, improving compliance, controlling smuggling and making local products competitive on international markets. In 2002, Malawi repealed Section 12A of the Customs and Excise Act (1969) and enacted a Surtax Act which extended the application of the tax from manufacturing to wholesale and retail with 20 % being the standard rate. This created a further expansion in the country's tax base. The standard rate was reduced to 17.5% from 20 % in 2003. Bill 7 of 2005 introduced and put VAT into operation on 1st January 2005 to replace Surtax. The tax was designed to avoid the cascading effect of surtax on intermediate inputs thereby removing distortions affecting input choices in production.

Section 7 of the VAT Act (2005) stipulates that VAT is charged on:

- (a) every supply of goods and services made in Malawi;
- (b) every importation of goods;
- (c) the supply of any imported service, other than exempt goods and services.

According to the VAT Act (2005) of Malawi, there are three types of supplies namely taxable supplies, exempt supplies and relief supplies. Taxable supplies are comprised of zero-rated supplies which attract a VAT rate of 0 % and standard-rated supplies which attract a VAT rate of 16.5 %. Exempt supplies are not subject to VAT. Relief supplies are taxable supplies that do not attract VAT on account that the supplies have been made to individuals, organisations and businesses specified in the third schedule to the VAT Act (2005).

Business entities supplying zero-rated goods or services do not charge output VAT on the supplies that they make. However, they claim input VAT on purchases made for the taxable business. Business entities supplying standard-rated goods or services charge output VAT on the supplies and claim input VAT on purchases made for the taxable business. Business entities supplying exempt goods or services do not charge VAT on the supplies and do not claim input VAT on the purchases made for the business.

As stipulated by the VAT Act (2005), imported services, whether digital or non-digital, are subject to VAT at 16.5%. With regard to services supplied within Malawi, registered business entities normally collect VAT on behalf of government. Reverse charge is a deviation from this normal rule since suppliers of imported services do not charge VAT on the services that they render to their customers. Instead, customers pay net amounts to

suppliers, calculate VAT on the services and remit it to MRA. This shows that with reverse charge VAT in Malawi, it is the obligation of the importer of services, rather than the suppliers, to account for VAT to Government.

CHAPTER 3

LITERATURE REVIEW

3.1 Theoretical Literature

The introduction of VAT is credited to Maurice Lauré, a French economist, and in 1954, France became the first country to adopt VAT on a large scale (Ufier, 2014). VAT served as an improvement on the earlier turnover tax whereby a product had been taxed repeatedly at every stage of production and distribution without relief for taxes paid at previous stages. VAT is currently the world's most common form of consumption tax, in place in more than 160 countries including every economically advanced nation except the United States of America.

Bikas & Andruskaite (2013) define VAT as an indirect tax levied on public and private consumption whereby at each intermediate stage of production or distribution, the tax burden is transferred from sellers to buyers of the product until it reaches the final stage where products are sold to the final consumer who bears the tax burden. Alizadeh & Motallabi (2016) define VAT as a multi-step tax obtained in different steps of importing, production and distribution based on the added value of the sold goods and delivered services. According to Godin et al (2015), VAT is essentially a tax on consumption. This means that the more a consumer buys taxable goods and services, the more VAT they pay.

The popularity of VAT across the world is attributed to its desirable features. First, VAT is a neutral tax in that it does not represent a real cost to anyone but the final consumer. Famulska & Rogowska-Rajda (2018) argue that VAT is neutral in the sense that VAT-registered businesses have the right to deduct input VAT charged on purchases of goods and services from output VAT thereby being relieved of the burden of VAT. Furthermore, they contend that VAT is neutral considering that supplies of goods or services that are similar and in competition with each other are treated equally for VAT purposes. In this context,

neutrality preserves competition among enterprises. Second, Williams (1996) argues that with VAT, there is potential scope for identifying and taxing the economic contribution or added value made by any commercial activity. Third, De Mello (2009) notes that VAT is relatively simple to collect because of its credit mechanism. Fourth, VAT significantly boosts tax revenues of countries as supported by Keen & Lockwood (2010) who state that most stakeholders refer to VAT as a cash machine.

Most countries employ the credit-invoice method in their implementation of VAT (Keen et al, 2006). In a credit-invoice method, VAT-registered businesses assess tax on taxable goods and services each time they supply them to either a business or a consumer. Registered traders are then permitted to reduce the amount of VAT they are liable to remit to the government by a credit equal to the amount of VAT paid to other registered traders in purchasing business inputs. The credit eliminates the VAT on goods and services used by a registered trader while leaving intact the VAT on sales to final consumers. Therefore, the total tax burden for a supply chain is the same irrespective of the number of stages in the chain. In contrast, the total tax burden of a turnover tax which applies at each stage without any deductibility increases with the length of the chain. This distorts a firm's production choices towards the use of inputs from short supply chains or causes firms to vertically integrate.

There are several factors that influence VAT revenue collection in an economy. Legeida & Sologoub (2003) distinguish between two main groups of factors that influence VAT accumulation: VAT rules (rates, basis, etc.) and other variables of economic activities, conditioning tax basis and compliance of tax regulations. Therefore, VAT revenue is determined by a number of factors including the economic situation of a country which is best characterised by GDP.

Bikas & Andruskaite (2013) opine that VAT is determined by levels of exports and imports. They argue that since VAT is not imposed on exports as they are zero-rated, an increase in them could lead to a decrease in VAT revenue. As an illustration, if taxable products are produced and consumed locally, registered businesses collect VAT on them and remit it to Government. However, if these products are exported, no VAT is collected on them leading to a decrease in VAT revenue. Hybka (2009) states that imports have the opposite effect on VAT revenue as compared with exports. His argument is that as imports are the target of VAT in the consuming country, an increase in them results in higher VAT revenue.

Bikas & Raškauskas (2011) consider households as the main payers of VAT. In light of the households' core income being wages, the authors regard unemployment as a factor influencing VAT revenue. This is likely to hold in practice since employed people have the financial capacity to purchase more goods and services on which VAT is collected.

Tanzi (1989) observes the existence of an often negative relationship between a country's VAT revenue and its official exchange rate in developing countries. An appreciation of the official exchange rate which is a fall in domestic currency units per unit of foreign exchange, leads to a decrease in VAT revenue and vice versa. This is because the tax base of imports is determined by the domestic value of the imported products measured at the official exchange rate. On the one hand, an appreciation of the official exchange rate would lead to a decrease in the domestic value of imported products for VAT computation leading to a decrease in VAT revenue. On the other hand, a depreciation of the official exchange rate would lead to an increase in the domestic value of imported services for VAT computation thereby bringing about an increase in VAT revenue.

The occurrence of inflation has a consequence of reducing public consumption of goods and services (Mahadianto et al., 2019). Given VAT revenue is highly dependent on the level of public consumption, inflation leads to low VAT revenue. It is further argued that governments need to maintain economic stability so that consumption levels continue to be stable, which will certainly have a positive impact on VAT revenue.

This study has adopted a theoretical model employed by Wawire (2017) which is based on Paul Samuelson's fundamental general equilibrium model of public sector activities (Samuelson, 1954) (Musgrave & Musgrave, 1989). The focus is on government financing required for provision of public goods. The fundamental general equilibrium model considers both the government revenue and its expenditure to provide public goods.

The model assumes the presence of a pure private good, Q_a and a pure public good, Q_b and that the private sector is initially in control of all resources. For good Q_b to be produced, government must transfer resources from the private sector. Another assumption is that government uses taxes to fully finance its activities. Furthermore, it is assumed that there is a set of individualistic preferences, $U(Q_a, Q_b)$ embodying continuously diminishing marginal rates of substitution between the public and private goods (Stiglitz, 2000). The demand function for the public good is derived by considering a model of utility-

maximizing behaviour coupled with a description of underlying economic constraints. The basic assumption is that a rational individual will always choose the most preferred bundle (x) that consists of both public and private goods from a set of affordable alternatives (X) that satisfy the individual's budget constraint. If Y is a fixed amount of income available to the individual and $p = (p_a, p_b)$ is a vector of prices for a private good and a public good respectively, the set of affordable bundles and the budget of the individual can be given by:

$$B = \{x \in X: PX \leq Y\}$$

The problem of utility maximization is then expressed as:

$$\text{Max } U(x) \text{ Such that } PX \leq Y \text{ and } x \text{ is a subset of } X$$

However, Varian (1992) notes that under the local non-satiation assumption, a utility-maximizing bundle x^* must meet the budget constraint with equality. As a result, the utility maximisation problem is re-stated in indirect form as follows:

$$V(P, Y) = \text{Max } U(x)$$

$$\text{Such that } PX = Y$$

The value of x that solves this problem is the individual's demand bundle which expresses how much of each good the individual would buy at given levels of prices and income. The function that relates P and Y to the demanded bundle, conditional on other covariates is the individual's demand function. The individual's bundle that maximizes utility is at a point where the budget line is tangent to the indifference curve (Varian, 1992). Therefore, a rational individual would choose to allocate the income between public and private goods in such a way that the marginal rate of substitution of the public good for private good ($MRS_{a,b}$) equals the ratio of their prices as stated below:

$$MRS_{a,b} = -P_a/P_b.$$

The above equation may not always hold because free foreign trade may prevent efficient allocation of income over time (Nath, 1979). Therefore, world prices should be accounted for in the optimum allocation of income between public and private goods such that the marginal benefit of any good must be equal to its marginal cost which should be equal to its world price in a competitive foreign market. Symbolically, we have:

$$MRS_{a,b} = -P_a/P_b = -P_{aw}/P_{bw}$$

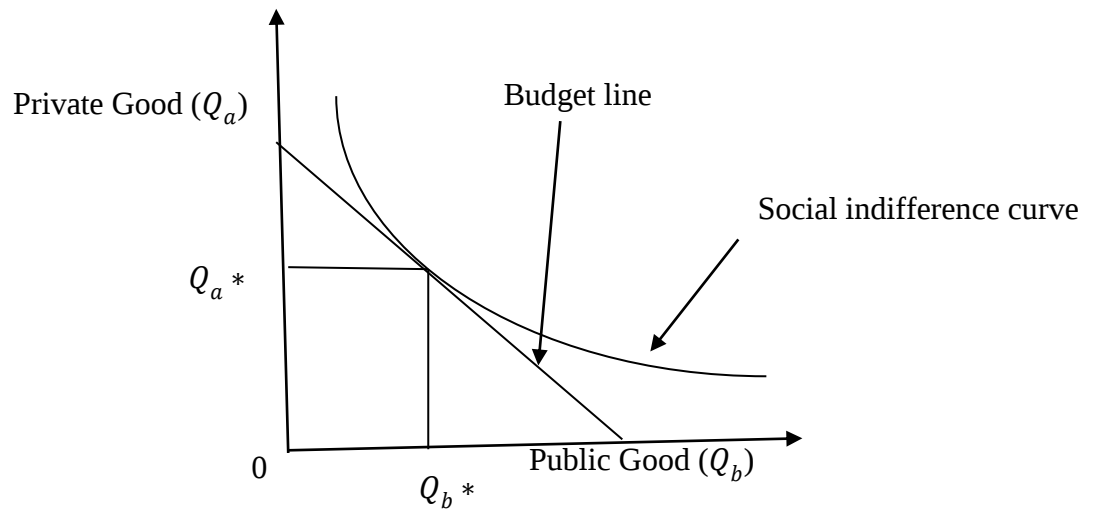


Figure 1: Budget Line-Indifference Curve Tangency Condition for Utility Maximisation.

Source: Wawire, H.W. (2017)

Q_a^* and Q_b^* are the optimal quantities of the private good and public good respectively that should be provided. Income and the prices of the public good and the private good determine the position and slope of the budget line. For each level of income, there will be some optimal choice for each of the goods. The optimal choice for the public good at each set of prices and income represents the demand function whose general form is as follows:

$$Q_b = f(P_b, y, z)$$

where Q_b represents the demand for the public good by an individual, P_b is the price that an individual pays for a unit of the public good, y is the income of the individual, and z is a vector of variables reflecting such things as the economic and political composition of the economy (Barnett, 1993). y is exogenously determined whereas P_b depends on the tax share which is determined by the tax base of an economy. Stiglitz (1988) notes that the demand curve is actually the marginal willingness to pay curve. At each level of output of the public good, the demand curve shows how much the individual would be willing to pay for an extra unit of the public good. The tax price of the public good at the optimal level is equal to the marginal rate of substitution which is the amount of the private good that an individual must give up for one more unit of the public good. A change in income alters the

vertical intercept of the budget line with its slope remaining unchanged as long as prices are fixed. An increase in income shifts the budget line to the right parallel to the original one. An individual can now purchase more of both goods and attain a higher utility-maximizing consumption choice for both public and private goods. Consequently, a locus of utility-maximizing bundles known as the income expansion path is created. It is from the income expansion path mentioned above that an Engel curve is derived. As can be seen in the figure below, an Engel curve relates income to the quantity demanded of the public good.

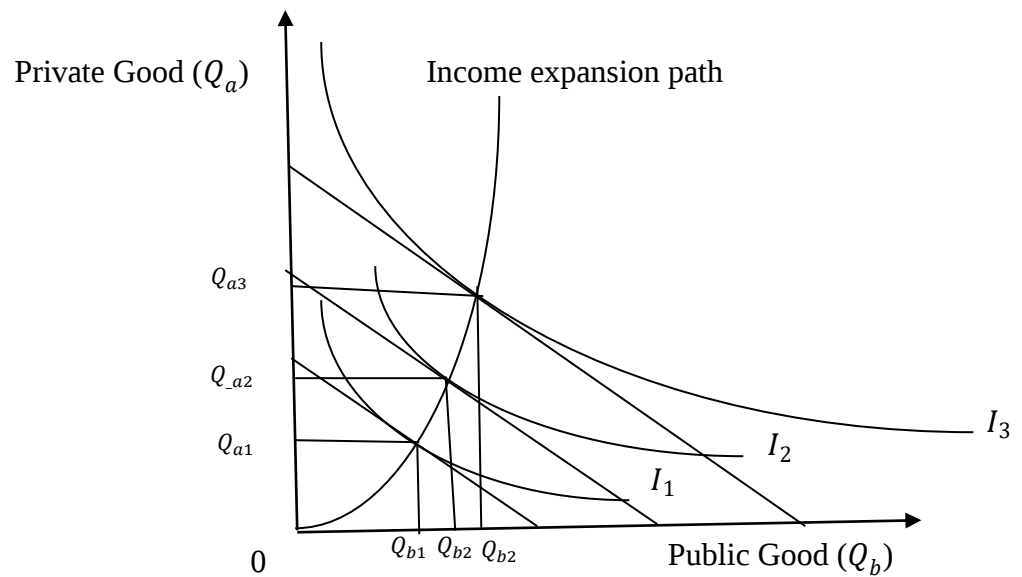


Figure 2: The Income Expansion Path. **Source:** Wawire, H.W. (2017)

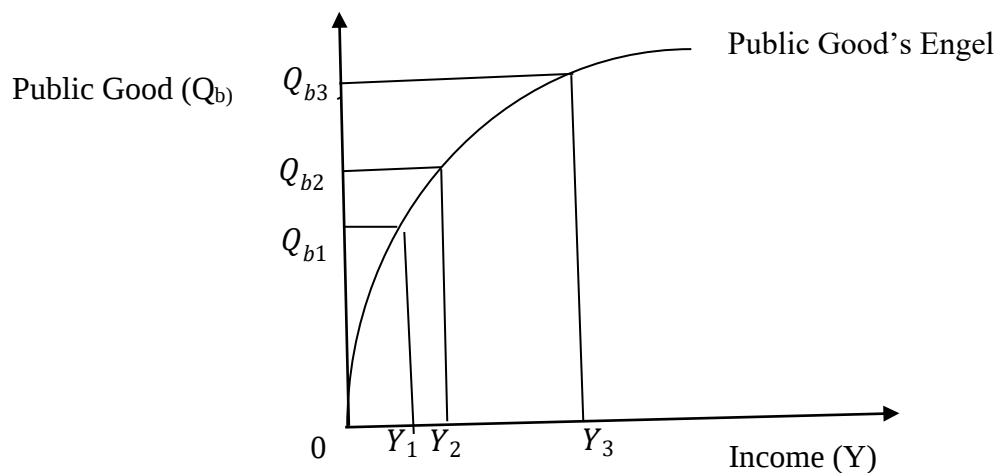


Figure 3: The Engel Curve. **Source:** Wawire, H.W. (2017)

Suppose the government wishes to tax a utility-maximizing individual in order to obtain a certain amount of revenue that it uses to provide the public good the individual consumes, the revenue to be obtained would depend on the tax base such as the individual's income. In this study, total VAT revenue is taken as a function of income. This relationship permits the estimation of Engel curves that relate the amount of tax revenue to income. Empirically, tax revenue functions are proxies for Engel curves. Since taxes are used to finance public goods, a relationship of tax revenue to income (GDP) serves as a proxy for the relationship between consumption of a public good and income, which is a public good's Engel curve. The factors in this study that shift the Engel curves are imported services, foreign exchange rate, inflation rate and exports.

3.2 Empirical Literature

A considerable amount of research has been conducted across the world to empirically establish factors that influence tax revenue. Gupta (2007) investigates the principal determinants of tax revenue performance across developing countries, including Sub-Saharan Africa, by using a broad dataset for 120 countries. The results show that factors such as per capita GDP, trade openness and foreign aid significantly influence the tax revenue performance of an economy. The paper also employs the findings of a revenue performance index to argue that, with the current levels of tax rates and increasing tax competition in Africa, further increases in tax rates would lead to undesirable results. An increase in tax rates would lead to tax evasion. Therefore, he suggests broadening the tax base as a more effective way of generating domestic revenue.

Mahdavi, (2008) carried out a study to establish the determinants of tax revenue. He used data on 43 developing countries covering a period from 1973 to 2002. He established that inflation is inversely related to tax revenue. In their study of the determinants of tax revenue in Pakistan, Chaudhry & Munir (2010) found foreign exchange rate to be negatively related to tax revenue collection. In addition, they found inflation to be statistically insignificant in determining tax revenue. Masiya & Chafuwa (2015) conducted a study in Malawi on the determinants of tax revenue using data from the year 2003 to 2012. On the one hand, the study found GDP, broad money and the lagged value of tax revenue to be positively related

to tax revenue. On the other hand, the study found inflation and the exchange rate to be insignificant in influencing tax revenue.

Palil (2011) examined the determinants of tax compliance in Malaysia leading to improved tax revenue collection. The results suggest that tax knowledge has a significant impact on tax compliance and, therefore, on revenue collection, despite the level of tax knowledge varying significantly among respondents. The results also indicate that the probability of being audited, perceptions of government spending, penalties, personal financial constraints and the influence of reference groups all influence tax revenue collection.

Adam et al. (2001) argue that a real depreciation of the real exchange rate is revenue inducing in sub-Sahara Africa. Fierro et al (1990) also provided evidence to show that a devaluation of the exchange rate has an overall positive effect on revenue generation in Korea and Mexico.

Bogetic et al (1993) carried out a study on the determinants of VAT revenue. In the study, they used a sample of 34 countries and found tax rate, tax base and tax rate dispersion as the key variables influencing VAT revenue performance. The first two variables increase tax revenues whereas tax rate dispersion, which is the difference between the highest and the lowest VAT rates, tends to reduce it. They also found in the same study that countries with a single VAT rate tend to have more revenues than countries with several rates. Bikas & Raškauskas (2011) also found a positive relationship between VAT rate and VAT revenues. Contrary to the above finding, (Matthews, 2003) found that changes in the standard VAT rate, where most of the changes are increases, have a negative impact on VAT revenues. The Laffer curve rationalises the preceding finding by showing that every economy has a revenue-maximising tax rate beyond which any further increases will promote non-compliance resulting in lower levels of tax revenues. As advice for countries with an appetite for raising VAT rates for increased revenue, Keen & Mansour (2009) argue that revenue generating potential for VAT can be maximised by expanding the bases through both tax policy changes and improving compliance rather than increasing standard VAT rates.

Adari (1997) implemented a study focusing on the introduction of VAT in Kenya that replaced sales tax in 1990. The study analysed the structure, administration and performance

of VAT. The estimated buoyancy and elasticity coefficients, which measure the total response of VAT revenue to changes in GDP, were less than unity implying a low response of VAT revenue to changes in GDP. This finding suggested the presence of laxity and deficiencies in VAT administration. Therefore, capacity building and closure of loopholes was likely to improve VAT buoyancy. Wawire (2017) carried out a study to investigate the determinants of VAT revenue in Kenya. He found GDP to have a positive effect on VAT revenue. Bikas & Andruskaite (2013) also found a positive relationship between GDP and VAT revenues.

Bikas & Andruskaite (2013) carried out a study aimed at analysing factors affecting VAT revenue collection in European Union countries. They found a positive relationship between imports and VAT revenues. Furthermore, they found a negative relationship between exports and VAT revenues.

In estimating the taxable capacity and collection efforts of Ghana's VAT, Andoh (2017) found inflation to have a negative effect on domestic VAT but a positive effect on import VAT. The negative sign is in support of results from a study by Fenochietto & Pessino (2013). Obviously, a higher rate of inflation reduces the purchasing power of consumers and, therefore, dampens consumption of goods and services resulting in a decrease in sales subject to VAT.

3.3 Conclusion

It is important to note that there is a lack of literature on the impact of imported services on VAT revenue. Furthermore, it can be seen from both the theoretical and empirical literature that there are many factors that influence tax revenue in general and VAT revenue in particular. While most empirical studies produced results that conform to a priori expectations, some found contrary results. One of the possible causes of such contrary findings could be ascribed to differences in economic environments across countries. It should also be noted that some empirical studies reviewed above found variables to have either a positive or a negative or even no effect at all on tax revenue. As tax revenue was generally treated given that it has several components, the current study specifically examining the determinants of VAT revenue may produce a result that is the opposite of those results from such previous studies. This is mainly because variables may affect different taxes differently. For example, a variable may affect VAT and income tax differently. The current study does not include all the variables that are regarded in the

literature as being important to VAT revenue collection. One of the reasons for this is unavailability of data on such variables. For instance, this study initially planned to include unemployment among the explanatory variables but has failed to do so because data on the variable is collected on a yearly basis whereas the study has employed quarterly data.

CHAPTER 4

METHODOLOGY

4.1 Variables in Use

The study has used VAT revenue, imported services, foreign exchange rate, GDP, inflation rate and exports as variables with the following relationship:

VAT Revenue = f (Imported Services, Foreign Exchange Rate, Gross Domestic Product, Inflation Rate, Exports).

These variables apart from inflation rate have been transformed to logs in order to examine their elasticity effects on the dependent variable.

4.2 Data Sources

The research has employed secondary data on VAT revenue sourced from Malawi Revenue Authority. Furthermore, the research has employed secondary data on imported services, foreign exchange rates, GDP, inflation rate and exports obtained from the National Statistical Office and the Reserve Bank of Malawi. These time series are quarterly data from 2005 to 2020. The choice of the year 2005 has been made considering that the VAT Act (2005) enabling VAT operation to be rolled out to all stages of the production and distribution chain took effect from 1st January 2005.

4.3 Expected Signs

A priori, imported services, GDP and foreign exchange rates are expected to have positive effects on VAT revenue whereas exports and inflation rate are expected to have negative effects on VAT revenue.

4.4 Model Specification

Considering developments in time series econometrics that clearly show that economic time series are not always stationary in their levels, diagnostic tests were conducted on each and every variable to check for the presence of stationarity. Basically, stationarity means that a time series has a constant mean and constant variance over time. Although not particularly

important for the estimation of parameters of econometric models, these features are essential for the computation of reliable test statistics.

One of the classical methods for estimating regression coefficients is the OLS method. One of the assumptions of this estimation method is that the variances and means of the time series are constant over time. Given that non-stationary time series do not meet this assumption, using the OLS method for estimations involving such time series would produce biased results. A check for stationarity should always be the first step in analysing time series because it offers direction with regard to what econometric model to use.

4.4.1 Unit-root Test

Some studies employ the ADF test which is an extension of the DF test to check for stationarity in the variables. While the DF test assumes that the error terms are independently and identically distributed, the ADF corrects for possible serial correlation in the error terms by adding the lagged difference terms of the dependent variable.

A time series may have structural breaks. In econometrics, a structural break is an unexpected shift in the time series data. This can lead to huge forecasting errors and unreliability of the model in general. A structural break may affect any or all of the model parameters, and these cases have different implications. If structural breaks are present in a data generating process but not allowed for in a unit-root test, then results of such tests may be biased towards the erroneous non-rejection of the non-stationarity hypothesis thereby leading to an inappropriate econometric model being adopted. Therefore, it is necessary to find a structural break and make necessary corrections before coming up with regression results. Structural breaks occur in many time series for so many reasons including economic crises, changes in institutional arrangements, policy changes and regime shifts.

The ADF test for a unit root is inadequate because it does not account for structural breaks in time series data. As a result, ADF test results can easily support a non-rejection of the null hypothesis of the presence of a unit root in the face of structural breaks. The zivot-andrews unit root test allows for structural breaks in time series data and, therefore, this study has adopted the test.

The results of the zivot-andrews test on the variables in levels showed that GDP was stationary while all the other variables were non-stationary. As Baumohl & Lyocsa (2009) note, a simple way to deal with non-stationary variables is by taking their first differences.

Therefore, all the variables found to be non-stationary in levels were first differenced and the zivot-andrews unit root test was repeated. The test found all these variables to be stationary. **Table 1** below contains zivot-andrews unit root test results for variables in both levels and first difference.

Table 1: Zivot-andrews unit root test results

	Level			First Difference		
Variables	T-Stat	Break	Decision	T-Stat	Break	Decision
LogVATRe	-2.421	2018q2	unit root	-8.975	2017q1	Stationarity
LogImportserv	-3.524	2010q1	unit root	-4.391	2012q4	Stationarity
Logexports	-3.181	2016q2	unit root	-4.542	2018q3	Stationarity
LogFER	-1.971	2017q2	unit root	-8.332	2012q4	Stationarity
LogGDP	-9.002	2010q1	Stationarity			
InflationR	-2.788	2014q1	unit root	-5.712	2012q3	Stationarity

Note:

The values -4.93, -4.42 and -4.11 are the tabulated critical values for the zandrews test with trend at 1%, 5% and 10% level of significance.

Structural breaks occurred at 2018q2, 2010q1, 2016q2, 2017q2, 2010q1, 2014q1.

Having established integration of order zero or I (0) for one variable and integration of order one or I (1) for the rest of the variables, the study adopted the ARDL model for estimation of regression coefficients.

4.4.2 Co-integration Test

The co-integration technique was developed for its usefulness in modelling long-run relationships of time series economic variables. The concept was initially developed by Granger in 1981 having been inspired by the fact that non-stationarity in time-series data can create a spurious regression problem for econometric analyses. In order to get rid of this problem, some researchers have recommended differencing the variables until the level of stationarity is reached. However, one of the limitations of the differencing approach is that it causes data to lose some important long-run information. Therefore, the concept of co-integration was introduced in order to resolve the limitation.

If two or more series are individually integrated but a linear combination of them has a lower order of integration then the time series are co-integrated. For instance, co-integration

exists if a set of $I(1)$ variables can be modelled with linear combinations that are $I(0)$. When two or more variables are co-integrated, the short-term deviations from equilibrium will feedback on changes in other variables thereby influencing a movement towards long-run equilibrium.

4.4.2.1 Gregory-Hansen Co-integration Test

The study has employed the Gregory and Hansen (1996) residual-based test for co-integration in order to allow for a structural break in the co-integrating relationship amongst the included variables. This approach is superior to the ARDL bounds test which yields inconsistent results in the presence of a break in any of the time series. Furthermore, this approach is superior to the Engle and Granger (1987) approach to testing for co-integration which tends to be biased towards the null hypothesis of no co-integration if there is a co-integration relationship that has changed at some unknown time during the sample period. The Gregory and Hansen test is an extension of the Engle and Granger approach and it involves testing the null hypothesis of no co-integration against an alternative of co-integration with a single regime shift in an unknown date based on extensions of the traditional ADF, Z and Zt test types. The results of the Gregory-Hansen co-integration tests as per **Tables 2a, 2b and 2c** below show that co-integration exists in the time series.

Tables 2a, 2b, 2c: Gregory-Hansen Co-integration Test Results

Table 2a: Model: Change in Level

	Test Statistic	Break Point	Date	Asymptotic Critical Values 5%
ADF	-6.13	31	2012q3	-5.56
Zt	-5.99	30	2012q2	-5.56
Za	-45.48	30	2012q2	-59.40

Table 2b: Model: Change in Level and Trend

	Test Statistic	Break Point	Date	Asympto tic Critical Values 5%
ADF	-6.16	31	2012q3	-5.83
Zt	-6.04	30	2012q2	-5.83
Za	-45.91	30	2012q2	-65.44

Table 2c: Model: Change in Regime

	Test Statistic	Break point	Date	Asymptotic Critical Values 5%
ADF	-6.16	31	2012q3	-5.83
Zt	-6.04	30	2012q2	-5.83
Za	-45.91	30	2012q2	-65.44

4.4.3 Specification of the ARDL Model

The ARDL model for the study is specified as follows:

$$\ln VAT_t = \beta_0 + \sum_{j=1}^p \beta_j \ln VAT_{t-j} + \sum_{i=1}^q \alpha_i \ln imp_{t-i} + \sum_{k=1}^q \theta_k \ln exp_{t-k} + \sum_{l=1}^q \rho_l \ln FER_{t-l} + \sum_{m=1}^q \phi_m \ln GDP_{t-m} + \sum_{n=1}^q \varphi_n \ln infl_{t-n} + \gamma Z_t + \varepsilon_t$$

Where β_0 is the constant

$\beta_j, \alpha_i, \theta_k, \rho_l, \phi_m, \varphi_n$ are the parameters to be estimated

ε_t is the white-noise error term

$\ln VAT_t$ is log of VAT revenue

$\ln VAT_{t-j}$ is lagged value of log of VAT revenue

$\ln imp_{t-i}$ is log of imported services

$\ln exp_{t-k}$ is log of exports

$\ln FER_{t-l}$ is log of foreign exchange rate

$\ln GDP_{t-m}$ is log of GDP

$\ln fl_{t-n}$ is inflation rate

γZ_t is a structural break dummy variable

4.5 Diagnostic Tests

Regression diagnostic tests are part of regression analyses whose objective is to investigate if the calculated model and the assumptions made about the data and the model are consistent with the recorded data. Four diagnostic tests namely autocorrelation, heteroskedasticity, normality and ARDL model stability were conducted on the model. These tests are tackled in turn as follows:

4.5.1 Test for Autocorrelation

According to autocorrelation results under appendix 2, the Durbin-Watson statistic of 2.02974 shows the absence of autocorrelation in the residuals of the model. Furthermore, the p-value of 0.0728 for the Breusch-Godfrey test means that the null hypothesis of no serial correlation cannot be rejected. Therefore, both tests have established the absence of serial correlation in the residuals of the model.

4.5.2 Test for Heteroskedasticity

Based on appendix 3, the null hypothesis of homoscedasticity cannot be rejected given that the p-value of 0.4329 is greater than the 5% level of significance.

4.5.3 Test for Normality of Disturbance Terms

The result of the test as per appendix 4 shows that the disturbance terms are normally distributed.

4.5.4 Test for ARDL Model Stability

The figure under appendix 5 clearly shows that the cusum graph is clearly within the 5% limits. This means that the model is stable.

CHAPTER 5

PRESENTATION AND INTERPRETATION OF RESULTS

5.1 Presentation of Regression Results

This chapter presents and interprets regression results for the ARDL model used in the study.

The ARDL model specified in the preceding chapter was run in STATA and the following results were obtained:

Table 3: ARDL Regression Results

ARDL (4,1,0,0,2,0,2) regression
Sample: 2006q1 - 2020q4

Number of obs = 60
R-squared = 0.7411
Adj R-squared = 0.6529
Root MSE = 0.0691

Log likelihood = 84.500559

D.logVATRe	Coef.	Std.Err.	T	P>t	[95% Conf. Interval]	
ADJ						
logVATRe						
L1.	-0.530	0.154	-3.450	0.001*	-0.840	-0.220
LR						
logImportServ	0.032	0.215	0.150	0.883	-0.401	0.464
logExports	0.392	0.174	2.240	0.030**	0.040	0.743
logFER	0.379	0.196	1.940	0.059***	-0.015	0.773
logGDP	0.336	0.679	0.500	0.623	-1.032	1.704
InflationRate	-2.050	0.755	-2.720	0.009*	-3.571	-0.529
z	0.503	0.303	1.660	0.104	-0.107	1.114
SR						
logImportServ						
D1.	0.802	0.308	2.600	0.013**	0.181	1.424
logGDP						
D1.	0.256	0.293	0.870	0.387	-0.334	0.845
z						
D1.	-0.247	0.120	-2.060	0.046**	-0.489	-0.005
_cons	1.181	6.663	0.180	0.860	-12.248	14.610

Note: * 1%, ** 5% and *** 10% level of significance

5.2 Interpretation of Regression Results

The model explains 65% of the variation in VAT revenue as evidenced by the Adjusted R-squared of 0.6529.

The coefficient of -0.5300854 for L1 is known as the error correction term or the speed of adjustment towards long-run equilibrium. This coefficient is statistically significant based on its p-value of 0.001 being less than the 1% level of significance. The presence of statistical significance and the negative sign implies that there is long-run causality running from imported services, exports, foreign exchange rate, GDP and inflation to VAT revenue. In other words, previous quarter's errors or deviations from long-run equilibrium are corrected for within the current quarter at a convergence speed of 53%.

5.2.1 Imported Services

Based on the short-run results, imported services are statistically significant at 5% level of significance to influence VAT revenue. The findings show that in the short run, on average, a 1% change in imported services positively leads to a 0.80 % change in VAT revenue, holding all other factors constant.

However, imported services are statistically insignificant to influence VAT revenue in the long run as evidenced by its p-value of 0.88. This is a sign of inefficiencies in collection of VAT on imported services.

5.2.2 Exports

The results show that the coefficient of exports is statistically different from zero at 5% level of significance. This shows that, in the long run, exports positively impact VAT revenue. Therefore, in the long run, on average, a 1% change in exports positively leads to a 0.39% change in VAT revenue, holding all other factors constant. This finding is at variance with theoretical literature which suggests a negative impact of exports on VAT revenue. It should be pointed out that for such theoretical literature to hold in practice, a country's products for exports should attract VAT if they are consumed domestically. This is an implicit assumption on which the literature is based. If such products do not attract VAT in an exporting country, then exporting them would not lead to any loss in VAT revenue. On the contrary, such exports should increase income for the exporters thereby increasing

expenditure on taxable products leading to more VAT revenue being collected domestically. This is a possible rationalisation of the finding of this study.

5.2.3 Foreign Exchange Rate

Foreign exchange rate is statistically significant at 10 % level of significance to affect VAT revenue. This means that, in the long run, on average, a 1% change in foreign exchange rate positively leads to a 0.38% change in VAT revenue, holding all other factors constant. Theoretical literature states that foreign exchange rate is negatively related to VAT revenue. This is viewed in terms of appreciation and depreciation of a local currency with respect to a foreign currency. For example, if the exchange rate of the Malawi Kwacha against the dollar today is MK1,200/dollar and rises to MK1,300/dollar tomorrow, then this represents a depreciation of the Malawi kwacha. Considering that the value of imports in Malawi Kwacha for VAT computation rises following a rise in the exchange rate, the resultant VAT revenue must rise too. This is why literature talks of a negative relationship between the variables. How you interpret the finding depends on whether you adopt the appreciation/depreciation approach or the direct rise/fall of the rate. In the final analysis, the finding is in line with a priori expectations.

5.2.4 GDP

Both the long-run and short-run p-values of 0.387 and 0.623 for GDP clearly show that the variable is statistically insignificant to influence VAT revenue. This finding is contrary to the study's a priori expectation.

5.2.5 Inflation Rate

The coefficient of -2.049906 for inflation is statistically different from zero at 1% level of significance. Therefore, in the long run, inflation negatively influences VAT revenue. This means that, in the long run, on average, a 1% change in inflation rate negatively leads to a 2.05% change in VAT revenue, ceteris paribus. This is not surprising because inflation reduces the purchasing power of consumers leading to fewer products being purchased than before. As a consequence, less VAT revenue is collected than before.

5.2.6 Structural Break Dummy Variable

In the short run, the structural break dummy variable is statistically significant at 5% level of significance to negatively impact VAT revenue. In the long run, however, the dummy variable does not statistically impact VAT revenue.

CHAPTER 6

SUMMARY AND POLICY RECOMMENDATIONS

This chapter focuses on two areas namely a summary of regression results and policy recommendations, and an indication for future research.

6.1 Summary and Policy Recommendations

Tax revenue is key to most governments across the world and Malawi is no exception. Governments use this revenue to finance investments in human capital, infrastructure and the provision of services for citizens and businesses. Malawi has been unable to raise enough tax revenue as evidenced by budget deficits experienced every year. Consequently, the government has on an annual basis been compelled to resort to borrowing in order to finance the budget deficits. However, government borrowing has its own undesirable consequences. One of them is that as borrowing increases, the government has to make more interest payments to holders of bonds. This is likely to lead to a greater percentage of tax revenue being committed to debt interest payments at the expense of development. Another consequence is that high levels of government borrowing can cause crowding out in an economy as it leaves less capital for private investment.

VAT is among the taxes levied by Malawi on various goods and services. The VAT Act (2005) lists imported services among the products that are subject to VAT. Considering that imported services have been on the rise due to global technological advancements, there is potential for more VAT being collected on the services. Unlike imported goods that MRA officers are able to inspect and charge VAT on, imported services are invisible and the obligation is on the importer of services to make a self-declaration of the imported services and charge VAT on them for remittance to MRA. The potential for more VAT collection may not be fulfilled because an importer of a service may choose to not pay related VAT to

MRA. In view of the foregoing, the study's objective was to assess the impact of imported services on VAT revenue collection in Malawi.

The study tested the null hypothesis that imported services do not affect VAT revenue in Malawi. The study employed quarterly time series data from 2005 to 2020. After conducting unit-root tests accounting for structural breaks, the study adopted an ARDL model for the study.

The study has established that, in the short run, imported services positively influence VAT revenue. The results show that a 1 % change in imported services, on average, leads to a 0.80% change in VAT revenue, holding all other variables constant. However, the study has established that, in the long run, imported services have no impact on VAT revenue. This long-run result may be attributed to the reverse-charge strategy that is used in collecting VAT on imported services. It is possible for a more effective strategy for collecting VAT on imported services to improve the positive short-run impact observed above and bring about a positive long-run impact of imported services on VAT revenue.

As one way of improving collection of VAT revenue on imported services, the study recommends that Malawi should introduce legislation requiring foreign suppliers of services to register as VAT vendors in Malawi to the extent that they make taxable supplies of services to recipients based in Malawi. As a result, payments made by consumers in Malawi to these foreign suppliers of services should be inclusive of VAT. These foreign suppliers should be required to appoint agents in Malawi who should be responsible for remitting VAT to MRA. In addition, a minimum business turnover per annum with a source in Malawi should be stipulated as qualification for VAT registration. A Malawi-based recipient of services from a foreign supplier will only be required to operate reverse charge on the imported services if the supplier is not registered as a VAT vendor.

6.2 Indication for Future Study

Much as this study has established important results for policy recommendations, there is still room for further research on the topic. Future research may focus on the impact of imports of both goods and services, and not just imports of services, on VAT revenue.

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APPENDICES

Appendix 1: Data Used in the Study

Quarter	VATRevenue	ImportedServices	Exports	GDP	FER	Inflat
2005q1	3,800,130,962.00	4,287,456,960.00	13,731,437,600.00	139,520,503,899.13	109.29	0.14
2005q2	4,159,874,812.00	4,606,740,650.00	16,786,786,500.00	170,564,873,071.05	117.20	0.16
2005q3	4,742,547,102.76	4,877,709,430.00	19,547,910,900.00	198,619,726,381.98	123.51	0.16
2005q4	4,537,961,405.81	5,100,363,300.00	22,014,810,800.00	223,685,063,831.92	123.68	0.16
2006q1	4,680,381,537.44	5,274,702,260.00	24,187,486,100.00	173,592,434,123.76	129.86	0.17
2006q2	5,695,635,737.06	5,400,726,300.00	26,065,936,900.00	187,073,985,923.13	103.20	0.16
2006q3	6,432,448,445.67	5,478,435,440.00	27,650,163,100.00	198,443,901,801.27	138.40	0.13
2006q4	6,408,141,902.30	5,507,829,660.00	28,940,164,900.00	207,702,183,193.57	138.22	0.11
2007q1	6,300,536,235.66	5,156,899,680.00	28,994,882,300.00	198,475,522,517.55	139.43	0.09
2007q2	6,957,514,084.32	5,222,467,800.00	30,072,858,800.00	205,854,478,116.87	140.24	0.08
2007q3	7,965,541,690.17	5,372,524,730.00	31,233,034,700.00	213,796,104,352.22	140.32	0.07
2007q4	7,890,878,905.28	5,607,070,460.00	32,475,409,900.00	222,300,400,539.10	139.93	0.07
2008q1	7,509,459,517.53	6,106,726,310.00	33,026,774,900.00	207,524,034,793.04	140.45	0.08
2008q2	9,743,353,471.06	6,438,001,130.00	34,742,832,700.00	218,306,899,292.29	140.50	0.08
2008q3	10,493,566,487.79	6,781,516,240.00	36,850,373,700.00	231,549,651,972.08	140.55	0.09
2008q4	9,922,779,500.81	7,137,271,620.00	39,349,397,800.00	247,252,292,204.06	140.60	0.10
2009q1	9,190,041,307.02	7,619,344,850.00	45,268,497,300.00	233,216,434,049.32	140.60	0.10
2009q2	9,281,148,959.47	7,953,949,770.00	47,339,051,000.00	243,883,612,754.67	140.60	0.09
2009q3	10,780,383,815.63	8,255,163,930.00	48,589,651,100.00	250,326,514,841.98	140.61	0.08
2009q4	11,097,669,512.73	8,522,987,360.00	49,020,297,600.00	252,545,140,311.26	142.87	0.07
2010q1	10,616,072,356.70	8,651,953,510.00	43,716,516,500.00	248,851,659,792.41	149.55	0.08
2010q2	11,358,212,005.13	8,895,182,050.00	44,473,045,200.00	253,158,119,632.95	150.79	0.08
2010q3	12,808,267,957.48	9,147,206,450.00	46,375,409,900.00	263,987,130,062.58	150.80	0.07
2010q4	13,774,924,694.11	9,408,026,710.00	49,423,610,500.00	281,338,690,512.06	150.80	0.06
2011q1	9,469,923,195.00	9,047,828,540.00	55,464,933,500.00	242,579,836,924.83	150.80	0.07
2011q2	13,270,629,847.74	9,578,166,250.00	60,065,891,400.00	262,702,453,984.85	150.80	0.07
2011q3	15,415,056,105.24	10,369,225,500.00	65,073,770,600.00	284,604,770,331.73	159.25	0.08
2011q4	15,633,904,065.40	11,421,006,400.00	70,488,571,100.00	308,286,785,965.45	165.26	0.09
2012q1	13,402,551,571.67	12,915,571,500.00	74,572,499,100.00	236,462,154,475.74	166.35	0.11
2012q2	16,845,634,535.78	14,415,970,500.00	81,496,259,800.00	258,416,727,434.34	228.37	0.17
2012q3	18,948,275,739.72	16,104,265,900.00	89,522,059,400.00	283,865,758,748.98	280.93	0.24
2012q4	20,515,513,089.84	17,980,457,900.00	98,649,897,800.00	312,809,248,102.55	320.78	0.34

Quarter	VATRevenue	ImportedServices	Exports	GDP	FER	Inflat
2013q1	18,615,057,185.09	20,881,276,000.00	110,614,988,000.00	252,592,573,677.20	364.87	0.36
2013q2	24,556,896,324.70	22,798,569,100.00	121,252,819,000.00	276,884,373,181.19	365.19	0.32
2013q3	30,614,664,446.19	24,569,066,900.00	132,298,603,000.00	302,107,745,341.59	339.46	0.23
2013q4	31,964,553,147.29	26,192,769,300.00	143,752,341,000.00	328,262,692,441.93	407.21	0.23
2014q1	30,318,186,710.78	27,126,956,300.00	166,514,464,000.00	294,007,848,662.42	426.14	0.25
2014q2	35,676,980,467.06	28,674,156,100.00	174,423,936,000.00	307,973,283,201.34	399.80	0.23
2014q3	32,544,568,994.97	30,291,648,600.00	178,381,188,000.00	314,960,442,870.16	399.70	0.24
2014q4	37,967,370,715.64	31,979,433,800.00	178,386,222,000.00	314,969,331,200.19	471.99	0.24
2015q1	42,076,445,483.74	33,737,351,500.00	153,779,355,000.00	308,324,178,216.37	447.26	0.20
2015q2	41,663,604,144.72	35,565,786,200.00	154,143,822,000.00	309,054,926,425.46	438.80	0.20
2015q3	42,188,993,024.17	37,464,577,700.00	158,819,942,000.00	318,430,442,769.91	522.36	0.23
2015q4	42,645,188,656.14	39,433,726,100.00	167,807,715,000.00	336,450,727,249.71	590.01	0.25
2016q1	42,645,188,656.14	39,599,138,800.00	202,161,957,000.00	311,680,467,715.40	719.07	0.23
2016q2	49,439,254,306.29	42,458,637,700.00	211,351,109,000.00	325,847,718,744.07	702.44	0.22
2016q3	56,496,057,888.68	46,138,130,400.00	216,429,986,000.00	333,678,008,786.37	724.27	0.23
2016q4	60,062,261,623.74	50,637,616,800.00	217,398,590,000.00	335,171,340,925.77	726.24	0.20
2017q1	59,804,168,909.49	60,447,452,100.00	199,986,932,000.00	344,877,540,917.77	730.40	0.17
2017q2	61,369,459,449.98	64,790,783,900.00	198,442,983,000.00	342,215,000,275.25	729.93	0.13
2017q3	68,726,463,136.55	68,157,967,500.00	198,496,755,000.00	342,307,730,109.87	730.18	0.09
2017q4	68,621,103,398.50	70,549,002,800.00	200,148,247,000.00	345,155,728,697.12	730.59	0.08
2018q1	64,626,281,494.94	68,242,159,600.00	200,457,832,000.00	337,116,985,689.06	731.27	0.09
2018q2	70,305,940,459.90	70,169,590,300.00	206,480,619,000.00	347,245,718,393.74	730.88	0.09
2018q3	84,252,796,877.85	72,609,564,900.00	215,276,979,000.00	362,038,866,352.34	731.13	0.09
2018q4	80,760,174,189.15	75,562,083,200.00	226,846,912,000.00	381,496,429,564.86	736.06	0.10
2019q1	74,190,970,607.17	78,713,977,900.00	262,088,223,000.00	365,149,668,946.07	736.48	0.09
2019q2	77,119,059,746.66	82,816,850,800.00	270,846,180,000.00	377,351,533,885.24	756.97	0.09
2019q3	84,467,929,512.08	87,557,534,500.00	274,018,587,000.00	381,771,432,469.59	748.56	0.09
2019q4	82,494,145,842.09	92,936,029,100.00	271,605,444,000.00	378,409,364,699.11	740.16	0.11
2020q1	76,467,383,831.01	98,952,334,400.00	263,606,753,000.00	446,899,960,541.15	741.96	0.11
2020q2	71,825,020,001.48	105,606,450,000.00	250,022,511,000.00	423,870,212,081.78	741.95	0.09
2020q3	84,975,925,121.43	112,898,377,000.00	230,852,721,000.00	391,371,126,617.98	749.97	0.08
2020q4	88,705,910,726.73	120,828,115,000.00	206,097,381,000.00	349,402,700,759.09	764.23	0.07

Appendix 2: Autocorrelation Test Results

Durbin-Watson d-statistic (16, 60) = 2.02974

Breusch-Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
-----+-----			
4	8.570	4	0.0728

H0: no serial correlation

Appendix 3: Heteroskedasticity Test Results

White's test for H_0 : homoscedasticity

against H_a : unrestricted Heteroskedasticity

$\chi^2(59) = 60.00$

Prob > $\chi^2 = 0.4392$

Cameron & Trivedi's decomposition of IM-test

Source	chi2	df	p
-----+-----			
Heteroskedasticity	60.00	59	0.4392
Skewness	21.80	15	0.1131
Kurtosis	1.34	1	0.2465
-----+-----			
Total	83.14	75	0.2431

Appendix 4: Normality Test Results

Jarque-Bera normality test: 5.492 Chi(2) .0642

Jarque-Bera test for Ho: normality

Appendix 5: ARDL Model Stability Graph

