MAKERERE UNIVERSITY

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EXTERNAL DEBT AND POVERTY LEVEL IN UGANDA

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DECLARATION

I Nalunkuma Shamirah, declare that to the best of my knowledge, this research dissertation is my original work and has never been published and/or submitted for any award in any other University/ Institution of Higher Learning.

Signed ..... Date: 8/12/2023

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APPROVAL

This Research Dissertation by Nalunkuma Shamirah has been written under our guidance and it is hereby submitted for examination with our approval as supervisors.

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DEDICATION

I dedicate this study to everybody that contributed to its successful completion; the supervisors, family and friends, colleagues and my employer.

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ABSTRACT

This study investigated the effect of External Debt (EXD) on Poverty level in Uganda. The specific objectives of the study included establishing the short run and long run effects of external debt, debt servicing and income percapita on poverty level. Employing the Vector Error Correction Model (VECM), the study used time series data that spanned a period of 28 years ranging from 1992 to 2019. The results of the study showed that, in the short run, external debt, percapita income and debt servicing do not influence the poverty level. In the long run, external debt and debt servicing were found to increase poverty level while percapita income had was found to reduce poverty level and statistically significant. The granger casualty test indicated a uni-directional causation running from poverty level to external debt in Ugandan. The study recommends that the Government needs to mobilize its domestic savings that are more reliable and less risky, and it should pursue vigorously policy initiatives that will alleviate poverty.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This section presents the background of the study, the problem statement, the objectives, scope and significance of the study.

1.1 Background of the Study

Reducing global poverty was a key aim of the Millennium Development Goals (MDGs), whose target was to reduce the number of people living in extreme poverty by half between 1990 and 2015. At the global level, this was achieved three years ahead of schedule, in 2012 (McArthur & Rasmussen, 2017). In the year 2012, eradicating poverty was recognized by the UN General Assembly as the greatest global challenge facing the world today, given that people living in poverty are among the most vulnerable in society: as well as lack of resources, the poorest families on average also see higher infant mortality, higher stunting in children and lower educational attainment (Development-Initiatives, 2019). Subsequently in September 2015, the United Nations' member states adopted the Sustainable Development Goals with aim to end extreme poverty for all people everywhere and at least cut in half the proportion of people living in poverty in all its forms as one of the 17 goals by 2030 (Development-Initiatives., 2021).

Tracking global progress on extreme poverty is necessary to know how close the world is to achieving this aim, in the year 2021 an estimated 698 million people, or 9% of the global population, were living in extreme poverty that is, living on less than $1.90 a day (Christensen, 2021). Over one-fifth of the global population live below the higher $3.20 poverty line (1,803 million people), and over two-fifths (3,293 million people) live below $5.50 a day (Francisco & Sanchez, 2017). However for 26 countries in sub-Saharan Africa, the number of people living in extreme poverty has increased between 2010 and 2020. The largest increases have occurred in Angola (9.4 million), the Democratic Republic of the Congo (8.8 million) and South Sudan (7 million). In 2021, 66% of the global population living in extreme poverty live in countries in sub-Saharan Africa for which Uganda is part (Development-Initiatives., 2021).

As Uganda aspires to see her citizens enjoying a high quality standard of living, the government focuses on improving; the quality of its population, health and nutrition status, literacy and numeracy, housing, water and sanitation conditions and provision of social protection for the citizenry. Focus is also put on reducing the number of people living in absolute poverty (Uganda Vision 2040). In an effort to address poverty, the government has initiated a variety of programmes dating way back in the late 1980s, the Rural Farmers Scheme aimed to boost agricultural productivity and farmers' livelihoods through credits, but most farmers were unable to benefit from the initiative, which ultimately failed (Busiku, 2022).

In 1995, a similar credit finance scheme known as Entandikwa ("seed capital") provided loans to the rural and urban poor, youth, disabled people, and women, but only about 40% of loans advanced to the target groups were recovered. A slew of more recent poverty-alleviation initiatives has included Bonna Bagaggawale ("prosperity for all"), National Agricultural Advisory Services (NAADs), Plan for Modernization of Agriculture, Operation Wealth Creation, and Emyooga. These interventions, too, have yielded little or no success, and most have been abandoned (Busiku, 2022).

Over the past three decades, Uganda's national poverty rate has fallen by more than half, from 56% in 1992/1993 to 21.4% in 2019/2020, owing mostly to improved agricultural incomes among poor households and improved regional markets after the end of conflict in Northern Uganda (UBOS, 2020; World-Bank-Group, 2022). Yet Uganda remains one of the poorest countries in the world. In 2019/2020, 12.3 million people (30.1% of the population) lived below the poverty line of U.S. $1.77 per person per day (UBOS., 2021).

The number of Ugandans who are not poor but vulnerable increased as well, as did the number of those who shift in and out of poverty. The proportions of people who are not poor but vulnerable to poverty increased by 10 percentage points, from 33% in 1992/1993 to 43% in 2016/2017 (World-Bank-Group, 2022). Between 2015 and 2019, 8.4% of households moved out of poverty, while 10.2% slipped into poverty (UBOS, 2020). And the COVID-19 pandemic has exacerbated the problem, causing 300,000 more Ugandans to slide back into poverty (UBOS., 2021).

It's believed that low savings, low investment and low growth rates cause poverty or poverty trap, particularly in underdeveloped countries, Also, in developing countries, low income levels,

high unemployment rates and low capacity utilization rates are characterized with high levels of poverty to address only a few of the various economic problems. These countries need external debt and foreign aid to meet the savings-investment deficit aimed at economic growth and reducing poverty (Ugwuegbe, Okafor, & Akarogbe, 2016). Some research analysis about the determinants of poverty reduction and inequality in Latin American countries have found evidence suggesting that per capita aggregate income growth leads to a reduction in the incidence of urban and rural poverty (Arif & Farooq, 2011; Young, 2012; McKay, 2013). However it's not conclusive if this is the case for Uganda due to the limited literature about the same.

Uganda's external indebtedness was nearly wiped out in mid 2000s under the World Bank and IMF's debt cancellation programs for poor and highly indebted nations. But over the last decade the government has vastly expanded its borrowing, mostly from China, to fund costly infrastructure including roads, airports, power plants and other projects that are sought to stimulate economic activities that would eventually reduce poverty levels. Uganda's external debt accumulation has continued to grow over the years from $2.97 billion (2010) to $11.68 billion (2020) and $12.9 billion (2021) representing 10% increase in external debt stock between 2020 and 2021 (MoFPED, 2022). Therefore this study intends to understand the causal relationship between external debt and poverty levels in Uganda.

1.2 Problem Statement

Since the year 1980s the government of Uganda has initiated a variety of programmes such as the rural farmers' scheme, seed capital, NAADS and prosperity for all among others in order to address poverty challenges. The fact that Uganda's tax performance has been weak compared to other countries in Eastern and Southern Africa (Uzma, et al., 2022), it heavily relies on borrowing to finance such socio-economic programs. Over the last decade the government has vastly expanded its external borrowing from $2.97 billion in 2010 to $12.9 billion 2021 in order to augment domestic resources and stimulate economic activities that would eventually reduce poverty (MoFPED, 2022).

Nevertheless despite all the above well intended efforts to reduce poverty in Uganda, a huge number of people still live under the standard poverty line (US$1.90 a day), and the proportion of Ugandans classified as not poor but vulnerable to falling below the poverty lines has increased

from 33% in 1992/1993 to 43% in 2016/2017 and 42% in 2019 (World-Bank-Group, 2022). Although it is known from theoretical evidence that external financing resources are required to remove the structural deficits and fill the savings-investment gaps to simulate growth and reduce poverty (Ugwuegbe, Okafor, & Akarogbe, 2016), empirical evidence to support or reject this assertion in the Ugandan context is still scanty. This study therefore sets out to investigate the effect of External debt on poverty level in Uganda for the period between 1992 and 2019.

1.3 Purpose of the study

The main purpose of the study is to investigate the effect of external debt on poverty level in Uganda.

1.4 The specific objectives are:

(i) To investigate the short run and long run relationship between external debt and poverty level in Uganda.

(ii) To examine the relationship between debt servicing and poverty level.

(iii) To examine the relationship between per capita income and poverty level.

(iv) To investigate the causal relationship between External debt and poverty level in Uganda.

1.5 Research Hypotheses

Hypothesis 1

H_{o1}: External debt has no effect on poverty level in Uganda.

Hypothesis 2

H_{o2}: Debt servicing has no effect on poverty level in Uganda.

Hypothesis 3

H_{o3}: Percapita income has no effect on poverty level in Uganda.

Hypothesis 4

H_{o4}: There is no causal relationship between external debt and poverty level in Uganda.

1.6 Scope of the study

The scope of this study was in threefold namely; geographical scope, time scope and content scope.

1.6.1 Geographical scope

The study used data aggregated at a national level for Uganda.

1.6.2 Time scope

The time span for this study ranges from 1992 – 2019 covering 28 years. This study period is mainly dictated by the availability of data on the study variables in Uganda.

1.6.3 Content scope

The study focused on the effect of external debt on poverty reduction in Uganda in both the short run and the long run. The causal relationship between external debt and poverty reduction was also be examined.

1.7 Significance of the study

i. The study will aid policy analysts to keenly focus on how the relationship between external debt and poverty reduction unfold in the new policy agenda of borrowing externally for deficit budget financing.

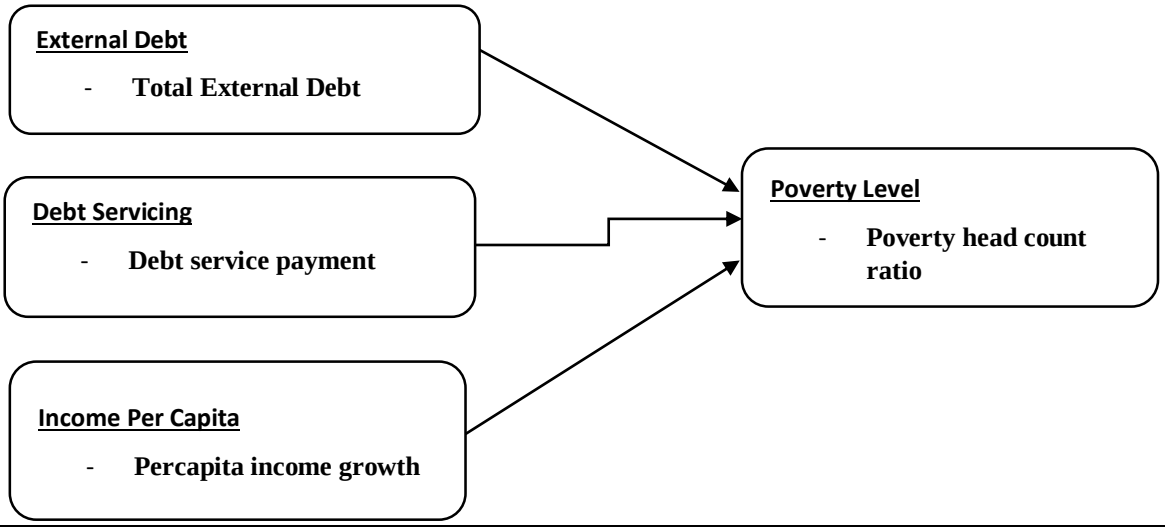
ii. The study findings will inform policy experts on patterns of debt accumulation after revealing the short run and long run effects of external debt on poverty reduction.

iii. The study findings will help to fill the information gap by providing empirical evidence to the broader understanding of the causal effect of external debt on poverty levels in Uganda.

1.8 Conceptual Framework

The conceptual framework of the study gives a visual representation of the study variables.

Figure 1: Conceptual Frame Work Linking External Debt, Debt Servicing, Income per capita and Poverty Level



Source: Adopted from (Oyedele, Emerah, & Ogege, 2013)

1.8.1 Explanation of the conceptual framework

It is argued by Ugwuegbe et al (2016) that poverty and external debt spiral is the result of savings-investment deficit and that the heavy external debt burden will lead these countries to short-term and low-productivity areas in their investment decisions. Second, other than borrowing due to poverty, excess external debt has also led to poverty. Following the crisis period in developing countries, increasing demands for external financing and restructuring debts, high external debt accompanied by capital flight and high debt service payments lead to low growth rates and social injustice and eventually, disintegration (Esener, 2013).

High indebtedness causes a decrease in the entrance of new external sources. As a result, this leads to poverty-related spending shortages, to poverty through income decline with the effect of lower investment in social sector in the long term, and to direct health and education output declines in the short term (Loko et al., 2003). According to another approach in which external debt is seen as necessity; external financing resources are required to remove the structural deficits that indicate that normal returns are not high enough to finance the spending increase in

the long term as a combination of investment, savings, trade and fiscal deficits (Ugwuegbe, Okafor, & Akarogbe, 2016).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents and discusses the literature of the study. The chapter begins with theoretical underpinnings for the study and then later discusses the empirical deductions.

Poverty theories

There are numerous theories which attempt to identify the underlying determinants or causes of Poverty. The theories include the theory of Economic, Political, and Social Distortions or Discrimination among others. To the structural theorists poverty is due to the structure of the larger socioeconomic order (Abdulai & Shamshiry, 2014). Proponents of this theory attribute the source of poverty to economic, political, and social system which cause people to have limited opportunities and resources with which to achieve income and well-being (Bradshaw, 2006). The same view is expressed by Sameti, Esfahani, and Haghighi (2012) who believe that larger economic and social structures is a cause of poverty. They argue that capitalism creates conditions that promote poverty, and that irrespective of individuals' effort; (hard work, skills and competencies); the structure of some economies ensures that millions of people are poor.

Early post-war reflections on the problems of developing countries led to the identification of insufficient capital stock as the cause of their low income. The less developed countries suffer from a dominant vicious circle of low production, no surplus for economic development, no tools and equipment which in turn cause low standard of production (Singer 1949). Similarly the problem of these countries was that there is small capacity to save resulting from low level of real income. The low level of real income is a reflection of low productivity, which in turn is due largely to the lack of capital. The lack of capital is as a result of small capacity to save. It is

evident that to break out of this vicious circle of poverty, a country must increase its savings (Nurtse 1953).

Increased savings as a panacea for under – development was also emphasized by Domar (1957) who indicated that in under-developed countries, it is clearly capital rather than labor that is inhibiting growth, he argued further that since the private sector is the user and sources of savings, government should develop and implement policies which would encourage savings, where the private sector cannot discharge this responsibility, government should shoulder the responsibility by diverting resources to itself through higher taxes (Kalder, 1955).

These considerations were based on the assumption that developing economy has the potential to finance its investment requirement. However given the need for large capital stock and the inadequacy of the domestic savings to finance investment, it was concluded that domestic savings should be supplemented by foreign resources.

2.2 Empirical Review of Literature

2.2.1 The effect of External Debt on Poverty reduction

Most empirical studies have delved into the relationship between either debt and growth, debt and/or poverty and growth (Atique & Malik, 2012; Clement, Bhattarcharya, & Nguyen, 2003; Manasseh, et al., 2022). Investigating the impact of foreign debt and debt servicing in the economy of Tanzania, it was found that the impact of debt service on real growth in Tanzania is negative (Mjema, 1996). Similarly Oyelede, Emerah, and Ogege, (2013) examined the impact of external debt and debt servicing on poverty reduction and the overall results indicated that both the external debt and debt servicing cause poverty in Nigeria.

Ajayi and Iyoha (1998) investigated the impact of external debt on economic growth in the severely indebted low income countries (silics) of sub-Saharan Africa, the study results showed that Debt overhang have significant depressing effect on growth. Although the debt overhang models do not analyze the effects of debt on growth explicitly, the implication still remain that large debt stock lowers growth by partly reducing investment with a resultant negative effect on poverty. Stiglitz (2000), contributed that government borrowing can crowd-out investment, which will reduce future output and wages. When output and wages are affected, the welfare of the citizens will be made vulnerable.

Siyanbola (2005) established that the debt service obligations and poverty are positively related. A country with a huge debt burden like Uganda, would find it difficult to utilize available resources for projects that benefit the poor. Further studies demonstrated that the increases in government expenditure on debt service obligations tend to adversely affect development from the distribution perspective, as the poor are likely to receive the short and of the stick in expenditure reduction measures (Tomori & Adebiyi, 2002).

Mbang (2021) examined the contribution of external public debt on poverty reduction in Cameroon and the results bring out the fact that, the external public debt has a direct and significant effect on poverty through the per capita income on indicators such as Life expectancy at birth, Infant mortality rate, and Primary gross enrolment rate, to measure poverty. It equally affects poverty indirectly through economic growth and development.

Soludo (2003) opined that countries borrow for two broad categories macroeconomic reasons (higher investment, higher consumption, education and health) or to finance transitory balanced of payments deficits (to lower nominal interest rate abroad, lack of domestic long-term creditor, or to circumvent hard budget constraints). This implies that economy indulges in debt to boost economic growth and reduce poverty.

Conversely according to Ochalibe, Awoderu, and Onyia (2017), there is existence of a relationship between external debt and economic development on the one hand and the existence of long run relationship between external debt and economic development on the other. The study concluded that the resultant effects of external debt on poverty development in Nigeria are negative and significant.

2.2.2 Effect of GDP percapita and Poverty reduction

Egla et al., (2020) analyzed the factors that impact poverty and compared these results between countries within the European Union and post-communist countries that include the Western Balkan, the results showed that income inequality indeed impacts the further progress of poverty for both the EU and WB, while economic development in terms of GDP is shown to have a more significant impact on EU than in WB, where the most significant impact was through income per capita.

Dollar, Kleineberg, and Kraay (2016) analyzed the systematic relationship between average growth and growth of the poorest groups, examining 151 countries. It was established that the income in the poorest deciles varies in equal proportions with average incomes. They also find that on average, the shares of income accruing to the poorest are fairly stable over time. These results emphasize the idea that policies aimed directly at increasing economic growth rates are indeed "pro-poor," in the sense that they lift the average income in the lowest deciles of the income distribution.

More recent literature has corroborated the importance of economic growth in reducing poverty. Bergstrom (2020) investigated the dynamics of the extreme poverty rate (PPP $1.90 per day poverty line) in 135 countries from 1974 to 2018, the results showed that 90 percent of the variation of poverty rates can be explained by changes in GDP per capita, while much of the rest is accounted for by changes in inequality. At the same time, according to Bluhm, Crombrugghe, and Szirmai (2018) a decline in income inequality (measured as the standard deviation of log income) reduces poverty more than an increase in GDP per capita.

Gustavo and Luis (2022) examined the inequality-growth and poverty-growth links in a panel of 158 countries, it was established that a decrease in the headcount poverty rate is associated with a subsequent increase in per capita GDP. Nelvi and Sri (2020) investigated the impact of per capita income and labor absorption toward poverty level, Main findings of this research shows that per capita income has negative impact on poverty level. Similarly Garza-Rodriguez (2018) analyzed the relationship between economic growth and poverty, the results confirmed presence of a negative relationship between income per capita and poverty level.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the methodology used to cater for the objectives and hypothesis of the study. The chapter is divided into three sections namely, Research design and sources of data, Variables and their measurement, Econometrics Model and estimation technique.

3.1 Research Design

The study employed a longitudinal research design with a quantitative approach of a time series data. The design helps to establish relationships between variables and allows the testing of the effects of variables against each other. This kind of research design facilitated a proper fulfilment of the objectives of the study.

3.2 Data Types and Sources

This study employed secondary data collected from World Bank data base (World-Bank, 2022). The reason for using secondary data is that the variables to be studied are aggregated at national level and their data is already captured at the national databases. Time series data was used because the study focusses on a single phenomenon over a given period of time. In order to get a good result from the regressed time series econometric model, the number of observations matters a lot. The higher the number of observations the better the result obtained, therefore this study used annual data covering the period of 34 years (1992-2019) for the variation of exogenous and endogenous variables.

3.3 Specification of the Model

The main variables of interest are External Debt as the independent variable and the Poverty reduction as the dependent variable, following the work of (Oyedele, Emerah, & Ogege, 2013), the effect of External debt, Debt Servicing and GDP percapita on Poverty reduction in Uganda can be modeled as follows;

PVL = f (EXD, DS, PCY) …. ……. (1)

To test the above relationship, the following estimation model will be used.

$$PVL = \beta_0 + \beta_1 EXD + \beta_2 DS + \beta_3 PCY + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where;

PVL = Poverty Level

EXD = External Debt

DS = Debt Servicing

PCY = Percapita Income

3.4 Variables and Measurement

Poverty level was measured by Poverty head count ratio. National poverty headcount ratio is the percentage of the population living below the national poverty line(s) (World-Bank, 2022).

External Debt was measured as total external debt to GDP measured in percentages. Debt servicing was measured as the ratio of debt service payment to exports of goods and services measured in percentage.

Percapita Income was measured as Annual percentage growth rate of GDP per capita based on constant local currency. GDP per capita is gross domestic product divided by midyear population (World-Bank, 2022).

3.5 Estimation Techniques

The estimation techniques used include unit root test, cointegration test; Diagnostic tests which include Normality test, Serial Correlation test and Heteroscedasticity test. It also includes the Vector Error Correction Model (VECM) and the Granger causality test to investigate the effect of external debt, debt servicing and income percapita on poverty level in Uganda and the causal relationship between external debt and poverty level in the period under review. The details are indicated below;

3.5.1 Unit Root Test

According to Gujarati and Porter (2008), non-stationary series produce spurious or meaningless model estimates. It is therefore important to test the order of integration of each variable in a

model, to establish whether it is non-stationary and how many times the variable needs to be differenced to derive stationary series. Stationarity of each individual data series was estimated based on the assumption that the variables are either I (0) or I (1) series. The study employed Augmented Dickey Fuller (ADF) test. The ADF test is used in determining the order of integration of each variable in the model because it assumes the errors are statistically independent and have a constant variance. Hypothesis of unit root was tested against a stationary alternative. The null hypothesis of unit root will be rejected if the test-statistic (t-statistic) is greater than the associated critical value at 5% level of significance, otherwise we fail to reject. If found non-stationary, the data is differenced in order to yield its stationarity. The stationarity test in the study used regressions of a time series data analyzed against a constant. These regressions can be expressed as follows;

$$Y_t = \alpha + \beta.t + \varepsilon_t \quad \text{......} \quad (3)$$

$$dY_i = a + \beta_t + \sum_{i=1}^{n} \lambda \, dY_{t-i} + \delta Y_{t-i} + \varepsilon_t \quad \text{......} \quad (4)$$

The stationarity of residuals (ε_t) has been tested. Lag length (p) of ADF (dY_{t-i}) equations have been selected using Schwarz Information Criterion (SIC).

3.5.2 Co-integration Test

The next process after the stationarity is determined is to estimate the short and long run relationship of the variables. In a regression involving non-stationary variables, spuriousness can only be avoided if a Stationary co-integrating relationship is established between the variables. Therefore, if two or more variables can be linked together to form an equilibrium relationship spanning the long run, then even though the variables themselves may contain stochastic trends, they will nevertheless move closer over time and the difference between them will be stable. Therefore a test for co-integration, need to be run and the ADF unit roots test to be used to test for the stationarity of the residuals. If the residuals are stationary, then there is a proof for the presence of co-integration in the series used in the model (Adam, 1993; Perman, 1989).

3.6 Diagnostic tests

The study carried out the following diagnostic tests to ensure that the estimated model does not suffer from common econometric problems that could render its parameter estimates spurious.

3.6.1 Serial Correlation

Autocorrelation/Serial correlation is the relationship between a given variable and a lagged version of itself over various time intervals. Serial correlations are often found in repeating patterns, when the level of a variable affects its future level. Autocorrelation also known as serial correlation or lagged correlation and is used to determine the strength of relationship of a variable with its own past and present values, or in another words, it can be explained as correlation of the error term in the present with the error term in the past (Penzin & Oladipo, 2021). Autocorrelation can happen whether in the time series data or cross-sectional data. In order to test the autocorrelation problem, Breusch-Godfrey serial correlation Lagrange multiplier test was used to check for the presence of the problem. The LM test has a better explanation on the higher AR model which is the AR(2) and Durbin Watson h-test is biased for the autoregressive moving average models so it is a chance that the autocorrelation is underestimated in the first place (Roberto & Jodiney, 2019). The Breusch-Godfrey test examines the null hypothesis that there is no serial correlation (Anjum, 2020). The null hypothesis cannot be rejected if the p-value associated with the chi-square exceeds the 5% significance level.

3.6.2 Normality test

Most of the statistical procedures are based on the assumption that the population from which the samples are taken are normally distributed (Field, 2009), specifically the Ordinary Least Square (OLS) assumption is that the residuals should be normally distributed, for when this assumption does not hold, it is impossible to draw accurate and reliable conclusions about reality (Oztuna, Elhan, & Tuccar, 2006). Therefore Normality test was done to examine whether the error term in the estimated model is normally distributed in the model. The study employed the Skewness and Kurtosis test for Normality to check for the distribution of residuals in the model. The null hypothesis in the test is Normality. The null hypothesis is rejected if the chi-square value, as well the skewness and kurtosis values are significant at 5% significance level, otherwise we fail to reject (Bal, Dash, & Subhasish, 2016).

3.6.3 Multicollinearity test

Multicollinearity exists if there is high correlation between independent variables. Correlations between the independent variables must not perfectly exceed 0.8 since any higher correlations are problematic (Schober, Boer, & Schwarte, 2018). The study used a pairwise correlation coefficients between the independent variables as well as the Tolerance value and Variance Inflation Factor (VIF). Tolerance value is an indicator of how much of the variability of the specified independent variable is not explained by the other independent variable in the model. If this value is very small (less than 0.2), it indicates that the multiple correlation with other variables is high, suggesting the possibility of Multicollinearity. VIF values above 10 indicate Multicollinearity.

3.6.4 Heteroscedasticity test

Heteroscedasticity refers to the state of systematic changes in the spread of residuals or error term of the model. The presence of residual variance in a model shows that the scattering of the model is dependent on at least one independent variable, this creates a scenario of deviation of the model from effective and actual results (Riya & Chetty, 2020). The Ordinary Least Square (OLS) assumption is that the variance of the residuals is constant. Therefore Heteroscedasticity test is done to examine whether the variance of the residuals is constant. The study used Breusch-Pagan test for Heteroscedasticity to examine whether the variance of the residuals was constant. The test examines the null hypothesis that there is no Heteroscedasticity (Iyke, 2019; Williams, 2020). The null hypothesis cannot be rejected if the p-value exceeds 5% significance level.

3.7 Vector Error Correction Model (VECM)

The first objective through the third were analyzed using Vector Error Correction Model and it can be explained as follows; the analysis of vector error correction model is carried out to determine whether there exist any short run or long run causal relationship within variables in the model specified. The presence of co-integrating relationship within endogenous variables is a necessary condition for estimating vector error correction model. Following (Tomson, 2014), the general form of the vector error correction model estimated in this study can be presented as follows;

$$\Delta X_t = \sum_{i=1}^{n} \beta t \, \Delta X_{t-1} + \sum_{i=1}^{r} Yi \, ECT_{t-1} + v_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Where X_t is an nx1 matrix and n = 6 vectors of dependent variables, ΔX_{t-1}, β and γ are parameters, while V_t is a residual. Error correction mechanism is evidence in the Error Correction Term (ECT_{t-1}). There are as many error correction terms as there are co-integrating vectors (r). Parameter γ_i associated with ECT_{t-1} measures proportion of adjustment back towards equilibrium that can be completed within a single period. If parameter γ_i is not significantly different from zero then there is no error correction process working within the model. Parameter β_t on the other hand, indicates the presence of a short term lag from one variable to another and it measures short term adjustment back towards equilibrium.

3.8 Granger Causality Test

The forth objective was analyzed using Granger Causality test, this can be indicated as follows. The Granger pair wise test was carried out in this study to estimate the causal relationship between external debt and poverty level in the period under the study. Granger (1969), proposed a time series data technique to determine causal relationships between set of variables. Granger causal relationship is said to exist if variable X_t helps to improve forecast of another variable, say Y_t. Following (Tomson, 2014), the forecast of Y_t can be denoted as $Y_{t+h}|Ω$ for optimum *h*–step at origin *t*, based on set of all relevant information in the universe ($Ω_t$). X_t is said to be Granger non-causal for Y_t if and only if $Y_{t+h}\ Ω = Y_{t+h}\ |Ω/[X_{t,s}|x \leq t], h=1,2, \ldots\ldots\ldots\ldots\ldots$ (5)

X_t can be non-causal for Y_t if removal of past information from X_t does not change optimal forecast horizon. In turn X_t Granger causes Y_t if (4) does not hold for at least one *h* and therefore a better forecast of Y_t can be obtained from some forecast horizon by including past information on X_t in the information set. The optimum lag length in the Granger causality test can be determined by information criteria.

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.0 Introduction

Here the chapter presents the econometric techniques that the study employed in order to achieve the study objectives.

4.1 Stationarity tests

Time series analysis requires that variables are stable before inferences can be made out of them. Non-stability of time series variables yields unreliable results that cannot be used (Chang, Rajput, & Bhutto, 2019). This study therefore tested for presence of unit roots in the variables using the Augmented Dickey Fuller (ADF) test.

4.1.1 Augmented Dickey Fuller (ADF) Test

The null hypothesis in the ADF test is that the tested series have unit roots (i.e they are non-stable). The null hypothesis of the test cannot be rejected if the test-statistic (t-statistic) is lower than the associated critical value (at all levels of significance). This would imply that the series are not stationary. Both levels and first differences of variables were tested for stationarity as presented in table 4.1 below.

Table 4.1: Results from the ADF test analysis

	ADF		
Variables	**Levels**	**First difference**	**Integration**
LnPVL	-4.514***	-2.006***	I(1)
LnEXD	0.957	-4.696 ***	I(1)
LnDS	0.202	-10.872***	I(1)

LnPCY	-3.998***	-8.225***	I(1)

Note: *** Implies significance at 1% significance level. Source: Author's computation based on World Bank Data

The results in table 4.1 above indicate that some of the variables (LnEXD and LnDS) were non-stationary at levels. However differencing the variables one time yielded their stationarity and so all the variables became stationary at first difference. The stationarity at first difference was confirmed at 1% level of significance. Variables that become stationary after being differenced once are ranked as being integrated of order one; that is I(1). Thus the study concluded that the model variables were I(1) variables.

4.2 Correlation Analysis;

For description of the study variables, the study carried out a correlation analysis to ascertain the relationship between them. The results are as presented in table 4.2 below

Table 4.2: Results from the Correlation analysis

Variables	LnPVL	LnEXD	LnDS	LnPCY
LnPVL	1.0000			
LnEXD	-0.4835	1.0000		
LnDS	-0.1495	0.6333	1.0000	
LnPCY	-0.0106	-0.2029	-0.0030	1.0000

Source: Author's computation based on World Bank Data 1992-2019

The results in table 4.2 show that all the variables are negatively correlated to poverty level. And all of the variables had lower correlation coefficients than 0.8 and thus including them in the model to be estimated would not cause multicollinearity according to (Gujarati & Porter, 2008). The study nonetheless carried out a test for multicollinearity to ascertain whether including all the variables together in the model would not produce multicollinearity.

4.4 Testing for Multicollinearity

The Variance inflation factor (VIF) test was used to check for multicollinearity among the study variables. The test checks how much of the variance of a regression coefficient could be inflated

due to multicollinearity in the model (Senaviratna & Cooray, 2019). The test also provides Tolerance values. VIF values greater than 10 and Tolerance values less than 0.2 indicate presence of high multicollinearity. The results of the VIF test are as below

Table 4.3: Results of the Variance Inflation Factor

Variable	VIF	1/VIF (Tolerance)
LnEXD	1.79	0.558981
LnDS	1.71	0.583548
LnPCY	1.07	0.933164
Mean VIF	**1.52**	

Source: Author's computation based on World Bank Data

From the results of table 4.3, it is evident that none of the study variables has VIF in excess of 10 and tolerance value lower than 0.2. These results imply that the problem of severe multicollinearity in the model to be estimated is not a threat to the robustness of the model. The study thus proceeded to carry out other diagnostic tests to ensure that other econometric assumptions for time series data are not violated.

4.5 Pre estimation diagnostic tests

The study proceeded to carry out statistical tests on the estimated model to ensure robustness of the model. The following diagnostic tests were carried out. Normality test, Serial Correlation test and Heteroskedasticity test. The normality test was carried out using Shapiro-Wilk (SW) test for normality. The test for serial correlation was carried out using Breusch-Godfrey LM test for serial correlation while Heteroskedasticity test was carried out in the study using Breusch-Pagan test. The details are indicated below.

4.5.1 Testing for normality of residuals

The Skewness and Kurtosis test for normality was used to check whether residuals in the model were normally distributed. The null hypothesis in the test is that the residuals are normally

distributed (Das & Imon, 2016). The null hypothesis cannot be rejected if the p-value associated with the z-value exceeds the 5% significance level. The results are shown in table 4.5 below

Table 4.4: Skewness and Kurtosis test for Normality results

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob>chi2
Residuals	28	0.7802	0.7702	0.16	0.9216

H_0: Normality. Source: Author's computation based on World Bank data.

The results in table 4.3 indicate that the chi-square value and the associated skewness and kurtosis are not significant at 5% level, thus they exceed the 5% threshold level of significance. The study thus cannot reject the null hypothesis of this normality test and therefore concluded that the error terms in the model are normally distributed.

4.5.2 Testing for Heteroskedasticity

The Breusch-Pagan test for Heteroscedasticity was used to examine whether the variance of the residuals was constant. The test examines the null hypothesis that there is no Heteroscedasticity (Iyke, 2019). The null hypothesis cannot be rejected if the p-value associated with the chi-square exceeds 5% significance level. The results are presented in the table below.

Table 4.5: White Test results for Heteroscedasticity

Chi2(1)	Prob>Chi
2.01	0.1564

Ho: no Homoskedasticity. Source: Author's computation based on World Bank data.

The results in table 4.4 indicate that the p-value (0.1564) exceeds the 5% significance level implying that the null hypothesis of no Heteroscedasticity cannot be rejected. Thus, it can be concluded that the variance of the residuals was constant.

4.5.3 Testing for Autocorrelation

The Breusch-Godfrey serial correlation test was conducted to test for relationships between residuals and the lagged versions of themselves because it is stronger than other serial correlation tests (Anjum, 2020). Presence of serial correlation would render model estimates no longer minimum variance estimators (Epaphra, 2016). The Breusch-Godfrey test examines the null hypothesis that there is no serial correlation (Anjum, 2020). The null hypothesis cannot be rejected if the p-value associated with the chi-square exceeds the 5% significance level.

Table 4.6: Results from the Breusch-Godfrey Serial Correlation

Lags (p)	Chi-square	Df	Prob > F
1	4.773	1	0.0589

Ho: no serial correlation. Source: Author's computation based on World Bank data.

The results in table 4.6 indicate that the p-value (0.0589) is greater than the significance level of 0.05, implying that the null hypothesis of no serial correlation cannot be rejected. Thus, it can be concluded that the residuals in the model are not serially correlated.

4.6 The Johansen test

The trace statistic within the Johansen test was computed to determine the rank of the model. The rank of the model are the number of cointegrating vectors within the model (Kilicarslan, 2018). The trace statistic tests a null hypothesis of r cointegrating vectors against the alternative hypothesis of r+1 cointegrating vectors. The null hypothesis is rejected whenever the trace statistic exceeds a corresponding critical value at 5% significance level. The results of the test are shown in the table below.

Table 4.7: Trace statistic results from the Johansen test for cointegration

Null Hypothesis	Eigenvalue	Trace statistic	5% critical value
$r \leq 0$		148.1543	47.21
$r \leq 1$	0.99402	40.6435	29.68

r ≤ 2	0.74439	11.9975*	15.41
r ≤ 3	0.33664	3.3783	3.76
r ≤ 4	0.14860		

Note: * indicates non-rejection of null at 0.05 level. Trend: constant. Sample: 1992 - 2019. Number of obs = 28. Source: Author's computation based on World Bank data

The results in table 4.9 above indicate that there are two cointegrating equations. This is because the null hypothesis of 2 cointegrating equations (r ≤ 2) cannot be rejected since the trace statistic falls short of the corresponding critical value at 5% level of significance (i.e., 11.9975 < 15.41). The confirmation of cointegration among the study variables leads to the conclusion that they have among them, a linear combination that yields a stable long run relationship. The study thus proceeded to the model estimation stage below.

4.7 The Vector Error Correction Model

Given that the model variables were found to be integrated of the same order I(1), the VECM was estimated since it is considered to yield better results when all variables are integrated of order one (Meyer & Hassan, 2020). The results of VECM are presented in the table below

4.7.1 The short run results of the VECM

Table 4.8: Results from the Vector Error Correction Model (Short run)

Variables	**Coefficient**	**Standard Error.**	**Probability**
_ce1 L1.	-0.0065139**	0.0030389	0.032
LnPVL	0.4150259**	0.1835615	0.024
LnEXD	0.0094889	0.0254450	0.709
LnDS	-0.0133613	0.1190330	0.262
LnPCY	0.0070663	0.0065406	0.280
_Cons	-0.0287755**	0.1236790	0.020

Note: Dependent Variable: LnNPovl. ***, **,* imply significance at 1%, 5% and 10% levels respectively. Source: Author's computation based on World Bank data

The results in table 4.8 above indicate that the coefficient of the error correction term is negative and statistically significant at 5% level. This implies that any previous shocks in the dependent

variable resulting from the independent variables and cause deviation from long-term equilibrium path are corrected in the current period. This is because; the negative sign of the coefficient of the error correction term indicates long run cointegration between the independent and the dependent variables whereas the magnitude of the coefficient itself indicates the speed of return to the long-term equilibrium. Thus, the coefficient of the error correction term in table 4.8 indicates that about 0.65% of previous year variations in poverty level due to variations in the independent variables (in the previous year) are restored in the current year.

The results also indicate that the coefficients of previous year values of poverty level (PVL), External debt (EXD) and Percapita income (PCY) had positive coefficient however only for PVL was significant. The coefficient for previous year Total debt servicing (TDS) was negative although not significant.

A specific interpretation of the results shows that, a percentage increase in previous year poverty level leads to a 0.42 percentage increase in the current poverty level in the short run and it's significant at 5%. Similarly, a percentage increase in previous year external debt leads to a 0.009 percentage increase in the poverty level while a percentage increase in debt servicing leads to a 0.01 percentage decrease in poverty level in the short run, albeit these coefficients are not significantly different from zero. On the other hand, a percentage increase in percapita income increases poverty level by 0.007 percent in the short run however it is insignificant.

The results also indicate that the constant term is significant at 5%. This could be taken to mean that the level of poverty is -0.03% when all the independent variables in the model are zero. The details are summarized in the equation below;

$$\Delta(PVL) = -0.03 + 0.009\Delta(EXD) - 0.013\Delta(DS) + 0.007\Delta(PCY) \dots\dots\dots\dots\dots\dots (6)$$

4.7.2 The long run results of the VECM

The study used the Johansen normalization from the VECM to establish the long run effects of the variables under study. The results are presented in table 4.9 below

Table 4.9: Results from the Johansen normalization restriction

Variables	Coefficient	Standard Error	Probability
LnEXD	4.231023***	1.379902	0.002

LnDS	2.636246**	1.232772	0.032
LnPCY	-4.065301***	0.6640352	0.000
_cons	52.76752		

Note: Dependent Variable: LnNPovl. ***, ** indicate significance at 1% and 5% levels respectively. Source: Author's computation based on World Bank data

The results in table 4.9 indicate that in the long run, a percentage increase in external debt, leads to a 4.23 percentage increase in poverty level and vice versa, keeping other factors constant and the coefficient is significant at 1% significance level. Similarly, the results indicate that in the long run, a 1% increase in debt servicing leads to a 2.64 percentage increase in poverty level keeping other variables unchanged and it's significant at 5% level of significance. However, a percentage increase in percapita income leads to a 4.07 percentage decrease in poverty level in the long run keeping other factors constant, and it's significant at 1% significance level. The details are summarized in the equation below;

$$\Delta(PVL) = 52.77 + 4.23\Delta(EXD) + 2.64\Delta(DS) - 4.07\Delta(PCY) \dots\dots\dots\dots\dots\dots\dots\dots\dots (7)$$

4.8 The test for Granger Causality

Subsequent to setting up the existence of long-run connection amongst the variables using the Johansen approach, the study interested itself in the determination of the direction of causality. Presence of cointegration in data series envisages the existence of Granger causality, but cointegration does not indicate the direction of the causality relationship. The study investigated the causal relationships within a VAR framework using the pairwise Granger causality test. The results are presented in table 4.10 below;

Table 4.10: Granger causality test results

Null Hypothesis	**Chi2**	**Prob > chi2**
LnEXD does not granger cause LnPVL	1.1577	0.282
LnPVL does not granger cause LnEXD	5.6922**	0.017

Notes: Sample period = 1992 - 2019, Number of observations = 28. Source: Researcher's computation using secondary data.

The results of the granger causality test show that in equation one, the null hypothesis *LnEXD does not granger cause LnPVL,* is not rejected because the associated chi2 value is found to be insignificant at 5% significance level. This implies that external debt does not granger cause poverty level in Uganda. However, in the second equation, the null hypothesis *LnPVL does not*

granger cause LnEXD can be rejected because the associated chi2 value is significant at 5%. This result implies that poverty level granger causes external debt. The results of this granger causality test show that there is a uni-directional causality running from poverty level to external debt.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter of the study discusses the findings in the previous chapter and makes conclusions basing on the study objectives. The chapter also gives policy recommendations from the study findings

5.1 Discussions

This study set out to achieve four major objectives that were to be achieved through hypothesis testing. The objectives of the study were to investigate the relationship between external debt and poverty level, to examine the relationship between debt servicing and poverty level, to examine the relationship between percapita income and poverty level and to examine the causal relationship between external debt and poverty level in Uganda. Hypotheses were tested by looking at the associated p-values of the respective parameter estimates as specified in the empirical model in equation 1 of chapter three. The findings of the results are discussed as below;

Objective one of this study was to establish the short run and long run effect of external debt on poverty level in Uganda. The study established that there is a significant effect of external debt on poverty level in Uganda in the long run. The nature of this effect is positive for the long run period, implying that in Uganda, when external debt increases, poverty levels also increases in the long run and it was statistically significant at 1%. External debt affects poverty level through high debt service's crowding out of government's social spending. High debt service that is a result of high indebtedness directly reduces government budgetary allocations on health, education, social safety nets, and water and sanitation. Therefore the hypothesis that *there's no significant effect of external debt on poverty level in Uganda* was reject. The same effect was established in the second objective where an increase in debt servicing leads to increase in

poverty levels in the long run. This can be explained by the fact that when debt is not canalized in income-generating and productive activities, the ability of an economy to repay the debt is significantly reduced. For example, when debts are contracted to cover public debts or fixed charges instead of investment opportunities, these debts cannot allow added value by reducing unemployment, and improving social conditions of the people. The results of this study are in agreement with the works of Zaghdouid and Hakimi, (2017), who found a strong evidence of a positive and significant long-run relationship between external debt and poverty in a panel of 25 developing countries. Similar results were also established by Siyanbola (2005) and Oyelede, *et al* (2013) who found positive effect of external debt and debt servicing on poverty levels.

The third objective of this study was to establish the effect of percapita income on poverty level in Uganda and the corresponding hypothesis was that *there's no significant effect of percapita income on poverty level in Uganda.* From the VECM model, it was established that percapita income negatively affects poverty level in the long run at 1% significance level. Thus, the null hypothesis was rejected. The results of the model specifically reveal that a percentage increase in the income percapita leads to a 4.07 percentage reduction in poverty levels in the long run, holding external debt and debt servicing constant. A negative effect implies that when percapita income increases, poverty levels reduce and vice versa. This implies that as income percapita increases, every person has the financial ability to meet their social and economic needs, which is a sign of reduction in poverty levels in the economy. This study is also in accordance with research conducted by Whisnu and Mudakir (2011), Nelvi and Sri (2020) that stated higher income percapita leads to the decrease of the poverty level. In the short run, the effect of income percapita on poverty level was found to be not significant. This can be understood to indicate that short term changes in the income percapita do not affect the poverty levels in Uganda.

Objective four of this study was to establish the causal direction between external debt and poverty level in Uganda. The results indicated a uni-directional granger causality running from poverty level to external debt. This revelation indicates that in Uganda, the causal relationship that exists between external debt and poverty level originates from the prevailing levels of poverty in the economy, thus it is poverty level that causes need for external borrowing. Since this study has already established that the relationship between external debt and poverty level is

positive for Uganda, it is also now evident that the source of the "positivity" originates from the levels of poverty.

5.2 Conclusion

This study examined the effect of external debt on the poverty levels in the Ugandan context using co-integration technique, Vector Error Correction model and granger causality analysis. The co-integration results indicated the existence of only two long-run equilibrium relationship among poverty level, external debt, debt servicing ratio and income percapita. The regression results also indicate that in the long run, the external debt and debt servicing positively affect poverty levels in Uganda while income percapita negatively affect poverty levels in the long run. The granger casualty test indicated a uni-directional causation running from poverty level to external debt in Ugandan context. This situation can be explained by the high unemployment rates, low income levels, low savings and low investment levels which necessitates government to increase external borrowing in order to meet the savings-investment deficit aimed at economic growth and poverty reduction.

5.3 Recommendations

Policy makers should implement effective debt management strategies by setting external borrowing strategies complying with international institutional standards. In this way, the use of external debt in domestic productive areas will contribute to reducing the debt service burden. The decline in external debt service will reduce the crowding-out effect of external debt service payments on social spending, by providing budgetary resources for economic infrastructure and social spending.

Government needs to mobilize its domestic savings efforts. This is because dependence on foreign resource for development purpose do cause poverty and it is both risky and unreliable. It is only the domestic efforts of a country that are more reliable and less risky for developmental purpose.

Government should pursue vigorously, policy initiatives such as fostering per capital income growth, raising agricultural production and the pursuit of education and health sector policies that will alleviate poverty.

5.4 Limitations of this study

The study was limited to the effect external debt, debt servicing and income percapita, which are largely economic factors; it does not consider institutional factors such as quality and management. The study also did not explore the link among indebtedness, growth and poverty in Uganda.

5.5 Possible areas for further research

Subsequent studies can consider examining the explicit link among indebtedness, growth, and poverty in Uganda. This will requires in-depth studies of transmission channels linking the external debt and poverty. In addition, the nexus between aforementioned variables will require further research by considering institutional quality and management.

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