Government Expenditure and Economic Growth Nexus in Tanzania

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Abstract

This paper empirically investigates how government consumption impacts upon economic growth in Tanzania for the period 1967 – 2020. Autoregressive Distributed Lag (ARDL) bounds cointegration test revealed economic growth and government expenditure were cointegrated, given the conditioning factors; and, revealed a small but statistically significant positive long run effect of government size on economic growth. The pairwise Granger causality test rejected the null hypothesis of no uni-directional or bi-directional causality between the government size and economic growth. The study also established the long run effect of inflation on economic growth was negative and statistically significant. The ECM results reveal the short run effect of government size on economic growth was negative and statistically insignificant; and, the effect of private investment on economic growth was positive and statistically insignificant. Besides, the short run effect of human capital on economic growth was negative and weakly significant. The results revealed a high speed of adjustment from disequilibrium to long run equilibrium. The findings support the conventional view: government consumption lacks significant positive effect on growth over the long run. This finding reveals the limit to the use of fiscal policy especially recourse to government expenditure to prime or stabilize the economy as maintained in Keynesian macroeconomic theory. The gestation period of government consumption is long. Furthermore, the finding underscore importance of price stability and, other things being constant, need for more proactive policies and strategies to avail business and macroeconomic environment that would increase private investment.

Key words: Keynesian view; ARDL bounds test; Granger causality; government size; Tanzania

JEL Classification Codes: H50, O47, O55.

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1.   Introduction

The Government of the United Republic of Tanzania (URT) started to implement the IMF (International Monetary Fund) and World Bank sponsored economic recovery programmes (ERP) in mid-1986. The programme was implemented in three phases, viz, ERP-I (1986 -1989) and thereafter ERP_II (1989-1991) and finally, as an Enhanced Structural Adjustment Programme (ESAF) (1992-1994). Among others, the drive to macroeconomic stability included exercise of fiscal prudence in order to achieve internal balance, that is, fiscal balance. To this end, the government implemented expenditure cuts and switches, coupled with efforts to increase tax revenues by strengthened institutional framework for tax administration and rationalized taxes, tax rates and both tariffs on imports and exports in order to increase tax revenues.

The underlying broad objective, which was routed in the conventional macroeconomic stabilization programme, was to reduce the government size which grew after the 1967 Arusha Declaration posited public sector as an engine of economic growth in Tanzania. The underlying macroeconomic theory, which was shared by development technicians and policy makers in Tanzania was that fiscal imbalance from excess of government consumption was one of the primary causes of macroeconomic crises experienced in Tanzania since the 1970s through the early 1980s. Thus, it was imperative that fiscal imbalances was addressed, among others, by reducing size of government as that would contribute to the achievement of internal balance and restoration of macroeconomic stability that would elicit high and sustained rates of economic growth and development.

The main objective of this paper is to answer one main question: what was and has been the effect of government size on economic growth in Tanzania? This question is of research and policy interest in several ways: it entails a postmortem of the role and limitations of government fiscal policy action in the process of socio-economic development. On this account the study is not on the causes of government size as in the theories of Wagner's (1883) Law of Increasing Sate Activity nor is it motivated by the theory of demand driven economic and political self-interest of the government and/or pattern of economic growth of the economy as presented by Niskanen (1971) and Peacock-Wiseman (1961) and Musgrave (1988). Nor is the study geared to investigate effect of specific components of government expenditure on economic growth or specific sector of the economy in Tanzania. Rather the study is on the effect of government size on aggregate economic growth. Specifically, the analysis seeks to answer the following questions: a) does government size impact positively or negatively on economic growth? b) Is there a one-way causal effect of government size on economic growth?

That knowledge is wanting in Tanzania for one main reason: it is common knowledge that government in developing countries, through the concessionary fiscal actions, have undisputable role to play to shape the course of economic growth and development. In the same vein, if not prudently conceived, their fiscal policy actions may lead to either unintended or rather unwanted or undesired outcomes in the form of macroeconomic instability. Granted, findings of the study may shed light on scope and limits of fiscal policy action, the government expenditure in particular, in macroeconomic management in Tanzania. Conversely stated, while fiscal budget expenditure may promote economic growth, it may also undermine economic growth if unchecked.

Unfortunately, survey of the literature suggests there exist only one study by Kyssima *et al.* (2017) which is on only the nature of the causality between aggregate size of government expenditure and output in Tanzania. Other specific studies on Tanzania, including Kweka and Morrissey (2010), Kapunda and Topera (2013), Morwa (2017), and Gisore et al. (2014) only investigated the effect of the components of government expenditure on growth of several sectors of the economy, for example, Maingi (2017) and Mudaki and Masaviru (2012) in Kenya; Paul and Furahisha (2017) in Tanzania; Akpan (2005) in Nigeria; and, Dao (2012), Bose, Haque and Osborn (2007) and Yasin (2003) in studies which covered some developing countries, including Tanzania. Such studies, though very informative, they only offer limited scope for macroeconomic policy inference. Specifically, effect of disaggregated government expenditure on economic growth lacks policy importance. Diamond (1989) also notes that the distinction between capital and recurrent expenditures is blurred by weighty of evidence in support of positive effect of aggregate government expenditures on growth, though that of current expenditure as a long gestation period. Furthermore, the empirical analysis in previous studies on Tanzania is limited to estimation of linear models by using ordinary least squares (OLS) method. Granted, the studies lacks estimation of short run and long run dynamics that characterize the nexus between economic growth and government size and other growth conditioning factors.

It is significant to note that it is thirty-seven years since Tanzania started to implement the IMF and World Bank sponsored economic reforms in 1986. The sample period covered by the previous studies on Tanzania does not cover data points for up to 13 calendar years—which is a lot! Study by Kweka and Morrissey (2010) covered the period 1965-1996; and, while Kapunda and Topera (2013) used data for the period 1965-2010; Kwendo and Munturi (2015) and Gisore *et al.* (2014), respectively used data for the period 1995-2010 and 1980-2010. Also, while Paul and Furahisha (2017) covered the period 1978-2014, Morwa (2017) covered the period 1970-2015. Noteworthy, therefore, is dearth of empirical studies on the nexus between economic growth and government size in Tanzania based on sample period with more recent data points.[1] One main implication from that gap is thus: there exist in previous studies a lack of descriptive and econometric analysis of the impact on economic growth and income poverty reduction from the increase in the size of government expenditures to achieve the objectives of the Tanzania Development Vision 20225 (TDV 2025) by effective implementation of, among others, the National Strategy for Growth and Reduction of Poverty (NSGRP), Five Year Development Plans (FYDP), and the Big Results Now (BRN) initiative. The ERPs implemented in Tanzania since the mid 1986 included, among others, reduction of government expenditure in order to achieve internal

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[1] The National Development Vision 2025 aims at achieving more than 8 percent real rate of economic growth so as to be able to reduce poverty significantly and reach a middle-income country status and better life for all. To that effect since the launch of economic reforms in mid-1980s government expenditure have remained aligned to the policy objectives of the strategies implemented. Accordingly, government expenditure has been directed to public investment in basic infrastructure, including transport and communication, electricity, etc. Also, the government innovated financed skills development and safety nets programmes, including "the Programme for Economic Empowerment and Job Creation; the Mwananchi Empowerment Fund; Small Entrepreneurs Loan Facility (SELF) and the National Income Generation Programme (NIGP)..". Besides " In addition, loans were also provided through the Women Development Fund, Youth Development Fund, and the Tanzania Social Action Fund (TASAF). See URT (2010, p. 24-25, 28).

balance and, in tandem, price stability. Lack of an empirical analysis of the structural effect of the reforms on economic growth is another gap of interest in the previous studies on Tanzania.

The noted gaps in the previous studies on Tanzania, coupled with the primary motive to investigate the government size-economic growth nexus, provide the *raison d'etre* of the analysis in this paper. The analysis is based on a longer sample spanning the period spanning from 1968 to 2020, for which data were available. The now popular Autoregressive Distributed Lag (ARDL) bounds cointegration test is used to fit the basic model followed by test for causality by using pairwise Granger causality test. The effect of the structural break in the government size on the economic growth in mid-1986 missed in previous studies on Tanzania is investigated by using a dummy variable.

The rest of the paper is organized as follows. The evolution of the government expenditure and economic growth is covered in Section 2. Section 3 dwells on the literature survey; and, methodology of the study is handled in Section 4. Empirical results are presented, discussed and compared with that of previous studies in Section 5. Section 6 concludes the paper with a presentation of the main findings, their policy implications and areas for further research.

2. Government Size and Growth in Tanzania: An Overview

Tanganyika, known as Mainland Tanzania, became independent in 1961, having been under the British protectorate government since the end of the second world war in 1919. The first phase post-colonial government, which was in power during the period 1961-1985, was led by the late President Julius K. Nyerere, also known as Mwalimu Nyerere. The Mwalimu Nyerere rule was succeeded by the Second phase government led by Ali Hassan Mwinyi (1985-1995), Third phase government led by the late Benjamin Mkapa (1995-2005), the fourth phase government led by Jakaya Mrisho Kikwete (2005-2015), the fifth phase government led by the late John Pombe Magufuli (2015-2021) and the present sixth phase government led by Samia Suluhu Hassan (2021 -).

The development agenda in all the six phases of the government in Tanzania rested on strategies and policies of the ruling Party, that is, TANU (Tanzania African National Union) manifesto (1961-1977) which was transformed into CCM (*Chama Cha Mapinduzi*, literal translation as "Revolution Party") in 1977, after merging with the ASP (Afro Shirazi Party of Zanzibar. In the early post-colonial period (1961-1964) the mainstream mode of "a liberal market economy" remained in place as in the colonial period (Lipumba, 1986). On the one hand, therefore, the role of the first phase government "was to provide social and economic infrastructure conducive to private investment in agriculture and industry" (Lipumba, 1986, p. 2). On the other hand, the government it had to expressly attend to several challenges from the colonial rule, among others, poverty, ignorance and diseases that afflicted a majority of the country's population of about 10.35 million people. Thus, fighting the three socio-economic vices remained prime in the socio-economic development agenda of the first phase TANU government which subscribed to philosophy of African Socialism innovated by its leader, Mwalimu Nyerere.

The role of the government expanded significantly after the TANU promulgated Arusha Declaration in 1967 that led to development strategies and policies based on Ujamaa (African Socialism) and Self Reliance Policy. The two expanded the traditional role of the government in breadth and depth. First, the nationalization of all private economic activities in key sectors of the

economy poised the first phase government as a producer of both public and private goods! Noteworthy, the very active involvement in production of private goods by state-owned enterprises (SoEs) increased development and recurrent expenditure beyond the existing fiscal space. Second, development strategies and policies in five year development plan emphasized attainment of rapid achievement of poverty eradication, self-sufficiency in educated manpower, provision of health, better transport and communication, and not least convenient access to water supply by a majority of the sparsely located population in the country. Third, to better secure her borders, the first phase government also remained committed to provision of asylum and support to the military groups cum political parties that were fighting for political independence in the South African region, among others, in the present day Zimbabwe, Mozambique, Angola, Namibia, and the Republic of South Africa.[2] Fourth, internal and external shocks, among others, crude oil crisis and drought (in 1975, 1976,1979), and the war against Idi Amin of Uganda (1978-1979), further demanded on urgent government expenditure.

Government's commitment to the achievement of the socio-economic and political ideals enshrined in the Arusha Declaration, coupled with commitment to the support of liberation struggle in the Southern African region and beyond, combined with external shocks led to an increase in the government expenditure since 1967 through the mid-1980s (Figure 1).
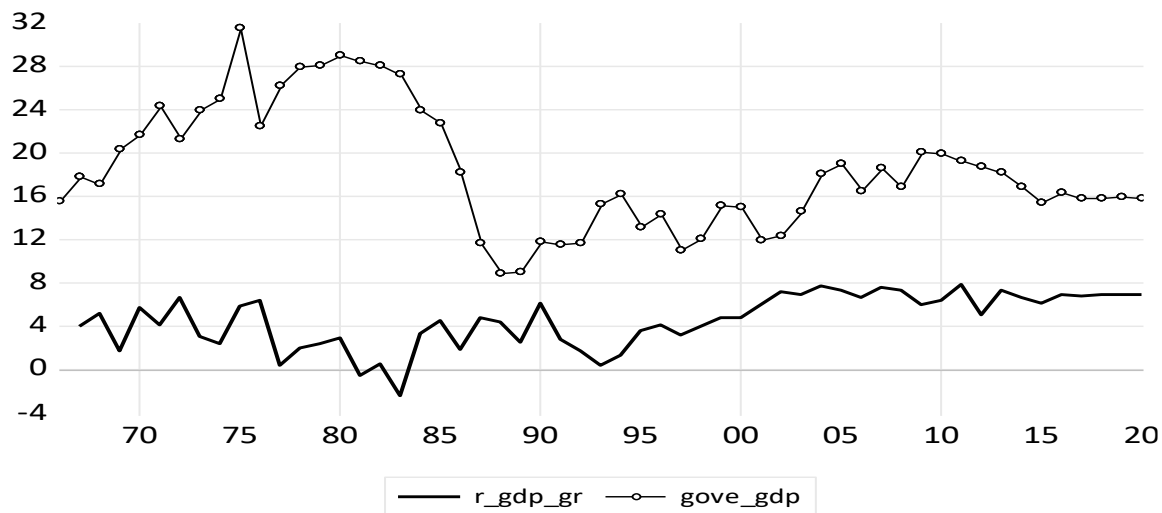

Figure 1:   Economic Growth and Size of the Government in Tanzania,1966 - 2020

Nonetheless, the impact of the government size on economic growth during the period was initially very marginal: the correlation between government size and economic growth between the launch of the Arusha Declaration in 1967 and commencement of the villagization drive in 1972 was positive but small (0.10); and between 1973 and 1982 was negative, and very low (-012). This

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[2] The liberation movements included African National Congress (ANC) and Pan African Congress (PAC) of South Africa; South-West African Peoples Organization (SWAPO) of South West Africa, now Namibia; Zimbabwe African National Union (ZANU) and Zimbabwe African Peoples Union (ZAPU) of Zimbabwe, the then Sothern Rhodesia; FRELIMO (*Frente de Libertação de Moçambique*, literally as "Liberation Front of Mozambique") of Mozambique, which had headquarters in Dar es Salaam and supported by the government. For a detailed history, see Roberts (2022).

suggests lack of significant growth generating expenditure in the growth of the size of the government during the period. This is alluded to by Lipumba (1986) who notes that the growth in government expenditure was largely due to finance of capital formation and the provision of social services and finance of the expansion of the bureaucracy.

Figure 1 shows the size of the government decreased after the launch of the IMF and World Bank sponsored Economic Recovery Programme (ERP) in mid-1986. Notable, the size of the government decreased by more than a half after the adoption of economic reforms in 1986: specifically, it decreased from 26.12 percent in 1981-1985 to 11.95 percent in 1986-1990, that is, a decrease of about 54.25 percent points over the period.[3] Noteworthy, the dramatic decrease in government size, among others, resulted from implementation of contractionary fiscal policy to achieve internal balance and also to avoid "waste pilferage, and other forms of unproductive expenditures" (Malima, 1990). Economic recovery also ensued: Figure 1 shows the rates of economic growth improved and, indeed, price stability became restored, at least in the second half of the 1980s (Ndanshau & Mtui, 2020). Granted, the relationship between the government size and real economic growth, as measured by correlation coefficient, also improved: the correlation increase from -0.12 in the period 1974-1982 to 0.743 in the period between the launch of the ERP in 1986 and onslaught of the Global Financial Crisis (GFC) in 2008. Thereafter, and up to 2020 the correlation between the government size and economic growth was negative and somehow very low, about -0.13. Evidently, the correlation between the government size and economic growth is unlikely to have been wholly positive or wholly negative during the sample period. The relevance of this contention is investigated by econometrics methods.

3.   Review of Relevant Literature

3.1   *Review of Theoretical Literature*

Governments plays different roles in an economy that fall under what are referred to in the literature as "six major functions of the government in a market economy", that include: provision of legal and social framework, maintenance of competition, provision of public goods and services, redistribution of income, correction of externalities, and stabilization of the economy. However, controversy exists in the literature as regard the economic outcomes, specifically the effect on economic growth and development, of government execution of its core functions (Paternostro et al., 2007).

On the one hand, existence of a positive outcome from government execution of its functions is underscored in some literature: a) stable socio-political system promotes economic growth by not only minimizing uncertainty and risk that would undermines private investment and capital inflows from abroad but also trigger speculative investment and development of inflation (Guseh, 2007); b) stable legal framework that protects private property and the national economy promotes (domestic and foreign) private investment and economic growth by guaranteeing existence of trust in enforcement of debt contracts, security to private property, among others, against nationalizations; c) guarantee of macroeconomic stability, are prerequisite for increase in domestic and foreign private investment that impacts positively on economic growth; d) regulatory

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[3] Based on basic data used in the analysis.

measures to curb monopolistic tendencies increase efficiency in production and service delivery that impacts positively on economic growth and development; and, e) provision of public goods, for example transport infrastructure, and to some extent, public education, electricity, water, and health services and some utilities that are costly to private sector investment, complement private sector initiatives. The outcome would be an increase in potentials for high return to investment that would attract domestic and foreign investment and therefore impact positively on economic growth (Ekpo, 1999; Abdullah, 2000; Cooray, 2009).

On the other hand, some commentators maintain existence of negative and zero-sum outcomes from government execution of its core functions in an economy, for example, Olopade et al. (2010) and Ansari, Gordon and Akuamoh (1997). Specifically, in the course of execution of its core functions the government harms or undermines economic growth and development. In this context is a view that governments lack sense of entrepreneurship which drives profit maximization but inefficiently spend on, among others, wasteful consumption that lacks impact on economic growth (Romer, 1990). Besides, the core functions of the government are considered to constitute the *raison d'etre* of big sized government that undermines economic growth in several ways: raising tax rates, crowd-out private sector from bank credit, fueling inflation by necessitating borrowing from the banking system, and undermine macroeconomic stability and, consequently, slow down economic growth (Diamond, 1989).[4]

3.2   *Review of Empirical Literature*

Literature is replete with empirical studies on the nexus between economic growth and government expenditure in developing countries.[5] First, though not by order of importance, are cross-country and country specific studies on the Wagner's hypothesis.[6] Some of such studies, carry evidence that supports Wagner's (1883) law that economic growth elicits growth in government expenditure. The empirical evidence in some of the other studies rejects the relevance of the Wagner's hypothesis in developing countries. Specifically, such studies established existence of significant and positive unidirectional causal effect of economic growth on the size of the government expenditure in some developing countries (Akitoby *et al*., 2004).

Aside the empirical studies on the Wagner's hypothesis the literature is also replete with studies that have tested the Keynesian and Neo-Classical hypothesis on relationship between government size and economic growth by using country specific or panel data of some developing countries in sub-Saharan Africa (SSA). The empirical evidence generated by such studies, at least since 2000, is inconclusive. On the one hand, some studies reveals existence of statistically significant and unidirectional positive effect of aggregate government size on economic growth (Ahuja and Pandit, 2020; Munongo, 2012); Komain et al., 2007; Cooray, 2009; Omoke, 2009;

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[4] Whether tax or debt financed government consumption undermines economic growth is debatable also an issue in the literature that exist under the so-called Ricardian equivalence theory that awaits empirical investigation.

[5] First, the literature is dominated by cross-country studies on developed countries, the OECSD in particular, that are not explicitly reviewed here but have been well reviewed, among others, by Facchini & Melki (2011) and Nijkamp, P. and Poot, J. (2004). The review does not cover the enormous number of studies on effect on growth of the sector specific government expenditures in developing countries, such as that by Aremu, Bta and Salako (2015), Musaba, Chilonda, and Matchaya (2013), Shenghen and Rao (2003), Kolluri et al. (2000), Usahab (2004). Also not comprehensively reviewed are most studies on government expenditure and economic growth prior to 2000s.

[6] A comprehensive survey of the studies on Wagner's hypothesis by Lindauer and Valenchik (1992) reveals almost all are developed market economies.

Bose, Haque and Osborn, 2007; Alexiou, 2007; Gregorio and Ghosh, 2007; Dogan and Tang, 2006; Loizides and Vamvoukas (2005); Haque and Kim, 2003; Loizides and Vanroukeas, 2005; Fajingbesi and Odusola, 1999). A few studies carry evidence which show existence of marginal effect of government size on growth caused by institutional factors, among others corruption. In relation, some studies have established existence of a positive unidirectional causal effect of economic growth on government size in developing countries, for example, Wu, Tang and Lin (2010) in a panel data study which covered 182 countries for the period 1950-2008. Others studies, for example, Olaoye (2023) reveal existence of neither unidirectional nor bidirectional causality between government spending and economic growth in ECOWAS (Economic Community of West African States) countries due to "high level of corruption, oversize government, and a waste of public resources".

The empirical evidence generated by some other studies reveal existence of a negative effect of government size on economic growth in SSA, among others, Odim, Okeke and Ikeh (2018), Ghura (1995), Nketia (2002), Guseh and Oritsejafor (2007), and Hamzah (2011).[7] Others failed to establish existence of either unidirectional or bidirectional causality between government size and economic growth, for example, Olaoye, Orisadare and Okorie (2020) and Olaoye and Afolabi (2021) in studies which covered ECOWAS countries and Olopade and Olopade (2010) in a study on Nigeria.[8] Similarly, Munene (2019) found the effect of government size on economic growth in Kenya was indeterminate. Also, noteworthy, while some studies established existence of bi-directional causality between economic growth and government size, for example, Abu-Bader et al. (2003) in a study Egypt, Israel and Syria, others, failed to establish existence of any type of causality between two macroeconomic variables, for example, Ansari *et al.* (1997) in a study on Kenya, Ghana and the Republic of South Africa (RSA). Generally, Nyasha and Odhiambo (2019) established from a review of the literature that causality between economic growth and government size was multifaceted but the "Wagner's type causality" dominated. Other studies also point to existence of threshold government size, that is, existence of a level of government expenditure beyond which economic growth is sacrificed.

In general, the literature survey reveals dominance of cross-country empirical studies on the size of government expenditure and economic growth nexus in developing countries. Specifically, the evidence lean more in favour of the Keynesian macroeconomic theory that the impact of government size on economic growth in developing countries is positive—a factual evidence from a comprehensive review of empirical studies prior to 1998 by Facchini & Melki (2011). Also, noteworthy, empirical studies mostly lack dynamic analysis of the nexus between economic growth and government size that would inform better policy inference; and, their results cannot be generalized due to inherent heterogeneity of countries covered with respect to socio-economic factors and even political and leadership factors (Maddala and Wu, 2000). What is evident and very clear from the literature survey, therefore, is that there is a dearth of country

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[7] Notable, there are other seminal panel data studies with coverage of some SSA counties that have established existence of significant negative effect of government consumption on economic growth, among others, Barro (1991), Sala-i-Martin (1992), Rebello (1993), Bromberg (1999), Grier and Tullock (1989) and Landau' (1986, 1983), and Ghura (1995).

[8] See also seminal works by Khan and Reinhart (1990) and Kormendi and Meguire (1985), and study by Ansari et al. (1997).

specific studies in the literature; and, in relation, there is a space and important of country specific studies that may inform better country specific policy options.

While there are several studies on the relationship between government size and economic growth in Tanzania, a majority of such studies are on sector specific effect of government expenditure, for example studies by Kweka and Morrissey (2010), Kapunda and Topera (2013), Gisore *et al*. (2014) and Kwendo and Munturi (2015). Only study by Kyissima *et al*. (2017) and Paul and Furahisha (2017) also focused on the aggregate effect of government expenditure on economic growth in Tanzania. The study nonetheless failed to establish either short-run or long-run effect of government expenditure on economic growth in Tanzania. Instead, the study found the causality ran from economic growth to government size over the long-run only. Second, the sample period of the previous studies lacks a capture of long-run and short-run dynamics in the evolution of government expenditure and economic growth in Tanzania over a long period. Notable a majority of the studies cover the period 1980-2010. Third, the analysis is mostly based on linear model mostly estimated using the ordinary least squares (OLS) method.

Previous studies on Tanzania appear to have assumed existence of a linear effect of government size on economic growth. However, business cycles may also impact upon the government expenditure and, therefore, render "spurious" the test of the underlying hypotheses. Besides, to the extent that Tanzania implemented economic reforms that reverted the economy to a market economy since the mid-1980s, a structural break is likely to characterize evolution of the nexus between government size and economic growth in either Wagner's law or the No-Classical contexts. It is also noteworthy potential simultaneity bias characterize previous studies which regressed economic growth on government expenditure and other potentially endogenous regressors, for example, inflation, openness, and financial sector development or bank credit to the private sector. These methodological issues are taken into consideration in econometric analysis and discussion of the results presented in this paper.

4. Methodology
4.1 *Analytical framework*
The nature of the link between government expenditure and economic growth lacks a concrete basis in the conventional growth models (Lindauer and Velenchik, 1992, p. 71). Nonetheless, within the Keynesian theoretical framework, the transmission of the effect of government expenditure to the real sector of the economy is not inconceivable. Government expenditure, particularly when directed to investment in the presence or absence of market failure, it directly contributes to output; and, through the so-called crowd-in phenomenon, it induces increase in private sector output. Besides, government expenditure, for example, on education, health and transport and communication infrastructure, legal and regulatory framework increase the level and efficiency of private sector investment that impacts positive on economic growth (Ghura, 1995). Nonetheless, lack of proper institutions, property rights, internal and external shocks, may undermined the theorized positive effect of government size noneconomic growth.

4.2   Model Specification

The estimation builds on endogenous growth models used in previous studies, among others, Grossman (1990) and Ram (1986). The model is specified as:

(1) $g_t = \alpha_0 + + \alpha_1 ge_t + \alpha_2 \pi_t + \alpha_3 pi_t + \alpha_4 hc_t + \alpha_5 op_t + \alpha_6 D_t + u_t$

Table 1:   Definition and Measurement of the Variables

Epithet	Description	Measurement (in percentage)
g	real rate of economic growth	First difference of the natural logarithm of real GDP
π	is inflation rate	First difference of the natural logarithm of Consumer Price Index (CPI, base 2010)
ge	Government size	Ratio of government consumption expenditure to the GDP
pi	Private investment	Ratio of Gross Fixed Capital Formation (GFCF) to the GDP.
op	openness.	Aggregate of exports and imports as a ratio of the GDP,
hc [9]	Human capital	Gross primary school enrollment rate
D	Economic reforms	1967-1986= 0 1987-2020=1
u_t	error term.	na

A note befits on measurement of government size and government expenditure used in the analysis hereafter. Review of the theoretical and empirical literature revealed existence of two alternative measures of government size and government expenditure. On the one hand, is measure of government size as a ratio of either total government expenditure, government consumption, tax revenues or stock of public investment to the GDP and also as growth rate of the total government expenditure (Alimi, 2014; Cooray, 2009; Landau, 1986).[10] On the other hand, the measure of government expenditure in some studies excluded transfers, subsidies, tax exemptions concessional lending, and public loan guarantees, and capital formation in the measure of aggregate expenditure over all levels administrative structure: local and central government.[11] Others only excluded local government expenditure but not transfers. At worst, some previous studies, like that on Tanzania, are insensitive to the measurement issue that characterizes government expenditure. The analysis in this study is based on aggregate government expenditure, which is measured to exclude transfers and gross capital formation in Tanzania.

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[9] The gross enrollment ratio can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition. https://ourworldindata.org/grapher/gross-enrollment-gpi-secondary. Typically, government expenditure on education and health, expressed as a ratio of the GDP and gross secondary school enrollment rate are the most common measures of human capital in the literature that have not been used here due to lack of reliable data.

[10] The rate of growth in government expenditure was not used in the analysis mainly in order to provide a room for the comparison of the results of this study with that obtained by some of the previous similar studies on Tanzania and elsewhere.

[11] Among other, Bergh & Henrekson (2011) maintains that the "seemingly contradictory findings" on the relationship between economic growth and government size "is largely explained by variations in definitions and the countries studied" (p. 0).

The analysis is based on annual time series data for the period 1967 to 2020. The choice of the sample period was dictated by data availability and need to investigate for structural break in the growth and government size nexus after the launch of the IMF and World Bank sponsored economic reforms in 1986. The data were obtained from diverse official sources. Data for nominal GDP and population were obtained from the publications of the International Monetary Fund (IMF). The data for the national CPI, imports and exports were obtained from the publications of the Bank of Tanzania (BoT); and, the data for private Gross Fixed Capital Formation (GFCF) was obtained from the publications of the National Bureau of Statistics (NBS) in Tanzania. The data for primary school enrollment were obtained from publication of the Ministry of Education and the National Bureau of Statistics (NBS) in Tanzania. The analysis of data was carried out by using E-Views (Version 12).

4.3 Estimation Methods

Two methods features in estimation of the model. One is the (bounds) Autoregressive Distributed Lag (ARDL) cointegration method, which is associated with Pesaran, Shin and Smith (2001). The other is use of pairwise Granger approach to test for causality between growth and government size.

The ARDL cointegration test technique is considered superior to Johansen and Joselius (1990) and Engle and Granger (1987) cointegration tests for several reasons. Among others, first, it assumes all variables of the estimation model are endogenous and give unbiased long-run parameter estimates; second, it accommodates small sample that characterizes the data set used in the analysis. Third, the techniques provide for a capture of both long-run and short-run dynamics that characterizes growth and government expenditure; and, fourth, the technique "has advantage of yielding consistent estimates of the long-run coefficients that are asymptotically normal irrespective of whether the underlying regressors are I(1) or I(0)" (Pesaran and Shin, 1997: 1). On only this account, the analysis was subjected to Augmented Dickey and Fuller (ADF) unit root test, to ensure the variables of the estimation model were not I(2) or a higher order.

The ARDL involve use of the Ordinary Least Squares (OLS) method to estimate Equ. 1 as an unrestricted error correction Autoregressive Distributed Lag (ARDL) model that reads as:

$$(2) \quad \Delta g_t = \emptyset + \alpha_1 g_{t-1} + \alpha_2 ge_{t-1} + \theta_j Z_{t-1} + \sum_{i=0}^{k} \beta_i \Delta g_{t-i} + \sum_{i=0}^{l} \vartheta_i \Delta ge_{t-i} + \sum_{i=0}^{p} \gamma_i \Delta Z_j + \gamma D + u_t$$

where Δ is a first difference operator, the β_i, ϑ_i, and γ_i are short-run impact multipliers, the α_i ($i = 1,2$) and $\theta_j (j = 1,2, \dots 5)$ are long-run parameters; k, l, and p are lag lengths; and u_t is a well behaved stochastic error term.

Existence of long-run equilibrium in Eq. 1 was tested by using F-test method, also referred to as Wald test. The testable hypothesis is that: $\alpha_1 = \alpha_2 = \theta_i = 0$; and, the alternative hypothesis was: $\alpha_1 \neq \alpha_2 \neq \theta_i \neq 0$. Following Pesaran, Shin and Smith (2001), a null hypothesis is rejected if the F-statistic is above the upper bound critical value, that is, I(1); and, it is accepted if it is below the lower bound critical value, that is, I(0).

Rejection of no cointegration, implying existence of a long-run equilibrium in Eq. 1, provide for estimation in level of a conditional equilibrium long-run ARDL model which reads as:

(3) $g_t = \alpha + \sum_{i=0}^{k} \beta_i g_{t-i} + \sum_{i=0}^{l} \vartheta_i ge_{t-i} + \sum_{i=0}^{p} \gamma_i Z_j + \gamma D + u_t$

where k, l, and p are lag lengths of the variables.

Given the long run model the short run dynamics are captured by use of a one period lagged error term ($\hat{u}_t$) estimated by Eq. 3, that is, (EC_{t-1}), to estimate a restricted error correction model (ECM) specified as:

(4) $\Delta g_t = \emptyset + \sum_{i=0}^{k} \beta_i \Delta g_{t-i} + \sum_{i=0}^{l} \vartheta_i \Delta ge_{t-i} + \sum_{i=0}^{p} \gamma_i \Delta Z_j + \partial EC_{t-1} + \epsilon_t$

In theory, the coefficients of the EC_{t-1}, that is, ∂ measure the speed of adjustment from short-run disequilibrium over the long-run period. Accordingly, the ∂ should be negative signed and statistically significant to suggest reversion to equilibrium after a short-run shock. The negative and statistically significance of the coefficient of the error term is a precursor to existence of causality, among others, between economic growth and government size investigated also by using the pair-wise Granger causality test.

5. Empirical Results
Estimation of the basic model was preceded by some tests to establish the adequacy and reliability of the data used in econometric analysis.[12]

5.1   *Descriptive Statistics*
Table 2 present descriptive statistics of the variables used. The statistics show the average real growth rate of the GDP was about 4.4 percent and ranged from -2.39 percent at the height of macroeconomic crises in 1984 to 7.6 percent in 2012.

Table 2:   **Descriptive Statistics**

Variable	Economic growth	Government size	Inflation	Private investment	Human capital	Economic openness
	g	*ge*	*π*	*pi*	*hc*	*op*
Mean	4.454	18.529	14.931	15.287	77.321	34.591
Median	4.814	17.546	11.292	14.343	75.862	36.217
Maximum	7.603	31.534	35.827	29.870	112.416	55.295
Minimum	-2.388	8.973	1.656	5.922	30.990	17.253
Std. Dev.	2.349	5.631	11.045	6.651	22.311	10.563
Skewness	-0.735	0.461	0.554	0.339	-0.587	-0.047
Kurtosis	2.871	2.394	1.756	2.114	2.540	1.916
Jarque-Bera	4.899	2.743	6.247	2.800	3.578	2.661
Prob.	0.086	0.254	0.044	0.247	0.167	0.264
Obs.	54	54	54	54	54	54

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[12] For a detailed insight on the relevance of this a priori data screening, among others, see Mukherjee, White and Wuyts (1998).

Table 2 also shows the government size, measured by the ratio of real government consumption expenditure to the real GDP, is about 18.5 percent and ranged from about 9 percent in 1987, that is, about one year after the launch of the ERP in 1986, to about 31.5 percent in 1990. Average inflation is about 14 percent and ranged from about 2 percent in 1967, that is, when the government launch the Arusha Declaration and its Self-Reliance Policy that led to fiscal dominance due to development of a public sector led economy, to about 35.8 percent in 2010 in the Global Financial Crisis (GFC) period.[13] Average private investment is about 15.43 percent and the median was about 14.6 percent, which is very low if compared to median for most SSA countries. The primary school gross enrollment rate, which is a proxy measure for human capital, is about 77.3 percent; and the mean openness of the economy is at 35 percent, below 50 percent.

5.2 Correlation of the Variables

The correlation coefficients of the basic data presented in Table 3, by and large, are very low.[14] Only the correlation between the real economic growth and inflation and that between private investment and human capital are relatively higher: respectively, 0.54 and 0.69 (Table 3). The correlation matrix reveals the correlation between government size and economic growth is not only very low (about 0.30) but it is also negative. This may not be unexpected since the measure of government expenditure used in the analysis exclude gross capital formation which some studies on Tanzania found to impact positively on economic growth, for example Kapunda and Topera (2013). The correlation between economic growth and private investment ratio is positive as expected but very low (0.32) if juxtaposed with policy measures and strategies implemented by the government to promote private investment since mid-1980s.

Table 3:   Correlation Matrix of Variables of the Estimation Model

Variable		Economic growth	Government size	Inflation	Private investment	Human capital	Economic openness
Economic growth	g	1.000	-0.329	-0.542	0.325	0.252	0.034
Government size	ge	-0.329	1.000	0.043	-0.088	-0.004	0.179
Inflation	π	-0.542	0.043	1.000	-0.170	0.022	-0.185
Private investment	pi	0.325	-0.088	-0.170	1.000	0.694	0.102
Human capital	hc	0.252	-0.004	0.022	0.694	1.000	-0.388
Economic Openness	op	0.034	0.179	-0.185	0.102	-0.388	1.000

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[13] The increase in government expenditure is the period is explained by prompt government response to the 2008 GFC by through provision of a moderate fiscal stimulus package during 2008/09 and 2009/10 that "helped ease the adverse effects of the crisis and helped the Government to continue the provision of essential services and meet its expenditure targets" (URT, 1011, p. xix).

[14] The real growth rate (g) in Tanzania was -0.5% in 1981 and -2.4%. Thus, it was raised by a constant number (+3) in order to serve its transformation by a natural logarithm operator.

Also noteworthy, the correlation between economic growth and both primary school enrollment and openness of the economy is positive as expected but quite low (about 0.2). Generally, the correlation coefficients in Tables 3 suggest lack of potential multicollinearity problem in the estimation: the coefficients are below the threshold level of 0.8 which is conventionally used to suspect potential multicollinearity problem in estimation of the basic model (Gujarati and Porter, 2009).

5.3   Unit Root Tests

The ADF unit root test results (with intercept only and intercept and trend) for all the variables of the estimation model (in natural logarithm) presented in Table 4 show that: three of them, namely measures of real economic growth (g), human capital (hc), and openness (op), are stationary in level, that is, are $I(0)$ and others have unit root, that is, are $I(1)$. The ADF test results (with intercept only) shows that all the variables of the estimation are I(0) in first difference.

Table 4: ADF Unit Root Test

	Variable	with intercept & no trend^a		with intercept & trend^b	
Variable		level	1st diff	level	1st diff
Economic growth	g	-2.103	-11.284***	-4.484***	-11.205***
Government expenditure	ge	-1.772	-8.033***	-2.250	-7.869***
Inflation	π	-1.774	-7.855***	-2.032	-7.983***
Private investment	pi	-1.610	-6.321***	-2.819	-6.687***
Human capital	hc	-2.138	-3.294**	-3.636**	-3205***
Economic Openness	op	-3.440**	-6.301***	-3.527**	-6.239***

Notes: a)   Significance with intercept only are: ***=1% (-3.560); **=5% (2.918); and *=10% (2.597).

b)   Significance with intercept and trend are: ***=1% (-4.141); **=5% (3.497); and *=10% (3.178).

The ADF test (with intercept and trend) also shows three variables of the estimation model, namely economic growth (g), human capital (hc), and degree of openness (op) are $I(0)$ in level as established in the ADF test results with intercept only also show all variables of the estimation model are $I(0)$ in first difference. The finding suggests spurious results may not be obtained from the estimation of the basic model on growth and government size nexus.

5.4   ARDL Cointegration Test Results

Estimation of an ARDL model demand for an *a priori* choice of lag length. In small sample annual time series data, the "conventional approach" is to use a lag length of 4 also supported by lowest values of SIC and AIC and also the explanatory power of the estimation model which is maximized as evidenced by the corresponding relatively high value of the F-statistic, which is 7.347 and the R^2 is 0.75 (Table 5).

Table 5:   Choice of Lag Length

Lag length	AIC	SIC	F-statistic	R^2
4*	3.858*	4.458*	7.347	0.754
3	4.016	4.579	6.173	0.700
2	4.072	4.592	5.858	0.661
1	4.165	4.649	5.298	0.614

Source: Authors' estimation.

The ARDL bounds cointegration test results in Table 6 reveal cointegration of the variables of the estimation model. The estimated F-statistics (8.718) is larger than that of the upper bound threshold level, which is, $I(1)$, which is 4.150 at the 1 percent level of significance test. Implicitly, the ARDL bounds test rejects the hypothesis of no cointegration of the variables of the estimation model. Suffice it to note that the cointegration of the variables of the estimation model imply at least a unidirectional (one-way) causality exist amongst them.

Given cointegration of the variables of the estimation model (eq. 1), Table 7 present ARDL based long run regression results. The results reveal the long run effect of government size on economic growth is positive but statistically insignificant at the conventional test levels. The finding is very inconsistent with that obtained by a previous study on Tanzania by Kweka and Morrissey (1999) and others on SSA countries, for example, Egbetunde and Fasanya (2013) in a study on Nigeria and Kweka and Morrissey (1999) in a study on Tanzania. However, a study on Tanzania by Kimaro et al. (2017) and Atteh et al. (2022) in a study on Ghana found the effect was positive and statistically significant. Suffice it to note that the finding that the effect of government expenditure on economic growth in Tanzania is positive but statistically insignificant over the long run weakly supports the Keynesian theory and, in relation points to likely ineffectiveness of government consumption as a fiscal policy instrument for promoting economic growth and development in Tanzania.

Table 6:   ARDL Cointegration Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	8.718	0.100	2.080	3.000
k	5.000	0.050	2.390	3.380
		0.025	2.700	3.730
		0.010	3.060	4.150
Actual Sample Size	52.000		Finite Sample: n=55	
		0.100	2.226	3.241
		0.050	2.617	3.743
		0.010	3.543	4.839
			Finite Sample: n=50	
		0.100	2.259	3.264
		0.050	2.670	3.781
		0.010	3.593	4.981

Source: Regression.

As maintained in theory, the effect of inflation on economic growth is negative and statistically significant at the 1 percent test level (Table 7). The coefficient on inflation suggests its increase by a unit would decrease economic growth by about 0.18 of a unit! Noteworthy, the negative effect of inflation on economic growth over the long run is consistent with theory and finding from most credible studies on developing countries in and outside the SSA, for example, studies on Tanzania by Kasidi and Mwakamela (2013) and Shitundu and Luvanga (2000). The results also shows the effect of private investment (as a ratio of the GDP) is unexpectedly negative and statistically insignificant at the conventional significance test levels. This finding is unexpected given pro-private investment strategies and policies adopted in the country since the 1990s.

Table 7: ARDL Long Run Bounds

Variable	Abbrev	Coefficient	Std. Error	t-Statistic	Prob.
		Levels Equation			
		Case 3: Unrestricted Constant and No Trend			
		Coefficient	Std. Error	t-Statistic	Prob.
Government size	ge	0.114	0.125	0.916	0.366
Inflation	π	-0.178	0.022	-7.926	0.000
Private investment	pi	-0.067	0.053	-1.266	0.214
Human capital	hc	-0.008	0.025	-0.341	0.736
Economic Opennes	op	-0.018	0.027	-0.645	0.523

Source: Estimation.

Note: ***=1%, **=5%, and *=10% statistical significance test levels.

As also expected from theory, human capital, measured by gross primary school enrollment rate, has a positive but statistically insignificant effect on economic growth.[15] On the one hand, the finding may not be unexpected because education has an indirect effect on economic growth; and, its rate of return has a long gestation period. On the other hand, it appears that the primary school enrollment rate used in the analysis is a poor proxy for human capital in Tanzania. Openness of the economy, has a positive but a statistically insignificant effect on economic growth; and, notable, its effect on economic growth is very small (Table 7).

Table 8 present the ARDL ECM regression results which reveals the short run effect of the contemporaneous government size on economic growth is negative but statistically insignificant at the conventional test levels. In contrast the coefficient of the one period lagged government size is also negative and statistically significant at the 10 percent test level. The finding suggest the overall impact of the government size on economic growth is negative, implying that fiscal policy action to stabilize the economy through government consumption would adversely impact on economic growth. The coefficient of the contemporaneous inflation rate is negative but statistically insignificant. However, the one and two-period lagged coefficients of the inflation rate are positive signed and are statistically significant at the 1 percent test level. The overall short run impact of inflation on economic growth is positive. This imply some inflation may "grease the economy" over the short run period. The coefficient on private investment is positive and statistically significant at the convential test levels. In contrast, signs on the coefficients of the measure of human capital alternate inconsistently; and, even though the third lag coefficient is statistically significant its sign is inconsistent with theory.

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[15] There is a dearth of empirical studies on growth and human capital nexus in Tanzania. Even though, some credible studies attests to positive impact on economic growth of government expenditure on education and human capital. Among others, see Jung and Thorbecke (2003) and Ghura (1995).

Table 8:   ARDL Error Correction Regression Results

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
		Levels Equation			
		Case 3: Unrestricted Constant and No Trend			
	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	C	5.381	0.756	7.119	0.000
Government size	ge	-0.124	0.081	-1.524	0.137
	ge_{-1}	-0.196	0.102	-1.919	0.063
Inflation	π	-0.019	0.044	-0.438	0.665
	π_{-1}	0.225	0.045	4.970	0.000
	π_{-2}	0.133	0.042	3.164	0.003
Private investment	pi	0.346	0.090	3.846	0.001
Human capital	hc	-0.060	0.058	-1.028	0.311
	hc_{-1}	-0.021	0.063	-0.326	0.747
	hc_{-2}	0.082	0.069	1.188	0.243
	hc_{-3}	-0.183	0.058	-3.135	0.004
Economic reform	D	4.437	0.662	6.699	0.000
Coint Eq(-1)*	EC_{-1}	-1.099	0.131	-8.362	0.000

Source: Regression.

Note: Automatically Selected Model: ARDL(1, 2, 3, 1, 4, 0).

***= 1%, **=5%, and *=10% are levels of statistical significance test.

The results in Table 8 also suggests economic reforms impacted positively and its effect was positive and very statistically significant. This finding may not be unexpected given the lift of entry barriers to private sector participation in production, trade and services sectors of the economy. In relation, it is also likely that a pent-up demand occasioned by government control of economic activities since the launch of Arusha Declaration and its Self-Reliance Policy in 1967 impacted positively on growth after the shift from regulated public sector led economy to a liberal market economy in 1986. Also, notable, the coefficient of the cointegrating equation, first, is negative as expected, a finding which suggests reversion of short run shocks to the long run equilibrium. Second, it is statistically significant at the 1 percent test level. Both the negative sign and statistical significance suggests cointegration in the estimation model. Third, the coefficient of cointegrating equation is about unit (about 1.1), suggesting that adjustment from short run shocks to the long run equilibrium is very fast: more than 100 percent of the short run shocks are cleared within a period of one year.

Some robustness test suggested the estimated model was reliable. Breusch-Godfrey Serial Correlation LM Test (F-statistic= 1.102, Prob. F(2,32)=0.344)) revealed lack of serial correlation in the estimation model. Moreover, the Breusch-Pagan-Godfrey method revealed absence of Heteroskedasticity problem in the estimated model.
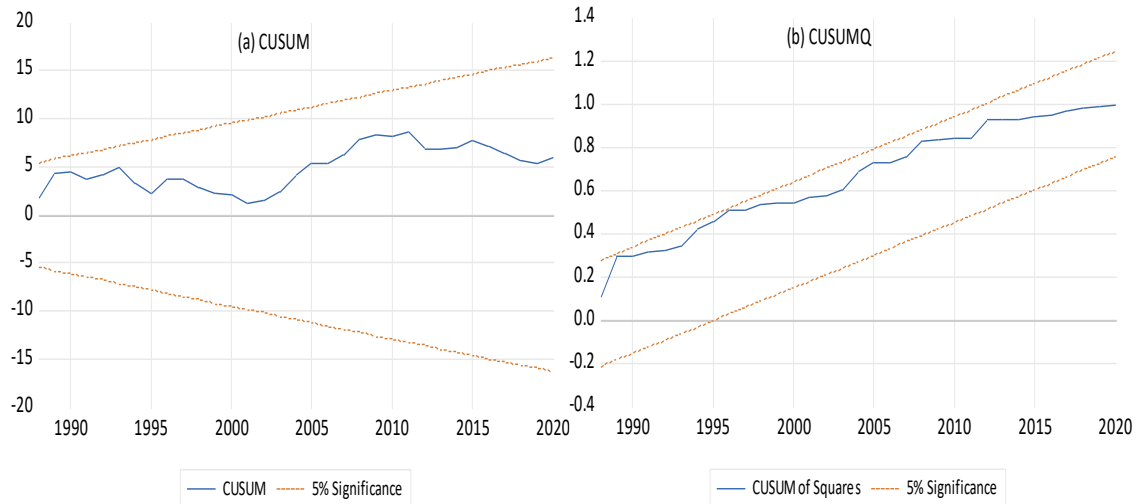

Figure 2: **CUSUM and CUSUM-q Stability Test Plots**

Moreover, the CUSUM and CUSUM-q plots in Figure 2 also suggests the estimated model was very stable because the estimated parameters lies between the lower and upper bounds of the tests.

5.5   Economic Growth and Government Size: Granger Causality Test

Existence and the nature of causality between economic growth and government size was investigated by using pair-wise Granger causality test. The results in Table 9 fail to reject the null hypothesis that government size does not cause economic growth. Instead, the alternative hypothesis that economic growth does not cause government size is accepted.

Table 9: **Pairwise Granger Causality Tests**

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
Real GDP growth does not Granger Cause Real Government size	53	1.07460	0.3495
Real Government size does not Granger Cause Real GDP growth		1.65570	0.2017

The pairwise Granger causality test rejects relevance to Tanzania of the Keynesian and Wagner based hypotheses on the nexus between economic growth and government size in Tanzania. On the one hand, the finding is inconsistent with the results obtained by some studies on SSA countries, among others, Awuma and Bonheur (2022) in a study on Ghana and Oteng-Abayie (2011) in a study which covered of five ECOWAS (Economic Community of West African States) countries. Nevertheless, the finding of this study are inconsistent with that obtained by other previous on SSA, among others, Frank, Joseph and Ackah (2014), Garba and Abdullahi(2013) in

a study on Ghana, and Ayo et al. (2011) in the case of Nigeria; Wu, Tang and Lin (2010) in a panel data of 182 countries; and Ahuja and Pandit (2020) in a panel data study which covered 59 countries. The finding is also inconsistent with findings obtained by a study on Tanzania by Kyissima et al. (2017) which specifically supported relevance of Wagner's thesis in Tanzania but for the period which covered the economic reforms period (1996-2014).

6. Conclusion

This paper sought to empirically investigate how government size impacts upon economic growth in Tanzania. The analysis was based on annual time series data for the period 1967-2020, a period for which reliable data was available. Autoregressive Distributed Lag (ARDL) bounds cointegration test was employed to investigate existence of long run relationship amongst the variables of the estimation model; and, ARDL error correction model (ECM) was estimated to establish the short run dynamics between economic growth and government size, given some growth conditioning factors relevant to Tanzania. In addition, pairwise Granger causality test was used to establish the nature of causality between growth and government size.

The econometric results revealed economic growth and government size were cointegrated; and, the long run effect of government size on economic was positive but statistically insignificant. Over the short run period, the effect of government size on economic growth was negative and statistically insignificant. The finding is weakly inconsistent with the Keynesian macroeconomic theory. In policy it suggests fiscal actions may not lead to "big and significant impact" on economic growth; and, use of fiscal policy to stabilize the economy by increasing government expenditure could be counterproductive, that is, destabilise rather than stabilize the economy. To the extent that the measure of government excluded capital expenditure, the results suggest increase in government consumption, in as much as is desirable in Tanzania, it undermines economic growth over the short run but not over the long run. The significant and theory consistent negative effect of inflation on economic growth, as one of the "growth conditioning factors" over the long run is notable. The results for the remaining growth conditioning factors, namely human capital and openness, by and large were statistically insignificant. Over the short run, the study found the effect of government size on economic growth was negative and weakly statistically significant. The effect of inflation and private investment on economic growth were also positive and statistically significant. Furthermore, the study found the overall effect of human capital on economic growth over the short run was unexpectedly negative and statistically insignificant.

In general, the results underscore importance of prudent government consumption and achievement of price stability and, other things being constant, need for more proactive policies and strategies to avail business and macroeconomic environment that would increase private investment in the country. Enhancement of investment in human capital to promote private investment and economic growth is also underscored by the long run results. Noteworthy, however, the negative effect of private investment on economic growth established by the study is unexpected and demand for policy and enhanced provision of institutional and regulatory framework supportive to existence and growth of the private sector in Tanzania. Nonetheless, more empirical studies on the relationship between economic growth and government expenditure are required in order to provide a good basis for understanding the scope and limits of fiscal policy instruments in the process of economic growth and development in Tanzania. The relevance to Tanzania of the policy inference from the findings of this study may better benefit from future

investigation of the growth-government size nexus by using other measures of the government expenditure and econometric methods.

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