

# Globalization and the Size of Public Expenditure: Analysis of Growth Effect of Globalization on Tanzanian Economy

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## Abstract

The main focus of this paper was to examine the impact of the progress of globalization on the economy of Tanzania. The Dickey-Fuller test was employed to determine stationarity nature of the time series data while Engle-Granger test of cointegration was used to determine the long-run associationship among the variables under the study. Moreover, the study employed growth curves with and without the dummy variable to analyse the change of various economic and financial variables before and after globalization. The dummy variable was used to determine the impact of the policy change (globalization) on the economy. With the use of Dickey-Fuller test we found all variables to be non stationary. However, the variables were found to be stationary when subjected to Engle-Granger test. This indicates existence of a long-run associationship among the variables. Besides with the use of the growth curves we observed that the progress of globalization has negatively affected the size and role of government in economic affairs. All other variables including GDP are also adversely affected by the progress of globalization. Hence, this is the evidence that the policies of globalization implemented in Tanzania since 1986 through the World Bank and IMF have no significant role in the growth of Tanzanian economy.

**Keywords:** Globalization, Public Expenditure, Economic Growth, Tanzania

## 1. Introduction

The relationship between government, its roles and functions and globalization has greatly been challenged by scholars and economic analysts in the recent years, yet not fully exhausted. It is clearly known that growth of any economy requires good policies especially those related to the size of government and public expenditures. The progress of globalization affects the roles and functions of the government and its state and thus the size of government and public expenditure. Globalization affects the ability of the government to provide social goods and services through reduced size of the government and state. This implies that the size of government tends to be smaller for countries with more globalized or market based economies compared to those with socialist or planned economies. Besides, the roles and functions of the government and public expenditure tend to shift according to changes in stages of economic development.

Different concepts and theories of state/government resulted in different systems of polity, roles and functions of the government in socio-economic spheres. But roles and functions of government and state are the direct determinants of public expenditure. Moreover, evolving social philosophy, political theory and economic systems have shaped and guided the roles and functions of the governments which, in turn, governed and guided the magnitude, composition and direction of public expenditure from time to time and country to country. For instance, till a few years ago the world economy comprised capitalist economies (US, Britain, France, Japan, Germany, etc) and socialist economies such as those of China, Eastern Europe, USSR, Cuba and North Korea. Within socialist and capitalist economies, there were developed, middle income and developing countries. All countries in Africa and Asia with the exception of few countries such as Japan (First world), Oil-Producing Middle East countries, were categorized in the group of third world countries or developing economies. The developing countries were classified into two groups: (i) Market based economies consisted of Malaysia, Thailand, Indonesia, Singapore, South Korea, Taiwan, etc in which the state or government was less to do with economic growth and (ii) socialist economies such as India, Tanzania and most of other African countries in which government and state acted as the agents of economic growth. The ensuing paragraphs attempt recapitulation of the evolving theory of the state and the resulting magnitude, direction and composition of public expenditure associated with changing roles, functions and the progress of globalization. We also examine the impact of globalization on growth of Tanzanian economy.

### 1.1 Theoretical Background

It is widely witnessed that the classical economists like Adam Smith, Thomas Malthus, David Ricardo and others were the first modern economists to use the philosophical framework of Plato, Aristotle, Hobbes, Quesnay and others to determine the areas of state's role and functions with reference to which they developed their economic theories and laws, especially those relating to public revenue and expenditure. All these and other classical economists advocated the economy with minimal government intervention on economic functions.

Some other authors, like John Maynard Keynes expanded the definition of classical economists to include Karl Marx and his followers.

In 1776 Adam Smith in his book titled 'The Wealth of Nations' advocated the philosophy of 'laissez faire'. In this philosophy, Adam argued that the economy of any state can best work if it is left to function on its own with minimal or without government intervention in terms of restrictions such as taxation or tariffs and other regulations. Adam Smith wrote, 'in the economic market people who only intend to serve their self-interest are driven by an invisible hand to serve the public interest, which was no part of their original intention'. The metaphor invisible hand here was used to explain why the society as a whole benefits from the free market or the forces of demand and supply and to determine how the economic functions without or with minimal government intervention. Adam Smith in his influential book also stressed that government intervention is only justified in order to deal with allocative and distributional inefficiencies brought about by market failures such as externalities, asymmetric information, public goods, monopolies and others. Thus the role and function of the state should be limited to three major activities; (i) protecting the society from violence and foreign invasion, (ii) protecting every member of the society from the injustice or oppression (maintenance of internal law and order), (iii) provision of public or quasi-public goods and services along with transfer payments. All other functions apart from these were considered beyond the scope of the state and expenditure on them was treated as unjust and wasteful. Today Adam Smith is considered by many the Father of Economics and his work has been the course of major changes in today's economy in terms of size, direction and magnitude of public expenditure.

The changes in philosophy and political theory have replaced the ruling state by the welfare state. Consequently, since then there has been striking expansion in the functions and roles of the state in various countries. This is mainly considered to be a reaction towards the major distortions that the laissez faire capitalism which occurred in the 18<sup>th</sup> century. The major challenge to classical economists came in the 19<sup>th</sup> century under Marxian thinking founded on Karl Marx's criticism of laissez faire capitalism, the system in which few individuals highly exploited the working class by making large profits at the expense of workers. The Marxian thinking thus strongly influenced the socialist movement in Europe. With socialist movements the role of welfare state increased in the economy and created egalitarian society where everyone was deemed equal in social status and the distribution of income and wealth was equal. In this system the state controls production and virtually no (or very limited) private property and the entire economy was under the state. The underlying assumption was that the state was required to maintain the welfare of the entire economy. This accelerated the change in the roles and functions of the government hence the theory of public expenditure.

Prakash, Shri and Chowdhury, S. (1995, p.20) argued that by understanding the theory of public expenditure one will be able to consider the concepts, meaning, scope and nature of public expenditure. According to classicists, the guiding principle of the state policy was to leave the individual free to pursue his self-interest in the best possible way that he could because he knows what is much better, what is good for him than what the state knows. Therefore an individual unit can be the best judge of its own economic interest which the government cannot know precisely and hence it will not be able to decide correctly on behalf of such self-seeking entities. The state was only responsible for the defence of the country against external enemies, maintenance of law and order, administration of justice and maintenance of the state apparatus itself. Here the state was supposed to leave the economy under the control of the market. Thus the political philosophy and economic theory propounded by classicists are neither supportive of high level of public expenditure at any given time nor to its growth through time.

The spread of economic development based on industrialization in various parts of the world resulted into a high level of inequality among different groups and economic classes in terms of wealth and income distribution. The highly marked inequalities of income and wealth have resulted from the denial of legitimate share to labour in the rising production and productivity throughout the economy. The working class was highly exploited by the few rich which resulted into increased misery, poverty, ill-health and immiseration to the vast majority of the masses. This fascinated criticisms of the policy of laissez faire and its base of economic theory by thinkers like John Ruskin, Thomas Carlyle and William Morris. The work of these thinkers not only criticized the laissez faire policy but also led to the change in the definition, scope and nature of economics and public expenditure. It then became difficult for economists, activists and government to remain silent about the increasing level of poverty, inequality in the distribution of income and misery among the majority. Thus the ideology of Fabian socialism, cooperatism and welfarism emerged and resulted into the change of focus of political philosophy and theory of state and its functions and economic theory including public expenditure was structured accordingly.

Economists like Marshall, Pigou and Cannon broadly defined economics by incorporating welfare as a subject matter of economics itself. The focus was then on social welfare maximization rather than output or profit maximization as it was the case of laissez faire philosophy. The state functioned as the protector of the poor and the weak from economic exploitation. Arthur Pigou in developing the theory of welfare economics argued that an economic system was better-off if the welfare of one person was improved without jeopardizing

anyone else's welfare. Hence the theory postulated public expenditure to focus of maximization of social welfare. In order to maximize social welfare the state was expected to invest the public fund in socio-economic infrastructure like health, education, street lighting, social security and insurance, power supply, transport and communication, irrigation and others. These were encompassed in the legitimate function of the state.

The modified and extended theory and philosophy of the state's roles and functions and public expenditure started in the last quarter of the 19<sup>th</sup> century to the first quarter of the 20<sup>th</sup> century. The first quarter of the 20<sup>th</sup> century witnessed two important events: (i) the socialist revolution in USSR, and (ii) the world wide great depression.

The socialist revolution in the USSR emphasized on public ownership of means of production and reorganization of production for accelerated maximal growth rather than the private profits earned by few individuals. Optimum welfare was obtained from the output of goods and services produced in the economy. The socialist revolution emergence was associated with planning system which was a tool to oversee the level of industrialization and economic development. With socialist movements the role of welfare state increased in the economy and created egalitarian society where there was an equal distribution of wealth. All these initiatives led to an increase in the average role of public expenditure in GDP.

The Great Depression of the late twenties and early thirties ended the face of classical laissez faire philosophy. This was due to the fact that the Great Depression increased the level of poverty and unemployment in many countries worldwide. Similarly, the depression proved the failure of the Say's Law of market. According to the law, 'production creates its own demand'. In other words, people produce and sell goods and services in order to buy things they want. The Say's law was put to rest because of the increased deficiency demand (overproduction) and widespread unemployment that occurred after the Great Depression of the late twenties and early thirties. In the 1930s Keynes turned the Say's law by declaring that demand creates its own supply and the public expenditure was strongly established as the best instrument to pull up an aggregate demand in order to attain full employment equilibrium. According to Keynes, public expenditure was the only tool to fill-up the income-consumption gap. He postulated that consumption behaviour may be analysed on the assumption that the marginal propensity to consume is invariably less than one and it tends to decrease with increasing income. Therefore public investment is required to fill-up the income-consumption gap which is likely to be left uncovered by private investment guided solely by profits and governed by the marginal efficiency of capital. It is because the laissez faire capitalism failed to cover the gap as dominated by the great depression, thus positive intervention in the market mechanism by the government with public investment was inevitable for stabilizing and pushing the economy onto full employment.

The Keynesian thoughts can be linked with two major theories of public expenditure namely: Wagner's Law and Wiseman-Peacock Hypothesis. Adolph Wagner (1883) developed a law called "The law of increasing state activities". In this law he revealed that as the economy grows over time the roles and functions of the state/government and its expenditure also increase. Prakash suggests that the Wagner's law operates both at macro and micro levels and it applies to the aggregate expenditure as well as its individual components irrespective of the item of expenditure. He also suggested that the public expenditure has a downward rigidity as its current level depends partly on its level in the preceding period and partly upon its growth from the preceding to the present level. Wagner did not examine the causes of underlying growth of public expenditure. It is therefore suggested that the law will only hold if expenditure grows in future less rapidly than income despite the fact that it has increased more than proportionately in the past. Therefore at the lower stages of development in the countries of the third world state has to expend its expenditure in various public activities in order to fill-up the gaps in the existing socio-economic structure. In these countries state has to overcome the shortages of enterprises and capital. However as the economy moves to next stage(s) along with its development path, several gaps would have been filled up and several deficiencies would have been made good, the growth of public expenditure may be slowed down. The private entrepreneurs may then crop up in adequate numbers with sufficient capital base to allow the state to hold its operations or even withdraw from some sectors of the economy. Because our study focuses on developing countries (Tanzania) expansion of public expenditure is necessary until the vicious circle of poverty is brought at its low level.

Wiseman-Peacock (1961) analysed public expenditure of the United Kingdom for the period 1890 – 1955 based on Wagner's law and found it to be still valid. They postulated that public expenditure tends to increase sharply and in a step-wise manner rather than continuously and smoothly. This is caused by the expenditure needs for periodic occurrence of socio-political and economic disturbances, and/or natural disasters and calamities which make public expenditure exceed revenue limits. This generates what is called 'displacement effect' by moving expenditure and taxation to higher level necessary for generating revenue to be used to overcome these disturbances. Although Wiseman-Peacock hypothesis is consistent with British data its validity for other countries seems to be questionable. In developing countries where economic growth and development has been initiated, sustained and guided through public enterprises/ by the government, public expenditure grows consistently under the impact of growth of planned investment. In developing countries the

rapid growth of public expenditure may not explain the systematic growth of public investment in economic development.

Galbraith's politically influential book 'The Affluent Society' (1958) used the experience of the Great Depression and the success of the expansionary fiscal policy before the World War II and backed the views that 'in the event of insufficient demand, public expenditure should be increased and tax should be cut'. Galbraith was in favour of the Keynes's work of the so called 'The End of Laissez-Faire' because he believed that free market economy as advocated by the former classicists (alongside Adam Smith) led to increased economic distress, massive unemployment and insufficient provision of public and merit goods. To him public poverty existed not only in education but also in the research and development, pollution control, foreign assistance for relieving hunger and starvation. Poverty could therefore be eliminated by more public spending (Tanzi, 2000).

However, things moved in a different direction in the 1970s when government policies proved failure in allocating resources efficiently, redistributing income in the well targeted manner and stabilizing the economy. This initiated a number of studies which highlighted the disincentive effects of high taxes and the growing underground economies (Tanzi). For instance in 1975 the supply side economists came out with an argument to refute Keynesian philosophy as it heightened economic stagnation of various western economies. This view was supported by Jude Wanniski, Robert Mundel and Arthur Laffer who collectively argued that growth of GDP can be managed more effectively by reducing restrictions to people to produce goods and services such as lowering capital gains tax and other excise taxes. These economists believed that when the tax rates are very high it would be beneficial for the government to lower the rates in order to be able to raise more revenue by stimulating more investments in the economy and expand free trade and free movement of capital, hence causing faster economic growth. Furthermore, as fiscal deficits and public debts were raising in the 1970s, many economists and policy makers considered the size of government and public expenditure to have grown beyond its justified role, undermining incentives, property rights and income of the future generations (Buchanan, 1975). All these marked the birth of the so called Reaganomics-Thatcheronomics in the early eighties starting in the United States and United Kingdom and spread in various corners of the world.

At the political level, the 1980s marked the change in political philosophy in favour of a smaller government role or free market economic policies. Ronald Reagan and Margaret Thatcher, the President of the United States of America and Prime Minister of the United Kingdom respectively were among of the opponents of big governments. With their powerful positions they carried out a political attack on big government. Over 1980s and early 1990s many social groups also began attacking what they considered excessive public spending and expensive welfare states. In the same years many of underdeveloped or third world nations like Tanzania experienced international debt and economic crisis. The USA, World Bank and IMF forced these countries to switch into neo-liberal policies (Reaganomics-Thatcheronomics) as a condition to rescue them from the financial and economic difficulties they had. The neo-liberal policies required underdeveloped nations to open their markets or prevent the public sector from putting controls over the multinational corporations; privatization of the public enterprises; reduce financial deficits; and social subsidies. These policies became the prerequisite for financial assistance under what was then known as the 'Washington Consensus' and now Post Washington Consensus. Tanzania started adopting the neoliberal policies of globalization, liberalization and privatization in 1986.

The Washington Consensus emphasized three main policies namely: (i) trade liberalization (ii) Privatization (iii) Macro stability in particular price stability. Many relate them to the "neoliberal" policies because of their great emphasis on liberalization like the 19<sup>th</sup> century liberalism which greatly emphasized on the importance of minimum role of the state/government and its expenditures in economic affairs. These policies besides other things resulted in a consistent cut of public expenditure in all directions including education, health, social security services, transport and communication, subsidies on agriculture and exports. Although many suggest that the Washington Consensus strategies were initiated to promote economic development of the poor nations, they failed to provide answers to the problems facing these countries (Stiglitz, J. 1998). Historical experience indicates that countries in Africa, Asia and Latin America which adopted the Washington Consensus policies have experienced slower economic growth than those countries which did not. Besides the WC policies have increased inequality and corruption in many economies.

The reforms based on Washington Consensus or market fundamentalism theory were highly criticised by the leading economist Joseph Stiglitz, (2003) following the financial crisis in Russia and Asia. Besides, the Structural Adjustment Programmes and Macroeconomic Stabilization policies caused adverse economic impacts on growth and poverty in the poor countries. For instance, public expenditure cut through introduction of the so called cost sharing through various charges on health and education created a high level of unemployment, poverty and income inequality. These criticisms resulted into the Post Washington Consensus which replaced the Washington Consensus. The WC policy objectives of development were too narrowly defined focusing only on increasing GDP without taking into account issues related to improvement of living standard, promotion of democracy and equity, Stiglitz, (2008). The WC policies also failed to incorporate the risks

associated with market failures which occur in many developing economies such as asymmetric information, incomplete markets, externalities and others. Instead, they focused on Adam Smith's Invisible Hand and conditions under which markets lead to efficient outcomes without taking in mind that markets are only efficient if there are no market failures. The existence of market failures gives rise to important role for the government and public sector operations in economic affairs. This argument can be supported by the historical experience of various economies like East Asian Countries, China which indicate that market economy alone cannot lead to rapid development. For instance the industrial development of all East Asian countries took place faster because of the government policies which encouraged people to save and thus provide available capital for firms.

Post Washington Consensus recognized that there is a role for the market and state/the government which is beyond the traditional roles and functions of the state emphasized by the neo-liberalists of enforcing contracts and property rights. It also recognizes that there are government failures as well as market failures. With the PWCC government and markets are seen as complementary, with government playing an important role of correcting market failures and creating conducive environment for markets to work better. Therefore a successful development requires not a limited or minimum government as stated earlier but the balance between market and state/government. However, the exact role for the government may differ from country to country depending on the state and level of economic development and public institution.

Despite all the political philosophical and economic theory changes still debates have existed over centuries till today among various economist, leaders, policy makers and activists as to whether globalization and the increased size of public expenditure contributes to improvement of welfare of the majority of citizens or whether citizens would be better off with lower growth of public expenditure. Welfare of citizens is linked to certain socio-economic indicators such as life expectancy, educational achievements, investment, literacy, infant mortality, and growth in per capita income, employment opportunities, inflation rates and others that government tries to influence through public spending.

## 2. Literature Review

While many economist have argued that globalization would promote economic growth (Grossman and Helpman, 1991, Dolla, 1992, Fishcher, 2003) these claims have been opposed by other economists like Edwards, (1993), Rodriguez and Rodrik, (2001), Stiglitz, (2008). Tanzi, (2000) also support the latter views. His analysis reveals that the progress of globalization affects the composition of public expenditure through the growing interdependence of fiscal policies. His analysis indicates that with globalization financial capital and high skilled or highly talented individuals become more mobile because their options expand to other nations such as higher taxes or too low wages and other regulations constraining them make them move elsewhere. The loss of highly skilled or talented individuals (brain drain) adversely affects economic growth of the country and on the tax revenue of a nation. Similarly, Rodrik, (1998) suggests that countries with more open economies tend to have bigger public sector and spending. This is due to the fact that citizens of such countries with bigger governments tend to increase their demand for more public goods, social security and welfare services in order minimize external risk. This view reveals a positive association between progress of globalization of an economy and size of its public sector.

Other anti-globalizers claim that the aim of Washington Consensus policies was not to foster economic growth/development in developing economies like Tanzania but to spread the wings of market capitalism through what they called globalization. They further argue that free market policies or Adam Smith's invisible hand do not work in developing countries because of the associated market failures emanating from incomplete markets and imperfect information. They perceive public sector intervention through increased public spending to have a role to play in the efficient allocation of resources because of the malfunctioning of invisible hand or the price mechanism. In addition, Gerschenkron, (1962) supports the view that state/government may be a solution rather than a problem in combating the problem of 'backwardness' in the economies affected by market failures. For example, state/government has a crucial role to play in combating coordination failures and instability of the financial system both of which affect investment negatively. The state and government through public spending play important roles in allocating capital and supporting infant industries in more beneficial way compared to trade liberalization, free trade, privatization and reliance on market forces. Here globalization is viewed to affect economic development/growth negatively.

Moreover some empirical evidence suggests that most of the developing countries have features that are associated with vicious circle of poverty. These features include low income, low savings, low investment, low per-capita income, low wage employment and low level of skills in terms of education, health and nutrition. According to Myrdal, G. (1958) transformation of vicious into virtuous circle needed an external shock since cumulative causation of market mechanism perpetuates rather than mitigates vicious circle. This shock has to be administered by the government. He advocated an active government intervention in place of '*laissez faire*' or low intervention as public policy. This is an extension and generalization of Keynes' remedial intervention in downward phase of the economy. This is what has promoted a great deal of government intervention as a way to

reduce this circle of poverty and to correct market imperfections and consequent failures through providing public goods like roads, health services, public education and even establishment of public under-takings in industrial sector. This led to phenomenal growth of public expenditure. Government intervention here can be through spending in three major ways, namely administrative purposes, maintenance of internal law and order and external security, improvement of societal welfare and initiating and nurturing development of the society in general and the economy in particular.

In another major study, Barro (1991) found that the relationship between GDP growth and public sector consumption as a share of GDP was negative and significant. He also revealed that growth rates of economies were positively related to measures of political stability and negatively related to a proxy for market distortions. Government intervention was postulated as the source of market distortion, though others will like to term it market correction where governments use policy instruments to remove and verse effects of private business. It is noteworthy that capitalist economies are dominated by oligopolies and market saturation both of which prompted multinational corporations (MNLs) to go southward (See Prakash, S. 1996).

Surveys conducted by Kweka and Morrissey (2000) in Tanzania found that increased public sector's intervention in th economy through investment in physical infrastructures has a negative impact on growth but consumption expenditure has a positive impact. This runs counter to logic as well as established theory. The results may be attributed to the fact that investment in physical infrastructure fructifies over long periods and promotes growth indirectly. Appropriate method is needed for capturing this. Many times, regression coefficient turns negative and/or not significant if either the dependent or independent variable does not vary substantially. This is a statistical feature of the results. Besides, in multiple regression models, such results may emerge from multi-collinearity. Since the authors did not examine these facets of their results, inferences are suspect. The expenditure on human capital was not significant while aid appears to have a positive impact on growth in Tanzania may be the scale/size or use pattern effect.

In this study we analyse not only the effect of globalization on the size of the public sector/expenditure but also its effects on other macroeconomic and financial variables like gross domestic product (GDP), saving/investment (I), consumption (C), public expenditure (PE), fiscal deficits (FSD), inflation (CPI), subsidies (SUB) and public revenue (PR). The sample for this study is divided into two time periods: (i) 1966 – 1985- the period before globalization and (ii) 1986-2012 the period after globalization in Tanzania. In the model, based on composite time series one alternative model is experimented with the introduction of dummy of policy variable.

### 3. Methods and Models

#### 3.1 Unit Root and Co-integration Tests of Time Series Models

Time series models need evaluation of stationary nature of the data series. Three versions of Random Walk Model (RWM) are used for testing whether the time series are stationary. No regression yields genuine and reliable results if the series is non-stationary. Either time series of each variable in the model is stationary individually, or the series are co-integrated. In case the random errors of the estimated linear regression model are stationary, the linear combination of the variables is treated as stationary and all the variables in the regression are said to be integrated of the same order. Dickey-Fuller unit root test is applied to the series of each variable separately to find if it is stationary. Engel-Granger test of co-integration is used to supplement unit root test. The following three versions of (RWM) are used for the application of Dickey-Fuller unit root test:

$$\Delta y_{it} = \delta y_{it-1} + \mu_t \dots \dots \dots (1)$$

$$\Delta y_{it} = \gamma_0 + \delta y_{it-1} + \mu_t \dots \dots \dots (2)$$

$$\Delta y_{it} = \gamma_0 + \delta y_{it-1} + \gamma_1 T + \mu_t \dots \dots \dots (3)$$

where  $\rho = 1 + \delta$ , and  $\rho$  is the root of the equation,  $\mu_t$  is white noise with zero mean and constant variance  $\sigma_\mu^2$ .

T stands for time and its coefficient captures the stochastic trend present in the series, if any.  $y_t$  is a stationary series, if  $-1 < \rho < 1$ . If  $\rho = 1$ , then  $y_t$  is in unit root circle (Harvey, 1981), and the series is non-stationary. The hypothesis of stationarity requires the value of  $\delta$  to be strictly less than zero:  $\delta < 0$ , that is,  $\delta$  has a negative value

so that,  $H_1 : \rho < 1$ . Dickey-Fuller (DF) test takes this as the alternative hypothesis, where the null hypothesis is:

$H_0 : \rho = 1$ . If equation 1 reveals the series to be non-stationary, then we move to evaluate equations 2 or/and 3.

Estimates of any regression equation based on non-stationary series are spurious.

Engel and Granger (1987) hypothesized that even if individually time series of two or more variables are non-stationary; it is possible that their linear combination in the regression model is stationary. This may be assessed by the use of Engle-Granger (EG) test of co-integration. Unlike other tests of stationary such as Dickey-Fuller

test, which focuses on auto-regression of one variable, Engle Granger test considers relationship among two or more variables. The Engle-Granger test subjects first order difference of residual of such regression models to unit root. If the residuals are stationary, the linear combinations of variables in the regression model are considered to be stationary even though individually one or more variables may be non-stationary. The study uses the following model for the application of Engle-Granger test of co-integration.

$$\Delta \hat{\mu}_t = \delta \hat{\mu}_{t-1} + \alpha \Delta \hat{\mu}_{t-1} + v_t$$

$$\therefore \Delta \hat{\mu}_t = \delta \hat{\mu}_{t-1} + \alpha \Delta \hat{\mu}_{t-1} + v_t \dots \dots \dots (4)$$

where  $\hat{\mu}_t$  is the series of the estimated residuals from a each regression equation. The null hypothesis is  $\delta = 0$ . If we fail to reject the null hypothesis, we can conclude that the residual series contains a unit root. Hence the dependent and independent variables in the regression equation are not co-integrated. However, if we reject the null hypothesis it implies that the residuals are stationary and therefore we conclude that the series are co-integrated or the series have a long-run relationship.

### 3.2 Growth Curves

Growth curve (semi-log linear regression model) is used to evaluate growth of income/GDP, investment/savings, consumption, population, public expenditure, subsidies and public revenue in Tanzania over the period under study. Natural logarithm is used for two major reasons; (i) it removes non-linearities from the data and (ii) slope coefficients may be interpreted as percentage rate or elasticities.

$$\ln y_{it} = \beta_0 + \beta_1 \ln x_t + \varepsilon$$

$$\therefore \frac{\partial y_t}{y_t} = \beta_1 \frac{\partial x_t}{x_t}$$

$$\therefore \beta_1 = \frac{x_t}{y_t} * \frac{\partial y_t}{\partial x_t} = e^{jx} \dots \dots \dots (5)$$

where  $\alpha_0$  = intercept (autonomous or minimum value),  $i=1,2,3,\dots,n$ ,  $\beta$  = estimated elasticity and  $x$ =GDP<sub>t</sub>. A growth model adopted from Gujarati, D.N. (2003, p.179-180) is used for estimation of growth trend of real gross domestic product (GDP), public expenditure (PE), fiscal deficits (FSD), population (POP), public revenue (PR), investment (savings) (I), consumption (CON) and subsidies (SUBS) in Tanzania over the period 1966 to 2011. We apply compound interest formula in developing the model as expressed below:

$$Y_{it} = Y_0(1+r)^t \dots \dots \dots (6)$$

where  $Y_{it}$  is the value of  $i$ -th variable at time  $t$ ,  $Y_0$  is the initial value of the dependent variable,  $r$ =compound rate of growth of the dependent variable over time and  $t$  is time trend (1966 – 2011). Taking the natural logarithm of the equation 6, the following equation is obtained:

$$\ln Y_{it} = \ln Y_0 + t \ln(1+r) \dots \dots \dots (7)$$

where  $\beta_0 = \ln Y_0$  and  $\beta_1 = \ln(1+r)$ . By rewriting the above equation and adding the error term to it we get the following model:

$$\ln Y_{it} = \beta_0 + \beta_1 t + u_t \dots \dots \dots (8)$$

where  $\beta_0$  and  $\beta_1$  are the unknown parameters to be estimated and  $u_t$  = random error. Ordinary Least Squares (OLS) estimates of the above growth curves in Eq.8 are used to derive estimates of compound growth rate (CGR). However, because the coefficient of the trend variable ( $\beta_1$ ) does not give us compound (over a period of time) rate of growth, but instantaneous (at a period of time) rate of growth after estimation of Equation 4 the

compound rate of growth is computed as  $r = (e^{\beta_1} - 1)$ . This means that the annual compounded growth rate (ACGR) is found by taking the antilog of the estimated  $\beta_1$  and subtracting 1 from it and multiplying the difference by 100.

### 3.3 Growth Curves with Policy Dummy as a Determinant

$$\ln Y_{it} = \beta_0 + \beta_1 T + \beta_2 D + \mu_t \dots \dots \dots (9)$$

where  $T$ =Time trend and  $D$ =Dummy variable ( $D=0$  for period prior to 1986 and  $D=1$  for period post 1986). We use regression analysis for the two periods of study 1966-1985 and 1986-2011.

#### 4. Data

The study employed secondary data related to; economic growth as a proxy of Real GDP, government expenditure, private consumption, subsidies, fiscal deficit, public revenue, population, inflation rate and savings/investment. These data are time series for 46 years spanning over 1966 to 2011. We collected data from various secondary sources including the Statistical Bulletin of the Central Bank of Tanzania, Ministry of Finance and Empowerment and Tanzania National Bureau of Statistics. The variables that been considered in this study include Real Gross Domestic Product (GDP), Public revenue (PR), Public expenditure (PE), Fiscal deficits (FSD), Investment (I), Consumption (C), inflation (INF), Subsidies (SUB) and Population (POP).

#### 5. Findings

##### 5.1 Unit Root Test

The table 1 contains OLS estimates of three versions of Random Walk Model (RWM) and application of Dickey-Fuller with the view to evaluate the value of the unit root of the regression functions. All variables are found to be non-stationary in all three versions of RWM except private consumption expenditure and investment/saving. The two last versions of RWM reveal time series of private consumption expenditure and investment to be stationary as the coefficient  $\delta$  attached to  $C_t$  and  $I_t$  is negative and statistically significant at 0.05 probability level.

**Table 1: Dickey-Fuller Test for Unit Root Results**

Variable	No Constant	With Constant		With Constant and Stochastic Trend		
	Slope	Intercept	Slope	Intercept	Slope	Trend
GDP <sub>t</sub>	0.0553 (17.2201)	-248013.512 (-6.0514)	0.0839 (15.9335)	-249458.3 (-6.360)	0.109 (8.827)	-7511.882 (-2.229)
PR <sub>t</sub>	3.4949 (3.5368)	1007914 (14.4714)	1.5240 (3.5078)	479516.8 (4.9224)	1.0341 (3.1948)	24044.26 (6.3378)
PE <sub>t</sub>	3.7969 (2.9889)	1416880 (11.356)	11.356 (3.788)	568322.9 (2.9459)	1.1102 (3.2323)	38711.65 (5.1250)
I <sub>t</sub>	-0.8349 (-11.295)	316157.32 (6.4277)	-0.9181 (-16.7096)	-120587.2 (- 2.0154)	-0.9498 (-27.9263)	19279.68 (8.4614)
C <sub>t</sub>	0.0279 (1.3219)	318543.27 (0.9543)	-0.0187 (-0.3517)	554859.78 (1.6970)	-0.2897 (-2.4869)	57474.26 (1.6969)
FSD <sub>t</sub>	1.1711 (3.0108)	439379.1 (6.6019)	0.8676 (3.0868)	75122.51 (0.6317)	0.7148 (2.8204)	16094.45 (3.5303)
POP <sub>t</sub>	0.0294 (15.9159)	0.2011 (1.5105)	0.0220 (4.2211)	0.082 (0.238)	0.037 (0.929)	-0.010 (-0.379)
SUB <sub>t</sub>	0.2368 (77.4207)	83.3456 (0.2380)	0.2364 (68.0696)	70.4659 (0.0977)	0.2363 (47.5823)	0.7036 (0.0205)

##### 5.2 Engle-Granger Test

On the basis of the pure random walk model (no trend, no intercept; with intercept, no trend; and with intercept and trend) all the variables were found to be non-stationary, so we need to apply unit root test to the residuals of Equation 5. However, by applying the unit root to the residuals (EG test) of Model 1-5 the null hypothesis of non-stationary was rejected for each of the equation showing that the residuals were stationary. This suggested that GDP, public revenue (PR), public expenditure (PE), consumption, investment, subsidies, fiscal deficit and population were found to be co-integrated or to have a long-term relationship. This implies that though all the variables under this study are individually non-stationary, in the long-run they move together as indicated in Table 2.

**Table 2: Summary of Engle-Granger (EG) Test Results**

	Model	EG test Statistics	tau-statistic
Model 1	$GDP_t = f(GDP_{t-1}, INV_{t-1}, PVCE_{t-1}, PE_{t-1})$	-0.484	-3.700
Model 2	$PR_t = f(GDP_t, PR_{t-1})$	-0.851	-5.551
Model 3	$PE_t = f(PE_{t-1}, GDP_t, FSD_t, SUBS_t)$	-0.561	-3.390
Model 4	$PVCE_t = f(GDP_t, INF_t, POP)$	-1.047	-6.514
Model 5	$INV_t = f(INV_{t-1}, GDP_t)$	-1.072	-6.652

### 5.3 Growth Curves without the Policy Dummy variable

OLS estimates of growth curves are presented in table 3. The growth curve fits the data of (i) gross domestic product (GDP) (ii) population (iii) consumption and (iv) subsidies, as in proportion of total variation explained by the function ranges 89.3 to 99.5 percent; coefficient of multiple determination is also significant. But the proportion of variation of investment, Public revenue and public expenditure ranges from 37.6 to 60.4 percent. These two coefficients of multiple determination are also significant. Besides, intercepts and slope in all these functions are significant. The growth curve, however, does not fit the data for fiscal deficit well, though the intercept of the function, the coefficient of determination and time are significant. It implies that systematic factors that time embodies explain the growth of all variables except fiscal deficit; fiscal deficit seem to be more subject to random influences than systematic factors or fiscal policy decisions.

Turning now to the elasticity coefficients calculated from the ratio of appropriate estimated growth values on Table 3 we can observe that, corresponding to 1 percent change in GDP growth rate, public revenue (PR), public expenditure (PE), consumption, investment, subsidies, population, and fiscal deficit rise at the rate ranging from 0.98 to 8.7 percent. These findings reveal that the intensity of growth of public expenditure, investment (savings), public revenue, subsidies, private consumption expenditure and investment is greater than that of GDP. Further analysis showed that elasticity coefficients for all variables except population and fiscal deficit are above unity in absolute reflecting more than proportional increase in public expenditure, investment (savings), public revenue, subsidies, and private consumption expenditure with respect to economic growth (GDP). Another important finding was that, while private consumption is growing at slightly higher rate as compared to GDP, population is growing at a slower rate than GDP.

**Table 3: OLS Estimates of Growth Curves without Policy Dummy**

Variable	Intercept	Slope	R <sup>2</sup>	F	P*	CAGR (%)	E-Growth Rate
lnGDP <sub>t</sub>	14.825* (494.021)	0.0301 (32.031)	0.959	1025.978	3.95E-32	3.056	1.000
lnPR <sub>t</sub>	13.2446 (171.18)	0.0235 (8.1919)	0.604	67.107	2.14E-10	2.376	2.376
lnPE <sub>t</sub>	13.5066 (124.198)	0.0257 (6.379)	0.481	8.798	0.0049	2.604	2.604
lnPOP <sub>t</sub>	2.420* (290.884)	0.0297 (96.230)	0.995	9260.131	8.39E-53	3.011	0.985
lnC <sub>t</sub>	14.7055* (308.112)	0.0331 (18.713)	0.888	350.181	1.42E-22	3.364	1.101
lnI <sub>t</sub>	13.021* (62.732)	0.0396 (5.1487)	0.376	26.509	5.89E-06	4.039	1.322
lnSUB <sub>t</sub>	1.930* (4.291)	0.2372 (11.906)	0.893	141.75	1.13E-09	26.775	8.768
lnFSD <sub>t</sub>	11.986 (44.4973)	0.0296 (2.966)	0.167	5.572	0.0227	3.004	0.983

\*(\*\*) denotes rejection of the null hypothesis at 5%(1% ) level of significance

### 5.4 Growth Curves with the Policy Dummy variable

The results in Table 4 indicate the OLS estimates of growth curves of various economic and financial variables with policy dummy as a determinant of policy change. The results reveal that (i) the fit of growth curve with dummy variable is better than that of the growth curve without dummy and the value of the coefficient of determination has improved in all cases (ii) all the slope coefficients are significant at 5 percent level in this case. However the effect of globalization on macroeconomic and financial variables is different for each variable. For example GDP, public expenditure, public revenue, private consumption expenditure and fiscal deficit have been significantly affected by the policy changes (globalization). Out of these five variables, four of them have significantly decreased over time as a result of globalization. The only variable which indicated a positive and significant growth rate is private consumption expenditure. Investment has shown positive sign but not significant. (iii) Other variables like population and subsidies growth rate appear to have not been significantly affected by globalization though they all indicate a negative sign. An important aspect of growth of Tanzanian economy, revealed by the growth curves is that (a) public expenditure, fiscal deficit and savings/investment have increased at faster rate than GDP growth rate (b) furthermore fiscal deficit has increased at the rate nearly twice that of public expenditure and nearly three times that of GDP and (c) public expenditure has grown even more rapidly than public revenue which furnishes the rationale for such growth of public revenue. In fact, growth of subsidies and fiscal deficit has revealed the highest growth rate as compared to all other variables followed by

investment and public expenditure growth. These inferences are also supported by the geometric means (reported in last column) of year on year on rates of growth of these variables. The R-squares and the F-tests indicate that the model fits the data well (see Table 4).

Year on year growth rate as shown by the value of the geometric means indicated that investment and fiscal deficits have recorded the highest year on year growth rate followed by subsidies, public expenditure and public revenue. The rest of the variables (GDP, population and consumer price index/inflation) have indicated a very small year on year growth rate that is below 3 percent. The average year on year growth rate of GDP and the year on year growth rate on all variables except population and consumption expenditure are reported to have negative significant values (See Table 4).

**Table 4: Growth Curves with Policy Dummy**

Variables	Intercept	Time (T)	Dummy (D)	R <sup>2</sup>	F	P*	CAGR (%)	Geomean
lnGDP	14.7855 (554.275)	0.0423 (22.922)	-0.2088 (-4.2230)	0.9709	718.2666	9.16E-34	4.321	3.4616
lnPOP	2.4202 (270.128)	0.0297 (48.749)	-0.00033 (-0.0205)	0.9953	4524.881	1.02E-50	3.015	2.8740
lnPR	6.1248 (79.16)	0.1919 (36.219)	0.5176 (3.6490)	0.9928	2957.438	9.02E-47	21.155	18.2783
lnPE	6.3700 (77.723)	0.2123 (38.128)	-0.0495 (-0.3318)	0.9928	2727.353	5.08E-46	23.652	19.7983
lnFSD	4.5466 (24.302)	0.2677 (20.1933)	-1.6565 (-4.6659)	0.9595	510.082	1.12E-30	30.965	33.7499
lnI	5.6899 (24.937)	0.1935 (12.4841)	0.5112 (1.2312)	0.9422	350.1564	2.45E-27	21.349	38.1597
lnINF	-2.0743 (-22.686)	0.1388 (22.3376)	1.2404 (7.4554)	0.9868	1601.691	4.21E-41	14.889	2.9444
lnSUB	1.8783 (10.3796)	0.2506 (20.3793)	-0.17056 (-0.5180)	0.97239	757.307	3.03E-32	28.480	27.3173

In the parenthesis ( ) are the t-values

## 6. Conclusion

The paper examines the empirical relationship between the progress of globalization and economic growth in Tanzania using time series data covering the period of 1966 to 2011. We employ the Dickey-Fuller test to determine data stationarity and Engle-Granger test of cointegration to determine the long-run relationship among the variables under the study. Besides, we employ growth curves with and without the dummy variable to analyse the change of various economic and financial variables before and after globalization.

It is clearly known that globalization leads to reduction in government role in economic affairs. Greater the globalization more is likely to be liberalization and privatization and less will be the role of government in economic affairs. Therefore government requirement for spending money should fall, meaning less revenue is required through reduced rate of taxation and increasing range of tax exemptions. Subsidies are also expected to decrease. However, the findings from this study reveal that on average both the pre and post globalization tax balance of the people has increased five times than GDP growth. But also the government has increased public spending and investment so as to promote welfare. Growth of public expenditure grew by faster rate than the growth of public revenue. The difference between public expenditure and public revenue is filled up by the fiscal deficit. Therefore more money to finance the fiscal deficit generated demand pull inflation. Moreover, both GDP and public expenditure of Tanzania have been growing consistently over the years, but public expenditure has been growing ahead of the growth of the economy. This reveals a conclusive evidence to support the above thesis as growth of public expenditure in absolute and relative terms has exceeded that of GDP and the policy of globalization has affected the growth of the economy significantly.

The results from this study provide some important policy implications for Tanzania and other developing nations. First, the policies of globalization in developing countries like Tanzania are growth retarding rather than growth promoting. For example, as observed from our analysis GDP, public expenditure, public revenue, private consumption expenditure and fiscal deficit have been significantly affected by the policy changes (globalization). All of these variables except one (public expenditure) have significantly decreased over time as a result of globalization. The growth in public expenditure has not been able to promote growth as expected and this is probably due a number of reasons: (i) the large part of public expenditure is not directed towards growth promoting projects, (ii) existence of high level of corruption and embezzlement of the public funds, and (iii) large proportion of the increased public expenditure being financed through fiscal deficit and

borrowing which increases the national debt and crowd-out effect of private investment by pushing up the cost of borrowing (real interest rate). Therefore, the poor countries like Tanzania need to adopt policies which advocate an active government intervention in place of 'laissez faire' or low intervention as public policy and the large proportion of public expenditure has to be spent on growth promoting projects.

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