The Factors Affecting Gross Domestic Product (GDP) in Developing Countries: The Case of Tanzania

Alex Reuben Kira[1]

1   Shanghai University of Finance and Economics, Address: 777 Guoding Rd., Shanghai, China.

Mobile: +86 13774361320, Email: alexkira10@gmail.com

Abstract

Gross Domestic Product (GDP) is one of the determinants of country's economic growth. This study intends to analyze the factors that affect the GDP of Developing Countries whereby Tanzania is selected as a representative. Keynes model was adopted to be tested in Tanzanian GDP from 1970 to 2009. The result shows the GDP being at the same level year after year with no significant changes subject to some dormant factors. The most common GDP trend is a continuous growth with periods of acceleration and deceleration. Some occurrences of unconditional decline are afterwards plagued by further growth. Developing county's GDP is confused and unbalanced, with regular and deep unconditional GDP falls and booms. Tanzanian GDP as a developing country is influenced by Consumption (Government Final Expenditure and Household Final Expenditure) and Exports. Investment sector have to be encouraged for its impact on GDP be realized including stimulation of industrialization at country level. Problems such as increase in oil prices, power shortages and political instabilities are a distinctive source of GDP sinking in developing countries which require abruptly solution.

Key words: *Gross Domestic Product (GDP) GDP variables, developing countries, Tanzania*

1.0   Introduction

There are some economic facts of life that emphasize all macroeconomic explanations of growth. Possibly the most significant factor is that, in order to accumulate the capital goods, the consumer goods will have to be foregone at present to generate more units of consumer goods in the future. An increase in the amount of capital goods or capital formation is termed as an investment. For the economic growth to occur the level of investment has to be greater than the amount of depreciation, i.e. the quantity by which machines wear out or become outdated during the year. The greater the intensity of investment over depreciation the larger the prospective output of the economy in the future.

Kitov (2006) suggested that real economic growth (GDP) (Note 1) can be studied using a concept of two-component, economic growth – a deviation or business cycle and an economic trend component. The trend component or economic growth is accountable for the long-term expansion and describes economic efficiency. The deviation component of economic growth has to have a zero mean value in the long run.

Prescott and Hodrick (2003) researched and proposed exogenous shocks as the force driving fluctuations of the real GDP growth rate. Their research during the last 25 years has revealed numerous features of the principal variables involved in the description of the economic development though still many problems still exist in dealing with the theory of economic growth.

Kitov (2005), proposed a GDP growth model that dependent only on the change in a specific age cohort in the population and the attained level of real GDP per capita. The model stated that, real GDP per capita has a constant growth increment and the observed fluctuations can be explained by the population component variance. The model has unveiled that in developed countries the real GDP per capita with time, usually grows along with a straight line if no significant change in the specific age population observed in the defined period.

The relative growth rate of GDP can be affected by a number of factors, some of which show an inverse relationship while other factors show a direct relationship. This paper is devoted to analyze the extent to which those factors affect GDP growth in developing countries as compared to developing countries.

2.0 Literature Review

2.1 Developing Country

There are several definitions of a developing country, but in this study some few concepts that have tried to define the concept. A developing country is defined as a nation with undeveloped industrial base, low standard of living, and minimum Human Development Index (HDI) (Note 2) relative to other countries (Sullivan & Sheffrin, 2003; UN Statistics Division, 2008). Conversely, countries with more advanced economies than other developing nations but which have not yet fully demonstrated the signs of a developed country are categorized under the term newly industrialized countries (Mankiw, 2007; Bożyk, 2006; Guillén, 2003; Waugh, 2000).

The International Monetary Fund (IMF) defines developing country by using a flexible classification system to differentiate from a developed countries whereby 3 criteria are used: *One,* per capita income level; *Two*, export diversification whereby oil exporters that have high per capita GDP would not make the advanced classification because around 70% of its exports are oil; and *Thre*e; degree of integration into the global financial system directly or indirectly (IMF, 2009).

The World Bank classifies countries into four income groups yearly (on July 1) whereby country economies' are divided according to 2008 Gross National Income (GNI) (Note 3) per capita using the following ranges of income: *First,* Low income countries had GNI per capita of US$1,000 or less; *Second*, Lower middle income countries had GNI per capita between US$1,000 and US$4,000; *Third*, Upper middle income countries had GNI per capita between US$4,000 and US$12,300; and *Fourth*, High income countries had GNI above US$12,300 (World Bank, 2009). The World Bank classifies all low-income countries and middle-income countries as developing but the use of the term is convenient was not intended to imply that all economies in the group are experiencing similar development or that other economies have reached a preferred or final stage of development; the classification by income does not necessarily reflect development status (World Bank, 2010).

The development of a country is measured with statistical indexes such as income per capita (per person) (GDP), life expectancy, the rate of literacy, health services, etc. The UN (Note 4) has developed the HDI, a compound indicator of the countries' development statistics, to evaluate the level of human development in countries where data are available. Business dictionary defines developing country as a term used to describe countries that lack and have low capacities on infrastructure, industrialization, sophisticated technology but are in the process to build these capabilities (Note 5). By using the significant percentage increase on these variables, one can easily estimate a rate for any of the developing countries compared to that observed in the developed world. Developing countries also can be evaluated based on their conformity to the principal characteristic of developed countries. Jain (2006) pointed that among the "fast" emerging or growing economies of some developing countries are China and India (also members of a BRIC) (Note 6). China and India are among growing suppliers of manufactured goods and services worldwide. Growth in industrialization and trade are among the factors which stimulate their growth.

2.2 The Gross Domestic Product and Macro Economic Models

The GDP is one of the measures of national income and output for a given country's economy at a given period of time. The definition of GDP is based on the total market value of all final goods and services produced within the country in a given period of time (normally one year). The evaluation process also involves the sum of value added at every stage of production (the intermediate stages) of all final commodities (goods and services) produced within a country in a given period of time monetarily.

Globally, macroeconomic models have been in used in formulation of economic policy almost in every country. These models not only provide an analytical framework to link the demand and supply sides and the resource allocation process in an economy but also may help in reducing fluctuations and enhancing the economic growth which are two major aspects of any economy. Keynesian approaches have evolved over time to analyze fluctuations of output, employment and price level over periods (Keynes, 1936; Hicks, 1937; Samuelson, 1939; Phillips, 1958; Friedman, 1968; Phelps, 1968; Tobin, 1969; Barro & Gordon, 1983; Sargent, 1986; Goodhart, 1989; Nickell, 1990; IMF, 1992; Lockwood et al., 1998).

The empirical validity of these models is tested by either macro-econometric simulations models, applied multisectoral general equilibrium models or by stochastic dynamic general equilibrium models (Kydland & Prescott, 1977; Wallis, 1989; MPC, 1999; Pagan & Wickens, 1989). A controversy exists about the causes, consequences and

remedies for the macroeconomic fluctuations in the short run in the literature. There is less controversy in the literature about the economic events in the long run despite plenty of work that has been done in area of endogenous and exogenous growth models (Solow, 1956; Lucas, 1988; Romer, 1990; Mankiw et al. 1992; Parente & Prescott, 1993).

Price system played a crucial role in the classical macroeconomic models. Income is either spent on the current consumption or saved for the future consumption. The real sector equilibrium is guaranteed by equality between the saving and investment. The price level is proportional to supply of money and the monetary neutrality is maintained by perfectly flexible real prices. An aggregate demand always equals the aggregate supply. The main objective of government is to ensure law and order so that business enterprises could grow and contribute to the country's economy. Keynes showed how deficiency in aggregate demand may continue for a long period if the government does not step in to solve the problem. In the national income identity, the sum of consumption, investment, government spending and net exports demonstrates how the aggregate demand should equal aggregate supply. The aggregate demand may remain less than aggregate supply and the productive capacity may be under utilized. Keynes spent a significant amount of time in explaining consumption and investment behavior of the economy. The values of multiplier and accelerator coefficients were determined based on the key structural parameters such as the marginal propensity to consume, productivity of capital and the sensitivity of imports to the national income. The existence of consumption, investment, government expenditure and trade balances ratios to the GDP provide broad indicators of resource constraints. The behavioral assumption behind each of these demand components give a good framework for analyzing how monetary, fiscal and exchange rate policies determine the level of aggregate output, employment, savings and investment activities which affect the growth of the economy.

Though the supply shocks, such as the rise in the oil prices in 1970s gave rise to new classical and new Keynesian approaches with more focus in the supply side of the economy but still the basic structure of Keynesian model are very useful in policy analysis. They can be used to compute the impacts of various policy scenarios such as tax cuts, increase in spending, increase in money supply or increase in external demand or change in the behavior of consumers and producers in an economy.

Macro-econometric models aim to test a macroeconomic model with time series or cross section data on major economic variables (Wallis, 1989; MPC, 1999; Pagan & Wickens, 1989; Hendry, 1995; Holly & Weale, 2000). These models can imitate an actual economy then can be used for policy analysis. Structural parameters such as the marginal propensity of consume and imports, elasticity of investment to the interest rate or change in aggregate demand, elasticity of production to capital and labor inputs. In view of the fact that the real parameters are known then a model can be used for policy simulation before the implementation of those policies. Policy makers have control over policy instruments such as government spending, exchange rate, interest rate, tax rate but they like to know how the actual output, employment, trade balances change and economic implication when certain policy measures are implemented in the economy. Macro models provide a systematic framework to analyze these exogenous variables to provide judgments and decisions on policies regarding money supply, taxes, exchange rate and division of resources across various sectors or between consumption and saving which affect GDP.

Literature attempt to provide a general review about the aspects of these macroeconomic models particularly in its three aspects a simple Keynesian model for analysis of economic policy and its empirical counterpart simultaneous equation model; comparative static analysis in the Keynesian model with a production function and a neoclassical growth model which takes many features of the Keynesian model for the long run prospects of the economy. These models generated solutions to analyze the underlying factors behind macroeconomic series by comparing their variance or covariance to actual time series since infinite period economy is approximated by steady state characterization of conditions by linking two or more consecutive periods.

3.0 The Model and Data

3.1 Keynesian Model

The Keynesian (Note 7) theoretical approach focuses on investment, savings and government expenditure as the major variables affecting the growth rate of GDP. The approach suggests that a high rate of savings is an essential condition for a high rate of growth in GDP. Government guidelines have to ensure savings are made compulsory, or provision of effective incentives for people to suspend consumption e.g. increased taxes on consumption commodities.

Governments may invest; boost savings through taxation as well as cutoff expenditures through tight budgets (balanced budget). To measure economic activity, one needs a meaningful aggregation of all kinds of production. The country's productions are the crossing results of Effective demand, Production capabilities and Income. Income rises from payments distributed to production factors and it provides the necessary finance for demand.

Insert Figure 1

GDP is generated from the sum of all domestic and foreign effective demand for national goods. Domestic demand comprises government, household, and firm expenditure [respectively called: public expenditure, consumption, and investment] while foreign customers buy national goods as exports. Domestic demand is attracted not only by national goods but also by imports, which reduce the GDP sum. A very small additional element is the change in inventories (the goods that nobody wants them). Income serves as a source of finance for the demand of goods and services. The three elements of GDP interact to determine the aggregate demand.

Consumption, the major component of the aggregate demand, is determined by disposable income as following:

$$C_t = \beta_0 + \beta_1(Y_t - T_t) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where: C_t is consumption, Y_t is the national income and T_t is the tax rate. Parameters β_0 and β_1 represent the consumption behavior in this model; β_0 can be considered as the level of consumption for subsistence and β_1 representing the marginal propensity to consume out of disposable income has value between 0 and 1;

$$0 < \beta_1 = \frac{\partial C}{\partial Y} < 1 \, .$$

Investment is another major component of aggregate demand. In simplest form the investment demand is determined by the rate of interest, the cost of capital and the change in the demand in the previous period as:

$$I_t = \mu_0 + \mu_1 R_t + \phi \Delta Y_{t-1} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where I_t is investment demand, R_t is the rate of interest, ΔY_t is the change in demand, i.e. $\Delta Y_{t-1} = Y_t - Y_{t-1}$.

Interest rate denotes the cost of capital and determines the level of investment, as shown by $\mu_1 = \frac{\partial I}{\partial R} < 0$.

Producers invest more if there is more aggregate demand, $\phi = \frac{\partial I}{\partial Y} > 0$.

The government demand (G_t) and exports (X_t) are other two components of aggregate demand. The G_t component is fixed because the government has commitment to a set of public services which cannot be easily altered. The X_t may be determined by the real exchange rate and the foreign income.

Imports provide for part of this demand as all goods and services consumed or invested in the economy cannot be produced at home. Most of Keynesian models relate imports to level of domestic income and the real exchange rate:

$$M_t = m_0 + m_1 Y_t + m_2 \lambda_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(3)$$

M_t is the imports and λ_t is the real exchange rate may be defined as $\lambda_t = \dfrac{eP}{P^*} > 0$ where e is the nominal exchange

rate, P is the domestic price level and P^* is foreign price level. Parameters m_0, m_1 and m_2 represent import

behavior of the economy. Import rises with a rise in the level of national income, $\dfrac{\partial M}{\partial Y} = m_1 > 0$ and the real

exchange rate $\dfrac{\partial M}{\partial \lambda} = m_2 > 0$. Higher real exchange rate makes the domestic economy less competitive in the world.

The nominal exchange rate may not always be aligned with the real exchange rate. The purchasing power parity (PPP) theory implies that currency should appreciate (depreciate) if the domestic inflation rate is lower (higher) than the foreign inflation rate. Existing evidence suggests that PPP holds in the long run but the risk adjusted uncovered interest parity theory is more appropriate for the short run.

Macroeconomic balance requires the aggregate demand to be equal to aggregate income. The households use part of their income in consumption, other parts to pay taxes or to save as:

$$Y_t = C_t + T_t + S_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(4)$$

This equation defines income constraint of an economy. An economy with more consumption has fewer amounts for saving or taxes or both. Most often the collection of taxes by the government is mainly determined by the level of income as:

$$T_t = t_0 + t_1 Y_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(5)$$

Where t_0 is the collection of lump sum taxes and t_1 is the tax rate proportional to the national

income, $\dfrac{\partial T}{\partial Y} = t_1 > 0$.

GDP identity emerges by putting all above features together to reflect the balance of aggregate demand and aggregate supply sides as:

$$C_t + T_t + S_t = Y_t = C_t + I_t + G_t + X_t - M_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

Where the left hand side represents components of national income and the right hand side represents components of aggregate demand. This also implies that the net national saving plus private net savings should equal the current account balance of the economy which is often called the fundamental identity of an economy.

$$(T_t - G_t) + (S_t - I_t) = (X_t - M_t) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(7)$$

If the net public spending is bigger than the net private saving then it has to be met by net capital inflow to the country. A country which is low credit worthy or has accumulated heavy debt will not be able to finance its deficit by borrowing from abroad. Existence of imbalances between revenue and government spending characterize a change in

the national debt $\Delta B_t = T_t - G_t$ and debt accumulates over time $B_t = \Delta B_t + rB_{t-1}$. Trade imbalances result in

external debt $\Delta D_t = (X_t - M_t)$ and debt accumulates over time $D_t = \Delta D_t + rD_{t-1}$. Persistence in budget or trade

imbalances results in massive accumulation of debt. Equations (1) to (7) represent the real sector in the Keynesian

model, where Y_t, C_t, M_t, I_t and T_t are endogenous variables and $\Delta Y_{t-1}, G_t, X_t$ and λ_t are predetermined or

exogenous variables.

The study assumes that the aggregate supply is fixed in the short run and output is completely determined by the demand side of the economy. The rise and fall in investment, government spending, consumption, or exports are the sources of fluctuation in income and employment in the long run and have effect in country's GDP. If national production can not generate for physical causes, i.e. power shortage, war or natural disasters, the GDP variables: Consumption (C), Investment (I) and Government spending (E) will negatively affected [Equation (4)]. In that instance, firms producing at full capacity will almost certainly decide to increase prices, fading the effective demand with inflation. In addition to fulfill demand imports have to be stimulated which have a negative impact on the Net Exports. The distribution of technological and organizational innovation can affect productivity in terms of quality and costs. GDP can noticeable.

3.2   Functional Variables and Data

This study adopts the most common approach used to measure GDP. The expenditure method stipulated in equation (1) and (2) is used to investigate the impact of the Investment (I), government expenditure (E) and current account (exports minus imports) on the GDP. The GDP as the function of: consumption; gross investment; government spending; and net exports.

$$Y_t = f(C, I, A) + \varepsilon_i = \beta_0 + \beta_c C_t + \beta_i I_t + \beta_a A_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(\mathbf{8})$$

Where: Y_t = GDP; $f(C, I, A)$ = GDP function of Country's Consumption (Note 8); Investment; and Net Exports; ε_i = Error term; and $\beta_0, \beta_c, \beta_{i,} \beta_a$ = Variable Parameters to be estimated.

In the regression model equation (8), the variables indicate the expected impact on the dependent variable while holding constant other explanatory variables and ε_i hold as a typical stochastic error term. Based on Keynesian theory, the GDP is positively related to Consumption, investment, government expenditure and Net exports (A).

This paper directly estimates the Keynesian Model specified in equation (6) and (8). The source of data is the United Nations Statistics data of Tanzania from 1970 to 2011 and its components (at constant 2005 prices). Most of data used in the model are not stationary at first level; therefore unit root test has to be conducted to test if they are stationary. To test stationary of data the Augmented Dickey-Fuller test (ADF) and Phillips Perron are mostly used. A cointegration technique recommended by Engle et al., (1987) is advised incase most of data are non stationary to avoid spurious regressions. Therefore, the estimated residual of each individual regression have to be checked by ADF test and Phillips Perron test to determine if it is stationary. If the estimated residual is found stationary, then a cointegration relationship exists between the dependent and independent variable may be a long-run equilibrium value of that dependent variable. However, there may be a larger error in predicting its short-run value.

4.0   Results and Discussion

In this paper, statistical software (Eviews) and a multivariate economic model were used to test the relationship between dependent variables (GDP) and independent variables (investment, consumption, and Balance of Payment (Note 9). The statistical economic data used in our research, contains the GDP, investment, Consumption (government expenditure & Household consumption) and Exports and Imports data of Tanzania as a randomly selected developing country. Explanatory variables namely, Consumption (CONS), Investment (INV) and net exports [(Exports (EXP01) and Import (IMP)] were used to estimate the regression coefficients which determine how those factors impact the GDP.

Since data are time series, to run regression first the Unit Root Test was conducted to test the stationary of data. Researcher opted for Augmented Dickey-Fuller test (ADF) and Phillips Perron (PP) to test the stationary of data by

conducting the unit root test of all variables. The results (Table 1) show that the data were stationary at order I (1).

Insert Table 1

Since the study data were stationary at I (1) and was not stationary at first difference, then this study regression was established at I (1). The responsiveness of each variable on GDP were tested in the model to establish to what extent does the estimated value of each β change the further explanatory variables are added to the right-hand side of the equation influence the GDP. Assuming GDP to be an index of economic performance, carry out tests of significance on all slope coefficients in the final regression equation model (8). After running an Ordinary Least Square (OLS) regression analysis through Eviews, the results shows that GDP in Tanzania is influenced by Consumption (CONS) and Export (EXP01).

GDP = 2.48057 + 0.6513CONS +0.1620EXP01   with $R^2 = 0.9816$.

Insert Figure 2

The slope estimate above implies that a 1 percent increase in Consumption (Government expenditure and Household expenditure) and Exports increases the GDP by 0.6513 and 0.1620 respectively while other factors are assumed to remain constant (ceteris paribus). The R^2 shows that the independent variable can explain the dependent variable in the model almost by 98 percent.

However there is a need to include other explanatory variables in the model in order to enhance its fitness. GDP changes over time; the mainly universal GDP movement is a continuous growth with stages of acceleration and retardation over time. Several occurrences of absolute decrease are afterwards plagued by further growth at a given period. Economic growth can differ in periods, for example decades can be relatively dissimilar in terms of average rate of GDP growth.

5.0   Conclusion

Macroeconomic models explain the quantitative relationship between variables in an economy and help researchers and policy makers to forecast economic growth. The study used the estimated coefficients in the model to simulate the factors which affect the GDP growth for Developing Countries. Some variables were inactive such as Investment and Imports indicating that their influence on GDP is not significant. The study result shows that Developing Countries GDP is mainly influenced by consumption and exports. This indicates that for Developing countries GDP to grow other factors also have to be stimulated including Investments. Developing Countries have to create development projects aiming to increase counties' investments, including creating environment to attract Foreign Direct Investments (FDI) and investment in industrialization. In many countries, especially dependable economies (countries with small manufacturing activities mostly known as the Third World Countries) economic growth is chaotic and uneven, with repeated and deep absolute falls and booms. Increase in oil prices (except oil producing countries), power shortages (electricity shortage), corruption, political instabilities and wars are a distinctive source of GDP tumbling in developing countries which mostly affect GDP. Globally the gap between rich and poor countries is widening on a daily basis. Locally some countries do take some step to reduce the gap but still the gap is widening. Some developing countries' economies have emerged and take a step on stages of economic growth after natural resources discoveries (such as oil or minerals) or booming in export trade which enable them to take off on the way to attain high development stage and affect their GDP growth.

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Notes

Note 1.   The gross domestic product (GDP) or gross domestic income (GDI) is one of the measures of national income and output for a given country's economy.

Note 2.   http://en.wikipedia.org/wiki/Human_Development_Index; The Human Development Index (HDI) is a composite statistic of life expectancy, education, and income indices to rank countries into four tiers of human development.

Note 3.   The Gross national income (GNI) consists of: the personal consumption expenditures, the gross private investment, the government consumption expenditures, the net income from assets abroad (net income receipts), and the gross exports of goods and services, after deducting two components: the gross imports of goods and services, and the indirect business taxes. The GNI is similar to the gross national product (GNP), except that in measuring the GNP one does not deduct the indirect business taxes.

Note 4.   The United Nations (UN) is an international organization whose stated aims are to facilitate cooperation in international law, international security, economic development, social progress and human rights issues. The UN was founded in 1945 to replace the League of Nations, to stop wars between nations and to provide a platform for dialogue.

Note 5.   Financial   Dictionary   http://financial-dictionary.thefreedictionary.com/lesauthor=Farlex   Financial Dictionary; Retrieved December 28 2012

Note 6.   **BRIC** is a grouping acronym that refers to the countries of Brazil, Russia, India and China, which are all deemed to be at a similar stage of newly advanced economic development.

Note 7.   *Keynesian Theory* is an economic theory based on the ideas of twentieth-century British economist John Maynard Keynes. The state, according to Keynesian economics, can help maintain economic growth and stability in a mixed economy, in which both the public and private sectors play important roles. Keynesian economics seeks to provide solutions to what some consider failures of the *laissez-faire economic liberalism*, which advocates that markets and the private sector operate best without state intervention.

Note 8.   Consumption comprises final consumption expenditure (FCE); the combination of Household consumption expenditure (including Non-profit institutions serving households) and General government final consumption expenditure.

Note 9.   The BOP measures the payments that flow between any individual country and all other countries. It summarizes all international economic transactions in that country during a specific time period (yearly). The BOP is determined by the country's exports and imports of goods, services, and financial capital, as well as financial transfers.

Table 1:   Unit Root Test for GDP variables of Tanzania from 1970 to 2011

	ADF test		**Philips Perron Test**			
Variables	Intercept	Trend and Intercept	Intercept	Trend and Intercept	Decision	
LGDP	3.4049**	0.3612**	3.1359**	0.3640**	GDP stationary order I(1)	is at
DLGDP	-3.0260**	-9.9468	-2.9363**	-3.9577**		
LCONS	0.6531**	-1.8192**	0.6531**	-1.7866**	CONS stationary order I(1)	is at
DLCONS	-6.4571	-6.4582	-6.4558	-6.457		
LINV	-1.3031**	-2.0442**	-1.3031**	-2.0283**	INV stationary order I(1)	is at
DLINV	-7.2494	-7.1841	-7.2543	-7.2173		
LEXP01	0.8161**	-1.9056**	0.4477**	-1.6636	EXP01 stationary order I(1)	is at
DLEXP01	-4.7498	-5.046	-4.803	-5.0314		
LIMP	0.2786**	-2.0373**	0.3966**	-1.5682**	IMP stationary order I(1)	is at
DLIMP	-4.5696	-4.8227	-4.5773	-4.8227		

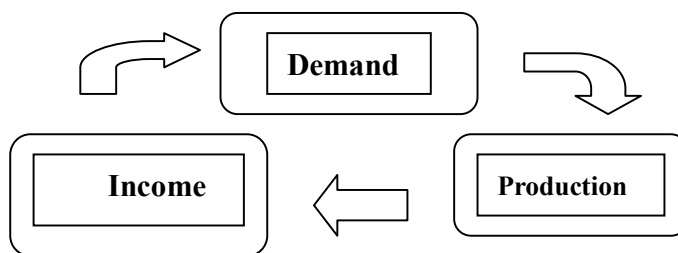*Note: Author computation based on Tanzanian data in Tanzania Shillings.*

Figure 1: Interconnectedness of County's Effective Demand, Income and Production Capabilities

Dependent Variable: LGDP
Method: Least Squares
Date: 02/07/13   Time: 21:50
Sample: 1970 2011
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.480656	0.376517	6.588431	0.0000
LCONS	0.651248	0.055632	11.70636	0.0000
LINV	0.016030	0.013492	1.188082	0.2424
LEXP01	0.162025	0.061638	2.628666	0.0124
LIMP	-0.045127	0.081221	-0.555615	0.5818

R-squared	0.981571	Mean dependent var		9.064799
Adjusted R-squared	0.979579	S.D. dependent var		0.503473
S.E. of regression	0.071947	Akaike info criterion		-2.314424
Sum squared resid	0.191527	Schwarz criterion		-2.107559
Log likelihood	53.60290	Hannan-Quinn criter.		-2.238600
F-statistic	492.6865	Durbin-Watson stat		0.334192
Prob(F-statistic)	0.000000			

Note: Author computation based on Tanzanian data in Tanzania Shillings.

Figure 2: Regression on Explainable Factors Affect GDP