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Full Length Research Paper

A contribution to the theory of economic growth: Old and New

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In this study it is possible to provide a simple theoretical and empirical literature framework that links the endogenous growth theory through to the classical economists' theory. There is also the following phenomenon that emphasises the proceeding to Harrod-Domar growth model, through to the model of the neoclassical growth theory. The study utilising the production function and, through to the developed new models of "new growth theory" or endogenous growth theory that consider policy influences on growth and divergent outcomes among countries. Within this recent approach, theoretical and empirical studies have attempted to find the relationship between development of financial markets and the new approach of endogenous growth theory. Economists working in this area should target their work directly to the analysis of policy options in developing countries. Policymaking generally will benefit from empirical results generated from more carefully constructed structural economic models.

Keyword: Economic growth, Harrod-Domar Growth Model, Neoclassical Growth Theory, New Endogenous Growth Theory, Financial structure.

INTRODUCTION

The growth and development theorists in both micro and macro-economic are concerned with collection activity, the level of national output and its growth over time. they also study the problems of stagnation, unemployment, inflation, interest rates, economic growth, wages, the exchange rate, the stock market and cyclical instability, and the policies (fiscal and monetary policy) adopted by governments to deal with these problems, economic conditions abroad (foreign level of activity and interest rates) also the price of oil, and the balance of payment within other countries. They also promote the economic welfare of the poor and wealthy households affected by

fluctuation in interest rates or the rate of inflation which are called endogenous variables, the others endogenous variables are the object of analysis in the economic and financial model as Figure 1 shows. The relationships between endogenous and exogenous variables are random, as exogenous variables are not strictly independent of the endogenous variables (Burda and Wyplosz, 2001).

Within the emergence of the endogenous growth literature model, the focus would be shifted from relying on the unknown exogenous technological progress to explaining economic growth by different theoretical and empirical models where the engine of growth also,

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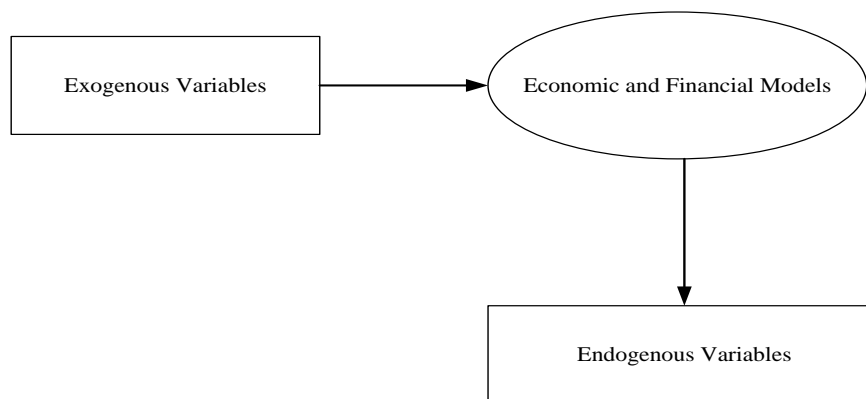


Figure 1. Relationships between endogenous and exogenous variables

concludes human capital or knowledge that is accumulated during a period of time.

However, periods of high unemployment and stagnation occur from time to time throughout the world (e.g. in the 1930s in the US, the early 1980s and the early 1990s in South East Asia). During the same period (1990s) Libya experienced the same economic problems of stagnation and unemployment. All development economists' structure and performance writing about forces determined the progress of the nation's economies as the countries of Europe improved the process of industrialisation, in the eighteenth and nineteenth centuries (Thirlwall, 2006). For these reasons, this continued to the theorists of the later 1950s and early 1960s who observed the process of development growth as a series of successive types of economic growth, in which the right quantity and mixture of saving, investment and foreign aid were all that was essential to enable the development of nations that had historically been followed more by developed countries (Bourne, 2006). Through the 1980s and early 1990s there was counterrevolution approach in economics such as the beneficial role policy of free market, open door economies and the privatisation of inefficient public enterprises projectiles (Todaro and Smith 2006).

Maddison (1995) considers the economic growth performance over the long-term to be due to three main causal influences which increase per capita output: technology progress; accumulation of physical capital; integration of global economies vis-à-vis trade in goods and services, investment, intellectual and entrepreneurial interaction. Within the fourth aspect are other elements: economic size; structural change; the relative scarcity or profusion of natural resources. For instance, Swan (1960:3) many years ago wrote:

"We also know that if we were asked to think about a five-year plan for India: we would need to learn a great deal about India, about people, about practical techniques, and we would not hope for more from economic theory that

than it might help us with some basic insights as to how to set about the task".

However, the target of economic growth theories is to increase the welfare of human beings and, hence, determine the growth in the standard of living of the population of a country. Also, economic growth can be defined as growth per capita of gross domestic product (GDP). The other elements, for instance, distribution of income, the availability of health and access to education remain part of economic growth.

The rest of study, therefore, is divided into four main sections, related to the a contribution to the theory of economic growth: old and new. Section 2 discusses the literature review is divided into four main sub-sections as follows: In Sub-section 2.1, the classical economists' theory is identified. Sub-section 2.2, the Harrod-Domar's growth model is discussed. Sub-section 2.3, the neo-classical growth theory and the use of production function is provided. This followed by an explanation of the new growth theory, or endogenous growth theory in Sub-section 2.4. Section 3, empirical framework in variation study can be identified are provided. In Section 4, a summary and conclusion of this study are also provided.

Literature Review

Historically, both theoretical and empirical studies of financial development and growth within the endogenous growth literature focuses almost always on the role the banks play in the rate of financial market development (Cameron (1967) and Mckinnon (1973), among others). Furthermore, following the new growth theory, which was beneficial in re-emphasising the number of fundamental issues concerning the interdiction of technical progress, economies of scale and formation of physical "convergence" of countries where the institutional policy and repudiation of the notion of "unconditional" convergence (on global scale) is useful and one way of focusing

attention upon the interaction of “proximate” and “ultimate” causal influences, (Maddison, 1995). In the following Sub-sections 2.1, 2.2 and 2.3, we focus the review of previous studies to provide a simple theoretical and empirical literature framework that links the endogenous growth theory through to the classical economists’ theory and then proceeding to Harrod-Domar growth model through to the neoclassical growth theory and the use of production function and, finally, to the so-called “new growth theory”/ or endogenous growth theory. Within this recent approach, theoretical and empirical studies have attempted to find the relationship between development of financial markets and the new approach of endogenous growth theory.

Growth Theory

The history of the economic theory growth of out-put and the distribution of income between wages and profits were presented by Adam Smith in 1776 as the “Wealth of Nations”. The most important contribution was to introduce the notion of increasing returns, based on the division of labour. His major contribution was to the fundamental forces which underlie the development of economic policy (Farmer, 1997). Adam Smith’s contribution is described as: “A poetic expression of the most fundamental economic balance relations, the equalisation of rates of return, as enforced by the tendency of factors to move from low to high returns” (Arrow and Hahn, 1971:1). According to Barkai (1969) the “Wealth of Nations” emphasized that technology was far more important than other factors which explained the nature and situation of the wealth of a nation¹.

Smith’s theory has been discussed in relation to the advance of stock as interwoven within within his theory is the notion which depends on capital accumulation to consider market allocation of resources and income in such a manner that Bowley (1975:376) is led to comment that, “advances of stock are of overwhelming importance as the means of resource allocation”. As the capital accumulation to the stocks plays a role in the economic growth process of circulating, fitted capital used to support productive labour in turn generates the capital necessary to support labour in the future. Smith indicated that the relationship of economic growth had for a long time been regarded as primary to the understanding of political policy and social environment by increased specialisation and division of labour and upon the accumulation of real capital. He created the simplest of production functions model of growth by the following equations:

$$Y = f(L, K, T) \quad (1)$$

¹ Also Schumpeter (1939:154) pointed out that: “Without development there is no profit, without profit no development”.

where Y is output, L is labour, K is capital and T is land. In this case output is related to labour and where Y is output, L is labour, K is capital and T is land. In this case output is related to labour and land to inputs. While, output growth (G_Y) is measured by population growth (g_i), investment (g_k) and land growth (g_t), and in overall productivity (g_f) as follows:

$$G_Y = \phi(g_f, g_k, g_t) \quad (2)$$

Smith proposed that the population growth in the tradition of time was endogenous. Also, it was investment endogenous, which was measured by the rate of saving. Land growth depended on new land/or technological improvement of old land. Subsequently, the technological progress could also increase growth overall. Thus, Smith did not see growth as forever rising, and he posited in the form of the “strong state” where population growth and capital accumulation were zero. According to Eltis (1975:426) “Adam Smith’s theory of growth has provided better predictions of the course that economic development was to follow in the nineteenth and twentieth centuries than the theories of his great successors, Malthus, Ricardo, and Marx, who predicted at best constant living standards for the great mass of population”. In fact, Smith chose to emphasise the capital acclamation portion of his theory, rather than the level of contribution which he began within “Wealth of Nations”. Thomas Malthus (1798) wrote his theory of population, called “Essay on the Principle of Population”. His focus was on the importance for development of maintaining effective demand and the possible imbalance between the supply of savings and the planned investment of capitalists, which could increase development. He notes that the population goes on doubling itself every twenty five years or increases at a gradual rate.

David Ricardo was another of the great classical theorists. In 1817 he published “Principles of Political Economy and Taxation” and his model, like Smith’s growth and development, is a function of capital accumulation, and the capital accumulation depends on re-investment. Karl Marx in his famous work “Das Kapital” (1867) presented the collapse of capitalism, and in the classical school agreed that the rate of profits on capital would be full as the economy grew, but this differed from Adam Smith and Ricardo, who argued that decline in profits, is the result of competition among capitalists. Ricardo also saw the fall as the result of diminishing returns to land and profits being pressed between rate and wages, leading to a stationary state. Marx’s model however emphasise a many similarities to other classical economic models.

In early 1890, as economics came under the static neoclassical value theory, Alfred Marshall wrote “Principles of Economics”, which treated growth and

development as a natural phenomenon; an evolutionary process similar to biological development in the natural world. Young (1928), provided a few point of framework on the older work of Marshall in 1890, pointed out the link between the internal productive economies and the external economies, and he agreed with Adam Smith's old idea that division of labour leads to inventions limited by the extent of the market, in which increasing to scale is realized into growth context, also pointed out the technological change progress of economic conditions as "endogenous growth theory"².

The Harrod-Domar Growth Model

The modern growth theory started with a classic article of British economists by Roy Harrod and Domar, "An Essay in Dynamic theory", now called the Harrod-Domar Growth Model. This model described the economic mechanism that more investment leads to more growth. According to Harrod (1939, 1948) and Domar (1946) the capitalist system is inherently unstable by using the production function. However, they explained how the aggregate supply expanded, which means the investment has two effects, one on the aggregate demand side such as business expends more, and the other on the aggregate supply side whereby more investment increases capital stock and produces more business as follows:

$$1) \text{ Production function (supply side)} \\ Y = a \cdot K \quad (3)$$

where a is the productivity of capital, so, the determent of changing in capital will be changing the income as:

$$\Delta Y = a \cdot \Delta K \quad (4)$$

Also, how the capital was changed by business and government / or investment:

$$\Delta K = I \quad (5)$$

Return to the equilibrium conditions of (S) saving ratio, (s) is propensity to save of national income (Y) as follows:

$$S = sY \quad (6)$$

2) The investment (I) is defined as the change in the capital stock (K), and can be represented ΔK such that:

$$I = \Delta K \quad (7)$$

However because the total capital stock (K) is retentively

direct to the total national income/ output (Y) as expressed by the capital-output ratio (k) it will follow that:

$$K = k \Delta Y \quad (8)$$

3) Additionally, because national saving (S) should be equal investment (I), the equation will be:

$$S = I \quad (9)$$

But from all equations (6, 7, 8, and 9) will be the following:

$$sY = k \Delta Y \quad (10)$$

Therefore, following that, the final question will appear as:

$$\frac{\Delta Y}{Y} = \frac{s}{k} \quad (11)$$

where (s) is the ratio of national saving, (k) the national capital-output ratio, ($\Delta Y/Y$) measures the growth of output. From the Equation 11 the most fundamental strategy of economic growth is simply to increase the proportion of national income saved, but this would raise s and then increase $\Delta Y/Y$ at the rate of GDP.

Nevertheless, the main obstacle for developing countries according to this theory was the relatively low level of new capital formation in most poor nations. Also, the capital constraint approach to growth and development became the justification in terms of cold war politics for transfers of capital and technical assistance from the developed to the developing nations. Kaldor (1955, 1956) indicated that the accumulation of capital has been observed and the quantity of labour available and the growth rate of the economic system determined by the share between increasing income and savings, in which the growth of the working population rose and, perhaps, the technological of the system will increase. The following equations of wages and saving/ or income ratio for the growth, have been used:

$$S = s_w (w/y) + s_p (P/y) \quad (12)$$

where s_w is the average of workers to save, and s_p is the average of capitalist to save, perhaps w/y and P/y are the shares between wages and profits, respectively. If $s_w = 0$ then workers save nothing. So, all the saving of the economic system being to carry thus, which will be the only case of equilibrium rate of profits $\pi = (P/K)$, which can be considered as the following:

$$\pi = g / s_p \quad (13)$$

² Young (1928:583) pointed out that: "Its internal economies dissolve into the internal and external economies of the more highly specialised undertakings which are its successors, and are supplemented by new economies."

where g exogenous to π unknown, this will lead the workers to save which is positive. The result of this theory is considered by Kaldorian, where Kaldor has called himself "Keynesian". Basically, this theory confirms the classical ideas of factors such as the production and the distribution of income.

According to Harrod-Domar is growth model, which has come under attack by new growth theory, investment does not matter for long-term growth (next part of "new" economic theory). The assumption and prospective of neoclassical growth theory will now consider how to understand the source of growth used in empirical models for developed and developing countries. The neoclassical growth theory was born as the result of Harrod-Domar is model and the new growth theory developed as the result of the neoclassical growth theory.

Neoclassical Growth Theory

The "neoclassical economic theory" tried to get closer to the Keynesian economics by development of the theory of expectations and of the real business cycle, where many problems could be faced today, both financial and social activities such as money and banking, organised securities, foreign exchange markets, large corporations, holding companies, business associations, organised labour, etc.

Neoclassical economics provided the framework since its arrival in the 1870s (Debraj, 1998), which paid attention to the choice of behaviour in analysing the statistics model's special point of view of the quantitative processes of response, rather than the qualitative mechanisms inherent in technological transformation. However, during the technological has been changed Second World War period the technological transformation altered rather than static quantitative model to increase in factor inputs, measured by increasing the economic growth rate (Brinkman and Brinkman, 2001). During the 1960s, neoclassical growth theory was practiced and people generally accepted its approach to modelling growth in the long-term, which has been driven by increasing returns: Ramsy (1928), Arrow (1962), Cass (1965), Koopmans (1965), Solow (1956) and Swan (1956). This kind of framework assumed the neo-classical model production of consumption rising as a function of the stock of knowledge increasing within constant return to scale, which returns to each input (labour and capital) as well as smooth elasticity of the substitution between the inputs. For instance, Arrow (1962), in his model "learning-by-doing", argued that new machines are improved and more productivity will result as the function of the cumulative which will also increase investment for the industry, because new knowledge should be discovered as the result of investment. However, Arrow's model meant that two problems could be encountered which would increase any rates of growth model of increasing returns:

- Existing competitive equilibrium.
- The function of capital and labour increase returns to scale.

Smith (1776) pointed out the technological improvement in the form of "learning by doing" or "learning by using" with economies of scale through to the concept of division of labour in the process of the wealth of nations. Furthermore, according to some recent studies (Lucas 1988; Romer 1986 and Stiglitz 1987), it has been argued that the major difference between the more and less developed countries increased by learning-by-doing. Thus, "learning-by-doing" increased the stock of knowledge and human capital, and other factors such as yield quality³.

The basic *neoclassical growth model* was developed by Solow-Swan. This model used the aggregate production function based on three key assumptions:

- a. The labour force grows at constant exogenous rate, 1 .
- b. Output is function of capital and labour such as: $Y = F(K, L)$ which the production functions relating output to constant returns to scale as shown in Figure 2.
- c. There is no independent investment: $S = I = sY$.

Now from production function equation $Y = F(K, L)$ will assumed consciously K, L as following:

$$Y/L = F(K/L, 1) \quad (14)$$

or, if $k = K/L$ we can write as:

$$y = f(k) \quad (15)$$

where $f(\cdot)$, is the intensive or per capita of the production function $F(\cdot)$, as the result from this equation of the macro-economic equilibrium condition will be:

$$i = sf(k) \quad (16)$$

From this equation, if the macro-economic equilibrium holds constantly, for example, $(I=S)$ always, then $i = sf(k)$ will be referred as the actual investment per person. As Figure 3 shows the intensive production function is $y = f(k)$ with the actual investment function equilibrium $i = sf(k)$.

Although, from the neoclassical model growth assumed that the population grows exogenously at the rate n as follows:

³ For more explanation see (Chang, 1997).

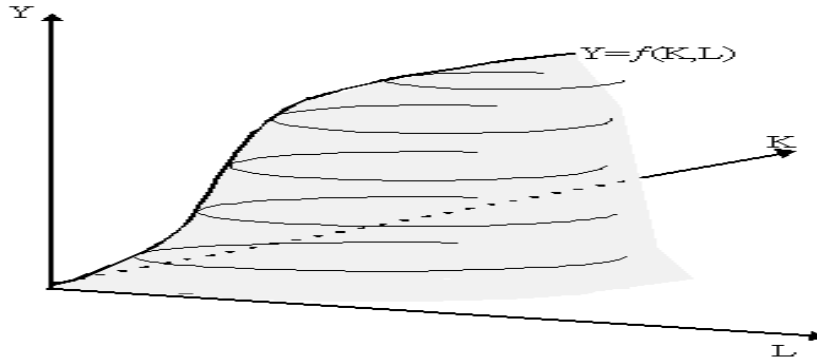


Figure 2. Production function for one –output/ two-inputs

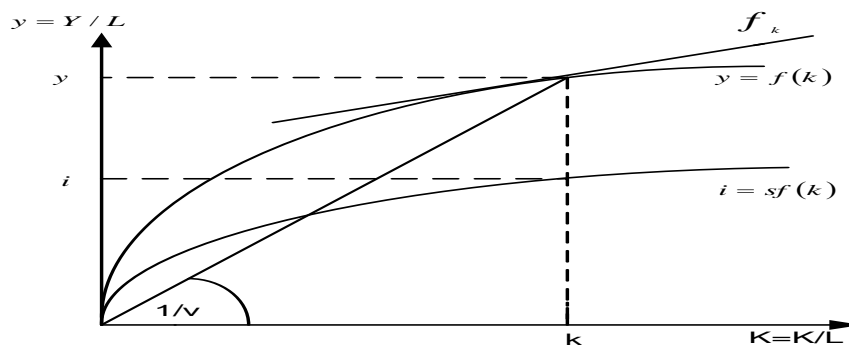


Figure 3. Intensive production function

$$g_l = (dL/dt) / L = n \tag{17}$$

So, if there is no investment, then $k = K / L$ which will automatically fall as the population grows, in which (k) will be constant, then there should be investment (capital must be grow) at rate (n):

$$gk^r = (dK/dt) / K = n \tag{18}$$

where r is the required growth rate of capital to keep the capital-labour ratio (k) steady, as investment is defined as $I = dK/dt$, the following equation arises:

$$i^r = nK \tag{19}$$

where i^r is required investment, divided by labour,

$L i^r / L = nK / L^r$, or: $i^r = nk$ in which the required investment per person to maintain steady k. the following figure shows steady-state of growth (Figure 4).

In addition, the basic *neoclassical growth model* is

designed to show how the economy will tend to be in the long-term equilibrium capital-labour ratio (k^*) at which output or income per head (y^*) is also in equilibrium so

all output, capital and labour growth are at the same rate, 1. Therefore, the model predicts long-term growth equilibrium at the natural rate. Nevertheless, the *neoclassical growth model* usually used function production method within constant returns to scale using something called “*Cobb-Douglas production function*” as follows:

$$Y = b k^\alpha L^{1-\alpha} \tag{20}$$

where α is the output with respect to capital, $1 - \alpha$ is the output respect to labour, and perhaps $\alpha + (1 - \alpha) = 1$, that is, 1 per cent increase in K and L will lead to 1 per cent to scale. Also, Equation 20 developed by (*labour-intensive*) dividing both sides of the equation using L to give output per head as function of capital per head:

$$\frac{Y}{L} = \frac{b K^\alpha L^\alpha}{L} = b \left(\frac{K}{L} \right)^\alpha \tag{21}$$

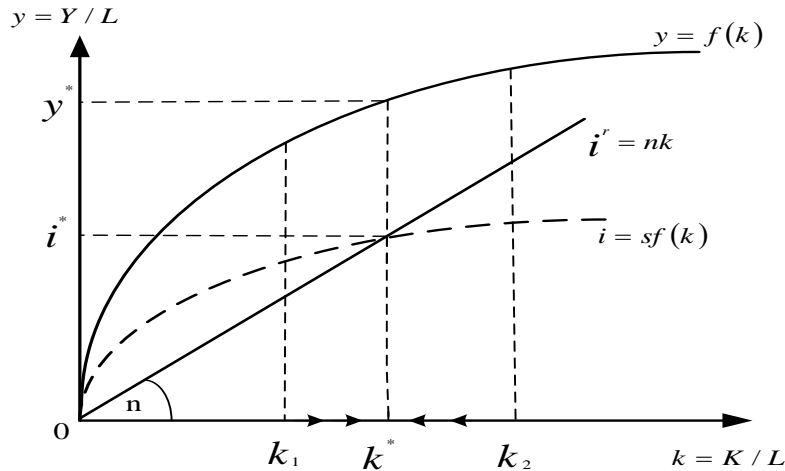


Figure 4. Steady-state growths

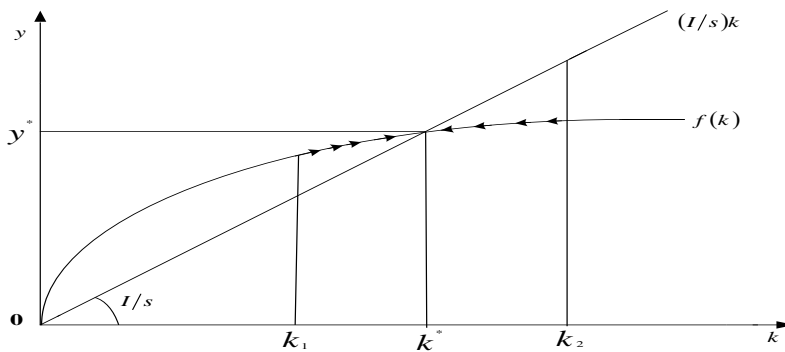


Figure 5. Equilibrium capital-labour ratios and out-put per-capita

or, for short equation:

$$y = b(K)^\alpha \tag{22}$$

Furthermore, the rate of growth of capital equals the rate of labour growth, so that the capital-labour ratio is constant and the capital-output ratio is constant. This is given by the equation:

$$y = (1/s)K \tag{23}$$

where s is the saving ratio, $1/s$ shows the level of y that will keep capital per head constant and the level of K that will keep output per head constant-given the rate of growth of labour force, l . From Figure 5 it is very clear where the two lines cross is the equilibrium capital-labour ratio (k^*) and output per head (y^*) defined.

Figure 5 shows where k^* reached equilibrium, y^* also reached

equilibrium, so they should all grow at the same rate, l , and the neutral rate of growth, within the capital-output ratio is constant. Also, Figure 5 shows that the savings or investment ratio does increase to national income (s), in which leads s rises, the lower slope of the $1/s$ line, which lead to increases, the equilibrium level of per capita income and the capital labour ratio, but it does not change the level of equilibrium growth rate. This is because the savings or investment ratio does not affect the long-term equilibrium growth rate so that higher savings-investment ratio is offset by higher capital-out put ratio.

New Endogenous Growth Theory and the Macro-determinants of Growth

Over two century's year by year, decade after decade, the process of modern economic growth has occurred in developed countries, for instance, the richest 5 per cent of

the world's nations averaged a per capita income over the period 1960-1985 that was about twenty-nine times the corresponding figure for the poorest 5 per cent. In 1985, the richest nation in the US was Connecticut and the poorest was Mississippi and the ratio of per capita incomes worked out at approximately 2 (Debraj, 1998). The per-capita income of the aforementioned eight East Asian economies over the period 1965-1990 excluding China was increased at an annual rate of 5.5 per cent. For the entire data set between 1980 and 1993, China's per capita income grew at an annual rate of 8.2 per cent as truthfully phenomenal (Debraj, 1998). Furthermore, over the period 1960-1985, per capita growth averaged 1.9 per cent per year of 102 nations study by Parente and Prescott (1993), and in other wealthy nation's the productive potential of the economy has been increased by capital accumulation, the opening up of new territories and increased supplies of better quality labour to their stock. In addition they have learnt so much more how to press output from resources through increasingly efficient for each other (Donaldson, 1971). According to Knight (1944: 32): "Technological advance, resting in new knowledge and occurring accidentally or mechanically, seems to be the only possible offset to this 'natural' tendency to diminishing returns".

Since the mid-1980s, there has been a new wave of literature and research on the applied economies of growth. This has led to the development and explanation of the difference in the rates of output growth and per capita income growth for the long-term across the world by the so-called new growth theory. However, the new model of endogenous growth theory began with authors such as Romer (1986, 1990), Lucas (1988) and Rebelo (1991) who developed models by non-decreasing returns to a broad class of capital goods including human capital. The difference between Rebelo's model and Solow's is simply the specification of the production function, in which presented output with capital in each period (t) is presented by the following equation:

$$Y_t = AK_t \quad (43)$$

From this equation there is no exogenous technological change. Therefore, this type of framework of the Eq.43 has been built by Arrow (1962), who developed models characterised by non-decreasing returns. Lucas (1988) used the "multi-good" model, which was adapted from Krugman (1987). The idea is that good produce to choice can be viewed as chance choice of physical and human capital accumulation rate. He commenced his model with aggregate production function of the following equation:

$$Y_t = A_t F(K_t, H_t) \quad (44)$$

where Y , K and H are output, physical capital and human capital as different types of investment at t and

the parameter A represents the level of technology. The new growth theorists who have followed Lucas his model in human capital incorporating have treated to differently from growth accountants who treat education as augmentation of labour quality, using relative earnings of people with given levels of education as weights. However, in general, use school enrolment rates as simple proxy measures for human capital. One of the main contributions was presented by Romer who published a series of papers on this area in the mid-1980s as the key factions of the endogenous growth models from the Solow type growth models.

1. In the endogenous growth model, the assumptions of constant return to scale and diminishing return of individual functions are given up, which means that the economy grows without bounds and no convergence around economies is predicted.

2. Technological change becomes endogenous; in this case it will be increased with aggregate capital stock by designing some kinds of externality of capital. This implies that it has a change of capital input which has both direct effects on output and indirect effect on technology changes. From this point it could be seen that the endogenous growth model may better reflect the reality of economic policy as the practice of today's economic transmission of advanced technology change and new knowledge.

Romer (1986:1003) argues that the technological change provides rising capital accumulation following the Solow (1956) model with technological change. He has explained that "the creation of new knowledge by one firm is assumed to have a positive external effect on the production possibilities of other firms, because knowledge cannot be perfectly patented or kept secret". His model stressed integration within a competitive framework by rediscovering the simple $Y = AK$, dependent from production on knowledge, and function of physical capital. The knowledge stock (A) is public good, which, like (A) in Solow's model, introduces positive spill-over into competitive framework to increasing returns to scale to the production function. This model resultantly treats "learning-by-doing" as "learning-by-investment". To consider the following equation of production function depends only on the capital stock:

$$Y_t = f(K_t) \quad (45)$$

where Y_t and K_t denote the output and stock of capital at time t , respectively. However, in the following equation it is different from Eq.45.

$$G_y = \frac{dk_t}{y_t} f(k_t) = s_t \varphi_t \quad (46)$$

where G_t is the growth rate of output, (s) is the saving rate and φ is the marginal productivity of capital. In this case if decreasing φ , output growth will be goes to Zero as capital stock, and K grows over time. Keller (1998:1470) has discussed the general class of models developed by Grossman and Helpman (1991) and argued that cross-country R&D spill-overs are important sources of productivity growth, and Keller points out that the productivity spill-over exist if “*the importing country pays less than the intermediate good’s full marginal product*”, which made a second critique more relevant to this endogenous-exogenous comparison⁴.

Barro (1991) has been found that human capital to be a significant contribution to growth rate, but in his regression analysis model he left behind a good deal of the weak performance, for example, Sub-Saharan African and Latin American countries unexplained. Romer (1990), however, extended his model to include a framework of competition to increasing returns of scale, through to fixed cost financial elements in intermediate goods sector, in which the treatment of knowledge stock is usually similar to physical capital as assumed to be dependent from cumulated Research and Development (R&D) activities. Therefore, this kind of model is incorporated in endogenous technical change (ETC).

Additionally, Mankiw et al. (1995) presented the endogenous growth theory by considering the production function, in which constant returns to the accumulated factor. Thus if the output of capital is doubled, then the amount of output is doubled too, as follows:

$$\dot{K} = sY - \delta K \quad (47)$$

This equation, together with the $Y = AK$ production function is:

$$\dot{Y}/Y = \dot{K}/K = sA - \delta \quad (48)$$

So, as $sA > \delta$, income will grow forever, even without the assumption of exogenous technological improvement from this equation saving leads to growth forever, but in the neoclassical model, saving leads to the rate of growth temporarily.

Levine (1997) examined two factors in financial function (capital accumulation and technological innovation) which could affect economic growth. Basically, in this situation the first class of growth models used capital accumulation (capital externalities or capital goods produced) discussed by Romer (1986), Lucas (1988), and Rebelo (1991) using constant returning to scale without using non-reproducible

factors to generate steady-state per capita growth models. The result of these models affects the steady-state growth by influencing the rate of capital formation. Also, the financial system affects capital accumulation by using the savings rate or by reallocating savings with different capital producing technologies. On the other hand, Romer (1990), Grossman and Helpman (1991), and Aghion and Howitt (1992) used second class growth models to focus the invention of new production process and goods. The result obtained from these models was that the function performed by the financial system affected steady-state growth by altering the rate of technological innovation.

Empirical Framework in Variation Study

The majority of studies have examined empirical studies and economic growth theory by using statistic analysis for variables. These will be tested by authors such as Levine and Renlt (1992) and Levine and Zervor (1993) who used extreme-bounds and analysis (EBA) discussed in Leamer (1983, 1985) and Leamer and Herman (1983), focusing upon cross-country regressions. Thus, consideration is made of EBA general equations of the form:

$$Y = B_i I + B_m M + B_2 Z + u \quad (49)$$

where Y is both per capita GDP growth /or the share of investment in (GDP), I is a set of variables always in regression, M is the variable of interest and Z is a subset of variables added to the regression, μ the random error term represents the collective unobservable influence of any committed variables. The first step of variables estimate the regression included I variables; for example, the initial level of per capita income and the variable of interest M in such investment. Then the three Z -variables are identifying the maximum and lowest values for the coefficient on the variable of interest, B_m plus two standard deviations. The correlation between variables Y and M could be inferred from the coefficient B_m . If B_m , remains significant without changing its sign, the result is regarded as “*robust*”. Otherwise, the result will be “*fragile*”. The only robust variables found in the majority of studies are the ratio of savings and investment to GDP, population growth (GPO), the initial level of per-capita GDP and investment in human capital measured by the secondary-school enrolment (SEC). However, the other variables are fragile.

The group authors who considered this, as Table 2 demonstrates, feature Barro (1991), Mankiw et al. (1992), Levine and Renelt (1992), Levine and Zervor (1993) and Barro and Lee (1993). Barro (1991) investigated the new growth theory by using the neoclassical growth model such as that of Solow (1956), Cass (1956) and Koopmans (1965) measured by human capital to examine the growth of per capita income from 1960 to 1985 in a cross-section

⁴ “Spill-over” means that the aggregate trading in financial market is related to the liquidity of individual equities, Levine and Schmukler (2006).

of 98 countries. The Table created by Summers and Heston (1988) shows this type of relationship for 98 countries; Barro discovered that there is no significant relation between the initial level of GDP and growth rate of per capita; the correlation is 0.09. This finding accords with recent models, such as Lucas (1988) and Rebelo (1991), in which it is assumed that non-diminishing returns to capital, while the growth rate of per capita GDP is positively related to initial human capital proxied by school enrolment rates (SEC). Although, countries grew slowly with higher human capital will be predicted by growth rate. Countries with high ratios of human capital also seem to be having lower fertility rates and a higher ratio of physical investment to GDP. Furthermore, growth rates are positively related to political stability and inversely related to a proxy for market distortions.

Mankiw et al. (1992) examined that whether the Solow (1956) growth model is consistent with the international variation in the standard of living. They argued to include human capital and tested it with the Summers and Heston (1988) which used three samples of 98 non-oil countries in the period 1960-1985 in intermediate 76 developing countries, and 22 OECD countries with populations of more than one million. They used the level of GDP as the developed variable and found over 50 per cent of income made a difference between saving rate and population growth. The model assumed that difference between human capital (*proxied by secondary school enrolment rates*) and Solow's model explained 80 per cent of differences in GDP. Human capital is a significant variable in all three samples of countries given. Also, they found regress the growth rate on initial GDP levels no tendency conditional convergence in all samples if differences exist between investment ratio and population growth. The authors claimed that the data supported Solow's neoclassical model against the new endogenous growth models, which means the assumption of non-diminishing returns to capital predict the variation in initial per capita income between countries.

Knight et al. (1993) tested the model by examining samples of 76 developing countries and 22 OECD countries by using panel data to observe the specific effects of the countries, including the rate of technical progress of trade policy and stock of infrastructure investment *proxied by the flow variable* and the government fixed investment as proportion of GDP. The result of the growth is that output per worker is positively related to the saving ratio and negatively to the growth of population and the initial level of GDP, while the human capital investment is significant and increases the productivity of physical investment. Also, there are additionally significant positive effects and coefficient on physical capital.

Barro and Lee (1993) tested 116 countries during the 1965-1985 period and found that five factors, or variables, explained 80 per cent of the differing growth rate from rapidly to slowly growing between countries as

follows (Table 2).

1. The initial level of real GDP per capita measured by education and health, which has negative effect.
2. The investment ratio has positive effect.
3. The ratio of government consumption to GDP has negative effect.
4. Market-distortions measured by the black market rate of foreign exchange has negative effect.
5. Political instability measured by the number of political revolution per year has negative effect.

Levine and Renelt (1992) used cross-country regression results for 119 countries over the 1960-1989 period for testing the average annual growth rate of GDP per capita (GYP) as dependent variables, including *I* variables consisting of investment ratio, the initial level of real GDP per capita from SH (RGDP60) in 1960 (often used to test the convergence hypothesis), the level of secondary school enrolment (SEC) and population growth (GPO). The pool of *Z*-variables used includes government expenditure to GDP (GOV), the exports ratio to GDP (X), inflation rate (PI), the growth rate of domestic credit (GDC), the variance of inflation (STDI), the standard of domestic credit growth (STDD) and political instability (REVC), etc. When the result of *Z*-variables need to be added to the *I*-variables, the investment ratio is robust; either the initial income variable remains robust, which has evidence of conditional convergence, or the secondary school enrolment rate is robust, but without population growth. In fact, this study repeats that of Barro (1991) and only finds investment ratio and initial level of rate GDP per capita robust, which suggests that the importance of trade may be improved through investment. However, this study discovered that a poor country tends to grow faster than a rich country. This was supported by DeLong (1988) and Romer (1987) for conditional convergence, as seen in Table 1, where countries grew faster in the period 1960-1989 due to higher share of exports in GDP, higher share of investment enrolment rates, lower inflation rates and lower black-market exchange-rate, than countries which grew at a slower rate.

Levine and Zervos (1993) adopted the EBA different set *I* and *Z* variables from new evidence on robustness; perhaps this new set of *I* (constant) variables was selected as corresponding to the "*Barro repressors*" cross-country in which variables used by Barro (1991) control variables of initial level of real GDP per capita, the log of the initial secondary school enrolment rate, and the number of revolutions and coups which occurred. The findings support the earlier study by Levine and Renelt (1992). However, they found that the black-market and exchange rate is related to long-term growth by using the Barro-repressors, but investment variable is not included. Also, they discovered that no *Z*-variables make growth and inflation negativity correlated, where countries with higher inflation rates have slower per capita income

Table 1. Showing cross-country averages over (1960-1989).

Variables ^a	Faster-growers	Slow-growers	<i>t</i>
Share of investment in GDP	0.23	0.17	5.18
Secondary-school enrolment rate in 1960	0.30	0.10	5.46
Primary-school enrolment rate in 1960	0.90	0.54	6.10
Government consumption/GDP	0.16	0.12	3.26
Inflation rate	12.34	31.13	-1.74
Black-market exchange-rate premium	13.57	57.15	-3.79
Share of exports to GDP	0.23	0.23	2.31

Mean growth rate = 1.92, the faster-growers are countries with greater than the mean growth rate, but slow-growers are countries with less than the mean growth rate. Levine and Renelt (1992).

Table 2 Empirical in variation study

Factors	Barro (1991)	Mankiw et al. (1992)	Knight et al. (1993)	Barro and Lee (1993)	Levine and Renelt (1992)	Levine and Zervos (1993)
Case study	98 countries 1960-1985	98 countries 1960-1985	98 countries 1960-1985	116 countries 1965-1985	119 countries 1960-1989	98 countries 1960-1985
Depended variable	Growth of per capita income	Level of per capita income	Growth of output per worker	Growth of GDP	Growth of per capita income	Growth of per capita income
Convergence	Conditional	Conditional	Conditional	Conditional	Conditional	Conditional
Savings-investment ratio	Not considered	Significant positively	Significant positively	Significant positively	Significant positively	Not considered
Population growth	Not considered	Significant positively	Significant positively	Not considered	Not robust	Not considered
Education	Significant positively	Significant positively	Significant positively	Significant positively	Significant positively	Significant positively
Government consumption distortions	Significant negatively	Not considered	Not considered	Significant negatively	Not robust	Not considered
Political instability	Not considered	Not considered	Not considered	Significant negatively	Not robust	Significant negatively
Monetary and fiscal variables	Not considered	Not considered	Not considered	Not considered	Not robust	Weak
Trade variables	Not considered	Not considered	Significant positively	Not considered	Not robust	Weak
Inflation	Not considered	Not considered	Not considered	Not considered	Not robust	Not significant

Thirlwall (2006).

growth.

In addition, there are other studies not included in Table 2 using different analysis variables for their model. For instance, Thirlwall and Sanna (1996), Temple (1999), Pugno (1995) and Bond et al. (2004), etc. Thirlwall and Sanna (1996) show the growth of exports of 65 countries over the 1960-1988 period to be highly significant independent determinant of different growth rate, together with investment ratio, population growth and initial level of per capita income.

Temple (1999) found evidence that poor countries are catching up with rich countries between “*growth miracles*” and “*growth disasters*” over the 1960-1990 period, using a set of data from Heston and Summer (1996) and described in more detail in Summers and Heston (1988,1991). They discovered that many of the faster growing countries in East Asia, whereas the slowest countries are in Sub-Saharan Africa, as Table 3 shows. In which do not seem to be catching up with the USA’s per-capita income grew around 2 *per cent* every year

Table 3. Growth miracles and disasters, 1960-1990, annual growth rates of output per-worker.

Miracle Countries	Growth	Disaster Countries	Growth
Botswana	5.9	Chad	-1.7
Hong Kong	5.8	Ghana	-0.3
Cyprus	4.4	Guyana	-2.1
Japan	5.2	Madagascar	-1.3
Korea	6.1	Mauritania	-0.8
Libya	4.0	Mali	-1.0
Lesotho	4.4	Mozambique	-0.7
Malta	4.8	Nicaragua	-0.7
Seychelles	4.4	Venezuela	-0.5
Singapore	5.4	Zambia	-0.8
Taiwan	5.8		

Calculated from CBL, statistical series and Monthly Bulletin, various issues. Temple (1999).

Table 4. Average per-capita GDP growth rates (1970-2000).

Country	Average growth	Standard Deviation of growth
Algeria	1.1	5.7
Bahrain	0.3	6.0
Djibouti	-4.6	3.0
Egypt	3.2	3.0
Iran	-0.3	7.6
Iraq	-5.1	21.3
Jordan	2.0	7.7
Kuwait	-2.6	11.7
Lebanon	3.2	18.4
Libya	-5.4	10.0
Mauritania	0.2	4.0
Morocco	1.7	4.6
Oman	2.7	7.3
Saudi Arabia	0.4	6.5
Sudan	1.5	6.1
Syrian	2.4	7.9
Tunisia	3.1	3.8
Turkey	2.2	3.8
UAE	-3.4	8.7
Yemen	1.6	4.9
MENA	0.2	4.8
East Asia and Pacific	5.6	2.3
Latin America and Caribbean	1.5	2.5
Sub-Saharan Africa	-0.1	2.6
World	1.5	1.3

World Bank, World Development Indicators (2003).

over this period also find that the higher population of India and China have average incomes rather less than the USA's countries. The correlation between growth in GDP per worker over 1960-1975 and over 1975-1990 is

just 0.17 *per cent*.

On the other hand, the MENA nations including Libya as Table 4 demonstrate that the average per capita GDP growth rate during the period 1970-2000, was

Table 5. Determinates of growth rate (1960-1985).

Sample Period	1960-1985	1960-1970	1970-1985	1960-1985	1960-1985	1960-1985
Number of Observations	113	113	113	61	98	54
Intercept	-0.0070 (0.0079)	0.0064 (0.0092)	-0.0156 (0.0109)	-0.0034 (0.0113)	0.0141 (0.0084)	0.0243* (0.0094)
GDP Relative to US (1960)	-0.430** (0.0118)	-0.0444** (0.0137)	-0.0422* (0.0163)	-0.0408** (0.0146)	-0.0292* (0.0133)	-0.0251 (0.0160)
Primary enrolment (1960)	0.0264** (0.0065)	0.0169* (0.0076)	0.0324** (0.0090)	0.0247** (0.0082)		
Secondary enrolment (1960)	0.0262 (0.0139)	0.0192 (0.0162)	0.0309 (0.0192)	0.0078 (0.0180)		
Education attainment (1960)					0.0013 (0.0010)	-0.0002 (0.0013)
Growth of population(1960-1985)	0.1015 (0.2235)	-0.1638 (0.2592)	0.2738 (0.3083)			
Average investment/GDP (1960-1985)	0.0578* (0.0224)	0.1153** (0.0260)	0.0201 (0.0309)			
Average investment/GDP (1960-1985)				0.3050** (0.0721)		0.3100** (0.0743)
Adjusted R^2	0.3480	0.3424	0.1921	0.3646	0.1893	0.2614

* Statistically sacrificing at the 0.05 level.

** Statistically sacrificing at the 0.01 level.

Equation $GDP\ G = f(INV, ED, LFG, RGDP60)$, of cross-economy regressions studies by Barro (1991); and De Long and Summers (1991); and Dollar (1992), where $GDPG$ is the average rate of real per capita income growth; INV is the average share of investment in GDP; ED is a measure of educational attainment; LFG is the rate of growth of the economically active population, and $RGDP60$ is the relative gap between per capita income in 1960 at 1980 US dollar price, and US per capita income in 1960. World Bank (1993).

characterised by a high variability in comparison to the other nations and the world average growth. Therefore, the average growth variability as measured by the standard deviation of the real per capita GDP growth rate for the MENA nations, where accounted about four times that of the world and twice that of the low-performing Sub-Saharan Africa countries. Although, the high variability in the growth performance of the MENA nations, which might explained by various factors such as: oil exporting countries that are frequently to the vagaries of the international oil market; political instability and the permanent regional conflict; finally, the lack of economic diversification that increases vulnerability.

The World Bank (1993) examined the relationship between accumulation and growth, using Heston-Summer's data during the 1960-1985 period cross-economy regression. The finding was that their significant coefficients regressions at 0.05 levels, as Table 5 shows, that investment was insignificant over the 1970-1985 period. Delong and Summers (1991, 1993), however, argued that equipment investment, rather than total investment, was explanatory variable for per capita income growth. They

also pointed out that school enrolment may not be a good indicator of human capital accumulation, as Barro and Lee's (1993) measure of education stock, based on population. The labour productivity change cannot be attributed to accumulation, investment in physical or human capital or to the component of TFP change associated with relative income levels.

Table 6 display that the gross domestic investment has followed also the growth pattern as mentioned in Table 4. During the 1980s and 1990s, investment has declined sharply. For instance, non-oil nations over the period investment rates reasonably stable due to the level of their low saving ratio. Oil-exporting nations, therefore, has borne the impact of this adjustment with substantial declines in the investment ratio.

Bond et al. (2004) presented evidence that the increasing investment as a share of GDP predicts a higher growth rate of output per worker in both short-term and steady-state, using data suggested by Islam (1995) and Caselli et al. (1996) based on a five-year analysis of 98 countries over the 1960-1998 period, followed by the approach of Pesaran and Smith (1995) and Lee et al.

Table 6. Gross domestic investment (*per cent* of GDP)

Countries	1961-1970	1971-1980	1981-1990	1991-2000
MENA	17.4	26.3	24.1	22.5
East Asia and Pacific	21.3	29.1	23.6	22.0
Latin America and Caribbean	14.9	24.1	24.4	22.1
Sub-Saharan Africa	19.1	28.6	31.8	34.4
World	20.4	23.6	20.3	20.8
MENA	16.9	21.1	17.5	17.1
East Asia and Pacific	24.3	25.3	23.2	22.6

World Bank, World Development Indicators (2003).

(1997). The result from this model determined that steady-state growth depends on the countries. A higher share of investment in GDP predicts a higher level of output per worker in the steady-state. They also found an increased share of investment in the short-term, and the steady-state which predicts a higher growth rate of output per worker. In the long-term the effect upon growth rates is quantitatively substantial, as well as statistically significant with the evidence from endogenous growth theory models, such as the *AK* model. The cross-section correlation between share of investment and average growth rates reported by Bernanke and Gurkaynak (2001) found that to be robust it was necessary to control unobserved heterogeneity in growth rates.

SUMMARY AND CONCLUSION

In this study it has been possible to provide a simple theoretical and empirical literature framework that links together the endogenous growth theory and the current theory on function of financial market and institutions, in order to study how financial markets development affects economic growth rate. The "*new*" endogenous growth theory, akin to many theories which consider various approaches of marginal productivity of capital, does not converge to zero as capital grows over time. As already indicated, it is possible for real per capita output to grow endogenously, even in the obstacles of exogenous productivity growth rate by altering the rate of human capital accumulation or technological development. Furthermore, investment in physical and human capital, respective of the endogenous growth theory, appropriate policies and options, assists private agents which could influence long-term steady growth. Therefore, in short, the overall policy regime of a country, including taxes, financial structures, market and regulatory regimes, liberalisation and macro-economic distortions, could alter savings and investment allocation in various ways that shape long-term growth rate. Solow (1956) argued that technological progress is the exogenous variables that affect the growth rate in the long-term. He also argued that financial markets could only affect the equilibrium

level of capital stock market per worker, not the rate of economic growth.

Nevertheless, the birth of the *new endogenous growth theory* has facilitated the development of improved growth models where the long-term rate could be affected by a number of elements. These included technology, education and health policies in the process of economic development, capital accumulation, government policies and institutional activities in the role of financial development in economic growth. A responsible, there is room for historical cultural and sociological factors as a result of economic growth rate for the long-term. Additionally, the role of financial factors in the *steady-state* of long-term rate in the neo-classical model could be related to the level of capital stock per worker or to the level of productivity but not to their respective rates. Notwithstanding, external to the *steady-state*, financial elements could affect the transitional growth rate where it is not in the long-term growth rate.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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Full Length Research Paper

Globalization, Foreign Direct Investment and Economic Growth in Sub Saharan Africa

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The paper examined contributions of foreign direct investment, globalization to real economic growth fluctuation in selected sub-Saharan Africa countries. Adopting the conventional vector autoregressive mechanism the time series data from the selected countries, the result showed that out of the eleven countries studied, foreign direct investment explained the highest proportion in just three countries, Morocco, Ethiopia, and Zimbabwe. Except in Tunisia, Tanzania and Kenya, where the degree of economic openness explained substantial proportion of the output fluctuations, the variations in most of the countries were explained by factors beyond foreign direct investment and economic openness. The result supports the existing finding on African economies that trade liberalization had not substantially impaired economic growth process of the sub African economies as alluded to by previous studies. The upsurge in the capital flows to African economies was also insufficient insulate the economic from the global meltdown and furthermore kick start post crisis economy recovery in Southern African countries. Therefore, the paper concludes that fluctuations in real economic growth in these countries might be beyond the external shocks from the capital inflows and trade flows.

Keywords: Globalization, FDI, Economic Growth and Sub-Saharan Africa

INTRODUCTION

Until the very early of 1990s cross border trade as a percentage of global GDP struggled to get to the level of 1913 when over one third of what was produced in the world flew across border (Kutznets 1967). While it is true that the growth of world trade during the 1990s has surged ahead of world output much faster than in the 1970s and 1980s. Data on trade participation by various

groups of countries show that intensity of trade is not the same as extensity of trade (Hoogvelt 2001). There was a turnaround of fortunes in the developing world as a whole, receiving not less than 38 percent of the total of world foreign direct investment by 1997 (UNCTAD, 1990). The direction of this flow however was extremely selective, with 60 percent going to 6 major recipients in

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the developing world, and 94 percent going to 20 countries including for so called transition economies in Central and Eastern Europe (Human Development Report, 1999). The UNDP Human Development Report noted that only 25 developing countries have access to private markets for bonds, commercial banks loan and portfolio equity, other sub Saharan countries included are shut out for lack of credit rating. In other words, what prospects do exist for sub Saharan African nations?

The concept of globalization which refers to the increasing integration of national economies significantly impacted positively on the world economy than its envisaged negative aspects. Among these positive aspects of globalization are most frequently mentioned factors of globalization as internationalization of production and services, international division of labour, global world trade, transfer of knowhow but also intercontinental transport and especially communications represented mainly by the latest information and communication technologies. In this latest case is the most visible aspect-Internet World Wide Web, e-mail but also still more and more widespread e-commerce, e-trade, e-banking, e-finance, e-education, etc. In this sense, the contemporary world is really becoming more interrelated, integrated into one entity often called "a global village" all these most positively perceived aspects of globalization are in general directly contributing to the acceleration of the overall socio-economic development on the global scale.

In view of the above synopsis, inflow of foreign direct investment and globalization significantly impacted positively on the real gross domestic product in developing countries, the basic issue remains however, how much of the inward FDI to developing countries comes to sub Saharan Africa and secondly, to what extent has openness in trade in the region contributed to economic growth of the countries? Though, some studies have been conducted into the subject matter in the region, this paper re-examines the relationship between growth and globalization with a view to determine the relative contribution of capital inflow and trade on the growth process of countries within the sub Saharan Africa.

The results of the paper supports the existing finding on African economies that trade liberalization though might not be the main driver of growth but it has not impaired the growth process either. Similar, the upsurge in the capital flows to African economies in recent times before the 2008 financial crisis was not sufficient enough to stimulate sustainable economic growth that could withstand the global economic shocks and kick start post crisis recovery in Southern African countries. The post crisis fluctuations in real economic growth in these countries might be beyond the external shocks from the capital inflows and trade flows. Therefore there is no sufficient evidence to claim that either foreign direct investment or trade policy orientation adopted by the African countries contributed negatively to real economic

growth in African countries. The rest of the paper is divided into five sections.

Survey of Literature

An extensive literature has developed on the influence of openness on foreign across countries. A number of researches, using different approaches, have found growth to be enhanced by foreign trade, or opens, or trade liberalization (Dollar 1992; Sachs and Warner 1995, Ben-David et al., 2000; Edwards 1998, based on earlier work; among others).

A general methodology problem arises in determining the impact of trade on growth because trade and output are determined simultaneously. Each researcher has developed surrogates for measuring the degree and character of openness, and each surrogate is open to disputation. Indeed, Rodriguez and Rodrick (2001) provided a withering critique of the studies mentioned in the preceding paragraph, raising serious doubts about whether the authors have demonstrated their claim that pursuits of liberal trade policies have enhanced growth. Rodriguez and Rodrick persuasively find fault with the surrogates, with choice of data, or with specifications of the model to be fitted.

Frankel and Romer (1999) also found a significant impact of openness on levels of per capita income. To avoid the problem of simultaneity, they constructed an index of trade possibility ban geographic factors and found that it is strongly correlated with per capita income. They also found that actual trade is positively correlated ($r=0.62$) with trade possibilities enhance income through three diverse channels, greater stock of capital, greater stock of education, and higher total factor productivity. But they explicitly cautioned against using their results to draw inferences for trade policy, which brings different issues into play.

Ades and Edward (1999) conjectured that greater openness, by relaxing constraints imposed by the extent of the domestic market, should be associated with higher growth. More particularly, they hypothesized that initial levels of per capita income should have greater (positive) impact on growth for more closed economies than for more open ones, since more open economies are less bound by domestic market size. Their hypothesis was broadly confirmed with the use of data for 66 countries and within 1960-85. They confirmed that the relationship of growth to initial per capita income is statistically significant for closed economies and insignificant for open ones.

Far less empirical work has been done on foreign investment than foreign trade, in part because data were neither so copious nor so detailed. Dobson and Hufbauer (2001) estimated conservatively that cumulative foreign investment (Mainly FDI) contributed over 60 percent to the GDP of emerging market countries by 2000. This

significantly outweighs the damage that foreign investment (mainly bank loans) may have contributed through banking or foreign exchange crises, which amounted to about 3 percent of the GDP of emerging markets (if half the estimated loss in GDP were attributed to foreign investment, an estimate the authors consider high).

Borensztein, De Gregorio and Lee (1998) examined the influence of FDI on economic growth in 69 developing countries for 1970-89, they found, after controlling for other variables, that FDI makes a positive effect on domestic investment. Kant (1996) found FDI to be associated with a significant reduction in capital flight as well. A World Bank (1998) found that economic aid alone did not foster economic growth- an appalling result, even allowing for the fact that much aid was given for political support to particular countries or governments, not necessarily to increase growth or reduce poverty. From the perspective of economic development, much aid seems to have simply been wasted. However, aid given to countries that pursue effective economic significant policies can boost economic growth significantly. Aid can contribute to economic growth in a policy environment that encompasses good management of economic policy and the setting of suitable development objectives. Aid alone cannot ensure the right policy environment, the government must desire economic development or improvements in health or education, and act accordingly. Vigorous economic growth in turn, always reduces poverty, even when it enriches some people more than the others.

The phenomenal difference between the growth rates of the East Asian economies and the Latin American economies over the last several decades had stimulated renewed interest in the determinants of economic growth. A prominent and important hypothesis is that these differences in growth rates can be explained by differences in the degree of openness to international commerce. Many suppose that the successful East Asian economies are open, and the unsuccessful Latin American economies are closed. But clear empirical support for this proposition is not easy to come by. Studies by Tyler (1981), Feder (1983), Karoussi (1984), Balassa (1985) and Ram (1985) have examined the relationship between trade and growth in a cross-section of countries by regressing the rate of growth of GNP on the rate of growth of trade and the rate of growth of certain measurable inputs. Generally, the coefficient on the growth rate of trade is positive and statistically significant for all these studies. These studies are however dated; it reflects the base in which this study is anchored.

Asiedu (2002), Globerman and Shapiro (2002) Fernandez-Arias (2000) found a positive relationship between the degree of openness and foreign direct investment (FDI). though Root and Ahmed (1979), Tumman and Emmert (1979) finds insignificant relationship, this could be adduced to paucity or the unreliability of data because these studies are quite dated. The key policy

issue however, is whether for each country, starting where it is, some liberalizations of trade (or foreign investment) would improve its economic performance. In recent times attempt has also being made to examine the causal nexus between trade and capital inflow. Liargovas and Skandalis (2012) examines the importance of trade openness for attracting Foreign Direct Investment (FDI) inflows, using a sample of 36 developing economies (Latin America, Asia, Africa, CIS (Commonwealth of Independent States) and Eastern Europe and found that though trade might not contribute significantly to economic growth in this region there wa sufficient evident to support in the long run, trade openness contributes positively to the inflow of FDI in developing economies.

In view of the discussions above on the influence of trade on growth and openness on the inflow of foreign direct investment, this study intends to fill the gap, not only in the area of scanty literature that exists for sub-Saharan Africa, but also in the area of methodology. This study uses the vector autoregressive modeling approach to estimate the relationship between these variables for some selected countries within the region.

Methodology and Empirical Analysis

Definition and Measurement of variables

The study examines the impact of globalization and foreign direct investment on economic growth in 12 African countries in the period 1986- 2004. The twelve African countries included in the study are Nigeria, Cote d'Ivoire, Ghana, Morocco, Tunisia, Egypt, Zimbabwe, Botswana, South Africa, Kenya, Tanzania, and Ethiopia. The choice of countries was determined primarily by the availability of data and also by categorization, in the sense that , three each were chosen from the four sub region within Africa ,that is west Africa, north Africa, south Africa, and east Africa respectively. The choice of period is premised on the fact that virtually all these countries started economic reform programme during this period. Detailed information on the definitions of variables used in the analysis is presented below:

(a) *Globalizations (GLO)*: In the literature, the popular measure of globalization is the degree of openness. The use of this measure is premised on the argument that the more a country opens, the higher the level of its integration with global economy and consequently, a resultant increase in economic growth. This actually explains the various liberalization policies in sub Saharan Africa (SSA) since mid 1980s. There are several measures of openness in literature. These include ratio of trade (exports + imports) to GDP, increase in export, Sach Warner index, and export- import ratio. Following Cigno et al (2002), Ramirez (2001) among others, we used the ratio of trade to GDP as our measure of degree of openness. Since

globalization involves dispersion of production activities and location of different segment of the same process in different countries, It is assumed that globalization boosts foreign direct investment (FDI) and equally, positively impact on growth of these economies.

(b) *Gross Domestic Product (GDP)*: this is defined as the rate of growth of GDP and is used as a measure of the attractiveness of the host country's market. Theoretically, investment will go primarily to markets that are large enough to support the scale economies needed for production. This simply means the higher the rate of growth of the GDP, the greater the possibility of increased inwards FDI, however considering the lack-luster performance of African economies in the last three decades, GDP growth might not have a significant effect on inward FDI

(c) *Foreign Direct Investment (FDI)*: we used the stock FDI based on the fact that the positive contribution of the surge in FDI in period under consideration is better measured by the stock variables. The stock FDI values used in this study were generated using a standard perpetual inventory model of the form:

$$K_t = K_{t-1} + I_t - \delta K_{t-1}$$

Where K_{t-1} is the flow of gross investment during period t , and s is the rate at which capital stock depreciates in period $t-1$. In this study, the initial stock of foreign capital was estimated by aggregating over 5years of gross investment (inward inflows)-1980-86 assuming 5percent depreciation rate. We however, anticipate a positive impact on growth of GDP.

Analytical techniques

The causal nexus between globalization (openness), foreign direct investment (FDI) and economic growth is examined within the context of a three-variable vector autoregressive (VAR) system. The model is specified and estimated using quarterly data for 1986(1)-2004(4). Virtually all sub Saharan countries were either implementing economic reforms or about to start economic reforms. Quarterly data were used for two reasons. First, the size of our system requires quarterly data in order to have enough degree of freedom for estimation. The second is based on a desire to minimize any problem with temporal aggregation (see Christiano and Eichenbaum, 1987) that might arise with the use of annual data. A vector autoregressive of order β , VAR (p), for a system of k variables can be written as:

$$X_t = A + B(L)X_t + U_t \dots\dots\dots (1)$$

Where X_t is a $(k \times 1)$ vector of system variables, A is a $(k \times 1)$ vector of constants, $B(L)$ is a $(k \times k)$ matrix of polynomials in the lag operator L , and U_t is a $(k \times 1)$

vector of serially uncorrelated white noise residuals. The standard Sims (1980) VAR is an unrestricted reduced form approach and uses a common lag length for each variable in each equation. Likewise here, no restrictions are imposed on coefficient matrices to be null, and the same lag length is used for all system variables. Three variables are included in the model: degree of openness (DO), foreign direct investment (FDI) and growth rate of GDP (Δ GDP). The data for all the variables are obtained from the International Financial Statistics (IFS). Prior to estimation of the VAR, augmented Dickey-Fuller test were employed to check for the first-order unit roots. These tests suggested that the first differences of the logs of DO, FDI and GDP should be used in specifying and estimating the model. Based upon the arguments of Engle and Granger (1987), co integration tests were also performed for the three variables that required differencing to achieve their stationarity. Since no evidence of co integration was found, the system was estimated with differences of all system variables.

Empirical Model

The model represented by a three-component vector is thus defined as:

$$V = [DO, FDI, GDP] \dots\dots\dots (2)$$

Where V is the vector containing the three variables, DO- degree of openness, FDI- foreign direct investment, and GDP- growth rate of GDP.

Equation (2) is an identity that would be estimated using the VAR technique. The impulse response functions (IRFs) and the variance decompositions (VDCs) are based on the moving-average representations of the VAR model and they reflect short-run dynamic relationships between variables. The VDCs show the percentage of the forecast error variance for each variable that may be attributed to its own innovations and to fluctuations in other variables in the system. The IRFs indicate the direction and size of the effect of a one standard deviation shock to one variable on other system variables over time. Since model variables are converted to first differences prior to estimation of the model, the VDCs and IRFs reported here indicate the effects of a shock to the changes in the growth rates on the changes in foreign direct investment and the degree of openness. The equations of the VAR contains only lagged values of the system variables, it is assumed that the residuals of the VAR model are purged of the effects of the past economic activity. Any contemporaneous relations among the variables are reflected in the correlations of residuals across equations. The Choleski decomposition is used to orthogonalize the variance-covariance matrix. The variables are ordered in a particular fashion, and as such, some structure is imposed in computation of the VDCs

Table 1. Variance Decomposition of Economic Growth in Selected African Countries

Country	Periods	Explained by Shocks to			
		S.E	LFDI	LOPEN	LGDP
Morocco	1	0.634	34.21	24.17	41.62
	3	0.798	53.27	15.95	30.78
	5	0.116	35.09	10.77	54.14
	7	0.138	38.14	15.89	45.97
	9	0.206	27.82	7.54	64.64
Ethiopia	1	0.192	9.89	10.31	79.8
	3	0.184	92.56	5.69	1.75
	5	0.127	89.64	8.7	1.66
	7	0.872	89.3	9.42	1.28
	9	0.656	89.55	9.03	1.42
Tunisia	1	0.473	4.54	21.51	73.95
	3	0.51	5.89	29.73	64.38
	5	0.573	7.22	34.39	58.39
	7	0.596	6.73	38.95	54.32
	9	0.691	10.65	38.77	50.58
Egypt	1	0.13	1.73	3.98	94.29
	3	0.159	4.25	27.63	68.12
	5	0.167	7.94	25.28	66.78
	7	0.178	7.99	30.69	61.32
	9	0.18	7.88	30.9	61.22
Senegal	1	0.782	1.74	0.06	98.2
	3	0.815	1.7	0.5	97.8
	5	0.88	2.51	0.85	96.64
	7	0.896	2.44	1.05	96.51
	9	0.91	2.47	1.13	96.4
Kenya	1	0.316	24.27	35.04	40.69
	3	0.371	17.68	42.53	39.79
	5	0.386	17.29	43.75	38.96
	7	0.399	20.39	40.83	38.78
	9	0.399	20.36	40.41	39.23
Tanzania	1	0.414	27.18	26.24	46.58
	3	0.521	20.81	29.95	49.24
	5	0.598	19.46	36.21	44.33
	7	0.711	24.41	35.17	40.42
	9	0.758	20.55	35.87	43.58
Zimbabwe	1	0.182	48.24	11.41	40.35
	3	0.866	41.95	13.58	44.47
	5	0.355	32.72	16.16	51.12
	7	0.938	33.09	12.54	54.37
	9	0.331	46.61	10.42	42.97

Table 1. Contd.

Nigeria	1	0.106	14.37	9.82	75.81
	3	0.119	10.78	12.66	76.56
	5	0.123	7.75	17.88	74.37
	7	0.128	8.75	28.41	62.84
	9	0.128	8.32	28.35	63.33
South Africa	1	0.308	0.58	0.66	98.76
	3	0.338	0.97	0.36	98.67
	5	0.356	0.06	0.33	99.61
	7	0.373	0.34	0.34	99.32
	9	0.392	0.72	0.34	98.94
Lesotho	1	0.22	3.27	2.64	94.09
	3	0.241	2.61	3.72	93.67
	5	0.254	1.92	2.41	95.67
	7	0.267	3.01	2.13	94.86
	9	0.28	2.99	3.35	93.66

and IRFs. The economic intuition of such ordering is that when a variable higher in the order changes, variables lower in the order are assumed to change. The extent of the change depends upon the covariance of the variables higher in the order with that lower in the order. Therefore, the order in which the variables enter the VAR system affects the outcome of the analysis. The preferred ordering in this paper is LFDI, LDO and LGDP. Accordingly, an increase in the foreign direct investment is assumed to stimulate investment within the economy, apparently improving exports and opening up the economy (LDO), and consequently, leads to an increase in economic growth (LGDP).

RESULTS

The causal nexus and sources of variation in globalization (openness), foreign direct investment and economic growth are examined through the computation of impulse response functions (IRFs), and the variance decompositions (VDCs), which in turn, are based on the moving-average representations of the VAR model and they reflect short-run dynamic relationships between variables. The VDCs shows the percentage of the forecast error variance for each variable in the system. The IRFs indicates the direction and size of the effect of a one standard deviation shock to one variable on other system variables over time. Since model variables are converted to first difference prior to estimation of the model, the VDC and IRFs reported here indicate the effect of a shock to the changes in globalization and foreign direct investment on the changes in economic growth rates.

More importantly, the equations of the VAR contain only lagged values of the system variables; it is assumed that the residuals of the VAR model are purged of the effect of past economic activity. Any contemporaneous

relations among the variables are reflected in the correlation of residuals across equations. The Choleski decomposition is used to orthogonalize the variance-covariance matrix. The variables are ordered in a particular fashion, and, in this way, some structure is imposed in computation of the VDCs and IRFs. The extent of the change depends upon the covariance of the variables higher in the order with that lower in the order. Therefore, the orders in which the variables enter the VAR model affect the outcome of the analysis. The preferred ordering in this paper is LFDI, LOPEN and, LGDP. As established by previous studies (for example Akinlo 2005), an increase in net foreign direct investment (LFDI) inflow is assumed to lead to increase in external trade that boost the ratio of trade to GDP, hence enhancing degree of economic openness. The degree of economic openness has also been found to have a positive relationship with economic growth, so increase in capital inflow and greater access to international goods and factor markets not only lead to increase productivity but also promote transfer of technology and knowledge spillover that bring about higher economic growth.

The determinant of economic growth varied across the eleven African countries considered in the paper. Own shock explained highest proportion of the variation in economic growth in eleven African countries (Morocco, Ethiopia, Zimbabwe, Kenya, Nigeria, Lesotho, South Africa, Egypt, Tunisia, Senegal and Tanzania). Out of these eleven countries studied, foreign direct investment explained the highest proportion in just three countries, Morocco, Ethiopia, and Zimbabwe. Except in Tunisia Tanzania and Kenya, where the degree of economic openness explained the substantial proportion of the output fluctuations, the variations in most of the countries were explained by factors beyond foreign direct investment and economic openness (Table 1). This result supports the existing finding on African economies

(Rodríguez and Rodrik 1998, Saibu 2004), that trade liberalization had not substantially impacted on the growth rate of the African economy. Though there was an upsurge in the capital flows in to the African economies but the inflow is not sufficient to kick start the economy to recovery in the Southern African countries, neither openness nor foreign direct investment explained any appreciable proportion in the variation in growth fluctuation thus, this implies that fluctuations in real economic growth in these countries should be seen beyond the external shock from the capital inflows or trade flows.

CONCLUSION

From the above result, some deductions can be made as regards economic growth dynamics in African countries. Policies that will improve the foreign direct investment and economic openness will not necessarily improve economic growth in the SADC area, while such policy might be effective in stimulating economic growth in the central and northern African countries. Therefore, trade policies, which encourage capital inflow and increase in volume of external trade might not necessarily implied economic growth in developing countries especially African countries, rather the growth enhancing policy must be the one that promote domestic economy, strengthened capacity building and shock absorbing capacity that will allow them withstand the externally induced shocks from trade and capital flows. However, this result does not necessarily imply that trade and foreign direct investment are irrelevant in growth dynamics of African economy but they may be complementary to other factors beyond trade and FDI.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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UPCOMING CONFERENCES

**Academy of World Business, Marketing and Management
Development Conference, Dubai, University of Wollongong in Dubai,
UAE. 11-14 August 2014**



**EUMMAS 2014 International Conference on Marketing, Management and
Economics, Sarajevo, Bosnia.
29TH -31st August 2014. - Sarajevo, Bosnia and Herzegovina**



Conferences and Advert

May 2014

International Conference on Accounting and Finance (ICAF 2014), Colombo, Sri Lanka

International Conference on Construction in a Changing World, Kandalama, Sri Lanka

International Conference on Accounting and Finance, Colombo, Sri Lanka

Learning Innovations and Quality (LINQ 2014)/EFQUEL Innovation Forum, Crete, Greece

Asian Aquaculture Insurance and Risk Management Conference, Kowloon, China

2nd International Conference on Environmental and Economic Impact on Sustainable Development, Ancona, Italy

AICPA Conference on Tax Strategies for the High-Income Individual, Las Vegas, USA

June 2014

AMA 2014 Marketing & Public Policy Conference, Boston, USA

Vietnam International Conference in Finance, Hanoi, Vietnam

20th International Symposium on Society and Resource Management, Hannover, Germany

14th INFINITI Conference on International Finance, Prato, Italy

Internal Revenue Service – Tax Policy Center Research Conference, Washington, USA

12th Annual International Conference on Marketing, Athens, Greece



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