

## **Africa's Development: Institutions, Economic Reforms and Growth**

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**ABSTRACT:** The paper examines the importance of relative prices, institutional quality and other factors which are regressed on the estimated total factor productivity (TFP). With panel data of 26 African countries for the period 1980-2011, the results show that relative prices have significant effects on TFP. Also the quality of institutions is an important determinant of non-input component of output growth. The macroeconomic measures to get "prices right" in sub Saharan Africa may also be constrained by the linkages of institutions to the macroeconomic variables. Thus, policies of getting prices right with establishing strong institutions are worth continuously pursuing with vigor.

**Keywords:** Prices; Growth; Total-factor-productivity; Africa; Institutions

**JEL Classifications:** P22; O43; O55; O47

### **1. Introduction**

Africa's growth rate, on average for the period 2001 -2010, has been around 5.7 percent yearly. The significant performance seems to be due to less conflict, improved political stability, important domestic economic reforms and favorable external environment. Moreover, better commodity prices have also been said to be the driver of growth (Collier, 2007a; Brixiova and Ndikumana, 2010). Africa is integrated into the global economy, an event in other countries directly or indirectly affects African economies/countries.

Starting with the relative price reforms in the 1980s, a series of socio-political and economic reform measures have been implemented with the aim of improving the economic environment. These included exchange rate liberalization, tariff reduction, and elimination of 'subsidies'. Yet the effects of these reforms were negligible. Some major historical developments seem to have also brought other issues including institutions into the development literature of the development process. These developments include the economic crisis, the collapse of the Soviet-style regimes, and the unprecedented rapid economic growth of the East Asian countries. Furthermore, the 2007/2008 global financial crisis with far-reaching global impact exposed the weaknesses of "free market policies", which have been strongly advocated and promoted in Africa by the Western institutions especially through the Bretton Woods institutions. Yet, during the global economic crises of the 2007 and 2008, the African economies were resilient.

Hence, it is argued that the absence of good institutions in the developing world has been a major cause of Africa's slow economic growth, and that good institutions or governance are essential for long-term development in the development process. Before the 1980s African countries carried out development plans ranging from three to ten years development plans. In the 1980s through the World Bank and IMF institutions these plans were deliberately abandoned and replaced by the "market oriented policies" especially the structural adjustment programs (SAPs) and poverty reduction strategy papers (PRSP). Some have strongly argued that these policies resulted to the poor Africa's economic performance.

Others have argued that the recent recovery observed in Sub Saharan African (SSA) countries is as a result of the relative price reforms embarked upon since the 1980s. Currently, Africa's growth has greatly improved and the region is growing on average about 5.7 per cent with greater prospect to grow above 6 per cent in 2012 and 2013 probably due to high commodity prices, expansion of demand and investment from Asia and external capital inflow (Sundaram and Arnim, 2008; World Bank, 2011; UNECA, 2012a; UN, 2012). Most African countries are considered as resource-rich countries. The natural resources which include oil and gas as well as minerals are being sold at very high world

market prices. Africa's economic growth since independence has tended to be driven by mainly primary production. Surely, the commodity boom comes along with many challenges. These include how to manage the resources from the boom as well as mobilizing the external resources into productive investments. The African economies are not properly diversified. The economies need to be well diversified with transformed economic structures to ensure an inclusive growth with balanced development. How to do this has been a great challenge.

Studies have shown that "appropriate" relative prices are the main factor in the process of economic growth. In other words, the recent recovery observed in SSA countries is as a result of the relative price reforms embarked upon since the mid-1980s. Initially, as the economic reform measures were being implemented, the institutional issues were ignored, believing that by getting the prices right and stabilizing the macroeconomic fundamentals everything would be alright and the economies would be on a sustainable growth path. But a shift in strategy to improving institutions seems to coincide with the resumption of economic growth in Africa. Institutions here are described in terms protecting property rights, enforcement of contracts, the rule of law, and social capital, amongst several, for long-run economic performance (Aron, 2000).

There is still much discussion on explaining the performance of Africa's economic growth (Heidhues, 2009). In Africa, growth has not been even. Some SSA countries that have implemented far reaching relative price reforms tend to have also performed better than the rest. Again, countries that have succeeded in ensuring what is generally now described as "good governance" as a result of good institutions tend to be faring well. Countries like Tanzania, Rwanda and Ethiopia, which have become the fastest growing economies, do not have much commodity such as oil and gas. Their fast growth has been due to structural reforms and better macroeconomic management (Collier, 2007a). This seems to include institutions and relative price reforms in the good performance outcome.

But how far these factors have contributed to economic growth is not quite clear. There is very little quantitative evidence to show in what way the macroeconomic fundamentals are affected. That is, the extent to which these variables account for the economic performance is still not well known. More important is the contribution of the crucial macroeconomic variables to the changes in the total factor productivity. Therefore, the question is to what extent do these factors (variables) contribute to Africa's economic growth through the total factor productivity? Today, the question is what should be done to have sustained good African economic performance. Should the stress continue being on getting the "prices right" and/or putting good economic institutions in place?

Over the past ten years there has been a consensus on the importance of institutions in the growth process. There is much qualitative agreement on the centrality of good institution on the growth process but there is very little quantitative evidence (Johnson et al., 2007). Hence the main purpose of the paper is to assess the growth performance. In doing this, we examine the effects of institutions and the effects of getting "prices right" on total factor productivity growth. An important dimension of the study is that the total factor productivity (TFP) growth rate is used as the main variable being affected by institutional and other economic reform variables. This is unlike other studies which have used the gross domestic growth (GDP) rate as the regressed variable. In doing this we try to show the importance of the non-factor changes on economic growth.

The paper continues as follows. Africa's reform experience since the 1980s is briefly discussed in the next section; and section 3 presents some theoretical framework on reforms, institutions and output growth. The methodology of the analysis is presented in section 4, and in section 5 we discuss the results. Section 6 concludes the paper with the main policy implication of the paper.

## **2. Reform Experience with Various Initiatives**

Africa has had many development initiatives since the early 1980s - the 1980 Lagos Plan of Action; with other initiatives including the 1986 – 1990 Priority Program of Economic Redressing of Africa adopted by the Organization of African Unity (OAU) in 1985; the complementary UN Program for the Development of Africa; Economic Commission for Africa (ECA)'s Alternative Structural Adjustment Programs for Africa; and the African Scope of Reference for SAPS for Socio-Economic Redressing and Transformation. Not much came out of these initiatives. The New Partnership for African Development (NEPAD) is the most recent African development initiative, which was adopted in October 2001 by the African Heads of States and Governments. NEPAD is another development

initiative showing the collective vision and commitment of African leaders in their development efforts. This was followed by the African Peer Review Mechanism (APRM) in 2003. APRM, among other things, tries to address the governance structures of member states of the African Union (AU), with the aim of strengthening African Institutions. To some extent, APRM has indirectly pressured African countries to carry out the development process with good institutions.

At the policy implementation levels of governments the IMF/World Bank sponsored Structural Adjustment Programs (SAPs) have had extensive impact on Africa's economies. African countries started implementing these in-depth market reform measures when the basic market structures and infrastructures were inadequate or even nonexistent. Yet the market reforms conditions were regarded as the necessary conditions for borrowing funds from these institutions. Thus, in a very rudimentary market infrastructure environment, the Sub-Saharan African countries carried out extensive price reform measures. These reform measures included liberalization of trade regimes and exchange rates, and substantial reduction of subsidies on several social amenities. The main objective was to "get prices right". That is letting the market play the key role in allocating resources within the Africa's economies. Since it was then further believed that the exchange rate regime was misaligned, the market forces were being stifled and as such they were not allowed to efficiently allocate resources. These were the sources of Africa's economic woes. The Structural Adjustment Programs (SAPS) were therefore imposed on the African governments. It was then suggested that SAPs were the only way to put the economies on a growth path. Yet for any African country to obtain any aid in the form of loans or grants, the country must meet certain conditions imposed by the Breton Woods institutions. The conditionality was critical because of the large size of the aid and because other donors' response depended on the assessment made by these institutions. The African countries incurred huge loans and at the same time they struggled to meet the conditions attached to these loans. African markets were disintegrated and are still with very poor and inadequate institutional and infrastructural linkages. There were and are still inadequate railways, roads linking rural and urban markets. Even the local markets are hardly linked or connected in any way. The landline and mobile telecommunications are nonexistence in the rural areas, and at best inadequate nationally and internationally. That is, markets are hardly well integrated in time and space. Given this type of market failure, the African governments were expected to get the prices right without first resolving the basic problems.

In the 1990s, again the IMF/World Bank indirectly instituted the poverty reduction strategy papers (PRSP). Again the PRSP main purpose was to strengthen the World Bank/IMF's conditional lend on poverty. PSRP was designed to be poverty oriented with poverty reduction results. There was concern about the poor record on poverty reduction and lack of ownership of the different programs by the people. Hence, multilateral funding could be increased through debt relief, if these concerns were addressed. Yet the whole focus was based again on conditional lending which was mainly on market oriented policies. The basic PRSP describe the macroeconomic and social policy of the country. The description of the county's economic and policy environment was usually linked to external financing. The new policy documents were expected to use country programs and projects to reduce poverty. But in actual fact, the PRSP was not substantially different from the SAPs, basically it was still "getting prices right". They both call for significant structural reforms.

During the 1980s and 1990s, average annual per capita income growth in SSA was largely below 2 percent with poor macroeconomic performance (Sundaram and von Arnim, 2008; Brixiova and Ndikumana, 2010), and for most of the period, it was negative. The region's performance was the least as compared to other World regions. The slow growth was pinned down to many factors, including: poor public institutions; inappropriate macroeconomic policies; poor financial systems; low level of physical infrastructure and low level of human capital; wars and conflicts; and the unfavorable international environment. Furthermore, achieving the Millennium Development Goals (MDGs) meant the region has to have high sustainable economic growth rates. Growth is needed for reducing poverty and increasing investment in human capital. In 2000 at the United Nations millennium summit, the leaders of the world articulated the eight Millennium Development Goals. These eight goals are measurable targets. They are time bound. They outline a globally agreed blueprint for reducing and even eliminating poverty, hunger, disease, illiteracy, child mortality, discrimination against women, and environmental degradation by 2015. Although it is difficult to see how these goals could be achieved within the time limit of 2015, it is important to note that the Millennium

Development Goals (MDGs) are much broader than the more narrowed SAPs and PRSP. But some crucial problems such as conflicts have not been included in these goals. Conflicts/wars have been associated with high level of multidimensional poverty. Many African countries have been affected by armed conflicts and wars. Conflicts have caused death, destructions, injuries, which have resulted to immediate and long run poverty. This is because conflicts have also led to high dependency ratio, increased disabled and elderly people, and break down of law and order (Handley et al., 2009). In fact all these have resulted to decrease in investment and savings with disruption of livelihoods. In economic terms, all these have also meant the collapse of the production function and no output growth, nor upward shift of production function.

Currently there is a growing understanding among African leaders that good governance (institutions), peace and security, a healthy, literate population and sound macroeconomic management are essential requirements for Africa's socio-economic development. But unequal trade relations still exist between Africa and the industrialized countries. African countries seem to be locked up in producing and exporting primary commodities with little or no value added. Hence, part of the negative impact of structural adjustments is the adverse terms of trade on Africa (ADB, 2009).

In the African economies, the financial sector is still very small and thin. For instance, there are very few (indigenous) commercial banks with African headquarters, to take care of African economies. In certain countries Commercial banks from the Western countries dominant the African economies. Hence, most of the policies do not favor the African countries. More so in general Central Banks engage in credit allocation and the management of international capital flows. But in Africa, Central Banks' role seems to be limited to stabilization and short term interest rates management. The Central Banks' main task is that of maintaining low inflation rate. It is generally known that high inflation rates tend to hinder macroeconomic stability. That should be well safeguarded. But it may be counterproductive by stressing very narrowly on maintaining low inflation rate to the neglect of other important variables such as real variables which may have great impact on the economy. These real variables include poverty, employment and growth. Inflation targeting may lead to credit restriction and reduction of opportunities for a trade-off between the inflation level and these real variables, particularly (un)employment. For instances, The CFA franc zone economies of Central and West Africa have very low inflation rates (levels), yet their growth rates are relatively very low.

### **3. Prior Studies with Empirical Evidence**

Economics is a dynamic discipline, and economists are continuously changing the views on economic events and finding ways of explaining the world. Keynes' (1936) response to the depression was an attempt to explain how the steady state of the economy is influenced by the equilibrium values of output and employment through macroeconomic policies. Capital accumulation is stressed in the neo-classical approach to growth (Solow, 1956; and Swan, 1956). The endogenous growth models try to explain some basic facts about growth in developing countries. The models endogenized the process of technological progress. These endogenous growth models attempt to give a significant role to human capital and share of national product devoted to education (Romer, 1986; Lucas, 1988; and Mankiw et al., 1992). The endogenous growth literature further attempts to explain the issue of growth convergence and disparity across countries/regions.

Yet, it has been found that the traditional determinants were not explaining much of growth differentials amongst countries (Naude, 2004; Acemoglu and Robinson, 2008; Robinson, 2010). That is getting "prices right" through structural reforms were not sufficient to put the economies on the right path to growth. There were other factors crucially determining growth. These factors are said to be the socio-political and legal environment, which are usually described as the quality of "institutions". "Institutions" is quite a broad term or concept (Amin et al., 2005):(a) institutions as "rules of the game" (North, 1990 and 1997); (b) social capital (Coleman, 198; and Collier, 1998); (c) governance, and (d) civil society. The reform process has not succeeded as expected. The reasons for the failure of the reform measures are many (Polishchuk, 2010; Robinson, 2010; Commander and Nikoloski, 2010). But Ahrens and Meurers (2002) argued that the questions concerning the appropriate role of the state, and how to craft effective governance structures as in the reform process in Post-Socialist countries, are about a country's formal and informal institutions. That is, institutions or governance matters in the process of reforms which promote economic growth.

Kaufmann et al. (2009) examined the impact of institutions on the growth process of several countries and concluded that institutions matter in the growth process. The argument is that the impact of institutions, market structures and economic policies are of importance for a medium and long-term economic growth as they have to be done in such a way that economic efficiency and proper resource allocation are promoted (Cornelious et al., 2003). When the economy is at a low level equilibrium of output level and employment, the reform measures are necessary to move the economy out of such low level equilibrium trap. It is important how the different policy packages are implemented. The reforms usually involve i) macroeconomic stability, ii) trade liberalization, iii) privatization of state-owned enterprises, iv) subsidies removal, v) labor markets reforms, vi) financial and banking sectors reforms, and vii) judicial and administrative reforms.

According to Basu (2004) one important issue is the extent to which the governments are putting the different policy packages together and implementing them subsequently to overcome the economic inefficiencies and problems with resource allocation. In general, the reform measures are expected to remove the different weaknesses observed in the economic system, which hinder potential for growth and development. These reforms were carried out rapidly where the institutions were still very weak. Although the rapidity was done in order to prevent potential reversal of the policies put in place.

Studying the transitional economies, Ahrens and Meurers (2002) argued that what the reform process overlooked or consciously ignored was that a functioning market economy requires an adequate institutional infrastructure providing market-preserving and market-enhancing incentives to both policy makers and private businesses. Why has good governance or institutions become so important? There is also the recognition of governments taking up their role in implementing the right policies properly. In addition to economic challenges, political obstacles to effective transformation are persistent in several countries and need to be eliminated as condition to sustained policy reform. This refers to overcoming corruption, political instability and power struggles, and more generally, to modernizing state apparatuses as well as using the institutions as they should be used (Polishchuk, 2010).

### *3.1. Some empirical evidence*

Studies have examined the impact of different aspects of "institutions" or "governance" on economic growth and performance. These studies include Mauro (1995), Barro (1997), and Knack and Keefer (1997). Some more recent studies providing supportive evidence to the growth-governance (institutions) correlation could be found in Akinlo (2011), Isksson (2007), Kaufmann et al. (2009), Chong and Calderon (2000), and Ahrens and Meurers (2002). They also observed that standard deviation increase in their indicators causes between a-half and four-fold increase in per capita incomes. King and Levine (1993), Demirguc-Kunt and Maksimovic (1998) highlighted several channels through which this relationship could be manifested with poorly protected property rights affecting physical investment and also investment in financial assets.

Using different statistical techniques, Treisman (2000) finds empirical support for the moderating effect of income level. Studies such as Hall and Jones (1999), and Chong and Calderon (2000) recognize that different observable measures of quality of institutions can be construed only as proxies for the variable of interest, and these studies are aware of the simultaneity of the relationship between these measures and growth. Naude (2004), Chong and Calderon (2000) seem to provide direct supportive evidence. The authors explicitly test for the mutual causality between good governance or institutions and growth, suggesting "multiple institutional equilibria". According to them, good institutions promote growth, which then leads to the adoption of good institutions. But other variables may have an important effect on institutions such that the causality may run in both directions. The general observation is that there is some support for the growth-governance/institutions correlation in the empirical literature, though there are serious problems in measuring institutions (Aron, 2000; Arrunada, 2007; Amin, 2008; Rodrick, 2008; Kaufmann et al., 2009; Zhuang, 2010).

## **4. Conceptual Framework with Model**

In the growth literature the argument is on whether or not the differences in physical and intangible capital as seen in different countries can explain the significant income differences typifying the current world economy. That is, attention is focused on why some countries achieve rapid economic growth, and some other countries do not. Hence, there is great interest in examining

the main sources of growth for different countries and even the different regions of economy. Our stress here is on estimating how much of the growth in output per worker is associated with growth in physical and human capital per worker and how much is due to technology, institutional change and other factors.

#### 4.1. Growth accounting model

Generally, total factor productivity (TFP) growth is represented by growth in output not accounted for by the traditional factors of production (labor, capital, land). That is, at the aggregate level, we can define TFP as  $Q_t/F(K_t, L_t)$ , where  $Q_t = A_t F(K_t, L_t)$ , the production function, with  $Q$  being the aggregate output or income,  $K$  the capital stock and  $L$  labor. “ $A$ ” measures TFP, and TFP is a measure of Solow residual. “ $A$ ” changes over time ( $t$ )

Whether the Solow residual measures technology shocks is a contentious issue. TFP is not necessarily a measure of technology since the TFP could be a function of other variables but here our emphasis is on TFP being a major output determinant. TFP is a production function shifter. Therefore, TFP could directly be a proxy for output growth.

This makes it possible to summarize detailed information about complex process of economic growth within a simple unified framework.

We specify the aggregate production function in Hicks neutral form, as

$$F(K(t), L(t), t) = A(t)F(K(t), L(t)) \tag{1}$$

$$\text{Or without “t” we have } F(A, K, L) = AF(K, L) \tag{1.1}$$

$A$  is total factor productivity (TFP), and measures the shift in the production function. It may vary from country to country (Hall and Jones, 1999). Differentiating the logarithm of equation (1) with respect to  $t$ , we obtain

$$\frac{\dot{Y}}{Y} = \frac{\partial F}{\partial K} \frac{K}{F} \frac{\dot{K}}{K} + \frac{\partial F}{\partial L} \frac{L}{F} \frac{\dot{L}}{L} + \frac{\partial A}{\partial A} \tag{2}$$

Hence, the last term on the right side of equation (2) is interpreted in equation (2.1) as the growth rate of TFP. This implies that equation (2) can be written as

$$\left( \begin{matrix} \text{growth rate} \\ \text{of GDP} \end{matrix} \right) = \varepsilon_K \times \left( \begin{matrix} \text{growth rate} \\ \text{of capital} \end{matrix} \right) + \varepsilon_L \times \left( \begin{matrix} \text{growth rate} \\ \text{of labour} \end{matrix} \right) + \left( \begin{matrix} \text{growth rate} \\ \text{of TFP} \end{matrix} \right), \tag{2.1}$$

Or

$$\left( \begin{matrix} \text{growth rate} \\ \text{of TFP} \end{matrix} \right) = \left( \begin{matrix} \text{growth rate} \\ \text{of GDP} \end{matrix} \right) - \varepsilon_K \times \left( \begin{matrix} \text{growth rate} \\ \text{of capital} \end{matrix} \right) - \varepsilon_L \times \left( \begin{matrix} \text{growth rate} \\ \text{of labour} \end{matrix} \right), \tag{2.2}$$

The elasticity of output with respect to capital and labor are respectively  $\varepsilon_K$  and  $\varepsilon_L$ . The growth rates of GDP, capital, and labor can be calculated from the national accounts data of most SSA countries. With the proper weights ( $\varepsilon_K$  and  $\varepsilon_L$ ) on the capital and labor growth rates, the TFP growth rates are obtained by subtracting from GDP growth as shown in 2.2. The difficulty is that the elasticities and parameters are not known and their magnitude may depend on the functional form of the production function. And it is these parameters that are critical in calculating TFP growth (Amin, 2002; Busari et al., 2009). In our estimates, we adopt a simply functional form of the production function as specified in equation 1 above.

#### 4.2. TFP Measurement and its determinants

In estimating the output elasticities, first, we assume a perfectly competitive input market, with profit maximization. That is, the income (GDP) is shared between capital and labor, given the elasticities of output. Also, the capital/output and labor/output ratios could be directly used in calculating the elasticities. With perfectly competitive input market and under constant returns to scale, being  $\varepsilon_K + \varepsilon_L = 1$ . But there may be increasing or decreasing returns to scale with the elasticities being greater or less than one. This gives different implications for TFP. By doing the appropriate substitution, the growth rate of TFP is calculated by simple subtraction with the appropriate data.

Second, we assume a parametric form of the production function (equation (1)) and estimate the parameters of the production function by running a regression. The output elasticities (with respect

to factor inputs) are the parameters being estimated. The TFP growth rates are obtained as the residual from the regression. We applied the following Cobb-Douglas Production function:

$$Y_t = A_t K_t^\alpha L_t^\beta, \quad 0 < \alpha, \beta < 1, \quad (3)$$

The parameters  $(\alpha + \beta)$  which are the elasticities are not constrained to unity. That is the total values could be greater or less than one - the possibility of non-constant returns to scale. To obtain our equation in terms of per worker basis, equation (3) is divided by the labour force (L).

$$y = A \kappa^\alpha L^{\alpha+\beta-1} \quad (4)$$

For simplicity, the time subscripts are removed. Equation 4 is in terms of per capita or per worker. That is, real GDP per worker, and  $\kappa$  is the per worker stock of physical capital. In terms of natural logarithms equation 4 is written as:

$$\ln y = \ln A + \alpha \ln \kappa + (\alpha + \beta - 1) \ln L \quad (5)$$

There seems to be inconclusive evidence on the nature and types of input to include in the production function. Mankiw et al., (1992), and Miller and Upadhyay (2000) argue for the inclusion of human capital in the production function. But Islam (1995) finds no significant contribution of human capital to explaining output. Hence, what may be included in the production function depends on each specification. For the sake of simplicity the human capital variable is not included in the specification. We apply the two approaches in estimating the TFP growth rates over time. The results from the two estimates are not significantly different.

#### 4.3. Empirical Model

It is assumed that changes in TFP tend to produce changes in output but this cannot be reflected by changes in factor inputs taken together. TFP is, therefore, an outcome of combined effect of factors different from factor inputs. GDP and TFP tend to be highly correlated; and TFP tends to be an important factor determining the GDP growth. There is little evidence available showing what brings out changes in TFP. Hence we try to examine the different factors affecting the TFP in the "Africa's economy". We model the 'determinants' of TFP in macro variables, which are categorized into relevant relative prices, macroeconomic stability, institutions and dummies of interest.

This is modeled as:

$$TFP_{it} = b + Z_{it}\beta + U_{it} \quad (6)$$

Where  $b$  is a constant term,  $\beta$  is vector of parameters,  $U$  is the error term and  $Z$  is a set of vectors grouping the relative prices, macro stability, institutions and dummy variables, with 'i' being for country and 't' for time (year). Hence the estimated model can be written as

$$TFP = f(\text{relative prices, macroeconomic stability, institutions, dummy variables}) \quad (7)$$

Or

$$TFP_{it} = b + (\text{relative prices})B1 + (\text{macro stability})B2 + (\text{institutions})B3 + (\text{dummy variable})B4 + u_i \quad (7.1)$$

#### 4.4. Empirical model: variables

The vector  $Z$  is composed of macroeconomic reform variables, institutions variables and "dummy" variables.

The macro stabilization variables used in the study are:

- Inflation rate (annual change in the consumers' price index).
- Degree of openness [(export plus import)/GDP].
- Financial sector deepening (M2 relative to GDP).

The following macroeconomic reform variables are used to reflect relative prices:

- Real exchange rate (nominal rate multiplied by ratio of domestic CPI to USA CPI- consumer price index).
- Agricultural terms of trade (agriculture relative to manufactured).
- Relative price of tradable to non-tradable.

Institutional variables:

- Variables measuring institutional quality

Dummy variables:

- Dummy variable reflecting oil exporting countries
- Dummy variable capturing years of conflicts/wars in a country

In measuring the quality of institution we combined some indexes. First, the index constructed by Hall and Jones (1998, 1999.2) is complemented with data from the Political Risk Services database, a firm that specializes in providing assessments of risk to international investors. Second in our data set, we included the updated data set used by Clagne et al. (1996). They use the index to evaluate countries' institutions and government policies, which determine the economic environment. Within this economic environment, "individuals accumulate skills and firms accumulate capital with labor and produce output". The quality of institution index constructed is based on each country's institutions and government policies as regards to a) bureaucratic efficiency, b) law and order, c) enforcement of property rights, d) risk of contracts repudiation by government.

In this study, it is assumed that the 26 countries had similar initial conditions including literacy rates, so no stress on initial conditions. A dummy variable is included to account for oil exporting countries and another dummy variable to account for years in which there were wars in a country. Since growth rate of TFP is used, it is needless to account explicitly for changes in factor accumulation. Earlier studies have shown the possibility of endogeneity of institutions and policies with respect to economic performance. There could be a reverse causation from growth to institutional development instead (Krueger and Ciolko, 1998; Chong and Calderon, 2000). We address this issue by considering lagged institutions and policies variables. The panel data are collected from 26 Sub Saharan African (SSA) countries for the period of 1980 - 2011, from IMF (2011), World Bank (2011), ADB (2012) and UNECA (2012b). The countries are Angola, Cameroon, Benin, Botswana, Burundi, Central Africa Republic, Congo Republic, Congo RD, Cote d'Voire, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Liberia, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, and Uganda.

## **5. Interpreting The Results and Discussion**

We study the effect of four groups of variables (relative prices, macroeconomic stabilization, quality of institutions, and dummy variables) on growth of TFP. They are used to capture the outcome of reforms and not the process of reforms. They, therefore, reflect the structural reforms. The dependent variable is the growth rate of total factor productivity. This is, done in order to bring out the direct effects of nonfactor inputs, in contrast to the usual approach of using real per capita GDP growth as the dependent variable.

The results are presented in Table 1. There are three regression specifications with regression one (I) being the sum of the other two specifications in columns three and four. There are three equations mainly to check the effects of the absence of (macro stabilization and dummy) variables from equation one. The t-statistics are in parentheses under the estimated coefficients. From the adjusted R-squared, it can be stated that the right hand variables explain about 75%, 69% and 62% of the variation of the TPF in the three specifications respectively. The F-statistics indicate that overall, the three models are significant. The values of the D-W statistics, suggest that there is no autocorrelation. The variables for the relative prices are significant at 5 percent significance level, except the relative price of tradable to nontradable variable.

There is a negative, but significant, relationship between the real exchange rate and growth in total factor productivity. On the other hand the positive and significant relationship of agricultural relative prices in the estimation is important. This readily confirms the significance of Terms of trade in the estimation. That is, increase in agricultural terms of trade tends to boost TFP growth. But does this mean these countries would continue to rely only on agricultural products? I do not think so. More value should be added. In the stabilization group of macro variables, inflation rate and financial sector deepening are significant at 5 percent; but openness is significant at 10 percent. Inflation rate has negative relationship, and financial sector deepening variable has a positive effect on TFP growth.

The measure of the institutional quality is seen to be positive and significant at 10 percent. As the dummy for oil producing/exporting country is positive and significant at 5 percent. TFP growths for oil exporting countries tend to be driven by the oil prices in the international market. As expected also, the war dummy is negative and significant at 5 percent. The third column, regression II, shows that relative price of tradable to non-tradable is insignificant, the only variable in the relative price group. In macro stabilization group, the financial sector deepening variable is significant at 5 percent. In this estimation, the institution quality indicator is not significant. At 5 percent level of significance, the war and oil dummies are significant. The first and the second estimations show the depressing



impact of civil conflicts on TFP growth. In the third regression (column 4), again, the financial deepening variable is significant at 5 percent, while the institutional quality variable is not significant. The results show that relative prices as measured by real exchange rate, terms of trade and agricultural terms of trade have significant impact on TFP growth in the sampled countries.

**Table 1. Regression results**  
Dependent variable: TFP growth rate

Regression	I	II	III
Constant	0.05981(0.997)	0.383(0.304)	0.704(0.361)
<i>Relative prices:</i>			
Real exchange rate	-0.081(-2.878)**	-0.0899(-3.301)**	-0.0789(3.105)**
Agriculture terms of trade (agriculture and manufacture)	0.0099(2.878)**	0.0436(3.501)**	0.0563(3.378)**
Relative price of tradable to non- tradable	0.0214(1.494)	0.0946(1.834)	0.00914(1.095)
<i>Macro stabilization:</i>			
Inflation rate	-0.0504(-3.60)**		
Degree of openness	0.089(1.898)*		
Financial sector deepening	0.008(4.108)**	0.012(3.914)**	0.0109(3.807)**
<i>Institution:</i>			
Quality of institutional	0.069(1.898)*	0.0687(1.511)	0.241(1.587)
<i>Dummy:</i>			
Oil exporting	0.0185(3.781)**	0.0058(3.102)**	
War	-0.045(-2.1235)* *	-0.109(-2.918)**	
<i>Statistics:</i>			
Number of observations	650	650	650
Adjusted R-squared	0.75	0.69	0.62
Durbin Watson	2.24	1.98	1.89
F-statistics	22.05	19.70	12.48

Sources: Author's estimates from IMF(2011) and World Bank (2011). t-Statistic in parenthesis; \*\*(\*) significant at 5(10) percent level. White Heteroskedasticity-Consistent.

The results seem to give significant statistical evidence in support of the suggestion that relative prices are important determinants of non-factor variables of real output growth in the 26 African countries. i) The real exchange rate has significant negative effect on TFP growth. That is, the trend in real exchange rate in these countries might not have been conducive to growth. ii) On the other hand, terms of trade have positive effect on growth in the estimated equations. That is, the deteriorating terms of trade of the primary commodities of these countries as aggregate tend to dampen growth. An improvement in the terms of trade would tend to have a positive impact on these countries non-factor growth. We defined relative prices in terms of unit price of agricultural goods to manufactured goods. The results show a positive relation between the ratios with TFP growth. That is, unit price of agricultural goods would increase relative manufactured goods and so improvement in TFP growth. This suggests the importance of improving agriculture productivity as well as transforming the agricultural products into manufactured goods.

In the first regression, the measure of institutional quality does seem to support the suggestion that quality of institution has a strong effect on non-factor output growth. In the other two estimations, the results were statistically insignificant, yet there is the positive relationship. It is important to note that there are several measures of institutional quality. Yet, there is some evidence to show the positive effects of the quality of institutions on TFP growth in this case. Again, this study has not explicitly taken into account the fact that institutional performance can be endogenous to macroeconomic performance. We try to address the endogeneity problem with lag variables.

The financial sector deepening variable is positive and significant; also the inflation rate variable is significant and negative. It is important to note here the narrow role of most Central Banks in Sub Saharan Africa – inflation targeting. In fact, the Central Bank should be seen to also generate and promote employment, economic growth with development, instead of being limited to just credit allocation and management of capital flows. Monetary policy should not be limited to inflation rate targeting but should also involve real economic variables that promote economic growth and

development. Furthermore the financial system in most African economies is very thin and in the CFA franc zone markets such as the stock exchange markets are almost nonexistent and at best in the embryonic stage. On inflation targeting role of the Central Bank, studies (UNCTAD, 2009) have shown that the negative effects inflation occur when inflation rates are greater than 3 to 5 percent. These are the rates pursued by the CFA franc zone Central Banks. But other countries could target higher rates without have any significant negative effects on real macroeconomic variables. The negative effects as observed in the regression analysis could be resulting from the very high inflation rates of the non CFA franc zone countries. While the results come from a panel data, it may be necessary to state the importance of each country determining its own optimal inflation level well-suited with its economic development goals.

## **6. Conclusion**

In the paper we investigate, the effects of four sets of variables (the non- factor inputs) on TFP growth of 26 Sub Saharan African countries. The paper brings out the importance of institutions and economic reform measures in Africa's development process. More so, the paper demonstrates the effects of the four sets of variables on the TFP growth.

From the results of the study there is quantitative evidence to show the importance of relative prices in the growth process of African countries. The quality of institutions is still crucially important as the positive statistical relationship is shown in the results. The coefficient of the variable of the quality of institutions is not significant statistically in two of the estimates, but given the different measures of the quality of institutions in the literature, we cannot rule out the significance of the variable in the growth process. Much effort is still needed in estimating or measuring the quality of institution (on growth). At the same time 'getting prices right' is still important in getting the Africa countries on sustained growth path. But this must be done properly. Furthermore, it is stated that the current growth is based on high commodity prices. Different ways must be sought out to link the growth to employment creation. This implies utilizing the resources coming from the commodity exports wisely in such a way that the base of the economy is broadened and the economic fundamental are strengthened. The macroeconomic measures to get "prices right" in sub Saharan Africa may also be constrained by the linkages of institutions/governance to the macroeconomic variables. Thus, policies of getting prices right combined with establishing strong institutions are still worth pursuing vigorously.

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