Horn of Africa Journal of Business and Economics (HAJBE), 2019, 2(1), PP: 49-69

ISSN: 2617-0078 (Print), 2617-0086 (Online))

The Inter-linkage between Institutional Quality and Economic Development in Some Selected African Countries: Panel Data Approach

Wondatir Atinafu

Department of Economics, Dire Dawa University, Ethiopia

The author can be reached using: **wondatiratinafu@gmail.com**

Abstract

This paper examines the inter-linkage between economic development and institutional quality of some selected countries in Africa. Data for 27 African countries over the years 1996 – 2016 are used in a dynamic panel model of System GMM estimation. Consequently, the results show that institutional quality significantly and positively affects development (real GDP per capita) indicating better governance enhance economic progress and vice versa. The causal link between governance and development is found to be ***bidirectional*** *running both from governance to development and from development to governance. Except voice and accountability all institutional quality indicators significantly affect economic development in Africa. Also, the result suggest that good governance have positive and significant impact on economic development of all countries under consideration regardless of their level of growth, but it is highly desirable for lower income economies. However, there is no significant relationship between institutional quality and HDI. Furthermore, the regression result depicts that the colonial background of the countries was one of the factors for cross country variation of institutional quality in Africa. Policies formulated to improve governance and development should not be treated as different strategies, rather it has to be treated as integral components of the same strategy.*

Key words*: Africa, Economic development, Institutional Quality, Panel data, GMM*

1. INTRODUCTION

North defined institutions as ñtools that are formulated and practiced by human being to control their political, economic and social interaction " (North 1990, p.3). Also, Acemoglu et al. (2005), described the importance of economic institutions as "one that determine the incentives of and the constraints on economic actors, and shape economic outcomes". In a nutshell, North (1990) argue that if the "rules of the game" are such that agents can secure the returns of investing in physical capital, human capital and new ideas then these investments will take place and economic progress will follow. Otherwise, people would invest in rent seeking, political competition and violence; and economic stagnation or decline would be the consequence.

Growth theories especially endogenous growth theory, have shown that economic development depends on accumulation of human and physical capital as well as access to modern technologies. Accumulation of these factors is likely to be influenced by institutional characteristics such as: distribution of political and civil rights, government effectiveness, the quality of the legal system and regulatory policies, better control of corruptioné etc. However, identifying an underlying effect of institutions on economic development, measuring its size, and understanding the mechanism of transmission of institutional quality to growth are difficult issues.

Why are some countries rich and others poor? Since Solow (1956), the tentative answer has been differences in capital accumulation and technical change, but this was unsatisfactory since the theory failed to explain what accounts for these differences. Endogenous growth theories (Aghion and Howit (1992); Romer (1990)) emerged to answer the same question and argue that differences in research and development and human capital lead to differential growth in technical change and accumulation. Still, why do some countries invest more in education and innovation? North (1990), Acemoglu and Robinson (2005) and other New Institutional Economists contend that differences in institutions can explain the differences in economic performance across time and space. However, some authors (Khan (2010); Chang (2011); Reinert (2007)) argues that it is not institutions that cause growth; rather, it is a countryôs economic structure that is the fundamental cause of economic performance. Hence, it is worth to give due emphasis to the concern of institution-development nexus in the African context.

The question of why Africa is one of the poorest continents in the world continues to be a fascinating one. The regionôs slow pace of development and its lack of convergence with their developed counterparts in terms of income and productivity has been academically stimulating. What is readily observable is that despite the large number of studies on this question, there is no consensus among researchers on the underlying factors of this sluggish economic performance of the region. The literature is widespread with several varying explanatory theories and postulations. Accordingly, institutional and policy thesis (Kilish et al. (2013)), geographic thesis (Sachs et al. (2015)), cultural and historical thesis (Acemoglu et al. (2000)), and trade thesis (Baltagi et al. (2009)) have emerged in recent time to explain growth differences across African countries.

Interestingly, there is a growing body of literature recently that places a lot of emphasis on the role of institutions in explaining the growth difference across countries. In effect, this body of literature has shifted the question from ñgetting prices rightò to ñgetting institutions rightò. What is rather worthy of note is that despite the large number of studies on the effect of institutions on economic growth, the effect of economic development on institutional quality and the question of which comes first remain a void in the literature. Put differently, there is a burning question that bothers on which of them must be prioritized over the other? This remains a wide gap in the NIE[1] literature and needs to be explored. The question that is left unanswered in the region is whether institutional quality is the cause or consequence of economic development. Thus, the trust of this paper is to analyze the causal relationship between institutional quality and economic development in African context.

Several empirical studies have been undertaken by different scholars on the unidirectional flow from institution to economic progress. Among these, Basu and Das (2010), Lennart (2016), Hadhek et al. (2012), Kilish et al. (2013), Constantinos et al. (2014), and Ifere et al. (2015).

However, the existing inconclusive theoretical and uni-directional empirical results make it difficult to draw unambiguous conclusion about the nexus between economic development and institution in LDC[2]s in general and Africa in particular. Hence, the purpose of this study is to fill this gap by attempting to see the bi-directional causation between institution and economic progress in African context using dynamic panel regression model.

Among the prior studies on this area, Ifere et al. (2015), and Lennart (2016) employed OLS[3] method of estimation. But Using OLS estimator for the estimation of dynamic panel model is both biased and inconsistent, however this paper will use the system GMM [4]estimation method which produces efficient parameter estimates than many techniques such as Ordinary Least Squares (OLS), Random and Fixed Effects particularly in instances of endogeneity and multicollinearity. Also, it could eliminate any bias rigorously related to unobserved individual heterogeneity and provides therefore a better efficiency of the estimation results. Moreover, the study also investigates the institutional quality of selected countries based on their colonial experience, an approach that to the best of the researcherôs knowledge has not been used in the literature.

The overall objective of this study is to investigate the interlinkage between institutional quality and economic development in the context of some selected African countries. More specifically, to investigate the direction of causation between institutional quality and economic development, to identify which of the governance indicator(s) matter most in Africa, to analyze whether there is difference in institutional quality between the selected countries based on their past colonial experience.

[1] NIE: New Institutional Economics
[2] LDC: Less Developed Countries
[3] OLS: Ordinary List Square
[4] GMM is Generalized Method of Moments

The reminder of the paper organized as follows. Section 2 includes review literature, section 3 includes data and descriptive statistics, section 4 reports on the findings and discussion of our analysis. Conclusion follows in section 5.

2. BRIEF LITERATURE REVIEW

The debate regarding the direction of causation between economic progress and institutional quality has been ongoing since few decades. While new institutional economists (North (1990), Acemoglu, Johnson and Robinson (2005)) Murphy et al (1993), Iqbal and Daly (2014), argue that better institutional quality leads to better economic progress. However, ((Khan (2010); Chang (2011); Reinert (2007), Glaeser et al. (2004)) argue that economic growth is the cause for the country to have better institutional quality. They argue that better economic progress is vital to construct well developed institution. Hence, there are two conflicting views regarding the direction of causation between economic growth and institutional quality. The first view argues that better institutional quality leads to better economic progress. While, others argue that economic growth is the cause for the country to have better institutional quality.

Economic development changes institutions through a number of channels. First, increased wealth due to growth may create higher demands for higher-quality institutions. Second, greater wealth also makes better institutions more affordable. Institutions are costly to establish and run, and the higher their quality the more ǿexpensiveô they become. Third, economic development creates new agents of change, demanding new institutions (Chang 2011).

On the other hand, North (1990), Institutions affect investment in physical and human capital, as well as the organization of production. In order to reach a high level of output per worker, the social infrastructure should provide an environment that supports productive activities, encourages capital accumulation, skill acquisition, invention and technology transfer (Hall & Jones 1999).

Earlier studies have provided a number of insights regarding the role of institution on economic growth by focusing on the uni-directional perspective i.e. from institution to development. Among these, Basu and Das (2010) used the Li-Racine (2004) generalized Kernel estimation methodology to study the relationship between institution and development, based on data for 102 countries from 1980 up to 2004. Their result indicated that institutions had a positive impact on the level of development.

Lennart (2016), assessed the nexus between institution and economic growth in Africa for the period between 1999-2014, using OLS estimation technique. The result revealed that institution positively and significantly affect economic growth in Africa. Also, Hadhek et al. (2012), studied the effect of institutional factors on investment and economic growth of a set of 11 countries in the MENA region during the period 2000-2009, using a model of dynamic panel data. The paper found that a significant relationship between institutional variables and economic growth.

Kilish et al. (2013) conducted study on the role institutions on economic performance in SSA using Arellano and Bond first difference and Blundell-Bond System Generalized Method of Moment estimators to estimate the specified models and their result reveal that institutions really matter for SSAôs economic progress.

Ifere et al. (2015) on the relationship between institutional quality, macroeconomic policy and economic development in Nigeria using OLS estimation technique for the period of 1995 up to 2013. The result depicts that institutions have an insignificant impact on Nigeriaôs economics development. Constantinos et al. (2014) studied the relationship between institutional quality and economic growth on Sudanese economy over the period of 1972-2008. By using *an* ARDL bounds-testing approach to co-integration proposed by Pesaran et al. (2001), The empirical results obtained suggest that, for the Sudanese economy, the quality of the institution is one of the most important defining factors of economic prosperity.

In spite of such a broad array of support for the positive impact of good governance on economic growth, there are only few studies that show results to the contrary. For example, an important challenge to the significance of good governance for the economic growth of African countries comes from Sachs et al. (2004). In an empirical analysis, they show that the differences in performance among African countries cannot be explained by differences in the quality of their governance.

Generally, there is no agreement on the causal linkage between institutional quality and economic development. In fact, most of the empirical studies focused on the direction of causality from institution to economic progress and the other way of interaction needs further empirical investigation.

3. METHODOLOGY OF THE STUDY

Data Type, Source and method of analysis

The study uses panel data for its advantage of accommodating the good identities of both the cross-sectional and time-series data; and due to the dynamic nature of the variables of interest. However, it is prone to the time series cyclicality of the data which might exacerbate measurement error. In order to overcome the cyclical effects of the data we adopt the approach followed by Barro (1997) and Islam (1995) which takes either the decade or the five-year averages instead of yearly observation. Thus, in this study we go with the five-year time intervals. Hence, the data in this study were transformed to five-years average allotting each country four observations, in this way the data was set to be longitudinal.

The study considers annual data of 27 selected African countries for the years from 1996 to 2016. The data sources for this study was WDI (2010,2012 and 2017), UNDP Reports, and WGI database. In this study, both descriptive and econometric data analysis were employed.

Model Specification

The basic model for dynamic panel with additional explanatory variable can be written as

$\mathbf{Y_{it} = \alpha Y_{it-j} + \times \beta X_{it} + \varepsilon_{it}}$**, where** $\mathbf{\varepsilon_{it} = \mu_i + \lambda_t + \nu_{it}}$

Where, **Y** and **X** are economic development or institutional quality, alternatively. Z represents control variables used as a mediator between governance and development such as Trade openness, human and physical capital. i= 1,é .,N is cross-section/country while t= 1,é ,T is time period. The denotations μ_i, λ_t, and ν_{it} are individual effects, time effects, and disturbance term respectively.

Specific to our objectives of examining the relationship between institutional quality and economic development using dynamic panel data, our paper rests on the following basic model. That is,

$\mathbf{Y_{it} = \alpha Y_{i,\,t-j} + X_{i\,t} + \delta Z_{it} + \varepsilon_{it}}$ **…….. (3.1)** $\mathbf{\varepsilon_{it} = \mu_i + \lambda_t + \nu_{it}}$

To put it precisely, the study contains three basic models so as to capture the nexus between institutional quality and economic development. Moreover, colonial dummies were incorporated on the last model so as to analyze whether there is difference in institutional quality between the selected countries based on their past colonial experience

The first equation (equation 3.2) specifies the effect of governance on development. That is,

$\mathbf{Y_{it} = \gamma + \sum_{J=1}^{m} \alpha_J Y_{i,\,t-j} + \sum_{r=0}^{n} \beta_r X_{i,\,t-r} + \sum_{k=0}^{q} \delta_k Z_{i,\,t(L)} + \mu_i + \nu_{it}}$ **…… (3.2)**

To put it in another form, the model is defined using the variables of interest as:

$\mathbf{LnGDPPC_{it} = \gamma + \sum_{J=1}^{m} \alpha_j\, LnGDPPC_{i,\,t-j} + \sum_{r=0}^{n} \beta_r\, IQ_{i,\,t-r} + k_o TO_{it(L)} + k_1 GER_{it(L)} + k_2 GIR_{it(L)} + \mu_i + \nu_{it}}$ **…. (3.2)**

We specify the second equation (equation3.3) identical to equation (3.2) as a general equation designed to estimate the effect of governance indicators on economic development.

The third equation (equation 3.4) is also similar with equation (3.2), but this equation use HDI (proxy for economic development) as a dependent variable. To put it in another form, the model is defined as

$\mathbf{HDI_{it} = \gamma + \sum_{J=1}^{m} \alpha_j\, HDI_{i,\,t-j} + \sum_{r=0}^{n} \beta_r\, IQ_{i,\,t-r} + k_o TO_{it(L)} + k_1 GER_{it(L)} + k_2 GIR_{it(L)} + \mu_i + \nu_{it}}$ **……. (3.3)**

The fifth equation is also similar with equation (3.2) with the exception of interchanged denotations between Y and X and inclusion of colonial dummy. i.e.,

$\mathbf{IQ_{it} = \gamma + \sum_{J=1}^{m} \alpha_j\, IQ_{i,\,t-j} + \sum_{r=0}^{n} \beta_r\, LnGDPPC_{i,\,t-r} + k_o TO_{it(L)} + k_1 GER_{it(L)} + k_2 GIR_{it(L)} + \sum Dc + \mu_i + \nu_{it}}$ **.. (3.4)**

Lastly, equation 3.7 is derived so as to see the effect of economic development on governance quality by taking HDI as a proxy for economic development.

$IQ_{it} = \gamma + \sum_{J=1}^{m} \alpha_j\, IQ_{i,\,t-j} + \sum_{r=0}^{n} \beta_r\, HDI_{i,\,t-r} + k_o TO_{it(L)} + k_3 GER_{it(L)} + k_4 GIR_{it(L)} + \sum Dc + \mu_i + \nu_{it}$... (3.7)

Estimation Method

The empirical model was estimated using the system Generalized Method of Moment (GMM) developed by Arrelano and Bond (1995). The key intuition behind the GMM method is that, the panel structure of the data provides a large number of instrumental variables in the form of lagged endogenous as well as exogenous variables. It is generally known that using many instruments can improve the efficiency of various IV[5] and GMM estimators (Blundell and Bond,1998).

It is important to note that, the use of lagged values (and first differences of lags) of the endogenous variable as instruments would be invalid in the presence of serial correlation. Therefore, we conduct test for serial correlation so that we judge the reliability of our estimates. Arellano and Bond (1991) provide a test for autocorrelation, AR (1) & AR (2), appropriate for linear GMM regression. If the test shows a first order autocorrelation but no second order autocorrelation, it is indicating that the instruments are valid.

In order to address the causality between economic development and institutional quality, the study adopted Engle-Granger causality test of panel (Wald test).

4. RESULT AND DISCUSSION

Data Presentation and Description

The World Bank governance indicators which consist of six indexes are used as measures of institutions in this paper. These include regulatory quality, voice and accountability, government effectiveness, political stability and absence of violence, rule of law, and control of corruption. All these indicators give the picture of governance performance of a country. Since the indicators are available for all countries of the world, it is easy to compare governance across countries.

The value of each indicator ranges from 0 to 1. The closer the value is to zero, the weaker the quality of governance and the closer it is to 1 the better the quality of institutions.

Econometric Result and Interpretation

System GMM Econometric Analysis

I. The Effect of Institutional Quality on Economic Development

A. *Taking GDP per capita as a proxy for economic development*

In model (***1A***), log of GDP per capita (proxy for economic development) is the dependent variable while aggregated institutional quality (IQ) is among the independent variables. Trade Openness (TO), Gross Investment Ratio (GIR) and Gross Enrolment Ratio (GER) are additional explanatory variables in the models.

[5] The name IV in this paper refer to Instrumental Variable

The regression result show that GDP per capita is significantly affected by its lag, governance quality and all other control variables. Institutional quality is found significant (at five per cent significance level) indicating the existence of strong positive relationship between governance quality and level of economic development. The positive coefficient shows that improved governance implies better economic progress and vice versa. The result is consistent with theoretical and empirical justifications given by Acemoglu (2003), Hall and Jones (1999), Iqbal and Daly (2014), Keefer et al. (1997), Campos and Nugent (1999) and Chauvet et al. (2004).

Model 1A: Two-step GMM regression result of economic development- institutional quality

Regressors	Coefficient	Std. Error	Z-statistics
LnGDPPC t-1	0.91 ***	0.03	30.32
IQ	0.157**	0.071	2.22
TO	-0.0033***	0.0012	-2.74
GIR	0.0163***	0.0025	6.52
GER	0.002***	0.0005	4.02
Const.	0.424**	0.017	24.93
Specification Test Statistics			
AR (1) P-value = 0.45			
Wald Stat, P-value = 0.000 Chi^2 (5) = 8655.6 Ho: $LnGDPPC_t = LnGDPPC_{t-1} = 0$			
Sargan Test Chi^2 = 9 (0.688) Hansen test Chi^2 =9 (0.68)			
Number of Observation = 81			
Number of Group = 27			

Unexpectedly, ñTrade opennessò which is statistically significant at one per cent with regression coefficient of (-0.0033) and it have a negative effect on economic development in countries under consideration. This result can be justified by the fact that most of these countries suffer from unfair trade with developed countries. Also, by liberalizing their trade these countries open the opportunity for developed countries to dump their manufactured commodities, which indirectly kill the domestic infant industry and result in unfavourable internal economic atmosphere.

Once we found that institutional quality is the important determinant of economic development in Africa, next we investigate whether the impact of governance quality differ by the conditional distribution of income. To capture this, three independent regressions were conducted by classifying the sampled countries into different groups depending upon their level of income. Countries were categorized as low-income economies (12 countries), lower middle-income economies (10 countries) and upper middle-income countries (5 countries) using World Bank (2016) classification of countries based on GNI per capita.

Here, before examining the effect of governance on economic development of the countries at different level of income, it is better to check whether the governance quality differ across different income level. Thus, the paper analyzed this case using dummy variable. The dummy was created by subdividing countries as a middle- and lower-income countries. The result obtained from regression depict that there is statistically significant difference in institutional

quality of the two income groups (see Appendix 1). Accordingly, middle-income countries have relatively better governance quality than lower-income economies.

Model 1B: Two-step GMM regression outcome of governance quality effect on economic development of different income group

Variables	Low-income economies	lower middle-income economies	Upper middle-income economies
	Model (I) Coeff.	Model (II) Coeff.	Model (III) Coeff.
$LnGDPPC_{t-1}$	0.92 *** (0.32)	0.87 *** (0.03)	0.85 *** (0.025)
IQ	0.321 *** (0.116)	0.26 ** (0.11)	0.11 ** (0.051)
TO	-0.054 *** (0.0046)	-0.0012** (0.0005)	-0.03 ** (0.013)
GIR	0.023 ** (0.011)	0.02 ** (0.009)	0.018*** (0.0015)
GER	0.0071 * (0.004)	0.0062 ** (0.003)	0.008*** (0.0021)
Const.	0.294 ** (0.114)	0.215* (0.101)	0.205 ** (0.095)
Hansen- Sargan Test P-value	0.28	0.55	0.20
AR (1) P-value	0.31	0.36	0.23
Wald test	0.000 (8596.7)	0.000 (7,025)	0.000 (4,852)
No. of obs.	36	30	15
No. of groups	12	10	5

The result from the table above indicate that institutional quality has a positive and significant[6] impact on all level of growth, except the low-income countries, but it has a larger positive impact on the lower income economies. Thus, the result indicates that good governance is desirable at all levels of growth, but it is more important for the lower income categories than for the middle-income economies.

The separate effect of Institutional indicators on economic development (GDP per capita)

The separate impact of the six governance indicators on economic development is analyzed using a regression shown in model (***1C***). Such an analysis also helps to identify the indicator with the most powerful impact and lay foundation to identify the area of attention (among the governance indicators) in accelerating economic development.

Model (**a**) represents development model where governance quality is represented by control of corruption (CC). Model (**b**) is the same model where political stability and absence of violence (PS) denotes governance quality. Similarly, models (**c**), (**d**), (**e**) and (**f**) are development models where government effectiveness (GE), regulatory quality (RQ), rule of law (RL) and voice and accountability (VA) respectively are exclusively the variables of interest.

[6] The result obtained by subdividing the countries in terms of their level of income may not be strong enough because of insufficient number of countries (observations) under consideration.

Result from model (***1C***) shows that control of corruption (CC)[7] affects economic development significantly at five per cent significance level with the coefficient of 0.211. It is found that an economy with lower corruption can realize better development and vice versa. This implies that the country that can control extent to which public power is exercised for private gain, including petty and grand forms of corruption can enjoy faster economic progress. This finding is consistent with the argument of (Murphy & Vishny (1993)).

Political stability and absence of violence (PS) found to be positively and statistically significant at ten per cent level of significance implying that political institutions seem to be correlated with economic progress of sampled countries. This good political institution will generate economic institutions to be less fragile and able to influence economic activity. Indeed, with property rights and contractual rights poorly protected and a legal structure unhealthy, it is impossible to stimulate economic activity, and realize good economic performance. It is found that an economy with no violence and characterized by political stability have better prospect of economic development and vice versa. This implies that in a situation where the likelihood of the government to be destabilized and overthrown by unconstitutional and violent means is higher, it is hardly possible to achieve accelerated economic development.

As indicated in (model 1C), regulatory quality (RQ) of the government has positive and statistically significant impact on the economic development of African countries. This result suggests that the ability of the government to formulate and implement sound policies could contribute to the increment in RGDP per capita. Moreover, rule of law (RL) that measures the enforceability of contracts as well as the effectiveness and predictability of the judiciary affects economic development positively and significantly (at ten per cent significance level). In a case when the rule of law is weak, economic progress slow down while strong rule of law catalyzes economic expansion. This finding supports the empirical investigation of Kilishi et al. (2013).

[7] The value of each indicator ranges from 0 to 1. The closer the value is to zero, the weaker the quality of the particular governance and the closer it is to 1 the better the quality of the indicator.

Model 1C: Two-step GMM regression outcome of economic development- institutional quality model by considering six governance indicators as a regressors

Variables	Model (a) Coeff.	Model (b) Coeff.	Model (c) Coeff.	Model (d) Coeff.	Model (e) Coeff.	Model (f) Coeff.
$LnGDPPC_{t-1}$	0.834 *** (0.53)	0.883 *** (0.033)	0.921 *** (0.031)	0.863 *** (0.044)	0.877 *** (0.038)	0.891 *** (0.04)
TO	-0.0024 * (0.0013)	-0.00024 ** (0.0011)	-0.0057 *** (0.002)	-0.0001 (0.002)	-0.0034 ** (0.0015)	-0.0033 *** (0.0012)
GIR	0.0186 *** (0.0033)	0.02 *** (0.003)	0.02 *** (0.0027)	0.018 *** (0.0033)	0.041 *** (0.003)	0.023 *** (0.0028)
GER	0.0035 *** (0.0007)	0.0023 *** (0.00073)	0.0024*** (0.00045)	0.00132 *** (0.00034)	0.0024 *** (0.0005)	0.0036 *** (0.0005)
CC	0.211 ** (0.09)					
PS		0.158 * (0.094)				
GE			0.235** (0.1)			
RQ				0.3 ** (0.138)		
RL					0.233 * (0.12)	
VA						0.106 (0.11)
Const.	0.773 ** (0.324)	0.385** (0.191)	0.353 * (0.205)	0.49 ** (0.242)	0.515 *** (0.154)	0.345 *** (0.21)
Hansen- Sargan Test P-value	0.695	0.475	0.66	0.628	0.442	0.532
AR (1) P-value	0.52	0.43	0.19	0.72	0.68	0.24
Wald test	0.000 (1794)	0.000 (5745)	0.000 (1867.1)	0.000 (922.95)	0.000 (1525.84)	0.000 (5677.9)
No. of obs.	81	81	81	81	81	81

Government effectiveness (GE) which proxies the quality of public services, the quality of civil services, the degree of their independence from political pressure, the quality of policy formulation and implementation, and the credibility of the governmentôs commitment to such policies is found to have positive and significant impact on economic development. However, voice and accountability (VA) found to be insignificant in affecting economic progress. Contrarily, all control variables came out with significant and positive, which conforms with the a priori expectation, but trade openness contribute negatively.

Generally, the regression outcome indicates that control of corruption, political stability and absence of violence, government effectiveness, regulatory quality and rule of law independently show very strong significance, implying that these variables explain economic development (GDP per capita) more, among the other.

B. Taking Human Development Index as a proxy for economic development

Unlike, in the case of GDP per capita, when HDI is taken as a proxy for economic development there no significant relationship between governance and economic progress, implying that among the three components of HDI, governance quality is highly correlated with income rather than education and health in countries under consideration. This can be justified that, almost all countries in Africa were realizing their economic progress by exporting natural resources which is the root cause for corruption and political instability in the continent which in-turn reduce the governance quality.

Model 2A: Two-step GMM regression result of economic development- institutional quality model (taking HDI as a proxy for economic development)

Regressors	Coefficient	Std. Error	Z-statistics
HDI t-1	0.871***	0.063	13.54
IQ	0.0022	0.024	0.09
TO	-0.001***	0.0003	-3.33
GIR	0.00043***	0.00012	3.56
GER	0.00045**	0.0002	2.24
Constant	0.036**	0.0162	2.23
Specification Test Statistics			
AR (1) P-value = (0.26)			
Wald Stat, P-value = 0.000 (1754.21) Ho: $HDI_t = HDI_{t-1} = 0$			
Sargan Test $Chi^2 = 9$ (0.902)			
Number of Observation 81			

Hence, governance quality in Africa is highly associated with income rather than health and education. This justification is in line with the finding of Islam et.al (2002), Congdon Fors and Olsson (2005).

The separate effect of Institutional indicators on economic development (HDI)

The individual impact of the six institutional quality indicators on economic progress is analyzed using a separate regression shown in model (***2B***).

The result reveals that political stability and absence of violence (PS) affects human development index (HDI) positively and significantly at ten per cent significance level (with the coefficient of 0.024). It is found that an economy with better political stability can realize better economic development vice versa, because absence of political turmoil enables the economies to expand qualified health and education centers which in-turn raise the HDI of the country. Also, in Africa the two major components of HDI (i.e. education and health) were mostly provided by foreign civil societies and NGOôs. Undeniably, such organizations strongly demand political stability and absence of violence before establishing health and education centers. Hence, the existence of political stability is a defining factor for better economic progress. However, voice and accountability have negative impact on institutional quality in Africa, although it come out statistically significant at five per cent level of significance. Control of corruption, government effectiveness, regulatory quality and rule of law found to be statistically insignificant implying that fight against corruption, government implementation capacity and likelihood of crime and violence do not seem to be correlated with HDI of sampled countries.

Moreover, the result from model ***(2A)*** exhibits that HDI is significantly affected by its lag, trade openness, gross investment ratio and gross enrollment ratio. Institutional quality is found statistically insignificant in affecting economic development, indicating the absence relationship between governance quality and level of human development index. This is due to the tradeoff between the effect of each institutional quality indicators on HDI (i.e. the above table)

designates that political stability have positive effect whereas voice and accountability negatively and significantly affect HDI). Hence, when we take the averaged institutional quality index the negative effect of voice and accountability offset the positive impact of political stability, as a result the net effect of governance quality on HDI become insignificant. This result negates with argument of institutions hypothesis, that is some societies have good institutions that encourage investment in machinery, ***human capital***, and better technologies, and, consequently, these countries achieve economic prosperity (Acemoglu (2003)).

Model 2B: Two-step GMM regression outcome of economic development- institutional quality model by considering six governance indicators as a regressor

Variables	Model (a) Coeff.	Model (b) Coeff.	Model (c) Coeff.	Model (d) Coeff.	Model (e) Coeff.	Model (f) Coeff.
HDI_{t-1}	0.767 *** (0.067)	0.763 *** (0.078)	0.827 *** (0.043)	0.852 *** (0.048)	0.821 *** (0.05)	0.839 *** (0.066)
TO	-0.0012 *** (0.0003)	-0.0006 ** (0.00024)	-0.0007 * (0.0004)	-0.001*** (0.00035)	-0.0014 *** (0.0002)	-0.001 ** (0.0002)
GIR	0.0063 *** (0.0011)	0.0045 *** (0.0008)	0.0048 *** (0.0008)	0.0055 *** (0.0008)	0.006 *** (0.0009)	0.004 *** (0.0005)
GER	0.0007 ** (0.0003)	0.0005 *** (0.00003)	0.0002* (0.00012)	0.0004 *** (0.0001)	0.0005 * (0.0003)	0.0007 ** (0.0003)
CC	-0.0114 (0.028)					
PS		0.024 * (0.011)				
GE			-0.0344 (0.042)			
RQ				-0.01 (0.03)		
RL					-0.007 (0.021)	
VA						-0.026 ** (0.012)
Const.	0.0481** (0.023)	0.0514 ** (0.024)	0.063 *** (0.021)	0.088 *** (0.017)	0.095 *** (0.025)	0.0514 * (0.03)
Hansen-Sargan Test P-value	0.632	0.24	0.3	0.526	0.736	0.528
AR (1) P-value	0.32	0.49	0.61	0.73	0.55	0.47
Wald test	0.000(452.5)	0.000 (1298)	0.000(733.4)	0.000(524.1)	0.000(739.2)	0.000(1858)
No. of obs.	81	81	81	81	81	81

Lastly, in all the regressions the coefficients of physical capital (GIR)
and human capital (GER) came out with significant and positive, which conforms with the a priori expectation. These results confirm the relevance of augmented Solow model in explaining Africaôs economic progress. Hence, investment in physical and human capital is important in promoting rapid growth in Africa.

II. The Effect of Economic Development on Institutional Quality

A. *Taking GDP per capita as a proxy for economic development and including colonial dummy*

Looking at the effect of development on institutions, GDP per capita is found to be positively and significantly related with governance quality of the country (at one per-cent level of significance), implying that economic progress is one of the most important determinants of institutional quality in Africa. The result strongly supports the argument of Chang (2011).

Model 3A: Two-step GMM regression result of institutional quality- economic development

Regressors	Coefficient	Std. Error	Z-statistics
IQ t-1	1.026***	0.023	44.67
GDPPC	0.001***	0.0003	3.31
GIR	0.0007**	0.0003	2.33
TO	-0.001***	0.0002	-5.07
GER	0.0005***	0.00013	3.85
Colonial Dummy			
0	0		
BRITISH	0.021***	0.006	3.48
Constant	0.043***	0.01	4.3
Specification Test Statistics			
AR (1) P-value = (0.70)			
Wald Stat, P-value = 0.000		Ho $IQ_t = IQt_{-1} = 0$	
Sargan Test Chi^2 = 67(0.721)			
Number of Observation	76		
Number of Group	26		

In addition to looking at the effect of economic development on governance quality, here colonial dummies are incorporated on this model so as to analyze whether there is difference in institutional quality between the selected countries based on their past colonial experience.

Acemoglu, Johnson, and Robinson (2001) document that in a large number of colonies, especially those in Africa, Central America, and South Asia, European powers set up ñextractive states.ò These institutions (again broadly construed) did not introduce much protection for private property, nor did they provide checks and balances against the government. The explicit aim of the European in these colonies was extraction of resources, in one form or another. Therefore, it is justifiable to check the cross-country governance quality of countries based on their colonial history.

Coming to our dummy variable, we created the dummy by classifying countries as British and non-British colony, this is because among countries taken into consideration most of them were British colonies, and also it is difficult to create additional dummies for other colonizers because of lack of sufficient 0ôs and 1ôs which is a precondition for valid dummy variable regression. Additionally, unlike the remaining colonizers, Britain followed indirect rule which was expected to open the door for colonized countries to build their own governance structure.

The result on the above table (model ***3A***) indicates that our dummy is significant at 1per cent level of significance implying that, there is a significant difference between the institutional quality of countries colonized by Britain and countries colonized by others (French, Portugal and Belgium). Hence, there is difference in institutional quality of African countries due to difference in their colonial background or colonial history is one important factor for cross-country variation of institutional quality in Africa. This result is supports colonial heritage arguments, that, the historical accidents have major role in explaining the current quality of institutions in the region. It is often argued that colonialists introduced extractive institutions in their colonies depending on the identity of the colonizer and whether European themselves settled in their colonies. These colonial institutions are believed to persist and determine the quality of current institutions former colonies have.

In general, the French administrative system was more centralized, bureaucratic, and interventionist than the British system of colonial rule. The other colonial powers-Portugal and Belgiumð used varied administrative systems to facilitate control and economic exploitation. However, no matter the system, they were all alien, authoritarian, and bureaucratic, and distorted African political and social organizations and undermined their moral authority and political legitimacy as governing structures.

B. ***Taking HDI as a proxy for economic development and including colonial dummy***

Now economic development is proxied by HDI so as to see the effect of economic progress on governance quality. HDI is found statistically insignificantly related with governance quality of the country, still implying that HDI is not one of the most important defining factors of institutional quality in Africa.

Model 3B: Two-step GMM regression result of institutional quality- economic development

Regressors	Coefficient	Std. Error	Z-statistics
IQ t-1	0.71***	0.078	9.1
HDI	0.012	0.08	0.15
TO	-0.002***	0.0003	-6.67
GIR	0.004***	0.0012	3.33
GER	0.00034***	0.0001	3.38
Colonial Dummy			
0	0		
British	0.06***	0.0145	4.14
Constant	0.094**	0.037	2.53
Specification Test Statistics			
AR (1) P-value = (0.32)			
Wald Stat, P-value = 0.112 (96.8)		Ho $IQ_t = IQt_{-1} = 0$	
Sargan Test Chi^2 = 14 (0.206)			
Number of Observation 76			

Regarding the colonial dummy the result we found here is similar with the outcome of model (***3A***), which still conform the existence of institutional quality difference between British and non-British colony.

Causality Results

To test whether economic development Granger-causes institutional quality, the coefficients of lags of economic progress (from model l and 2) are tested jointly employing Wald test. The null hypothesis that economic development does not Granger-causes institutional quality is tested against the alternative that at least one of them is different from zero. The Wald test result from model 1 and 2 rejects our null hypothesis of no causality. This indicates that economic development Granger-causes institutional quality which in turn means that current and past information on economic progress helps to improve prediction of governance quality.

Similarly, the null hypothesis that the coefficients of lagged values of institutional quality (in ***model 3A***) are jointly equal to zero is tested against the alternative that at least one of them is different from zero. The Wald test, again, rejects the null hypothesis of no causality showing that governance quality also Granger-causes economic development. In other words, current and past information on institutional quality helps to improve the prediction of economic prosperity. The causality test result, therefore, implies that institutional quality and economic development (GDP per capita) have bidirectional causality running both from governance to development and from development to governance. However, in model 3B (i.e. economic development is proxied by HDI), the Wald test failed to reject the null hypothesis of no causality showing that institutional quality does not Granger-causes economic development (HDI).

Arellano-Bover Estimation Diagnostic Tests

In most instances one and/or two post estimation procedure(s) is (are) undertaken to evaluate the Arellano and Bover (1995) and Blundell and Bond (1998) model. Two types of diagnostic test are used to determine the validity of our empirical models. These tests include the Hansen-Sargan test of identifying restrictions and autocorrelation test. The tests are reported at the lower end of each table corresponding to each model.

I. Test of over identifying restrictions

The Hansen-Sargan test of identifying restrictions under the null hypothesis of the validity of instruments (Roodman, 2006) examines the quality of specification of the model and the appropriateness of the instruments used. For all models, a high p-value of Hansen-Sargan test statistics is observed and hence the null hypothesis fails to reject. This shows that all specifications are well specified and that the instruments are appropriate.

II. Test for autocorrelation

The test results of first-order autocorrelation (AR (1)) reported on each model of this paper show that the null hypothesis of no autocorrelation is failed to be rejected as the p-values exhibits insignificance. Hence, the observed high p-value results of AR (1) in all of our models reveal that the instruments used in all models are independent of the error term and hence appropriate for the estimation. Also, it suggests the consistency of our estimates and validity of the System GMM estimator.

5. CONCLUSION AND IMPLICATIONS

5.1. Conclusion

To capture the inter-linkage between economic development and institutional quality, GDP per capita and human development index (HDI) were used as proxy for economic development whereas governance quality is proxied by average institutional quality index which is aggregated from six independent indicators. The parameters of the model were estimated using panel data by Arellano and Bover (1995) dynamic panel data estimation technique.

The estimation result of the first model shows that aggregated institutional quality positively and significantly affects real GDP per capita. More specifically, looking at the impact of each governance indicators on economic development, except voice and accountability all governance indicators have strong positive impact on economic progress. After disaggregating countries in terms of their level of income, the result we obtained suggests that good governance have positive and significant impact on economic development of all countries under consideration regardless of their level of growth, but better institution is highly desirable for lower income economies.

The estimation result of the second indicates unexpected outcome, that, there is no significant relationship between governance quality and economic development. Moreover, when we analyzed the separate effect of governance indicators on HDI, only political stability and voice and accountability found significant with positive and negative coefficient respectively. This implies that, the transmission mechanism of institutional quality to development is income.

The last model which was conducted to capture the causation shows that, institutional quality is positively and significantly affected by economic development and vice versa. The estimation results show the relationship between development and governance is **bidirectional**, meaning governance has a statistically significant effect on economic development and economic development also has a significant effect on institutional quality. It is shown that institutional quality Granger-causes development, and development also Granger-causes governance quality. This indicates that the growth of one will be retarded unless the other is carefully managed.

Furthermore, the regression result depicts that there is significant difference between the institutional quality of countries colonized by Britain and countries under other colonizers (France, Belgium and Portugal). Hence, the colonial background of the countries was one of the factors for cross country variation of institutional quality in Africa.

In a nutshell, development and governance have a significant relationship with bidirectional causality running in both directions. Control of corruption, political stability and absence of violence, regulatory quality, rule of law, and government effectiveness independently and significantly affects economic development.

The salient conclusion drawn from this study suggest that good governance is important for the economic progress of African economies, especially in those countries which are at the low end

of the income level. In addition to improvement in quality of institutions, two other variables seem to matter for Africaôs progress too, increase in investment in physical and human capital, but trade openness have a negative effect on African economic development. Also, economic development (RGDP per capita) the most important defining factor of governance quality in Africa.

5.2. Policy Recommendations

The significance and bi-directional causality between economic development (GDP per capita) and institutions necessitates the need to formulate ñdevelopment-inducingò ñgood governanceò strategies. Since the causality is running from both directions, governments have to put ñdevelopment-inducingò and ñgood governanceò simultaneously among their priorities. Due attention, also, has to be given to improve the quality of governance while working towards accelerating economic development. Consequently, the stakeholders should not treat them as different strategies, rather it has to be treated as integral components of the same strategy.

To achieve sustainable economic development in Africa, both domestic and external policy makers have to place significant emphases on the maintenance of the *political stability*, *government effectiveness, regulatory quality*, *rule of law*, and *control of corruption*. More specifically:

- Government should formulate and implement sound policies and regulations that encourage the private sector development
- Countries should eliminate the likelihood of government destabilization and domestic violence
- Countries should combat the practice of using public power for private gain
- Government should ensure its effectiveness by enhancing the quality of public and civil services as well as policy implementation.
- Countries should maintain the effectiveness and predictability of their judiciary organ.

Also, there is the need to design appropriate policies that promote economic growth (as institutional quality responds positively to the improvement in economic performance). Therefore, African countries need to concentrate on policies to promote development since development enhances institutional quality.

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APPENDICES

Appendix 1: Two-step GMM regression result after disaggregating countries in terms of level of income

Regressors	Coefficient	Std. Error
IQ t-1	0.93***	0.0134
LnGDPPC	0.0072**	0.003
GIR	0.0032*	0.0017
TO	-0.0053***	0.0014
GER	0.0005***	0.00013
Colonial Dummy		
0	0	
Lower-income	-0.0036*	0.002
Constant	0.096**	0.04
Specification Test Statistics		
AR (1) P-value = (0.002)		
AR (2) P-value = (0.25)		
Wald Stat, P-value = 0.000	Ho $IQ_t = IQt_{-1} = 0$	
Sargan Test Chi^2 = (0.361)		
Number of Observation	81	
Number of Group	27	

Appendix 2: Selected countries

Algeria
Angola
Benin
Botswana
Cameron
Chad
Congo, Rep.
Cote dôIvoire
Ethiopia
Egypt
Gabon
Ghana
Kenya
Mali
Malawi
Morocco
Mozambique
Namibia
Nigeria
Rwanda
Senegal
Tanzania
South Africa
Uganda
Tunisia
Zambia
Zimbabwe