DEPARTMENT OF ECONOMICS AND FINANCE WORKING PAPER SERIES • DECEMBER *2010*

The Impact of Governance on Economic Growth: Further Evidence for Africa

Bichaka Fayissa*
Department of Economics & Finance, Middle Tennessee State University, TN

Christian Nsiah
Black Hills State University, Spearfish, SD

Abstract

Sub-Sahara African countries have had a checkered past when it comes to good governance and good institutions. Increasingly, economists and policy makers are recognizing the importance of good governance and institutions for economic growth and development. The New Partnership for Africa's Development (NEPAD) which was initiated by the African Heads of State and endorsed by the G8 countries including the European Union, Japan, and China in October 2001 has four main goals: eradicating poverty, promoting sustainable growth and development, integrating Africa into the world economy, and accelerating the empowerment of women. The NEPAD objectives are based on the underlying principles of a commitment to good governance, democracy, human rights and conflict resolution, and the recognition that the maintenance of these standards is fundamental to the creation of an environment conducive to investment and long-term economic growth. The objective of this paper is to investigate the role of governance in explaining the sub-optimal economic growth performance of African economies while controlling for the conventional sources of growth. Our results suggest that good governance or lack thereof contributes to the gaps in income per capita between richer and poorer African countries. Furthermore, our results indicate that the role of governance on economic growth depends on the type and the level of income growth of countries under consideration.

Key Words: Workers' Remittances, Economic Growth, Panel Data, Arellano-Bond, Quantile Regression, Sub-Saharan Africa

JEL Classification: E21 F21, G22, J61, O16

***** Corresponding author: Bichaka Fayissa, Professor of Economics, Department of Economics & Finance, Middle Tennessee State University, Murfreesboro, TN 37132, Tel. (615) 898-2385, Fax (615) 898-5596, Email: bfayissa@mtsu.edu

The Impact of Governance on Economic Growth: Further Evidence for Africa

I. Introduction

The growth literature is replete with empirical studies which have considered the impact of the conventional sources of growth including investment in physical and human capital, labor, trade, aid, foreign direct investment (FDI), geography, and a variety of other variables within the neoclassical growth framework. Since the end of the Cold War until the early 1990's, however, the issue of good governance has become an important concept in the international development debates and policy discourse.

The working definition of what constitutes good governance has evolved over the years. Schneider (1999) defines good governance as the exercise of authority, or control to manage a country's affairs and resources. The United States Agency for International Development (USAID, 2002), on the other hand, defines good governance as a complex system of interaction among structures, traditions, functions, and processes characterized by values of accountability, transparency, and participation. The UNDP (2002) defines good governance as striving for rule of law, transparency, equity, effectiveness /efficiency, accountability, and strategic vision in the exercise of political, economic, and administrative authority.

Historically, sub-Saharan African countries have had a checkered good governance record in comparison to other regions of the world. These countries have been bogged down with political instability, government ineffectiveness, the lack of rule of law, and serious problems of corruption which are signs of bad governance. With respect to the importance of good governance to development, improving governance in this region has been given a central place in the New Partnership for Africa's Development (NEPAD). Over the past few years, some countries in this region including, but not limited to Botswana and Ghana, have made significant progress in terms of governance.

Recently good governance has become conditionality for the disbursement of development assistance to less developed nations. Furthermore, foreign investors are increasingly basing their investment decisions on good governance. Granted, there are some economists including Owens (1987), and Sen (1990) who recognized and advocated for the need for political and economic freedom as an essential dimension for economic growth, these studies were theoretical discourses rather than being empirical expositions. Since 1990s, however, empirical studies in this area have dealt with the effects of lack of good governance rather than its direct impact on the economic growth of emerging countries.

Given that the governance situation differs from one sub-Saharan African country to the other, the objectives of this inquiry are twofold. First, we investigate the effect of various governance indices on economic growth of sub-Saharan African countries while considering the conventional sources of growth. Second, we investigate whether the impact of these governance indicators differ by the conditional distribution of economic growth. Thus, we investigate whether the impact of governance on economic growth depends on the relative level of growth.

The rest of the paper is organized as follows. Section II provides a review of selected literature. In section III, we specify a conventional neoclassical growth model which incorporates remittances as one of the sources of growth and we also specify a quantile regression model. Section IV presents estimation results for both the fixed and random effects regressions accounting for both the country and time effects and quantile regression estimation. The last section summarizes the results, draws conclusions, and makes some policy recommendations for promoting remittances as a growth and development strategy.

II. A Review of Selected Literature

Earlier studies including Owens (1987) and Sen (1990) have argued for the need for economic and political freedom as necessary conditions for the economic growth and development of nations.

Nevertheless, most of the previous studies only considered certain dimensions of governance which are theoretical in nature. Empirical studies that have been undertaken since 1990's primarily dealt with the effects of poor governance (as proxied by political and export instabilities and corruption) on the sources of growth rather than its direct impact on growth.

Keefer et al. (1997) find that institutions such as property rights and contract enforcement positively influence economic growth. Campos and Nugent (1999) also find that the institutions of governance improve the development performance. Kaufmann, et al. (1999a and 1999b) identify the problems associated with the aggregation of good governance measures, but conclude that good governance matters for development.

In a cross-sectional analysis of all developing countries, Chauvet and Collier (2004) found that those countries suffering from poor governance, on average, experience 2.3 percentage points less GDP growth per year relative to other developing countries. There are also other recent findings that suggest a strong causal effect running from better governance to better development outcomes.[1]

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 once differences in their levels of development have been accounted for and thus conclude that a focus on governance reforms is misguided.[2]

---

[1] See Knack and E. Keefer (1995), Mauro (1995), and Acemoglu, et al. (2004)

[2] Doornbos (2003) acknowledges that the metamorphosis of good governance is a policy metaphor.

The above findings which appear to contradict each other signify the need for more research in this arena. Our study seeks to reconcile the two opposing research findings by first focusing our analysis only on African countries, secondly investigating the impact of the different measures of good governance (such as voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption) while controlling for the conventional sources of growth, and also examine the impact of the composite index of good governance on the economic growth of Sub-Sahara African countries. Furthermore, we use quantile regression analysis to investigate if the impact of governance on economic growth differs by the composition of the income distribution of African countries (see the appendix for a brief exposition of quantile regression) . In a recent study of institutions, governance, and economic development in Africa, Fosu, et al. (2006) draw the conclusion that while politically accountable governments can lead to improved economic outcomes, they are unlikely to adopt economically desirable policies that are unpopular with the populace and that the tendency of such governments which increases the risk of political discord may actually stand in the way of a meaningful economic growth path. Our study may also shed some light on the validity of the above observations for making growth-enhancing governance policy recommendations. We now turn to the specification of an empirical model for the analysis of the impact of the various governance measures described above while controlling for the conventional sources of growth in section III.

III. An Empirical Model of Economic Growth with Governance

This study employs panel data for 28 sub-Saharan African countries for the years between 1990 and 2004. The choice of countries and time series data rests on the availability of data. Except for the governance indicators (which are taken from the Fraser Institute's Economic Freedom of the World Index) and the foreign financial flow data (which are taken from the UNCTAD Handbook of Statistics) all data are from the World Bank Development Indicators (WDI, 2006) CD. The definitions and descriptive statistics of each variable included in the growth model are provided in Tables 1 and 2, respectively.

Our primary goal is to investigate whether good governance has an impact on the economic growth of African countries and thus may explain the differences in their economic growth. Furthermore, we seek to determine whether the impact of good governance is similar along all conditional distributions of income (i.e. low, middle, and high groups). While the focus of this study is on the impact of good governance on economic growth, we also take into consideration the traditional sources of economic growth such as investment in physical and human capital, openness to trade, foreign investment, and official development assistance. We specify a simple double log-linear Cobb-Douglass production function as:

$$PCI_{it} = \alpha + \beta_1 GFC_{it} + \beta_2 SCH_{it} + \beta_3 TRD_{it} + \beta_4 AID_{it} + \beta_5 FDI_{it} + \beta_6 HHC_{it}$$
$$+\beta_7 OIL_{it} + \beta_8 DPR_{it} + \beta_{10} TEL_{it} + \beta_{11} GG_{it} + \varepsilon_{it} \qquad (1)$$

where β denotes the estimated coefficients, i and t denote the i^{th} country and the t^{th} time period, *respectively.* PCI_{it} is the natural log of real GDP per capita; *GCF* is the log of gross fixed capital formation which is used as a proxy for investment in physical capital; *SCH* is secondary and tertiary school enrollment as a percentage of the gross enrollment used as measure of investment in human capital; *TOT* is the log of trade as a percent of GDP for each country under consideration to capture the impact of openness of the economy on economic growth; *AID* denotes official development assistance and foreign aid in current US$; *FDI* is the log of foreign direct investment flows in US$ as a percent of real GDP; *HHC* denotes real household consumption expenditure per capita, whereas as *OIL* is the log of crude oil production; DPR_{it} is the log of dependency ratio; TEL denotes the log of landline phones per thousand population; Last, GG_k denotes each of the six indicators of good governance and the composite index of good governance).

We hypothesize a positive relation between investment in physical capital (GCF_{it}), investment in human capital (SCH_{it}), the openness of the economy (TOT_{it}), and real GDP per capita income (PCI_{it}). Intuitively,

it makes sense to expect that foreign direct investment (FDI) will promote growth in the host country, not just by providing direct capital financing, but also creating positive externalities via the adoption of foreign technology and know-how. The empirical literature, however, finds mixed evidence on the impact of foreign direct investment on host country's economic growth. The conclusions made by related literature range from significantly positive (Ram and Zhang, 2002 and Campos and Kinoshita, 2002) to insignificant (Carkovic, and Levine 2002), and to significantly negative (Dutt 1997 and Saltz 1992). Other macro level studies also suggest that country characteristics are important in determining the contributions of FDI to growth. For example, Borensztein et al. (1998) and Xu (2000) point out that FDI leads to positive growth only if certain minimum stock of human capital exist in the host country, whereas Alfaro et al. (2002) and Durham (2004) argue that only countries with well developed financial markets realize significant growth rates due to FDI. Since the effect of foreign direct investment (FDI_{it}) on economic growth has been mixed, the expected relation may be ambiguous (i.e., positive or negative).

The impact of foreign aid (AID_{it}) on economic growth is also controversial. In her recent book titled Dead Aid, Moyo (2009) argues that aid disbursements which are especially in the form of concessional loans and grants have hampered, stifled, and retarded Africa's development. Some studies including Hansen and Tarp (2000; 2001) and Dalgaard et al. (2004) find a positive impact while others including Mosley (1980) and Shan (1994) identify a negative impact of aid on growth. On the other hand, Fayissa and El-Kaissy (1999) and Burnside and Dollar (2000) conclude that aid has a positive impact on growth in developing countries with good policies and little effect in countries with poor policies. Using an expanded version of the dataset of the latter study, Easterly et al. (2004) raise new doubts about the effectiveness of aid even in the case of good policies. Thus, the effect of aid (AID_{it}) on economic growth cannot be predicted *a priori*.

High dependency ratio (DPR) has been associated with low economic growth in the literature. The argument put forth is that high DEPR dilutes the contribution of per worker real GDP growth to real per capita GDP growth. Bloom and Sachs (1998) conclude that it negatively impacts national savings and

human capital formation. Krugman (1994) stresses the importance of changes in DPR as the main driving force for the rapid growth of several Asian economies in recent years.

Most previous literature shows a positive relationship between infrastructure and economic performance. Datta and Agarwal (2004) indicate that telecommunications infrastructure played a positive and significant role in economic growth in 22 OECD countries from 1980-1992. OECD (1994), and Roller and Waverman (2001) examine the effects of telecommunication infrastructure investment and economic performance and find telecommunication investment has a significant growth effect, particularly when there is already a substantial network infrastructure in place. Easterly and Levine (1997) also find that infrastructure development as measured by telephones per worker contributes to economic growth. We follow the example of Easterly and Levine (1997) and proxy infrastructure investment with telephone mainlines per thousand population(*TEL*). The relationship between infrastructure investment and economic growth is expected to be positive.

We estimate the parameters corresponding to the explanatory variables of Eq. 1 above by the fixed-effects and random-effects models based on panel data for 28 African countries spanning from 1990 to 2005. An empirical representation of the model is provided in equation (2) below.

$$Y_{it} = \delta_i + \Gamma_t + \left(X_{it}\right)\Phi + \Psi_{it} \qquad (2)$$

Y_{it} is the natural logarithm of real GDP per capita in country *i* at year *t;* and X_{it} is a vector of the explanatory variables (investment in physical and human capital, terms of trade, foreign aid, foreign direct investment, household consumption, oil production, dependency ratio, telecommunications investment, and the measures of good governance) for country i = 1, 2…, n and at time t= 1, 2, …,T; Φ is a scalar vector of parameters of $\beta_1 \ldots \beta_7$; ψ_{it} is a classical stochastic disturbance term with $E[\psi_{it}]= 0$ and var $[\psi_{it}]= \sigma_{\varepsilon}^2$, δ_i and Γ_t are country and time specific effects, respectively. Instead of *a priori* decision on the behavior of $\delta_i + \Gamma_t$, different types of assumptions are separately imposed on the model with the one having robust estimates chosen.

Assuming the country specific effects to be constant across countries and the time specific effects are not present [i.e. $\delta_i = \lambda$ and $\Gamma_t = 0$)], model (2) then is being estimated by the Ordinary Least Squares (OLS) method, or restricted OLS method. The second estimation technique assumes that the country specific effects are constant, but not equal (i.e. $\delta_i = \lambda_i$ and $\Gamma_t = 0$) which yields a One-Way fixed-effects model. The third assumption presumes a situation where the country effects are not constants, but rather disturbances; the time effects then are not present [i.e. $\delta_i = \lambda + w_i$ and $\Gamma_t = 0$], where E [w_i]=0 and var[w_i]= σ_w^2 and cov[ψ_i, w_i] =0. In this case, model (2) is estimated by the Generalized Least Squares (GLS) which yields a random-effects model.

Next, using a modified version of equation (2), we employ a quantile regression analysis to investigate whether the impact of good governance on economic growth depends on the conditional economic income distribution of countries. A quantile regression is a statistical technique intended to estimate and conduct inference about conditional distribution functions. Just as the classical linear regression methods based on the minimization of sums of squared residuals enables one to estimate models for conditional mean functions, quantile regression methods offer a mechanism for estimating models for the conditional median function and the full range of other conditional quantile functions. The estimation of conditional mean functions with techniques for estimating an entire family of conditional quantile functions, allow us to provide a more complete statistical analysis of the stochastic relationships among random variables (Koenker and Billias, 2001).

The quantile regression model, first introduced by Koenker and Bassett (1978), and applied by Buchinsky (1998) can be written as:

$$lny_{it} = x_{it}^{'} + \beta_\theta + \mu_{it} \quad with\ |Q_\theta(lny_{it}/x_{it}) = x_{it}^{'}\beta_\theta \qquad (3)$$

where lny_{it} denotes the vector of log of gross domestic product per capita, x_{it} is a vector of all the independent variables used in the OLS type regressions , β is a vector of the parameters to be estimated, and u_{it} is a vector of residuals. $Q_\theta(lny_{it}/x_{it})$ represents the θ^{th}conditional quantile of lny_{it} given x_{it}. The θ^{th} regression quantile (0 < θ < 1), solves the following minimization of the sum of absolute deviations residuals:

$$\min_{\beta} \frac{1}{n}\left\{ \sum_{i,t:lny_{it} \geq x_{it}'\beta} \theta|lny_{it}\beta| + \sum_{i,t:lny_{it} \geq x_{it}'\beta} (1-\theta)|lny_{it} - x_{it}'\beta| \right\} = \min_{\beta} \frac{1}{n} \sum_{i=1}^{n} \rho_\theta(\mu_{\theta it}) \quad (4)$$

Where $\rho_\theta(.)$ is called the "check function" which is defined as:

$$\rho_\theta(\mu\theta_{it}) = \begin{cases} \theta\mu_{it} & if\ \mu_{\theta it} \geq 0 \\ (\theta-1)\mu_{\theta it} & if\ \mu_{\theta it} < 0 \end{cases} \quad (5)$$

By allowing θ to continuously change from zero to one, we are able to trace the impact of each governance indicator and other control variables on the entire distribution of per capita GDP at any given quantile. Thus, the unique feature of this methodology is that it allows us to relax the assumption made in least squares regression where the parameter estimates are assumed to be the same at all points on the conditional GDP distribution.

Thus, unlike the OLS estimator which provides the impact of an explanatory variable at the conditional mean of the dependent variable, the quantilie regression derives estimates for different conditional quantiles of the dependent variable. The coefficients can be interpreted as the partial derivative of the conditional quantile of dependent variable with respect to particular explanatory variable. This derivative can be interpreted as the marginal change in the dependent variable at the θ^{th} conditional quantile due to the marginal change in a particular explanatory variable. In implementing the quantile regression to panel data, Koenker (2004) suggests that unobserved firm level fixed-effects can be controlled by including

firm dummies in the regression. We follow Koenker (2004) by incorporating country level dummies to control for unobserved country level fixed-effects.

Following Koenker and Hallock (2001), this study fits a regression model for nineteen quantiles of per capita income; they are evenly spaced at intervals of .5, starting at the first quantile and ending at the 9.5^{th} quantile. We use these regressions to check whether the impact of good governance on economic growth varies by quantiles of conditional gross domestic product. The result of this analysis is presented in Figures 1, panels A through G.

<<Insert Table 1 here >>

IV. Empirical Results and Interpretations

Several versions of equation 2 are tested in order to obtain a model which yields robust results and best fits of the data. Accordingly, Table 2 presents the estimation results of the fixed-effects model whereas Table 3 presents the estimation results for the random-effects model. Apart from the magnitude of the coefficients, the results reported in Tables 2 and 3 are comparable.

A comparison of the consistent fixed-effects with the efficient random-effects estimates using the Hausman specification test, rejects the random-effects estimates at $p<0.05$ in favor of the fixed-effects model. We thus base the discussion of our findings on the more robust fixed-effects results reported in Table 2. Broadly, the results reveal the expected relationship between the per capita income (GDP_{it}) and the explanatory variables i.e., the variables representing the sources of growth have the expected signs and are according to the a *priori* predictions. All the coefficients represent elasticities since we estimated a double-logarithmic model.

<< Insert Tables 2 and 3 here>>

The results from our model of choice indicate that all the governance variables have positive and statistically significant effects on the GDP per capita (at $p < .05$) of African countries. However, we find that the magnitude and significance of the impact of good governance depends on the proxy of good governance used. Accordingly, when the voice and accountability index (*VAI*) is used as the proxy for good governance, a 10 percent improvement in the voice and accountability of a county's citizenry leads to a .68 percent increase in its real per capita income. In the case of political stability (*PSI*), we find that a 10 percent increase in the political stability index of a country corresponds to a .37 percent rise in its real per capita income. We find that a 10 percent improvement in a country's government effectiveness index (*GEI*) and regulatory quality (*RQI*) lead to a .73 and .61 percent increase in its real per capita income, respectively. Similarly, we find that a 10 percent improvement in rule of law (*RLI*) and control of corruption index (CCI) translate into a .21 and .15 percent rise in per capita income. When considering the composite governance indicator (*GOI*) which is the unweighted average of all the six sub-categories of good governance, we find that a 10 percent improvement in good governance, results in a .91 percent increase in the real per capita income of a country.

For the quantile regression, although the analyses were done with all the explanatory variables used in the fixed and random-effects models, we concentrate our discussion on the governance indicators, our variables of interest in the interest of space. The results are presented in Figures 1 panels A through G.

In the case of the voice and accountability index (*VAI*), the results as presented in Panel A indicate that voice accountability have a positive impact on all quantiles of income, except the 95^{th} quantile, but it has a larger positive impact for the lower quantiles. Further, the graph indicates that several estimated coefficients for the quantile regression fall outside the confidence interval area for the OLS estimates as denoted by the dotted lines. This finding implies that the impact of voice and accountability on income for those quantiles is significantly different from the OLS estimates.

For the political stability (*PSI*), the results as presented in Panel B suggest that *political stability* also hasa positive impact at almost all levels of growth. The graphical of the quantile regression estimates indicate that political stability is much more important for "low-income economies" than for and "high-income economies." The graph also shows that several estimated coefficients for the quantile regression fall inside the 95% confidence interval area for the OLS estimates as denoted by the dotted lines. This finding indicates that the impact of political stability on income estimated for the conditional quantiles are not significantly different from the OLS estimates.

In the case of *government effectiveness*, the quantile regression estimates as presented in Panel C indicate that government effectiveness has a positive impact on growth at all economic level. The V-shape of the graph though suggests that the impact of government effectiveness is more pronounced at lower and upper levels of growth than for middle quantiles of economic growth. Further, apart from the estimate for the 5^{th} quantile, the graph indicates that the impact of government effectiveness on growth for all the other quantiles falls within the 95% confidence interval area for the OLS estimate as denoted by the dotted lines, suggesting that. the impact of government effectiveness on income estimates for the conditional quantiles are not significantly different from the OLS estimates.

The quantile regression estimates for the *regulatory quality* in Panel C indicates that it has a positive impact on economic growth at all levels of growth. However, the magnitude of the impact is higher at very low levels of growth than for higher levels of growth. Further, the graph shows that several quantile estimates fall outside the 95% confidence interval area for the OLS estimates, indicating that these quantile estimates are significantly different from estimates derived from OLS type regressions.

The impact of *rule of law* on economic growth (Panel E) indicates that it has a positive impact on economic growth at all levels of income. However, the graph shows that the impact of rule of law is generally larger for lower levels of economic growth than at the higher levels of economic growth. The graph shows that quantile estimates up to the 1^{st} quantile fall outside the 95% confidence interval area for

the OLS estimate (denoted by the dotted lines), indicating that those quantile estimates are significantly different from the OLS estimates.

In the case of *control of corruption*, the quantile regression estimates show a positive impact of corruption control on economic growth at all levels of growth (Panel F). The graph also indicates a small variation between quantiles in terms of the magnitude of the impact of corruption control on economic growth. Despite the visible difference between the quantile and OLS regression estimates of the impact of corruption control on economic growth, most of the quantile regression estimates fall within the 95% confidence interval area for the OLS estimate as denoted by the dotted lines, implying that the quantile regression estimates are not significantly different from the OLS estimate.

Finally, the quantile regression estimation results for the overall measure of good governance indicator (Panel G) show that good governance has a positive impact at all levels of growth. The u-shape of the graph indicates that good governance is desirable at all levels of growth, but it is more important for the lower and upper quantiles than for the middle quantiles of economic growth.

V. Conclusion

The purpose of this inquiry has been to identify the impact of good governance on per capita income growth for countries of the Sub-Saharan African region and to investigate whether the impact differs by conditional distribution of GDP per capita. Six different sub-categories of good governance (*voice and accountability*, *political stability*, *government effectiveness*, *regulatory quality*, *rule of law*, and *control of corruption*) and one overall measure of good governance are analyzed. The empirical results are based on annual panel of data of 28 African countries covering the years between 1995 and 2005. The results of the alternative estimated models suggest that good governance has a positive and significant impact on growth, regardless of the proxy used for good governance. Furthermore, the results indicate that the

impact of good governance differs by the conditional distribution of the GDP per capita under consideration.

The salient conclusions drawn from this study suggest that good governance is important for the economic growth of sub-Saharan African economies, especially in those countries which are at the low end of the income distribution spectrum. To reverse the persistent anemic economic growth trend in Sub-Sahara Africa, both domestic and external policy makers may have to place significant emphases on the maintenance of the *voice and accountability*, *political stability*, *government effectiveness*, *regulatory quality*, *rule of law*, and *control of corruption*.

References

Acemoglu, Daron, Simeon Johnson and James A. Robinson (2000), "The Colonial Origins of Comparative Development: *American Economic Review*, 91, No. 5 (December 2001): 1369-1401.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., Sayek, S. (2004), "FDI and Economic Growth: The Role of Local Financial Markets," *Journal of International Economics*, 64: 89-112.

Barro, R, J. (1995). "Inflation and Economic Growth." *Bank of England Quarterly Bulletin* (May).

Bloom, D. and J. D. Sachs (1998). "Geography, Demography, and Economic Growth in Africa." *Brookings Papers on Economic Activity*, 2, 207-73.

Buchinsky, M. (1998). Recent Advances in Quantile Regression Models: A Practical Guide for Empirical Research. *Journal of Human Resources* 33(1): 88-126.

Borensztein, E., J. De Gregorio, and J-W. Lee (1998). How Does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics*, 45, 115-135.

Bruno, M., and W. Easterly (1995). "Inflation Cruises and Long-run Growth." Mimeo, Washington, D.C.: World Bank, July.

Burnside C., and D. Dollar (2000). Aid, Policies, and Growth. *The American Economic Review*, 90, 847-868.

Campos, N. F. and Y. Kinoshita (2002). Foreign Direct Investment as Technology Transferred: Some panel Evidence from the Transition Economies, *Centre for Economic Policy Research. Discussion Paper No 3417*. Paper also available at www.cepr.org/pubs/dps/DP3417.asp

Campos, N.F., and Nugent, J.B. (1999), "Development Performance and the Institutions of Governance: Evidence from East Asia and Latin America," *World Development*, Vol. 27, No. 3: 439-452

Carkovic, M. and R. Levine (2002). Does Foreign Direct Investment Accelerate Economic Growth? University of Minnesota Department of Finance Working Paper.

Chauvet, Lisa and Paul Collier (2004), "Development Effectiveness in Fragile States: Spillovers and Turnarounds", Centre for the Study of African Economies, Department of Economics, Oxford University (Mimeo).

Dalgaard, C-J., H. Hansen, and F. Tarp (2004). On the Empirics of Foreign aid and Growth. *Economic Journal*, 114, 191-216.

Datta, A. and Agarwal, S. (2004), Telecommunications and economic growth: a panel data approach. *Applied Economics*, 36:1649-1654

Doornbos, M. (2003), "'Good Governance': The Metamorphosis of a Policy Metaphor", *Journal of International Affairs*, 57, no.1: 3-17, Fall 2003.

Durham, B.J., 2004. "Absorptive Capacity and the Effects of Foreign Direct Investment and Equity Foreign Portfolio Investment on Economic Growth." European Economic Review, 48, 285-306.

Dutt, A. K. (1997). The Pattern of Direct Foreign Investment and Economic Growth. *World Development*, 25, 1925–1936.

Easterly, W., and R. Levine. (1997). "Africa's Growth Tragedy: Policies and Ethnic Divisions." *Quarterly Journal of Economics*, 112(4), 1203–50.

Easterly, W., R. Levine and D. Rodman (2004). Aid, Policies, and Growth: Comment. *The American Economic Review*, 94, 774-780.

Fayissa, B. and M. El- Kaissy. (1999). Foreign aid and the economic growth of developing countries (LDCs): Further evidence, *Studies in Comparative International Development*, 37, (9), 37-50.

Fosu, Augustin,, Robert Bates, and Anke Hoeffler, (2006), "Institutions, Governance and Economic Development in Africa: An Overview, *Journal of African Economies*, 15 (Supplement 1):1-9.

Hansen, H., and F. Tarp (2000). Aid effectiveness disputed. *Journal of International Development*, 12, 375-398.

Hansen, H., and F. Tarp (2001). Aid and growth regressions, *Journal of Development Economics*, 64, 547-570.

Kaufmann, D., Kraay, A. and Zoido-Lobaton, P. (1999a), Aggregating Governance Indicators, Policy Research Working Paper No. 2195, Washington DC: World Bank.

Kaufmann, D., Kraay, A. and Zoido-Lobaton, P. (1999b), Governance Matters, Policy Research Working Paper No. 2196, Washington DC: World Bank.

Knack, Stephen and Phillip Keefer (1995),Institutions and Economic Performance: Cross-Country Test Using Alternative Institutional Methods, *Economics and Politics*, 7 (3), pp.207 – 227.

Koenker, R. and G. Bassett, (1978), Regression Quantitles, *Econometrics*, 46: 33-50.

Koenker, R and Y. Billias, (2001), Quantile Regression for Duration Data : A Reappraisal of the Pennsylvania Reemployment Experiment, *Empirical Economics*, 26 : 199-220.

Koenker, R. and K. F. Hallock, (2001), Quantitle Regression, *Journal of Economic Perspectives*, 15(4): 143-156.

Koenker, R. (2004). Quantile Regression for Longitudinal Data. Working Paper, University of Illinois at Urbana Champaign.

Kormendi, R. C., and P. G. Meguire. (1985). Macroeconomic Determinants of Growth: Cross-Country Evidence, *Journal of Monetary Economics*, 16(2), 141–63.

Krugman, P. (1994). "The Myth of the Asian Miracle." *Foreign Affairs*, 73(6), 62-78.

Loungani, P., and N. Sheets. (1997),Central Bank Independence, Inflation, and Growth in Transition Economies, *Journal of Money, Credit and Banking*, 29(3), 381-99.

Mosley, Paul, 1(980), *Aid, Savings and Growth Revisited*, *Oxford Bulletin of Economics and Statistics*, 42(2):79-95.

Moyo, Dambisa, 2009, Dead Aid: Why Aid Is Not Working and How There Is a Better Way for Africa, Farrar, Straus and Giroux (March 17, 2009).

OECD (1994), The impact of telecommunications infrastructure on economic growth and development DSTI/ICCP/TISP (94)4, Secretariat Working Paper.

Owens, E., 1987, The Future of Freedom in the Developing World, Pergamon Press.

Ram, R. and H. Zhang (2002),Foreign Direct Investement and Economic Growth: Evidence from Cross-Country Data for the 1990s, *Economic Development and Cultural Change*, 51, 205–215.

Roller, L., & Waverman, L. (2001), Telecommunications infrastructure and economic development: a simultaneous approach, *American Economic Review*, 91(4), 909-923.

Sachs, Jeffrey D., John W. McArthur, Guido Schmidt-Traub, Margaret Kruk, Chandrika Bahadur, Michael Faye and Gordon McCord (2004), Ending Africa's Poverty Trap, *Brookings Papers on Economic Activity* 1: 117-240.

Saltz, S. (1992). The Negative Correlation between Foreign Direct Investment and Economic Growth in the Third World: Theory and Evidence, *Rivista Internazionale di Scienze Economiche e Commerciali*, 39, 617-633.

Shan, J. (1994). Impact of Foreign Capital on Domestic Savings and Growth in Developing Economies, Discussion Paper No. 13, School of Economics and Public Policy, Queensland University of Technology, April.

Schneider, H. (1999), Participatory Governance: The Missing Link for Poverty Reduction, Policy Brief No. 17, Paris: OECD Development Centre.

Sen A., 1999, Development as Freedom, Alfred Knopf Publisher (New York: NY).

UNDP, 2002, Giving Voice to the Voiceless: Good Governance

USAID, 2002, "USAID Supports Good Governance," http://www.docstoc.com/docs/673298/USAID-Supports-Good-Governance

Xu, B. (2000). Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth, *Journal of Development Economics*, 62, 477-493.

Table 1: Variable Description and Summary Statistics

Variable	Description	Mean	Std. Dev.	Min	Max
PCI	GDP per capita (constant 2000 US$)	853.020	1326.883	56.520	7618.543
SCH	School enrollment, secondary + tertiary (% gross)	31.561	22.920	5.503	113.104
OIL	Crude Oil including Lease Condensate Production	82.352	329.560	0.000	2328.962
AID	Aid (% GNI)	14.260	17.595	0.000	210.561
FDI	Foreign direct investment, net inflows (% of GDP)	45.403	150.415	-6.890	2001.110
GFC	Gross fixed capital formation	20.351	11.265	1.802	113.578
HHC	Household final consumption expenditure per capita (constant 2000 US$)	582.123	828.622	64.199	4955.969
TRD	Trade as a percent of GDP	78.767	45.265	12.797	275.232
DPR	Age dependency ratio (dependents to working-age population)	0.900	0.110	0.460	1.130
TEL	Telephone mainlines (per 1,000 people)	24.879	51.059	0.180	286.660
VAI	Voice and Accountability Index (0-100)	31.035	20.946	1.000	79.800
PSI	Political Stability Index (0-100)	33.558	24.117	0.000	87.000
GEI	Government Effectiveness Index (0-100)	28.808	21.649	0.000	78.200
RQI	Regulatory Quality Index (0-100)	29.085	18.837	0.000	77.100
RLI	Rule of Law Index (0-100)	28.934	21.503	0.000	81.000
CCI	Control of Corruption Index (0-100)	29.137	19.693	0.000	84.000
GOV	((vap+psp+gep+rqp+rlp+ccp)/6)	30.093	18.103	0.567	76.067

Table 2: Random Effects Estimation Results

Variables	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Constant	2.433 ***	2.433 ***	2.465 ***	2.514 ***	2.325 ***	2.166 ***	2.449 ***
	(0.237)	(0.240)	(0.225)	(0.229)	(0.234)	(0.232)	(0.229)
SCH	0.060 ***	0.061 ***	0.058 ***	0.037 *	0.057 ***	0.049 **	0.051 **
	(0.021)	(0.021)	(0.020)	(0.021)	(0.021)	(0.022)	(0.021)
OIL	0.014 ***	0.014 ***	0.013 ***	0.012 ***	0.014 ***	0.014 ***	0.014 ***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
AID	-0.036 ***	-0.031 ***	-0.040 ***	-0.040 ***	-0.028 **	-0.032 ***	-0.039 ***
	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)
FDI	0.047 ***	0.049 ***	0.036 ***	0.040 ***	0.048 ***	0.053 ***	0.042 ***
	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)	(0.00()
GFC	0.017	0.021	0.020	0.012	0.024	0.042 **	0.012
	(0.020)	(0.021)	(0.018)	(0.019)	(0.020)	(0.023)	(0.019)
HHC	0.485 ***	0.501 ****	0.467 ***	0.484 ***	0.523 ***	0.539 ***	0.471 ***
	(0.041)	(0.039)	(0.037)	(0.037)	(0.037)	(0.037)	(0.038)
TRD	0.084 ***	0.073 ***	0.075 ***	0.071 ***	0.070 **	0.084 ***	0.073 ***
	(0.027)	(0.028)	(0.025)	(0.071)	(0.028)	(0.027)	(0.026)
DPR	-0.289 *	-0.289 *	-0.228	-0.230	-0.305 **	-0.231	-0.254 **
	(0.148)	(0.149)	(0.142)	(0.143)	(0.149)	(0.154)	(0.144)
TEL	0.088 ***	0.086 ***	0.088 ***	0.093 ***	0.083 ***	0.104 ***	0.094 ***
	(0.022)	(0.022)	(0.021)	(0.021)	(0.022)	(0.024)	(0.021)
VAI	0.047 **						
	(0.018)						
PSI		0.026 **					
		(0.012)					
GEI			0.071 ***				
			(0.013)				
RQI				0.057 ***			
				(0.012)			
RLI					0.021 *		
					(0.013)		
CCI						0.012	
						(0.009)	
GOV							0.084 ***
							(0.019)
R-squared	0.8476	0.8361	0.862	0.855	0.837	0.827	0.863
# of observ	384	384	384	384	384	384	384

Notes: Coeff. denotes estimated coefficients, and the number in parenthesis represents standard errors, ***,**, *, denotes significance at the 1%, 5%, and 10% levels. The estimation includes 4 regional dummies and nine year dummies.

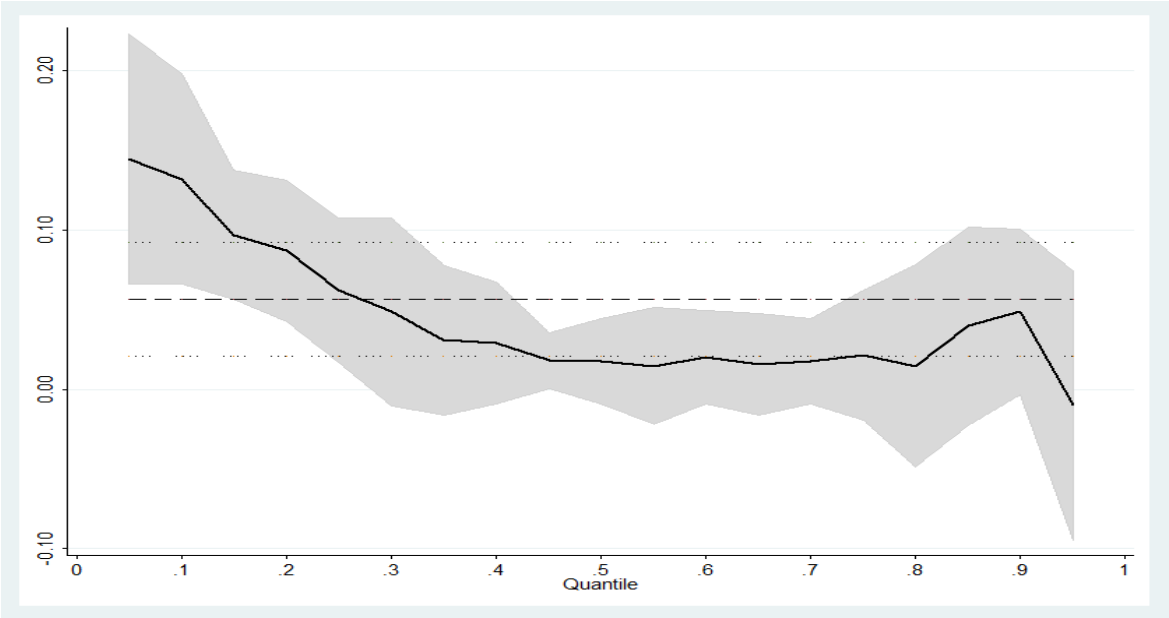
Table 3: Fixed Effect Estimation Results

Variables	Coef.		Coef.		Coef.		Coef.		Coef.		Coef.		Coef.	
Constant	4.115	***	4.106	***	3.963	***	4.027	***	3.887	***	3.897	***	4.002	***
	(0.250)		(0.253)		(0.232)		(0.236)		(0.250)		(0.254)		(0.237)	
SCH	0.066	***	0.068	***	0.061	***	0.039	**	0.062	***	0.062	***	0.053	***
	(0.018)		(0.019)		(0.017)		(0.018)		(0.019)		(0.019)		(0.018)	
OIL	0.005	*	0.006	**	0.005	*	0.004		0.006	**	0.006	**	0.005	*
	(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)	
AID	-0.023	**	-0.015		-0.025	***	-0.025	***	-0.012		-0.011		-0.024	**
	(0.010)		(0.010)		(0.009)		(0.010)		(0.010)		(0.010)		(0.010)	
FDI	0.028	***	0.031	***	0.018	**	0.023	***	0.031	***	0.031	***	0.024	***
	(0.008)		(0.008)		(0.008)		(0.008)		(0.008)		(0.008)		(0.008)	
GFC	0.027		0.035	*	0.034	**	0.025		0.040	**	0.040	**	0.025	
	(0.017)		(0.018)		(0.016)		(0.016)		(0.017)		(0.019)		(0.016)	
HHC	0.207	***	0.233	***	0.228	***	0.245	***	0.276	***	0.273	***	0.221	***
	(0.043)		(0.042)		(0.038)		(0.038)		(0.040)		(0.041)		(0.040)	
TRD	0.043	*	0.027		0.036		0.031		0.030		0.040	*	0.033	
	(0.023)		(0.024)		(0.022)		(0.022)		(0.025)		(0.024)		(0.023)	
DPR	-0.315	**	-0.315	***	-0.239	**	-0.238	*	-0.332	**	-0.325	**	-0.268	**
	(0.130)		(0.131)		(0.125)		(0.127)		(0.134)		(0.138)		(0.127)	
TEL	0.064	***	0.059	***	0.067	***	0.071	***	0.057	***	0.054	**	0.073	***
	(0.020)		(0.020)		(0.019)		(0.019)		(0.020)		(0.023)		(0.019)	
VAI	0.068	***												
	(0.016)													
PSI			0.037	***										
			(0.011)											
GEI					0.073	***								
					(0.011)									
RQI							0.061	***						
							(0.010)							
RLI									0.021	**				
									(0.011)					
CCI											0.015	**		
											(0.008)			
GOV													0.091	***
													(0.016)	
R-squared	0.8496		0.8441		0.8655		0.8686		0.8444		0.8328		0.8642	
# of observ	384		384		384		384		384		384		384	

Notes: Coeff. denotes estimated coefficients, and the number in parenthesis represents standard errors, ***,**, *, denotes significance at the 1%, 5%, and 10% levels. The estimation includes 4 regional dummies and nine year dummies.

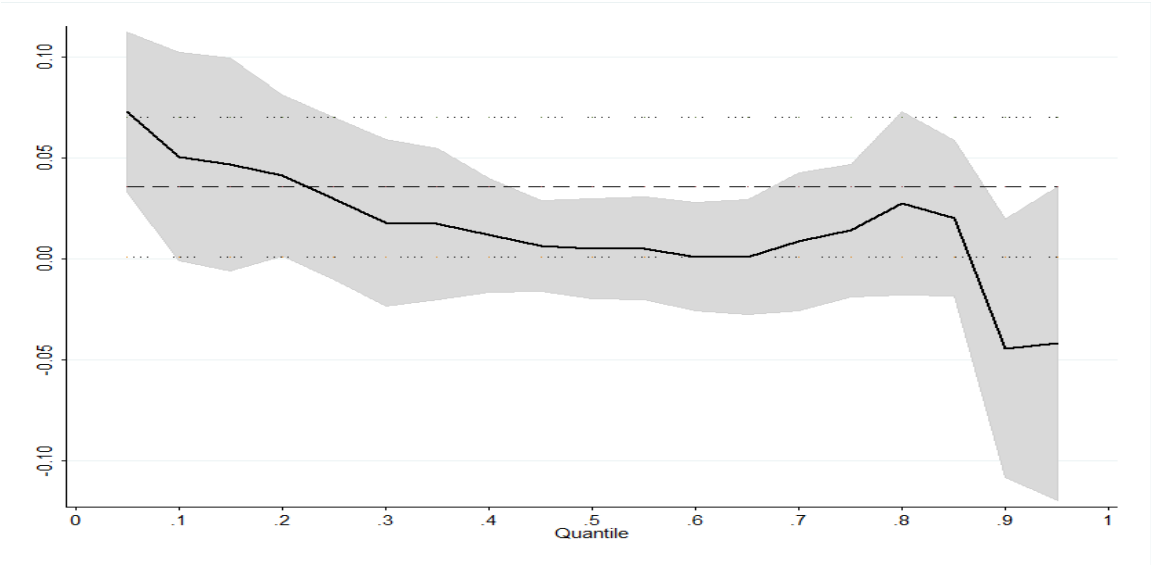
Figure 1: Quantile Regression Analysis of the Governance Measures

Panel A: Voice Accountability



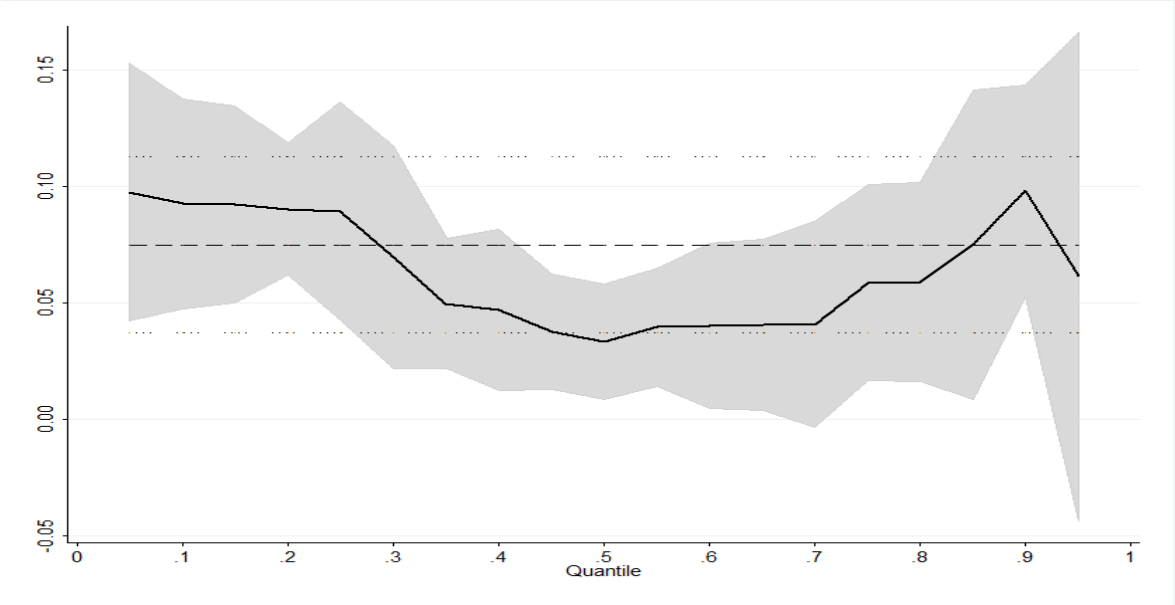
Notes: The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.

Panel B: Political Stability



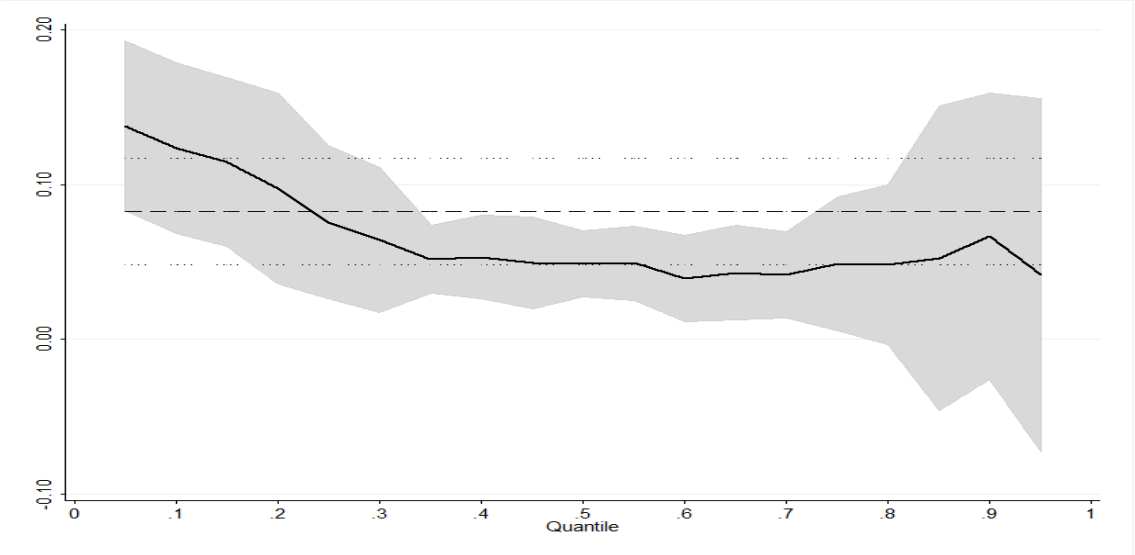
Notes: The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.

Panel C: Government Effectiveness



Notes: The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.

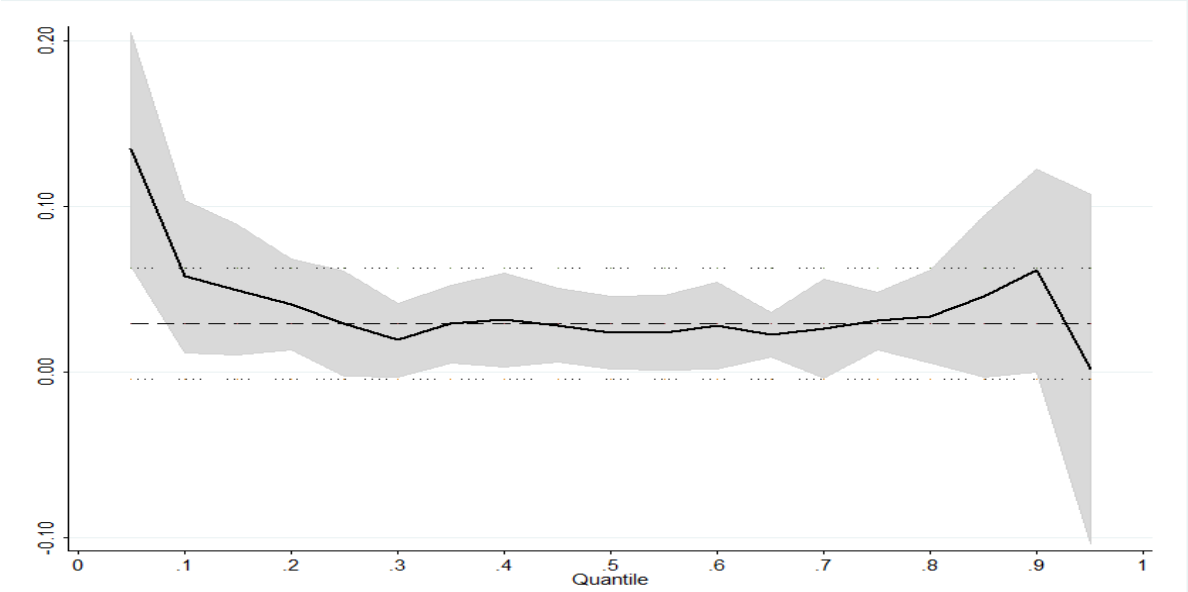
Panel D: Regulatory Quality



Notes:

The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.

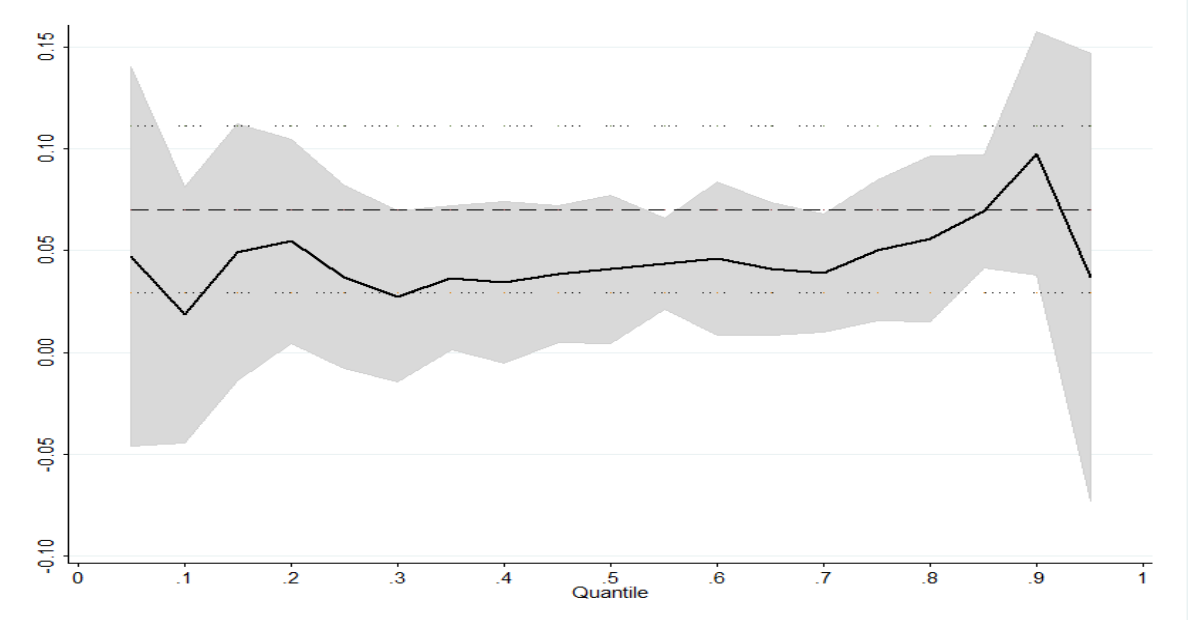
Panel E: Rule of Law



No

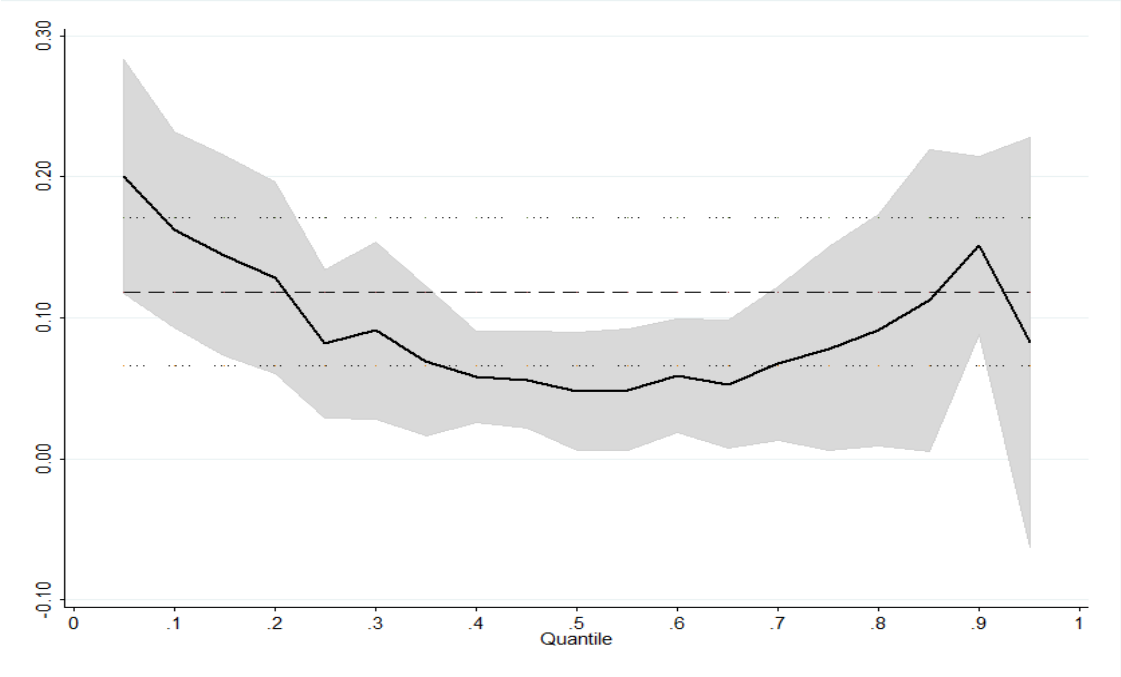
Notes: The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.

Panel F: Control of Corruption



Notes: The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.

Panel G: Overall Good Governance



Notes: The solid line denotes the quantile regression estimates. The grey area denotes the bootstrap confidence interval for the quantile regression estimate. The dotted lines denote the 95% confidence interval for the OLS estimate whereas the dash line denotes the OLS estimate.