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Do Governance Indicators Explain Development Performance? A Cross-Country Analysis

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DO GOVERNANCE INDICATORS EXPLAIN DEVELOPMENT PERFORMANCE? A CROSS- COUNTRY ANALYSIS

Xuehui Han, Haider Khan, and Juzhong Zhuang

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Xuehui Han, Haider Khan,
and Juzhong Zhuang

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ABSTRACT

The central question addressed by this study is whether countries with above-average governance grew faster than countries with below-average governance. Using the World Bank's worldwide governance indicators to measure governance performance, it examines whether a country with governance "surplus" in a given base year (1998) grew faster on average in a subsequent period (1998-2011) than a country with governance "deficit." Governance is defined in several dimensions, including government effectiveness, political stability, control of corruption and regulatory quality, voice and accountability, and rule of law. The study finds that government effectiveness, political stability, control of corruption and regulatory quality all have a more significant positive impact on country growth performance than voice and accountability and rule of law. Developing Asian countries with a surplus in government effectiveness, regulatory quality and corruption control are observed to grow faster than those with a deficit in these indicators—up to 2 percentage points annually, while Middle East and North African countries with a surplus in political stability, government effectiveness, and corruption control are observed to grow faster than those with a deficit in these indicators by as much as 2.5 percentage points annually. Good governance is associated with both a higher level of per capita GDP as well as higher rates of GDP growth over time. This suggests that good governance, while important in and of itself, can also help in improving a country's economic prospects.

Keywords: governance, development performance, Asia

JEL Classification: I30, O11, O53

I. INTRODUCTION

Development policy discussions in recent years have focused on the need for good governance. While the intrinsic value of good governance as a development end is now universally accepted, its instrumental value as a means to better development performance is still not well understood, despite the emergence of a considerable and still growing body of literature (Rodrik 2008, Acemoglu and Robinson 2012).

Two important developments explain the rising concern over governance and its role in development since the late 1980s. One is the emergence of a new stream of economics literature known as the new institutional economics. This emphasizes impersonal and impartial institutions for protecting property rights and contracts, which encourage the extension of market exchange, investment, and innovation. The second development is increasing concern that the effectiveness of development assistance depends not only on the nature of the policies pursued, but also on the nature of government (Burnside and Dollar 2000, for example). On the basis of empirical observations, Easterly (2006) argues that countries pursuing destructive policies, such as high inflation, high black market premiums, and chronically high budget deficits, may miss out on economic growth, but that it does not follow that growth can simply be created with macroeconomic stability. The involvement of larger structures in the determination of policy, its implementation and outcomes is the entry point for “governance.”

Against this backdrop, this chapter first investigates if a country starting with an above-average quality of governance has a greater chance of growing faster and vice versa. It then looks at whether improving governance quality leads to higher economic growth.

II. A LITERATURE REVIEW ON GOVERNANCE AND DEVELOPMENT PERFORMANCE

Zhuang, de Dios, and Lagman-Martin (2010) comprehensively survey the literature on connections between governance, economic growth, and inequality; and they also address issues of causality. Acemoglu and Robinson (2012) examine why and how governance matters by comparing cities adjacent to each other along the United States–Mexico border. They overrule simplistic explanations of differences in location and culture, and instead give a nuanced institutional account based on differences in modes of governance. In their account, the evolution of incentive structures and state-market relationships play a critical role in determining the performance of cities.

Other authors have explored specific dimensions of how governance matters. Goncalves (2013) discusses specific governance mechanisms and components of human development. Gerring et al. (2011) discuss the multiple channels, socioeconomic and political, through which democratic governance affects economic growth. On the political side, the access of citizens to governance mechanisms is intimately linked with development performance, as pointed out in Oster (2009). In a similar vein, Kumar (2013) notes how discriminatory governance mechanisms can lead to poor development. Blaydes and Kayser (2011) study the links between democratic governance, distribution, and standards of living.

Although the debate on the connection between the type of governance regime and economic performance seemed to suggest no significant association between the two, recent studies suggest otherwise. In the earlier view, democracies and autocracies perform equally well on average, though democracies may be less volatile (Doucouliagos and Ulubasoglu 2006, Mulligan, Gil and Sala-i-Martin

2004). The earlier literature also claimed that democracies may find it more difficult to initiate painful, but necessary economic reforms (Dornbusch and Edwards 1991, Kohli 2004, Leftwich 2005). But the new body of work disputes this view. It finds that when a country's regime history is taken into account, there is a positive and robust relationship between democratic governance variables and economic growth (Gerring et al. 2005, Persson and Tabellini 2006). In addition, various economic policies deemed essential to growth also remain significant in these analyses (Thacker 2011).

Nevertheless, the possible causal connections between regime history, and economic policy and performance remain unclear. The arguments advanced tend to be highly speculative, since the causal pathways are usually difficult to identify and test empirically (Bohara, Mitchell, and Mittendorf 2004; Kapstein and Converse 2008; Keefer 2003; Lederman, Loayza, and Soares 2005; Montinola and Jackman 2002). This paper provides empirical evidence in supporting positive contributions of governance on economic development.

III. METHODOLOGY AND DATA

A. Methodology

We use two complementary methods to empirically examine the relationship between governance and development performance. The first involves dividing the sample countries into two groups: one with (initial) governance in surplus and the other with governance in deficit. The average growth performance is compared across the surplus and deficit governance countries on different measures of governance. The second method furthers the analysis by employing a dynamic generalized method of moments (GMM) panel model to examine the contributions of governance quality on development performance across countries and over time.

According to Quibria (2006); and Zhuang, de Dios, and Lagman-Martin (2010), a country is classified as having a surplus in governance if its governance score is greater than the expected value corresponding to its level of income, with the expected values derived from a cross-country regression of governance scores on real income per capita. Similarly, a country is classified as having a deficit in governance if its governance score is below the expected value corresponding to the country's income per capita:

$$\tilde{G}_i = G_i - \hat{G}_i, \text{ surplus when } \tilde{G}_i > 0; \text{ deficit when } \tilde{G}_i < 0, \quad (1)$$

$$G_i = \alpha + \beta Y_i + D_i + \varepsilon_i, \quad (2)$$

where G_i is the score of a particular governance indicator of country i ; Y_i is the log of gross domestic product (GDP) per capita (in 2005 purchasing power parity terms) of country i ; D_i is a dummy for oil-rich countries; α and β are parameters to be estimated; and ε_i is the error term. The difference \tilde{G}_i between the observed G_i and the predicted \hat{G}_i estimated by equation (2) is the criteria to differentiate the surplus and deficit countries. The analysis uses governance scores and log GDP per capita (in 2005 purchasing power parity terms) of 215 countries in 1998 to estimate equation (1) and (2).

After the countries are classified into two groups, average development performance in the following years is calculated for each and then compared. Various development outcome indicators can measure development performance, such as GDP growth, pace of poverty reduction, quantity and

quality of public services, progress on Millennium Development Goals, and so on. In this chapter, we focus on GDP per capita growth alone. To control for endogeneity, we use the base-year data to group sample countries and compare development performance during the subsequent period.

Next, a dynamic panel data model is estimated to examine the contribution of governance quality to development outcomes. The specification of the model is

$$Y_{it} = \alpha_i + \lambda Y_{it-1} + \beta G_{it} + \gamma Z_{it} + \varepsilon_{it}, \quad (3)$$

where Y_{it} is the log real GDP per capita or annual growth of GDP per capita in country i at time t ; G_{it} are the governance variables, such as voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption; Z_{it} are the control variables, such as the share of the working-age population aged 15–64 to the total population, access to improved water sources, access to improved sanitation, economic openness, and foreign direct investment (FDI); and ε_{it} is an independent and identically distributed error term.

Before running the GMM model on equation (3), a principal component analysis is used to deal with the possible multicollinearity problem. The eigenvalues and explained cumulative variance as a share of the total right-hand-side variable variance are used to select the number of principal components. The resulting principal components are used as the explanatory variables in the dynamic panel data analysis to examine the contributions of governance quality on development. To test whether the contributions of governance on economic development in Asian countries differ from the rest of the world, we include an interacting dummy term for Asian countries and the governance variables. That is, equation (3) is transformed into:

$$Y_{it} = \alpha_i + \lambda Y_{it-1} + \delta F_{it} + \theta D_{Asia} F_{git} + \varepsilon_{it}, \quad (4)$$

where F_{it} are the principal components, including both governance principal components and the principal components for the controlling variables; D_{Asia} is a dummy variable for Asian countries; and F_{git} is the governance principal component for country i in time t . The parameter θ measures the difference in the contribution of governance in Asia compared with other countries in the world. The dynamic GMM analysis is next applied to estimate the coefficients of equation (4). This follows the approach of Blundell and Bond (1998), in which the equation is transformed into a first-order difference equation, and the lagged right-hand side variables for selected periods are used as instruments. Their method also enables us to deal with the problem of endogeneity between log GDP per capita and governance indicators.

B. Data

The variables used here are mostly obtained from the World Bank's World Development Indicators. For governance indicators, the Worldwide Governance Indicators, compiled at the World Bank by Kaufmann, Kraay and Zoido-Lobaton (1999) and Kaufmann, Kraay and Mastruzzi (2003), are used. The indicators are based on some 30 opinion and perception-based surveys of various governance measures from investment consulting firms, non-government organizations, think tanks, governments, and multilateral agencies; and classified into six clusters (Kaufmann, Kraay and Mastruzzi 2003).

These are:

- i. **Voice and accountability.** Measured by the extent to which a country's citizens are able to participate in selecting their government as well as freedom of expression, association, and the press.
- ii. **Political stability and absence of violence.** Measured by the likelihood that a government will be destabilized by unconstitutional or violent means, including terrorism.
- iii. **Government effectiveness.** Measured by the quality of public services, the capacity of civil services and their independence from political pressure, and the quality of policy formulation.
- iv. **Regulatory quality.** Measured by the ability of a government to provide sound policies and regulations that enable and promote private sector development.
- v. **Rule of law.** Measured by the extent to which agents have confidence in and abide by the rules of society, including the quality of property rights, the police and the courts, and the risk of crime.
- vi. **Control of corruption.** Measured by the extent to which public power is exercised for private gain, including both petty and grand forms of corruption as well as elite "capture" of the state.

The Worldwide Governance Indicators have been published annually since 1998. Other development indicators are sourced from the World Development Indicators, including GDP per capita in 2005 purchasing power parity terms, annual GDP growth, working-age population share, access to improved water and sanitation, openness measured by the share of imports and exports to GDP, and FDI in current dollars. To align the scaling of variables, FDI is standardized (by subtracting the mean value and dividing by the standard deviation).

IV. GOVERNANCE SCORES: WORLD BY REGION AND DEVELOPING ASIA BY SUBREGION

A. World by Region

Table 1 and Figures 1a and 1b report average governance scores for various regions in 1998 and 2011. Each composite indicator for each country is constructed to yield a value centered around zero and ranging from -2.5 to 2.5, with larger positive values indicating superior performance. Simple averages are used, instead of weighted averages.

Table 1: Average Governance Scores by Region, 1998 and 2011

		Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
Developing Asia	1998	-0.22	-0.27	-0.29	-0.37	-0.20	-0.33
	2011	-0.32	-0.12	-0.32	-0.45	-0.30	-0.42
Europe: Middle income	1998	-0.19	-0.36	-0.54	-0.26	-0.54	-0.58
	2011	-0.01	-0.19	-0.24	0.10	-0.25	-0.38
Latin America and Caribbean	1998	0.36	0.03	0.06	0.29	-0.06	0.00
	2011	0.35	0.17	0.13	0.09	-0.06	0.15
Middle East and North Africa	1998	-0.91	-0.43	-0.30	-0.47	-0.20	-0.33
	2011	-1.04	-0.72	-0.26	-0.26	-0.29	-0.35
OECD: High income	1998	1.27	1.00	1.49	1.27	1.39	1.57
	2011	1.25	0.84	1.41	1.34	1.42	1.39
Sub-Saharan Africa	1998	-0.69	-0.62	-0.72	-0.70	-0.77	-0.62
	2011	-0.64	-0.56	-0.79	-0.71	-0.75	-0.61

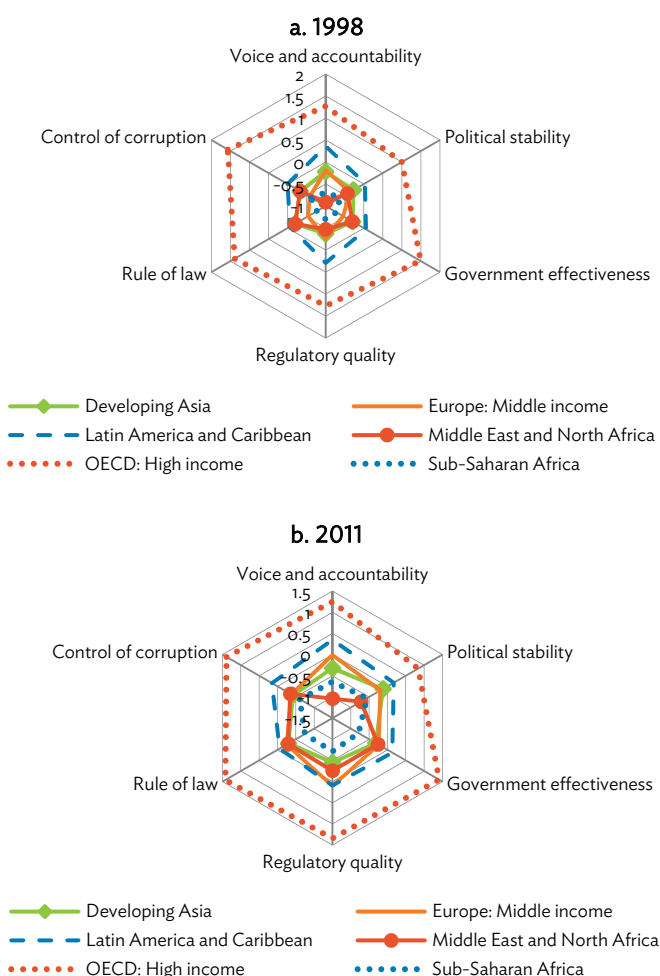
OECD = Organisation for Economic Co-operation and Development.

Notes: Simple averages. Developing Asia refers to the 44 developing member countries of the Asian Development Bank. The Republic of Korea is included in Developing Asia, not in OECD: High income. Middle-income Europe includes Albania, Belarus, Bosnia, Bulgaria, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Romania, the Russian Federation, Serbia, and Ukraine.

Source: Authors' estimates using the World Bank, Worldwide Governance Indicators online database (accessed December 2013).

In 2011, high-income Organisation for Economic Co-operation and Development (OECD) countries had the highest governance score, with a positive value in all six dimensions. For other regions, the score varies across the six dimensions: (i) Latin America and Caribbean ranks second in voice and accountability, political stability, government effectiveness, and control of corruption; and third in regulatory quality; (ii) middle-income Europe ranks second in regulatory quality; third in voice and accountability, government effectiveness, and rule of law; and fourth in political stability and control of corruption; (iii) developing Asia ranks third in political stability; fourth in voice and accountability, and control of corruption; and fifth in government effectiveness, regulatory quality, and rule of law; and (iv) Middle East and North Africa ranks last in voice and accountability, and political stability; fourth in government effectiveness, rule of law, and control of corruption; and fifth in regulatory quality; and (v) sub-Saharan Africa ranks fifth in voice and accountability, and political stability; and last in government effectiveness, regulatory quality, rule of law, and control of corruption.

Figure 1: Average Governance Scores by Region



OECD = Organisation for Economic Co-operation and Development.

Source: Authors' estimates using World Bank, Worldwide Governance Indicators online database (accessed December 2013).

Comparing 2011 with 1998, there is strong persistence in the governance scores and regional rankings. But several changes are also noticeable:

- i. High-income OECD economies experienced a sizable reduction in the scores of political stability and control of corruption.
- ii. Latin America and Caribbean improved their scores considerably on political stability, government effectiveness, and control of corruption, but deteriorated in regulatory quality.
- iii. Middle-income Europe improved its score on all dimensions.
- iv. Developing Asia improved on political stability, but worsened on all the other dimensions, especially voice and accountability, rule of law, and control of corruption.
- v. Sub-Saharan Africa improved slightly in voice and accountability, and political stability, but fell in its ranking on government effectiveness.

B. Developing Asia by Subregion

Table 2 and Figures 2a and 2b show that in 2011 in developing Asia, East Asia ranks highest in government effectiveness, regulatory quality, rule of law, and control of corruption; and second highest in voice and accountability, and political stability. The Pacific ranks highest in voice and accountability, and political stability; second in rule of law and control of corruption; and lowest in government effectiveness and regulatory quality. Southeast Asia ranks second in government effectiveness and regulatory quality; third in political stability, rule of law, and control of corruption; and fourth in voice and accountability. South Asia ranks third in voice and accountability, and governance effectiveness; fourth in regulatory quality, rule of law, and control of corruption; and last in political stability. Finally, Central Asia ranks fourth in political stability, government effectiveness, and regulatory quality; and last in voice and accountability, rule of law, and control of corruption.

Table 2: Average Governance Scores: Developing Asia, 2011

	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
2011						
Central Asia	-1.21	-0.51	-0.57	-0.57	-0.92	-0.98
East Asia	0.09	0.39	0.72	0.72	0.57	0.38
South Asia	-0.50	-1.17	-0.47	-0.71	-0.62	-0.65
Southeast Asia	-0.77	-0.22	0.03	-0.08	-0.22	-0.33
Pacific	0.45	0.65	-0.73	-0.89	-0.12	-0.32
1998						
Central Asia	-1.03	-0.81	-0.89	-0.94	-1.10	-0.90
East Asia	0.06	0.35	0.40	0.59	0.41	0.38
South Asia	-0.55	-0.77	-0.37	-0.47	-0.36	-0.45
Southeast Asia	-0.66	-0.27	0.01	0.01	-0.18	-0.11
Pacific	0.80	0.76	-0.41	-0.73	0.16	-0.37

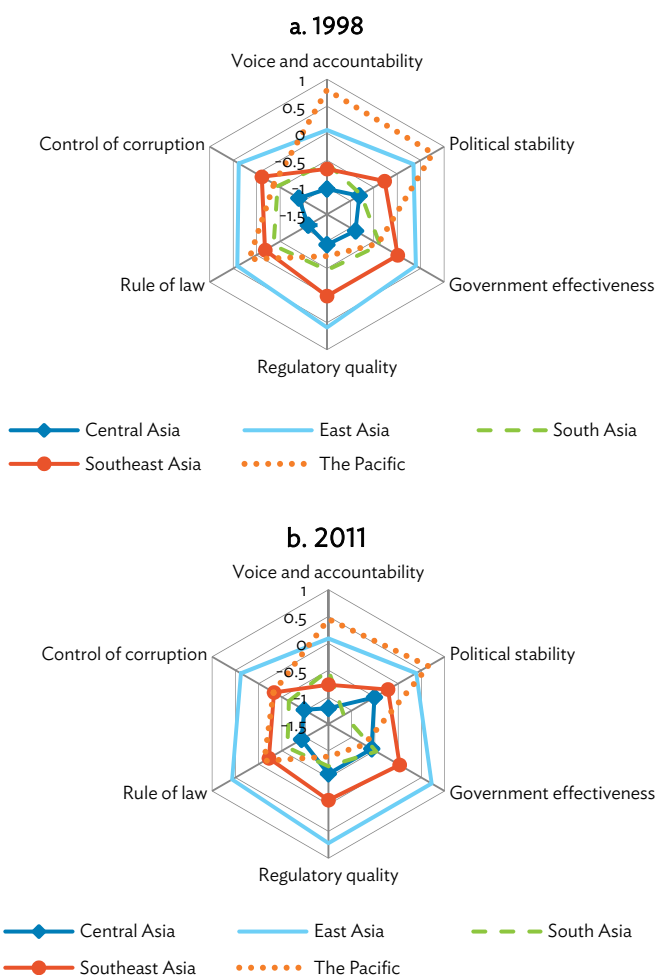
Notes: Simple averages. Developing Asia refers to the 44 developing member countries of the Asian Development Bank.

Source: Authors' estimates using the World Bank, Worldwide Governance Indicators online database (accessed December 2013).

Comparing 2011 with 1998, there is also strong persistence in the governance scores and regional rankings within Asia. But several changes are also noticeable:

- i. East Asia improved significantly in most of the six governance dimensions, especially government effectiveness, regulatory quality, and rule of law.
- ii. The Pacific worsened significantly in all dimensions, except control of corruption, with the worsening particularly significant in voice and accountability, government effectiveness, and rule of law.
- iii. Southeast Asia worsened in voice and accountability, regulatory quality, rule of law, and control of corruption, but improved slightly in political stability and government effectiveness.
- iv. South Asia improved slightly in voice and accountability, but worsened significantly in all other dimensions.
- v. Central Asia improved in political stability, government effectiveness, regulatory quality, but worsened in voice and accountability, and control of corruption.

Figure 2: Average Governance Scores: Developing Asia



Source: Authors' estimates using the World Bank, Worldwide Governance Indicators online database (accessed December 2013).

V. EMPIRICAL RESULTS FOR SURPLUS-DEFICIT ANALYSIS

As described in the previous section, to examine whether a higher initial governance score (the base year being 1998) leads to better growth performance in a subsequent period (1998–2011), all the countries with comparable data (about 215) are grouped into (i) those with actual governance scores higher than the international reference level (the mean level of the countries with a similar per capita income), which are the governance surplus countries; and (ii) those with actual governance scores lower than the international reference level or the governance deficit countries.

Table 3 shows the estimated results for the international reference lines. All the equations have a good statistical fit, with the R^2 ranging from 0.448 for political stability to 0.715 for government effectiveness. The coefficient of GDP per capita is positive, ranging from 0.53 to 0.6573, and is statistically significant. These suggest that the level of per capita income has significant power in explaining cross-country variations in governance indicators. The dummy for oil-rich countries is negative and also statistically significant, suggesting that these countries on average have a lower governance score compared with those at a similar income level.

Table 3: International Reference Lines

	Estimated Equation	R^2	Number of Observations
VA	$G_i = -4.4756 + 0.5385 Y_i - 1.325 D_i$ (-13.8) (14.1) (-8.7)	0.566	180
PS	$G_i = -4.5145 + 0.5300 Y_i - 0.6664 D_i$ (-11.8) (11.8) (-3.7)	0.448	175
GE	$G_i = -5.5142 + 0.6573 Y_i - 0.9711 D_i$ (-20.5) (20.8) (-7.7)	0.715	179
RQ	$G_i = -5.0456 + 0.6052 Y_i - 1.0469 D_i$ (-17.2) (17.5) (-7.6)	0.645	179
RL	$G_i = -5.4216 + 0.6423 Y_i - 0.9471 D_i$ (-19.1) (19.2) (-7.1)	0.681	180
CC	$G_i = -5.3140 + 0.6362 Y_i - 1.0371 D_i$ (-17.6) (17.9) (-7.3)	0.653	179

CC = control of corruption, GE = government effectiveness, PS = political stability, RL = rule of law, RQ = regulatory quality, VA = voice and accountability.

Note: Figures in parentheses are t-statistics.

Source: Authors' estimates.

Table 4 classifies the countries in the region into three groups: (i) those with an actual governance score greater than the upper bound of the 90% confidence band of the predicted value given by the international reference line (governance in surplus), (ii) those with a governance score smaller than the lower bound of the 90% confidence band of the predicted value (governance in deficit), and (iii) those with a governance score lying within the 90% confidence band of the predicted value (neither in surplus nor in deficit). Annual growth rates of per capita GDP of these three groups are reported in Table 5.¹

¹ Similar analysis was also carried out with the countries classified into two groups: governance surplus countries and governance deficit countries. Surplus countries refer to those above the international reference line and deficit countries refer to those below the international reference line. The results lead to similar conclusions and hence are not reported.

Table 4: Governance Surplus and Deficit Countries in Developing Asia, 1998

	Total Number of Surplus Countries	Total Number of Neither Surplus nor Deficit	Total Number of Deficit Countries
VA	16	7	17
PS	12	13	9
GE	11	13	13
RQ	10	18	10
RL	12	17	9
CC	11	14	13

CC = control of corruption, GE = government effectiveness, PS = political stability, RL = rule of law, RQ = regulatory quality, VA = voice and accountability.
Source: Authors' estimates.

Table 5: Average Annual Growth Rates of GDP per Capita, 1998–2011
(%, 2005 PPP \$)

	Governance Status	Developing Asia	Europe: Middle Income	Latin America and Caribbean	Middle East and North Africa	OECD: High Income	Sub-Saharan Africa	World
Voice and accountability	Deficit	4.57**	4.33	2.01	0.81	1.63	2.14	2.65
	Neither S/D	6.50	3.75	1.56	2.47	1.44	2.04	2.51
	Surplus	2.71**	4.69	1.86	...	1.76	2.65	2.42
Political stability and absence of violence	Deficit	3.78	3.89	1.86	0.54***	1.18**	2.98	2.61
	Neither S/D	5.83	5.65	1.36	1.08	1.40	0.81	2.41
	Surplus	3.52	4.31	2.16	3.00***	1.92**	2.21	2.51
Government effectiveness	Deficit	2.61**	4.38	1.56	0.73**	1.92	1.97	2.20
	Neither S/D	5.19	...	2.31	1.20	3.37	3.32	3.16
	Surplus	4.53**	4.52	2.25	2.31**	1.37	2.13	2.59
Regulatory quality	Deficit	2.99*	4.37	1.79	1.31	1.38	3.10	2.64
	Neither S/D	4.26	3.75	1.39	0.69	1.90	2.64	2.24
	Surplus	4.85*	4.70	2.19	1.97	1.64	1.77	2.61
Rule of law	Deficit	3.33	4.35	1.89	1.57	1.80	2.51	2.60
	Neither S/D	5.11	4.79	1.48	0.39	2.55	1.11	3.05
	Surplus	3.65	4.52	2.05	1.20	1.52	2.35	2.29
Control of corruption	Deficit	2.94**	4.38	1.89	0.82**	1.94	2.34	2.42
	Neither S/D	3.81	...	1.33	1.04	2.40	2.87	2.41
	Surplus	4.94**	4.52	2.34	2.56**	1.42	2.16	2.69

D = deficit, S = surplus, OECD = Organisation for Economic Co-operation and Development.

Notes: Simple average growth rate. *** means that the difference between surplus and deficit countries is statistically significant at 5% level, ** means that the difference is statistically significant at 10% level, * means that the difference is statistically significant at 20% level, ... means no countries are classified into this group.

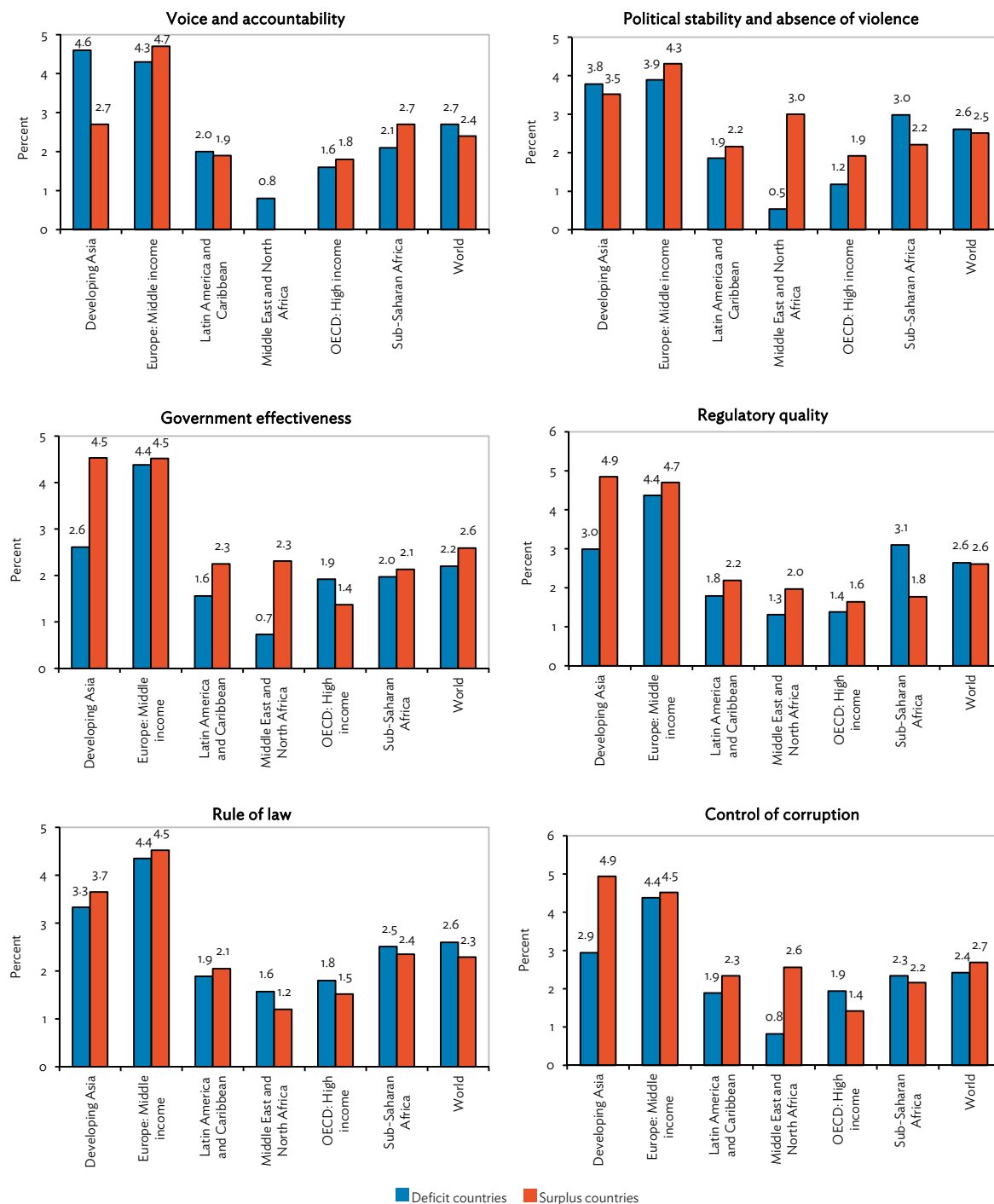
Source: Authors' estimates.

For developing Asia, in voice and accountability, countries with governance deficit grew close to 2 percentage points faster annually than those with governance surplus, with the difference statistically significant at 10%. In government effectiveness, regulatory quality, and control of corruption, governance surplus countries grew close to 2 percentage points faster annually than those with governance in deficit, with the difference also statistically significant at 10%, with the exception of regulatory quality, for which the difference is only significant at 20%. For rule of law, surplus countries grew 0.32 percentage points faster annually than deficit countries; for political stability, deficit countries grew 0.26 percentage points faster annually than surplus countries, but the difference is insignificant in both cases.

For the Middle East and North Africa, countries with governance surplus in political stability grew about 2.5 percentage points, in government effectiveness 1.6 percentage points, and in control of corruption 1.7 percentage points faster annually than countries with governance in deficit in these areas. The difference in political stability was statistically significant at the 5% level and in government effectiveness and control of corruption, it was significant at the 10% level. In the other three dimensions, the difference in growth performance between surplus and deficit countries was statistically insignificant.

For other regions and for the world as a whole, although countries with governance in surplus grew faster than those with governance in deficit in most of the governance dimensions, the difference is mostly statistically insignificant. Figure 3 compares the annual growth rates of per capita GDP of surplus countries during 1998–2011 with those of deficit countries for the six governance dimensions.

Figure 3: Average Growth Rates of GDP per Capita, 1998–2011
(2005 PPP \$)



GDP = gross domestic product, OECD = Organisation for Economic Co-operation and Development, PPP = purchasing power parity.
Source: Authors' estimates using data from the World Bank, Worldwide Governance Indicators online database (accessed December 2013).

VI. EMPIRICAL RESULTS FOR THE PANEL DATA ANALYSIS

A. Principal Component Analysis

The first step is to apply general principal component analysis to include all the right-hand side variables (11 in total) simultaneously. The initial results show that the first four principal components can explain 89% of the total variation in all right-hand-side variables. This analysis therefore focuses on the four principal components in undertaking the second step. Tables 6 and 7 present the final results. As Table 8 indicates, all the Eigenvalues are greater than one and the four principal components explain 89% of the total right-hand-side variable variance, supporting the choice of the four principal components.

Table 6 ignores the loading factors whose absolute value is smaller than 0.4. The column H2 indicates how much variance in a corresponding variable has been included in the newly constructed principal component. For example, for voice and accountability, the first principal component covers 83% of its variance. High H2 values for all variables also imply that the four principal components are appropriate choices.

Table 6: Standardized Loading for the Four Main Components

	PC1	PC2	PC3	PC4	H2
Voice and accountability	0.88				0.83
Government effectiveness	0.87				0.94
Political stability	0.79				0.73
Regulatory quality	0.85				0.90
Rule of law	0.90				0.95
Control of corruption	0.89				0.91
Share of population aged 15–64		0.85			0.84
Access to improved water		0.85			0.87
Access to improved sanitation		0.86			0.86
Openness			0.97		0.98
Foreign direct investment				0.97	0.99

PC = Principal component.

Note: Only the absolute loading factors higher than 0.43 are reported.

Source: Authors' estimates.

Table 7: Eigenvalue, Proportion Variance, and Cumulative Variance

	PC1	PC2	PC3	PC4
Eigenvalue	4.87	2.79	1.08	1.07
Proportion variance	0.44	0.25	0.10	0.10
Cumulative variance	0.44	0.70	0.79	0.89

PC = Principal component.

Source: Authors' estimates.

The results of the principal component analysis show that the variables in G_{it} are well summarized in principal component 1, which we call the governance component. The variables in Z_{it} are summarized into three components, one representing mainly the effect of the share of the working-age population, access to improved water, and access to improved sanitation, called here the human development component; another is solely caused by openness, called here the openness component; and the last caused by the variation in FDI, the FDI component. The four principal components fulfill the orthogonal conditions (no correlation). Fortunately, each component corresponds to variables that have similar intuitive meanings. The four principal components are then used in a panel regression analysis using equation 4.

B. Using Log GDP per Capita as the Dependent Variable

First, we apply the ordinary least squares (OLS) method to estimate a simple fixed effects model without controlling for the endogeneity as our benchmark. In this model, in addition to common effects from the lagged log GDP per capita and the four principal components of governance, human development, openness, and FDI, it is assumed that there is a country-specific unobserved fixed effect capturing the influence of all the other unobserved variables. As Table 8 shows, the lagged log GDP per capita has a dominant effect on the dependent variable. The governance component also has a significant positive effect, as do the human development, openness, and FDI components. The analysis also tested whether the governance component acts differently in Asian countries by interacting it with a dummy variable for Asia. The results indicate that governance factors in Asia contribute less to economic growth compared with the other regions. The model has an adjusted R-squared at 0.8041 and all the coefficients are significant at the 1% level.

Table 8: Fixed Effects Model with Log GDP per Capita as the Dependent Variable

	Estimated Coefficients	T-Value
Lagged log GDP per capita (in 2005 PPP)	0.78	75.14***
Governance component	0.11	10.89***
$D_{ASIA} \times$ Governance component	-0.04	-2.80***
Human development component	0.13	11.63***
Openness	0.02	6.50***
Foreign direct investment	0.02	8.39***
Adjusted R-squared	0.80	
Number of observations	1,805	

GDP = gross domestic product, PPP = purchasing power parity.

Note: *** means significant at 1%, ** means significant at 5%, and * means significant at 10%.

Source: Authors' estimates.

To further clarify the contribution of governance quality on economic development, we control for endogeneity by applying GMM to estimate equation (4). To estimate the model, the equation is transformed by taking the first-order difference, with all lagged governance and human development components used as instruments. The reason for choosing the lagged values for these two variables and all the lagged periods as the instruments is that it avoids the “over identifying” problem judged by the Sargan test and avoids second-order serial correlation judged by the autocorrelation test.

As Table 9 shows, after controlling for endogeneity, there are still significant positive effects of the governance component on log GDP per capita. The coefficient of 0.25 is an average contribution of governance to log GDP per capita. The results again suggest that governance appears to matter less for economic development in Asia relative to other regions. The new results are consistent with the OLS method as presented in Table 8. A comparison of Tables 8 and 9 suggests that the control for endogeneity raises the estimated effect of governance on economic development from 0.11 to 0.25 for non-Asian countries and from 0.07 to 0.15 for Asian countries.

Table 9: GMM Estimation Results with Log GDP per Capita as the Dependent Variable

	Estimated Coefficients	Z-Value
Lagged log GDP per capita (in 2005 PPP)	0.48	10.74***
Governance component	0.25	4.80***
D _{ASIA} * Governance component	-0.10	-1.81*
Human development component	0.32	7.13***
Openness	0.06	4.65***
Foreign direct investment	0.05	6.59***
Sargan test: chisq with (p value)	140.61 (0.210)	
Second-order serial correlation (p value)	1.06 (0.143)	
Wald test for coefficients: chisq with (p value)	551.38 (2.22e-16)	
Number of observations	1,805	

GDP = gross domestic product, GMM = generalized method of moments, PPP = purchasing power parity.

Source: Authors' estimates.

To test the contribution of each single governance indicator on economic growth, alternative specifications are also used by entering only one governance indicator at a time, together with the working-age population share, openness, and FDI as control variables. The principal component analysis is still applied to deal with multicollinearity. Table 10 reports the estimated coefficients of the governance indicators from these alternative specifications. The results show that all coefficients are statistically significant at the 1% level, implying that governance quality in all six dimensions has a positive and significant effect on log GDP per capita.

Table 10: GMM Estimation Results with Log GDP per Capita as the Dependent Variable Using only One Governance Indicator

	Voice and Accountability	Government Effectiveness	Political Stability	Regulatory Quality	Rule of Law	Control of Corruption
Lagged GDP per capita	0.67 (16.64)***	0.68 (15.79)***	0.68 (15.28)***	0.68 (16.23)***	0.60 (11.77)***	0.69 (15.24)***
Governance indicator	0.09 (5.15)***	0.06 (3.69)***	0.05 (4.43)***	0.06 (3.80)***	0.09 (4.73)***	0.04 (3.26)***
D _{ASIA} * Governance indicator	-0.07 (-2.75)***	0.08 (2.34)***	-0.01 (-0.51)	0.02 (-0.84)	-0.03 (-1.45)	0.01 (-0.29)
Working-age population share	0.13 (4.97)***	0.13 (4.35)***	0.12 (4.33)***	0.12 (4.19)***	0.18 (5.03)***	0.11 (3.80)***
Openness	0.04 (3.81)***	0.04 (3.17)***	0.04 (3.29)***	0.03 (2.87)***	0.05 (4.39)***	0.03 (2.91)***
Foreign direct investment	0.03 (6.03)***	0.02 (4.74)***	0.02 (4.86)***	0.02 (5.20)***	0.03 (5.54)***	0.02 (-4.68)
Sargan test: chisq with (p value)	146.70 (0.15)	145.99 (0.16)	144.74 (0.178)	147.67 (0.138)	139.93 (0.103)	149.86 (0.112)
Second-order serial correlation (p value)	0.57 (0.284)	0.13 (0.449)	0.17 (0.432)	-0.02 (0.491)	0.45 (0.325)	0.01 (0.495)
Wald test for coefficients: chisq with (p value)	1,355.81 (2.22e-16)	1,658.18 (2.22e-16)	1,424.39 (2.22e-16)	1,649.90 (2.22e-16)	1,170.16 (2.22e-16)	1,730.91 (2.22e-16)
Number of observations	1,805					

GDP = gross domestic product, GMM = generalized method of moments.

Notes: The values in parentheses are Z test value. All controlling variables and governance indicators are principal components. For each specification, all original lagged governance indicator and working-age population share are used as the instrumental variables. *** means significant at 1%, ** means significant at 5%, and * means significant at 10%.

Source: Authors' estimates.

Table 10 shows that the governance indicators have uneven “additional” effects on economic development in Asian countries. Among the indicators, voice and accountability contributes less to economic growth in Asian countries compared with other regions, while government effectiveness contributes more to economic growth.

C. Using GDP Growth as the Dependent Variable

When using the annual GDP growth rate as the dependent variable, there are still significant positive effects of the governance component on GDP growth. Table 11 reports the results of a fixed effect model without controlling for the endogeneity. As expected, the lagged log GDP per capita has a negative and significant effect on the GDP growth rate, as higher-income countries tend to have lower growth rates. The four principal components all have a significant and positive effect on annual GDP growth rates, with the estimated coefficient being 8.05 for governance, 10.94 for human development, 1.84 for openness, and 1.69 for FDI. However, the adjusted R squared decreases dramatically in comparison with the specification when log GDP per capita is used as the dependent variable.

Table 11: Fixed Effect Model with GDP Growth as the Dependent Variable

	Estimated Coefficients	T-Value
Lagged log GDP per capita (in 2005 PPP)	-11.90	-12.76***
Governance component	8.05	9.14***
D _{ASIA} * Governance component	-1.89	-1.60
Human development component	10.94	10.77***
Openness	1.84	5.59***
Foreign direct investment	1.69	7.41***
Adjusted R-squared	0.1024	
Number of observations	1,805	

GDP = gross domestic product, PPP = purchasing power parity.

Note: *** means significant at 1%, ** means significant at 5%, and * means significant at 10%.

Source: Authors' estimates.

Table 12 reports the results of applying the GMM analysis, thus controlling for endogeneity. The coefficient of the governance component remains positive and significant, as do the other three components. The negative coefficient of the interacting term (between governance component and the Asia dummy) is not significant. Therefore, when governance is examined in an aggregated manner, Asian countries have no significantly different pattern with respect to other regions.

Table 12: GMM Estimation Results with GDP Growth as the Dependent Variable

	Estimated Coefficients	Z-Value
Lagged log GDP per capita (in 2005 PPP)	-36.64	-6.80***
Governance component	20.95	5.08***
D _{ASIA} * Governance component	-6.55	-1.54
Human development component	26.67	6.57***
Openness	4.93	5.64***
Foreign direct investment	3.74	6.51***
Sargan Test: chisq with (p value)	135.45 (0.309)	
Second-order serial correlation (p value)	0.77 (0.221)	
Wald test for coefficients: chisq with (p value)	113.41 (2.22e-16)	
Number of observations	1,805	

GDP = gross domestic product, GMM = generalized method of moments, PPP = purchasing power parity.

Note: *** means significant at 1%, ** means significant at 5%, and * means significant at 10%.

Source: Authors' estimates.

Table 13 shows the results of specification where only one governance indicator entering the regression (and principal component analysis) together with the other three controlling variables' principal components as explanatory variables. The estimated coefficients of all the governance indicators are positive and significant at a normal confidence level.

Table 13: GMM Estimation Results with GDP Growth as the Dependent Variable Using only One Governance Indicator

	Voice and Accountability	Government Effectiveness	Political Stability	Regulatory Quality	Rule of Law	Control of Corruption
Lagged GDP per capita	-21.75 (-5.88)***	-21.51 (-5.67)***	-20.72 (-5.32)***	-21.23 (-5.55)***	-21.51 (-5.45)***	-20.26 (-5.00)***
Governance Indicator	7.22 (4.84)***	5.28 (3.58)***	4.75 (4.62)***	4.37 (3.67)***	5.96 (3.78)***	3.30 (3.00)***
D_{Asia} * Governance Indicator	-5.06 (-2.16)**	8.18 (3.12)***	-0.63 (-0.38)	3.20 (1.72)*	0.21 (0.11)	1.67 (0.93)
Working-age population share	11.15 (5.36)***	11.48 (4.88)***	10.40 (4.83)***	10.61 (4.63)***	11.02 (4.74)***	10.04 (4.27)***
Openness	3.90 (4.40)***	3.76 (3.78)***	3.73 (3.94)***	3.50 (3.58)***	3.84 (4.07)***	3.49 (3.51)***
Foreign direct investment	2.36 (5.69)***	2.00 (4.61)***	1.83 (5.03)***	1.87 (4.92)***	2.07 (4.95)***	1.64 (4.73)***
Sargan test: chisq with (p value)	143.08 (0.204)	145.97 (0.160)	147.78 (0.136)	148.85 (0.123)	144.72 (0.178)	145.47 (0.167)
Second-order serial correlation (p value)	0.49 (0.310)	0.22 (0.413)	0.30 (0.381)	0.22 (0.414)	0.22 (0.414)	0.19 (0.425)
Wald test for coefficients: chisq with (p value)	71.50 (=2.01e-13)	46.98 (1.89e-8)	56.62 (2.18e-10)	41.06 (2.81e-7)	44.81 (5.10e-8)	50.44 (3.84e-9)
Number of observations	1,805					

GDP = gross domestic product, GMM = generalized method of moments.

Notes: The values in parentheses are Z test value. All controlling variables and governance indicators are principal components. For each specification, all original lagged governance indicator and working-age population share are used as the instrumental variables. *** means significant at 1%, ** means significant at 5%, and * means significant at 10%.

Source: Authors' estimates.

As shown in Table 13, the results for GDP growth rate being the dependent variable are consistent with those for log GDP per capita being the dependent variable in Table 10. All governance indicators have a significant positive effect on growth rate. The interaction term between voice and accountability, and the dummy for Asia has a negative and significant coefficient; and that between government effectiveness and the dummy for Asia has a positive and significant coefficient. This implies that voice and accountability is less important and government effectiveness is more important in driving growth in Asia than in the rest of the world.

VII. SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

By classifying countries into those with governance in surplus and those with governance in deficit using an international reference line as the classification criterion, several interesting findings emerge.

First, when pooling all the countries in the world together, there is no difference in growth performance between governance surplus countries and deficit countries. But when the analysis is broken down by region, governance quality does have a significant impact on growth performance, especially in developing Asia, and the Middle East and North Africa. Regional specificities of both governance and growth are therefore important to consider.

Second, on balance, government effectiveness, political stability, control of corruption, and regulatory quality have a positive and more significant impact on growth performance than voice and accountability, and rule of law. In developing Asia, countries with governance surplus in government effectiveness, regulatory quality, and control of corruption grew close to 2 percentage points faster annually than those with governance in deficit during 1998–2011. In the Middle East and North Africa, countries with governance surplus in political stability, government effectiveness, and control of corruption grew 1.5–2.5 percentage points faster annually than those with governance in deficit during the same period.

Third, the results on voice and accountability, and rule of law are mixed. For voice and accountability, developing Asian countries with governance deficit grew faster than those with governance surplus by 1.8 percentage points annually during 1998–2011, and the difference is statistically significant at a normal confidence level for other regions. However, the difference in growth performance between governance surplus and deficit countries is not statistically significant. For rule of law, the difference in growth performance between governance surplus and deficit countries is not statistically significant for all the regions.

The dynamic panel data model suggests two key results. First, the governance component has a positive and significant effect on economic outcomes using both the log GDP per capita and annual growth rate as the dependent variable; the lagged log GDP per capita and the four principal components as the explanatory variables; and by applying both OLS and the GMM methods; which controls for fixed effects, endogeneity, and multicollinearity. Entering the governance indicators one at a time, together with other controlling variables through principal components, and by applying the GMM method, it is found that the six governance indicators each has a significant positive effect on both the log GDP per capita and annual growth rate.

Second, at an aggregated level, the linkage of governance with economic performance appears to be weaker in Asia than the rest of the world. At the disaggregated level, the linkage of voice and accountability with log GDP per capita and annual growth rate is significantly weaker for Asia than for the rest of the world, whereas the effect of government effectiveness and regulatory quality on economic performance is significantly higher in Asia than in the rest of the world.

These results suggest that governance matters for development—better governance correlates with faster growth and higher income levels, but its relationship with development may vary across dimensions of governance and a country’s stage of development. In terms of policy, these suggest that priorities of governance reform are likely to be country-specific. Low-income countries should perhaps strive for more effective government, better regulatory quality, and rule of law, and tighter control of corruption. Graduating to higher income entails improving governance quality with respect to citizen participation and government accountability. Middle- and high-income countries are likely to reap considerable rewards from their citizens’ greater voice, political stability, and word-class institutions. By focusing on the biggest hurdles to growth and development, countries are more likely to see their governance reform efforts succeed.

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Do Governance Indicators Explain Development Performance?

A Cross-Country Analysis

Will improving governance quality lead to higher economic growth? Do countries with above-average governance grow faster than countries with below-average governance? Using a cross-country analysis from 1998 to 2011, this study finds that government effectiveness, political stability, control of corruption, and regulatory quality have more significant impact on country growth performance than voice and accountability, and rule of law. Countries with a surplus on the former four indicators are observed to grow faster by as much as 2.5 percentage points annually. The results suggest that governance matters for development but may vary across dimensions of governance and a country's stage of development.

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