GOVERNANCE AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES: A PANEL THRESHOLD REGRESSION ANALYSIS

Nabil Alimi[1] and Lassad Ben Dhiab[2*]

[1]University of Tunis El Manar, Faculty of Economics and Management of Tunis, Tunisia
[2]Higher Institute of Management of Gabes, Tunisia

This study is aimed at analyzing the effect of the governance index and the governance components index on economic growth in 48 developing countries over the period 2002-2020. Corruption control, the effectiveness of the government, political stability, and regulatory quality are but a few of the many variables taken into account by the governance components index. The findings of the study show that governance has an asymmetric effect on economic growth. Moreover, the results indicate that enhancing governance in developing countries can obstruct economic growth in them. This outcome should not surprise and cast doubt on the positive effects of sound governance on economic growth, as improving governance requires numerous resources currently lacking in these countries. Therefore, policymakers must boost economic growth at the initial stage so that they can identify resources for improving governance and capitalize on them as well.

Keywords: economic growth, governance, governance components, panel threshold regression model

INTRODUCTION

For developing countries struggling with numerous economic and social issues, improving governance effectiveness is crucial to fostering economic growth. Effective governance is often regarded as the most important factor able to transform economies, draw in investments, and consequently encourage economic

growth (Gani, 2011). Furthermore, M. Jr. Olson (1996) noted that an increase in governance quality could have a significant influence on the ability of the poorest nations to sustain long-term economic growth and raise their living standards and wellbeing. According to M. Jr. Olson (1996), developing nations do not appear to have reached their full potential for growth because they lack the structures of the incentives needed to encourage productive cooperation, such as fair legal systems capable of upholding contracts and protecting property rights.

* *Correspondence to:* L. B. Dhiab, Higher Institute of Management of Gabes, Tunisia;
  e-mail: lassad.dhiab2015@gmail.com

According to the literature, bad governance has a detrimental impact on development and economic growth. Therefore, governance plays a crucial role in illuminating the reason why the majority of developing nations have been lagging behind while some have experienced the growth that is significantly faster than the growth of high-income countries.

According to N. Rosenberg and L. E. Birdzell (1986) and J. Mokyr (1992), differences in governance and institutions are essential in describing why innovation, the industrial revolution and modern economic growth took place in the West, as opposed to the other regions of the world. According to M. P. Mauro (1995), governance can account for the success or failure of some development policies, to which J. G. Castañeda (2003) and M. Wolf (2005) added that corrupt practices and poor governance were to blame for economic failure in developing countries.

Developing countries have taken major steps towards reforming their economies and they have invested heavily in improving the quality of their governance systems, realizing how crucial good governance is to the achievement of sustainable growth. Despite these efforts, results for most of these countries have fallen short of expectations. D. Rodrik (2006) and R. Hausmann, D. Rodrik and A. Velasco (2008) stressed the fact that improved governance does not always have to translate into an increase in the country's growth rate. In this sense, K. P. Huynh and D. T. Jacho-Chávez (2009) disproved the notion that there was a causal connection between decent governance and economic growth.

In light of this divergence pertaining to the effect of governance, as well as their six components, on economic growth, it seems possible that this effect is nonlinear, so there are thresholds which it is reversed at. Therefore, the research hypotheses tested in this paper can be formulated as follows:

H1: The effect of governance on economic growth in the observed developed economies is nonlinear, i.e. there is a threshold effect.

H2: There is an asymmetric (nonlinear) impact of the governance components on the economic growth in the observed developed economies.

To verify this hypothesis, the panel threshold regression (PTR) model defined by B. E. Hansen (1999) was used for the purpose of investigating the way how the governance index (at the first level) and the governance components (at the second level) affect the economic growth of 48 developing countries between 2002 and 2020.

This study substantially contributes to the already existing body of the knowledge of governance improvement. To start, the empirical evidence demonstrates that this effect is nonsymmetrical. Secondly, this research study demonstrates how the efforts made by the developing countries in order for them to improve their governance blocked economic growth. This result can be argued by the fact that, to improve governance, governments have to invest a lot of resources that could be committed to boosting economic growth.

The remaining part of this paper is structured into sections. Section 2 presents the relevant literature on the influence governance exerts on economic growth. In section 3, the data and methodology used in the study are defined. Section 4 is the discussion of the empirical findings. Finally, Section 5 gives the conclusion.

LITERATURE REVIEW

The relationship between governance and economic growth

The influence of governance on the economic growth process has been the subject matter of much reflection and discussion. Therefore, a broad range of theoretical and empirical studies have focused on the success or failure of development policies in developing countries. Several studies were carried out on the liaison between governance and economic growth based on the World Bank's (WB) World Governance Indicators (Kaufmann & Kraay, 2002; Bađun, 2005; Beck & Laeven, 2006; Fayissa & Nsiah, 2013). Some of them showed through a variety of methods how good governance assisted to stimulating economic growth

and led to a nation's effective and efficient growth (Al-Naser, 2019; Duan, Zhou, Cai, Gong, Zhao & Ai, 2022). There are those such as D. Rodrick (2006), however, who argued that the relationship between governance and growth was tenuous and should be treated with caution.

M. Jr. Olson, N. Sarna and A. V. Swamy (2000) demonstrated that the effectiveness of governance had a significant positive influence on economic growth, so that the countries with improved governance had higher productivity for that reason. According to the authors, innovation, which can boost economic growth, depends on effective governance. D. Kaufmann and A. Kraay (2002) revealed a strong positive relationship between good governance and higher income *per capita* by using an instrumental variable method.

W. Easterly and R. Levine (2003), as well as H. Jalilian, C. Kirkpatrick and D. Parker (2007), demonstrated how effectively governance accounted for economic growth. W. Easterly and R. Levine (2003) also recognized that enhancing governance could help reduce the gap in the GDP *per capita* between developing and developed nations.

Between the years 1992 and 2004, T. Beck and L. Leaven (2006) used panel regression to investigate the connection between governance and economic growth in 24 transition economies and found that a strong positive influence was exerted on economic growth by effective governance. In addition, B. Fayissa and C. Nsiah (2013) used the same methodology to examine the connection between economic growth and governance in Sub-Saharan African countries between the years 2002 and 2009, and 1995 and 2005, concluding that governance had influenced economic growth in a favorable way. According to B. Fayissa and C. Nsiah (2013), the effect of governance on economic growth varies with income levels.

Additionally, M. H. Khan (2007) showed that good governance confirmed the effectiveness of the market by upholding property rights. On a sample of 71 countries in the period 1996-2003, A. Cooray (2009) discovered that the effectiveness of governance had a favorable effect on economic growth. This

conclusion was supported by M. Petreski (2014), who demonstrated that economic growth in 30 transition economies was positively influenced by good governance in the period from 2005 to 2011.

According to D. Rodrik (2006), the cross-national literature was not able to conclusively prove a strong causal relationship between strong governance and economic development. The results of the study by J. Sachs, J. W. McArthur, G. Schmidt-Traub, M. Kruk, C. Bahadur, M. Faye and G. McCord (2004) are supported by Rodrik's findings, which show a weak correlation between growth and advancement in good governance.

The relationships between the governance components and economic growth

It is possible that the study of the effect of the governance index on economic growth can hide a specific effect of different governance components on economic growth. Thus, some studies focused on how the governance components affected economic growth (Manasseh, Abada, Okiche, Okanya, Nwakoby, Offu & Nwonye, 2022).

Corruption control and economic growth

M. P. Mauro (1995) examined the connection between corruption and investment in 58 different nations introducing the fact that it significantly decreased the investments to the GDP ratio. Using cross-country regressions similar to those of M. P. Mauro (1995), M. P. Mauro (1996) demonstrated that improvements in the standard deviation of the corruption index were correlated with both the increases in the investment rate and the annual growth rate of the GDP *per capita*.

According to N. A. Lash (2004), corruption reduces economic efficiency, which decreases capital formation and eventually slows economic growth. Also, B. Podobnik, J. Shao, D. Njavro, P. C. Ivanov and H. E. Stanley (2008) demonstrated that the annual GDP *per capita* growth rate increased by 1.7 percent for all nations globally from 1999 to 2004 for every unit increase in the corruption index. P. Karnane and

M. A. Quinn (2019), who showed that corruption had had a detrimental effect on the economic growth of 157 countries between 1996 and 2014 for the reason of political instability, which nevertheless had had a little direct influence on it, supported this conclusion.

Good quality governance and economic growth

C. J. Huang and Y. H. Ho (2017) examined Granger causality, which links governance to economic growth in 12 Asian nations between 1996 and 2014. They applied the frequency domain approach. With the exception of South Korea, they found that the "free" countries did not exhibit any discernible causality linking the majority of the governance-related factors to economic growth. The Granger theory of the rule of law drives economic growth in the "partly free" countries (apart from Indonesia and Thailand). There are several aspects of governance, particularly the government efficiency and the rule of law, contribute significantly more to economic growth in the "not free" countries.

There is also considerable disagreement over the contribution an effective government makes to economic expansion. M. J. Kurtz and A. Schrank (2007) showed that economic growth was unaffected by the effectiveness of the government. In contrast, M. R. Alam, E. Kitenge and B. Bedane (2017) found a significant positive influence of the government effectiveness on economic growth for 81 countries for the years 1996, 1998, and 2000, as well as for the period from 2002 to 2011. Specifically, the economic growth rate increased by 0.68 percentage points for every unit increase in the government efficiency.

Political stability and economic growth

A. Aisen and F. J. Veiga (2013) showed that political instability adversely affected economic growth by slowing down the productivity growth rates in a sample of 169 countries in the period from 1960 to 2004 using the generalized method of moments (GMM). This finding supported those of Y. Feng (1997), who demonstrated that political instability

hindered economic growth in 69 nations in the period 1960-1980. Additionally, it backed up the findings of A. Alesina, S. Özler, N. Roubini and P. Swagel (1996), who found that political instability characterized by a high propensity for the failure of the state was significantly associated with lower economic growth in 113 countries for the period 1950-1982.

R. J. Barro (1991) also demonstrated that, for 98 countries in the period 1960-1985, the growth rate of the real GDP *per capita* was positively correlated with political stability. A. K. Fosu (1992) argued that, in the period 1960-1986, political trouble and economic growth were positively correlated in 31 Sub-Saharan African countries. According to the research done by P. McGowan and T. H. Johnson (1984) the 39 Sub-Saharan African nations with the fastest-growing economies experienced fewer military coups d'état than the slower-growing (or worse-performing) nations in the period 1960-1981.

The long-term effect of political instability on the economic growth, however, was demonstrated by N. F. Campos and J. B. Nugent (2002). The short-term effect is the only extent evidence. In addition, J. M. Mbaku (1988) discovered a negligible correlation between the annual growth of the GNP *per capita* and political instability for 35 Sub-Saharan countries in the period 1960-1981. Furthermore, A. K. Fosu (2001) found a connection between political disturbance and economic expansion for 31 countries in Sub-Saharan Africa in the period 1960-1986. According to A. K. Fosu (2001), there was a misspecification issue that had led to the findings indicative of a negative relationship.

Regulatory effectiveness and economic growth

Regressions across a cross-section of 135 nations in the period 1993-2002 were used by S. Djankov, C. McLiesh and R. M. Ramalho (2006), who demonstrated that the countries with better regulations experienced faster economic growth. The authors concluded that improving corporate regulation could boost economic growth. C. Kirkpatrick, D. Parker and Y. F. Zhang (2006) argued that improving the capital formation environment could boost economic growth.

In addition, M. Jr. Olson *et al* (2000) found that countries with better institutions had advanced productivity levels. These results were supported by D. Kaufmann and A. Kraay (2002), who also stressed the importance of governance in the economic growth process.

H. Jalilian *et al* (2007) showed that regulatory quality had a greater influence on economic growth than the other governance indicators did for a total of 117 countries in the period 1980-1999. The authors specifically noted the fact that a one-unit change in regulatory quality and effectiveness correlated with an average 0.6 to 0.9 increase in economic growth.

DATA AND METHODOLOGY

Data

The GDP *per capita* growth rate is the dependent variable in this study, and the study sample consists of 48 developing nations in the period between 2002 and 2020 (Appendix A). The Governance Index (GOV), defined as the average of the six governance components (Corruption Control (CC), Government Effectiveness (GE), Political Stability and Nonviolence (PS), Regulatory Quality (RQ), Rule of Law (RL), and Voice and Accountability (VA)) (Appendix A) is the variable of interest (Easterly & Levine, 2003). The logarithm of the GDP *per capita* (GDP_{2002}) taking into account the convergence hypothesis of the neoclassical growth model, the bank credit granted to the private sector taking into account the development of the financial sector (CPS), the growth rate of gross fixed capital formation taking into account investment growth (GFCF), the total trade of goods and services taking into account the degree of openness (OPEN) and the population growth rate adjusting for demographics development (POP) are the control variables. All the variables and the data sources are presented in Table 1. Table 2 accounts for descriptive statistics on the three variables considered in the analysis.

Table 1 The variables and the data sources

Variables	Sources
The output *per capita* growth rate (Y)	The World Bank (2022a)
Banking credit to the private sector (CPS)	The World Bank (2022a)
The growth rate of the investment fraction of the GDP (GFCF)	The World Bank (2022a)
The inflation rate (INF)	The World Bank (2022a)
The trade fraction of the GDP(OPEN)	The World Bank (2022a)
The population growth rate (POP)	The World Bank (2022a)
Governance components (CC, GE, PS, RL, RQ, VA)	The World Bank (2022b)

Source: Authors

Table 2 The descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
GDP	912	4.345	3.448	-14.800	14.441
GDP_{2002}	912	24.679	1.701	20.720	28.516
DCPS	912	41.491	28.918	0.185	160.125
GFCF	912	6.133	17.633	-249.570	113.403
INF	912	5.437	5.141	-3.648	51.460
OPEN	912	80.515	36.717	22.106	210.373
POP	912	1.492	1.017	-0.993	4.260
GOV	912	-0.125	0.533	-0.994	1.603
CC	912	-0.227	0.643	-1.231	1.572
GE	912	-0.077	0.621	-1.604	1.285
PS	912	-0.244	0.807	-2.806	1.202
RL	912	-0.184	0.642	-1.251	1.418
RQ	912	0.031	0.608	-1.279	1.674
VA	912	0.024	0.646	-1.470	1.243

Source: Authors

Methodology

To examine the relationship between governance and economic growth, the panel threshold regression model (PTR) developed by B. E. Hansen (1999) was

employed, the application of which was supported by the context of the locally weighted scatterplot smoothing (LOWESS) method. It revealed that the relationship between economic growth and the governance index, on the one hand, and between economic growth and each component of governance, on the other, is nonlinear (Figures 1 and 2).

The data observed were generated from a balanced panel y_{it}, q_{it}, x_{it} : $1 \le i \le n$. The index i indicates the individual, and the index t indicates the time. The dependent variable y_{it} (the GDP *per capita* growth rate) is scalar, the threshold variable q_{it} (the governance index) is scalar, and the regressor x_{it} is a k-vector (GDP$_{2002}$, GOV, DCPS, GFCG, INF, OPEN and POP). The structural equation of interest reads as follows:

$$y_{it} = \mu_{it} + \beta_1' x_{it} I(q_{it} \le \gamma) + \beta_2' x_{it} I(q_{it} > \gamma) + e_{it} \qquad (1)$$

where I(.) is the indicator function. An intuitive alternative to the equation (1) is as follows:

$$\begin{cases} \Delta Y_{it} = \beta_1' x_{it} + e_{it} , q_{it} \le \gamma \\ \Delta Y_{it} = \beta_2' x_{it} + e_{it} , q_{it} > \gamma \end{cases} \qquad (2)$$
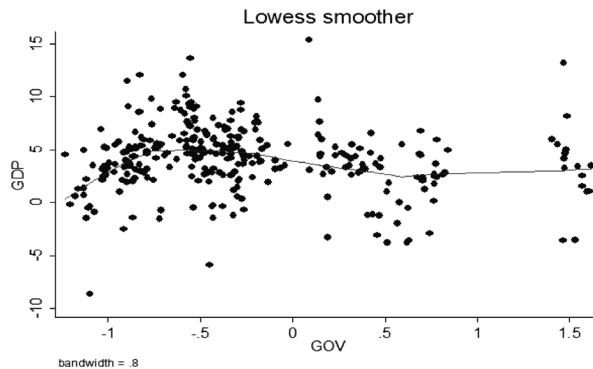
$\beta = (\beta_1' \beta_2')'$ so (1) equals:

$$y_{it} = \mu_{it} + \beta x_{it}(\gamma) + e_{it} \qquad (3)$$

Depending on whether the threshold variable q_{it} is lesser or greater than the threshold, the observations are divided into two ranges. The regression slopes β_1 and β_2 that differ between the regimes allow for a differentiation. It is necessary that the components of x_{it} be not time-invariant in order to identify β_1 and β_2. The threshold variable q_{it} is also assumed to be not time-invariant.

The error e_{it} is considered to have an independent and identical distribution (*iid*), the mean of zero, and a finite variance. The lagged dependent variables are excluded from x_{it} by the *iid* assumption.

According to the literature, two principal models are outlined: the first one studies the relationship between economic growth and governance as an overall index that is the average of the six governance components mentioned above, whereas the second model examines the impact of each governance component on economic development.

$$\begin{cases} \Delta Y_{it} = \alpha_0 + \alpha_1 GOV_{it} + \alpha_2 CPS_{it} + \alpha_3 GDP_{2002} + \alpha_4 GFCF_{it} + \alpha_5 INF_{it} + \alpha_6 OPEN_{it} + \alpha_7 POP_{it} + e_{it} , q_i \le \gamma \\ \Delta Y_{it} = \alpha_0' + \alpha_1' GOV_{it} + \alpha_2' CPS_{it} + \alpha_3' GDP_{2002} + \alpha_4' GFCF_{it} + \alpha_5' INF_{it} + \alpha_6' OPEN_{it} + \alpha_7' POP_{it} + e_{it}' , q_i > \gamma \end{cases} \qquad (4)$$

$$\begin{cases} \Delta Y_{it} = \alpha_0 + \alpha_1 GOVCOMP_{it} + \alpha_2 CPS_{it} + \alpha_3 GDP_{2002} + \alpha_4 GFCF_{it} + \alpha_5 INF_{it} + \alpha_6 OPEN_{it} + \alpha_7 POP_{it} + e_{it} , q_i \le \gamma \\ \Delta Y_{it} = \alpha_0' + \alpha_1' GOVCOMP_{it} + \alpha_2' CPS_{it} + \alpha_3' GDP_{2002} + \alpha_4' GFCF_{it} + \alpha_5' INF_{it} + \alpha_6' OPEN_{it} + \alpha_7' POP_{it} + e_{it}' , q_i > \gamma \end{cases} \qquad (5)$$

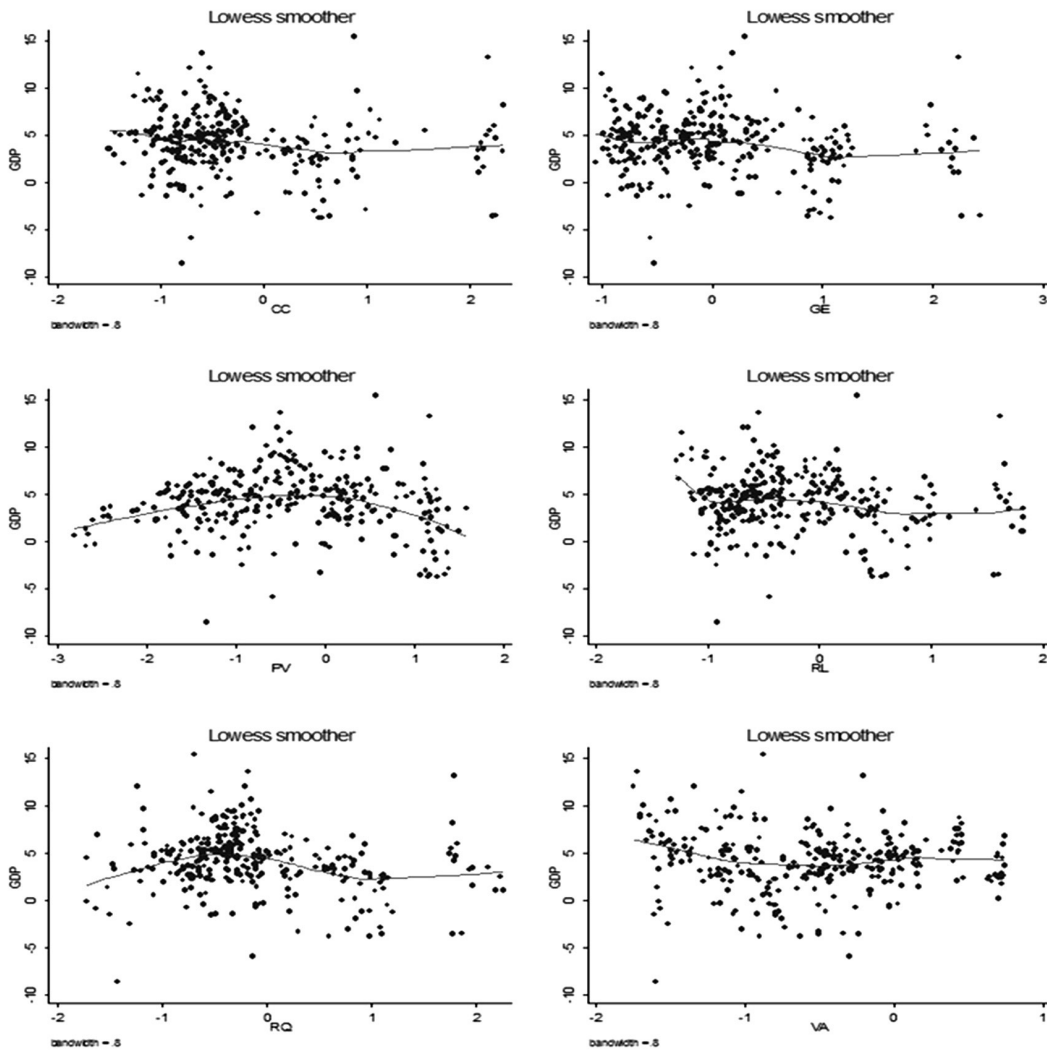**Figure 1** The relationship between economic growth and governance for developing countries

Source: Authors

The notation is as follows: ΔY_i - the growth rate of the GDP *per capita* for the country *i*; *GOV* - the governance index; *GOVCOMP* - the governance components (Corruption Control (CC), Government Efficiency (GE), Political Stability and the Absence of Violence (PS), Regulatory Quality (RQ), Rule of Law (RL), Voice and Accountability (VA)); *GFCF* - the gross fixed capital formation; *INF* - the inflation rate; *OPEN* - the openness rate, and *POP* - the population growth rate.

EMPIRICAL RESULTS AND DISCUSSION

Unit root analysis

The stationarity of the variables used in the analysis should be checked prior to estimating the panel threshold regression model. For the unit root test, the Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) panel data stationarity tests were used. All the variables of x_{it} are stationary, as is shown in Table 3.

Figure 2 The relationship between economic growth and governance for developing countries

Source: Authors

Table 3 The stationarity test

Variables	LLC	p-values	IPS	p-values
GDP	-21.314	(0.000)	-10.607	(0.000)
CPS	-1.759	(0.039)	-3.386	(0.000)
GFCF	-3.515	(0.000)	-1.868	(0.000)
GOV	-6.268	(0.000)	-2.030	(0.021)
INF	-13.963	(0.000)	-11.032	(0.000)
OPEN	-4.731	(0.000)	-2.225	(0.013)
POP	-2.154	(0.015)	-5.615	(0.000)
GOV	-6.268	(0.000)	-2.030	(0.021)
CC	-2.768	(0.002)	-5.660	(0.000)
GE	-6.906	(0.000)	-6.233	(0.000)
PS	-6.661	(0.000)	-6.471	(0.000)
RL	-7.830	(0.000)	-4.876	(0.000)
RQ	-6.030	(0.000)	-4.877	(0.000)
VA	-6.848	(0.000)	-5.497	(0.000)

Source: Authors

Table 4 The governance index - economic growth: The threshold estimations

Variables	Regime 1 $\sigma_i \leq \gamma = 0.222$		Regime 2 $\sigma_i > \gamma = 0.222$	
	Coef.	St. Error	Coef	St. Error
C	3.093	2.225	3.718	11.070
GOV	0.391	0.613	-3.479***	0.858
CPS	-0.014**	0.007	-0.047	0.011
GDP_{2002}	-0.063	0.096	-0.649	0.422
GFCF	0.167***	0.023	0.099***	0.116
INF	-0.030	0.034	-0.190	0.131
OPEN	0.002	0.011	0.037***	0.009
POP	-0.116	-0.314	0.109	0.444
Observations	492		420	
R^2	35.42%		46.43%	
Hetero-skedasticity Test (P-Value)	0.039			

Note: The coefficients are significant at the *10%, **5%, and ***1% levels.

Source: Authors

The relationship between the governance index and economic growth

The threshold estimations used make it possible to determine whether the governance index has an effect on economic growth or not. The findings are presented in Table 4.

First of all, according to the foregoing findings, relationship between the governance index and economic growth is nonlinear, which indeed is below the threshold level of 0.222; the relationship between the governance index and economic growth is positive but not significant (Regime 1). However, the effect of governance on economic growth above this level is negative and significant (Regime 2), which means that an improvement in governance in developing nations may be able to restrain economic expansion.

This result can be explained by the fact that governments must spend a lot of resources on governance improvements, the resources that could be spent in a better way on promoting economic growth. The same model is used to estimate the relationship between governance and economic growth in order to answer the fundamental question of whether there is a threshold above which effective governance results in increased economic growth. The findings of this research study demonstrate that, when the growth rate is below 6.3 percent, it exerts a negative influence on the governance index; above this point, however, economic growth enhances governance. These findings complement B. Fayissa and C. Nsiah's (2013) result of the irregularity of the governance effect on economic growth according to the income level. It also follows the same line of thought as that of M. H. Khan's (2004) argument that it is difficult to conclusively show that growth

promotes good governance, rather than the reverse, that growth and the rising of income *per capita* are necessary for long-term improvements in good governance. It also corroborates the conclusion made by E. Jakopin (2018), who concluded that the influence of institutions on transition economic growth in Serbia was insignificant, which is not the case when the impact of economic growth on the development of institutions was subjected to analysis.

These findings are important for the policymakers who, first, endeavor to increase economic growth in order to find resources for setting up an effective governance system, and later for obtaining the beneficial effects of governance on overall economic growth.

Since investment is a major driver of economic growth in developing countries, the evolution rate of the gross fixed capital formation (GFCF) meaningfully boosts overall economic growth. Furthermore, it can be observed that the influence of the GFCF in Regime 1 is greater than the influence it has in Regime 2. These findings are consistent with the argument expressed here that, in Regime 2 (above the threshold level of governance), there is a negative relationship between government and economic growth. To put it another way, the impact of investment on economic growth in Regime 2 is smaller than it is in Regime 1, because the government will prioritize the improvement of governance over investment when allocating resources.

The GDP *per capita* for the year 2002 (GDP$_{2002}$) was significant and shows the expected sign, which is consistent with the neoclassical theory of economic growth. Furthermore, the increased openness of trade (OPEN) boosts expansion in developing nations.

As a measure of the soundness and development of financial systems, the lending of the banking system to the private sector is negative. This result can be attributed to the weak financial sector in most developing nations, these loans additionally not being used for productive purposes.

The governance components and economic growth: The threshold estimations

To examine the influence of the governance components on economic growth, the model is estimated by regressing on each component individually (the specifications 1 to 6 in the tables 5 and 6). The regression results for each specification are presented in the tables 5 and 6 for Regime 1 and Regime 2, respectively.

The results obtained and accounted for first point to the nonlinear link between economic growth and the six pillars of governance. For GE, CC, PS, RL, RQ, and VA, the threshold effects are -0.142, -0.446, -0.244, -0.642, -0.290, and -0.168, respectively.

The findings empirically demonstrate the fact that good governance does in fact matter for economic growth in developing countries, as is shown by the regression results reported in Table 4 (Regime 1). According to the empirical data, increases in regulatory quality, voice and accountability, and the government effectiveness all significantly boost economic growth when they are below their threshold levels of -0.142, -0.290, and -0.168, respectively.

The GE coefficient is statistically significant and positive. These findings contribute to the belief that improving public services, the civil service and its degree of independence of political densities increases economic growth in developing nations. Such a result is in agreement with that obtained by T. Pushak, E. R. Tiongson and A. Varoudakis (2007) and M. R. Alam *et al* (2017), who showed that, in the countries with relatively better public sector governance, macroeconomic stability and public spending could lead to higher growth payouts.

The positive and statistically significant RQ coefficient indicates that improving the ability of the government to develop and put into effect sensible regulations and policies and fostering the private sector growth as well are likely to help boost economic growth in developing nations, corroborates the results obtained by D. Kaufmann and A. Kraay (2002), S. Djankov *et al* (2006), H. Jalilian *et al* (2007), and J. O. Afolabi (2019).

Table 5 The governance components and economic growth: The threshold estimations (Regime 1)

	Regime 1					
	Specification 1 $\sigma_i \le \gamma = -0.446$	Specification 2 $\sigma_i \le \gamma = -0.142$	Specification 3 $\sigma_i \le \gamma = -0.244$	Specification 4 $\sigma_i \le \gamma = -0.642$	Specification 5 $\sigma_i \le \gamma = -0.290$	Specification 6 $\sigma i \le \gamma = -0.168$
c	5.216*** [4.568]	7.016*** [8.144]	4.415*** [6.305]	2.244* [1.358]	7.412*** [5.161]	5.860*** [6.135]
GDP_{2002}	-0.057 [-0.548]	-0.007 [-0.045]	-0.083 [-0.697]	-1.263*** [-2.239]	-0.379 [-0.783]	0.759*** [2.232]
CPS	-0.033*** [-2.171]	-0.083*** [-4.821]	-0.020*** [-3.353]	-0.069*** [-2.502]	-0.047*** [-2.471]	-0.029*** [-3.086]
GFCF	0.124*** [6.334]	0.013 [0.819]	0.151*** [10.586]	-0.0002 [-0.018]	0.001 [0.134]	0.004 [0.283]
INF	-0.072*** [-3.025]	-0.062 [-1.613*]	-0.073* [-2.870]	-0.004 [-1.432]	-0.052 [-0.937]	-0.033 [-0.857]
OPEN	0.002 [0.456]	0.028*** [3.767]	0.004 [0.732]	0.028*** [3.544]	0.006 [0.864]	0.012** [1.816]
POP	-0.083 [-0.357]	0.194 [0.833]	0.121 [0.672]	0.588* [1.430]	0.204 [0.565]	0.072 [0.265]
CC	0.173 [0.205]	-	-	-	-	-
GE	-	3.667*** [4.434]	-	-	-	-
PS	-	-	0.040 [0.156]	-	-	-
RL	-	-	-	-1.540 [-1.050]	-	-
RQ	-	-	-	-	3.590*** [3.471]	-
VA	-	-	-	-	-	1.486*** [2.685]
Obs.	489	419	393	366	414	480
R²	0.37	0.33	0.45	0.28	0.27	0.37

Source: Authors

The voice and accountability (VA) coefficient is statistically both significant and positive. This result proves the importance of democracy, the freedom of speech, access to the media, and the right to association in fostering economic growth in developing countries. This result is consistent with the findings of R. C. Kormendi and P. G. Meguire (1985), and D. Kaufmann and A. Kraay (2002), who discovered that the nations with greater civil liberties typically had higher prosperity levels.

According to the results of the control variables, investment (GFCG/GDP) and the openness level (TRADE/GDP) both contribute to economic growth. However, the banking system's lending to the private sector and inflation have a negative influence on economic growth. In fact, these credits are not invested in fruitful and productive activities and may be the cause of the CPS's detrimental influence on economic growth.

The empirical results presented in Table 6 (Regime 2) revealed that, above the threshold levels, all the other aspects of governance, apart from voice and accountability (VA), are negatively and statistically significantly correlated with economic growth, which is implicative of the fact that improving these aspects of governance would block economic growth in these developing countries.

Table 6 The governance components and economic growth: The threshold estimations (Regime 2)

	Regime 2					
	Specification 1 $\sigma_i > \gamma = -0.446$	Specification 2 $\sigma_i > \gamma = -0.142$	Specification 3 $\sigma_i > \gamma = -0.244$	Specification 4 $\sigma_i > \gamma = -0.642$	Specification 5 $\sigma_i > \gamma = -0.290$	Specification 6 $\sigma_i > \gamma = -0.168$
c	3.784***	3.250***	2.538***	4.205***	4.013***	3.904***
	[5.580]	[5.865]	[2.448]	[7.972]	[7.556]	[6.682]
GDP_{2002}	-0,070	-0.094	-0.336	0.055	-0.014	-0.099
	[-0.679]	[-0.606]	[-1.607*]	[0.647]	[0.152]	[-0.908]
CPS	-0.021***	-0.008**	-0.020***	-0.015***	-0.017***	-0.017***
	[-4.281]	[-1.983]	[-3.234]	[-4.058]	[-4.001]	[-3.995]
GFCF	0.020	0.142***	0.021***	0.116***	0.131***	0.130***
	[1.054]	[6.872]	[1.125]	[7.248]	[7.150]	[8.388]
INF	0.103**	0.028**	0.209***	0.023*	-0.012	-0.035
	[1.891]	[1.965]	[2.556]	[-1.432]	[-0.492]	[-0.884]
OPEN	0.005	0.007*	0.014***	0.0009	0.005*	0.001
	[1.221]	[1.379]	[2.466]	[0.209]	[1.154]	[0.319]
POP	0.397***	0.093	0.311*	-0.017	0.081	0.204*
	[2.234]	[0.465]	[1.450]	[-0.121]	[0.518]	[1.284]
CC	-0.492**	-	-	-	-	-
	[-1.900]					
GE	-	-1.127***	-	-	-	-
		[-2.842]				
PS	-	-	-1.095***	-	-	-
			[-2.544]			
RL	-	-	-	-0.471**	-	-
				[-1.719]		
RQ	-	-	-	-	-0.650***	-
					[-2.259]	
VA	-	-	-	-	-	-0.177
						[-0.508]
Obs.	489	419	393	366	414	480
R^2	0.26	0.3	0.44	0.32	0.35	0.38

Source: Authors

Economic growth is hampered by an increase in the corruption control index (CC), which is in line with S. P. Huntington's (1968) assertion that a rigid, centralized, and dishonest bureaucracy is worse for a society's ability to economically grow than a rigid, centralized, and honest bureaucracy. Furthermore, F. T. Lui (1985) showed how corruption could effectively reduce the time people spend in lines. According to P. G. Méon and K. Sekkat (2005), corruption can cover up for a number of bureaucratic dysfunctions. Slowness is the first one. The results of S. Haggard and L. Tiede (2011) demonstrated a positive connection between corruption and economic growth for developing countries between 1985 and 2004, which is also in agreement with these findings.

Economic growth tends to be significantly harmed by improvements in the government effectiveness (GE) and regulatory quality (RQ), the reason for which lies in the fact that these countries do not have sufficient resources to improve the quality of their public services, civil service, policy formulation, and policy implementation, and that, even if they did have sufficient resources, that would be at the expense of economic growth.

According to the political stability coefficient, which is negative and statistically significant, political instability in developing countries did not harm economic growth between 1996 and 2015. This conclusion is in line with the research study carried

out by A. K. Fosu (2001) and may be supported by the observation that investment declines and savings increase during periods of political unpredictability and instability, which has the effect of slowing down both short- and long-term economic growth.

It is statistically significant that the rule of law (RL) coefficient is negative. Since corruption control (CC) has a favorable influence on economic growth, this result is consistent with those findings. The introduction of the rule of law will limit corruption, which seems to be advantageous to developing countries at the present stage of development.

CONCLUSION

The relationship between appropriate governance and economic growth is considered to be one of the more active areas of theoretical and empirical debate in the literature. Using a threshold regression model, this paper was initially aimed at examining the relationship between economic growth and governance in 48 developing countries between the years 2002 and 2020.

In reference to the first hypothesis of this paper (H1), first, the results obtained herein do confirm the nonlinear relationship between economic growth and the governance index. This relationship is indeed characterized by the presence of the threshold effect. Second, economic growth in developing countries slows down when governance improves. In fact, the relationship between economic growth and governance is negative and significant (Table 4, Regime 2). Despite these findings, the positive effects of sound governance on economic growth should not be cast a doubt on. Numerous resources needed for improving governance, however, should be provided by boosting economic growth at the initial stage, which could in turn enable good governance to support further economic growth.

When speaking about the second research hypothesis (H2), the findings presented herein are also supportive of the idea that the relationships between economic growth and the governance components, such as corruption control (CC), the government efficiency (GE), political stability (PS), the rule of law (RL), regulatory quality (RQ), and voice and accountability (VA) are nonlinear. Indeed, CC, PS and RL are not significant below their threshold level. Above their threshold levels, however, these components are negatively significant. In addition, the relationships between economic growth and GE, RQ and VA are positive and significant. Nonetheless, these components exert a negative influence on economic growth, except for VA.

By way of conclusion, the implications of the findings presented herein and pertaining to developing economies are thus profound. In spite of the positive effect of corruption as long as it is below its threshold level, its effect is negative when the same is above this cutoff point. Thus, developing economies are suggested to build a strong institution to limit corruption and keep it at a supportable level.

In addition, as long as their indices are below their cutoff points, regulatory quality (RQ) and the government effectiveness (GE) have a positive influence on economic growth. However, the effects are reversed when these aspects of governance, as well as political stability (PS) and the rule of Law (RL), improve.

Therefore, it is recommended that developing countries should ensure the economic growth that will then guarantee them means to establish the governance system that will sustain this growth in the long run. They are simultaneously called upon to build the strong institutions that promote accountability, limit corruption and facilitate the functioning of the rule of law.

REFERENCES

Afolabi, J. O. (2019). The impact of governance on economic development in West Africa: A system GMM dynamic panel approach. *Acta Universitatis Danubius. Œconomica, 15*(3), 217-231.

Aisen, A., & Veiga, F. J. (2013). How does political instability affect economic growth? *European Journal of Political Economy*, *29*, 151-167. doi:10.1016/j.ejpoleco.2012.11.001

Alam, M. R., Kitenge, E., & Bedane, B. (2017). Government effectiveness and economic growth. *Economics Bulletin, 37*(1), 222-227.

Alesina, A., Özler, S., Roubini, N., & Swagel, P. (1996). Political instability and economic growth. *Journal of Economic Growth*, *1*(2), 189-211. doi:10.1007/BF00138862

Al-Naser, M. H. (2019). Public governance and economic growth: Conceptual framework. *International Journal of Business Ethics and Governance*, *2*(2), 1-15. doi:10.51325/ijbeg.v2i2.21

Bađun, M. (2005). The quality of governance and economic growth in Croatia. *Occasional Paper Series*, *10*, 1-32. doi:10.3326/ops.29

Barro, R. J. (1991). Economic growth in a cross section of countries. *The Quarterly Journal of Economics*, *106*(2), 407-443. doi:10.2307/2937943

Beck, T., & Laeven, L. (2006). Institution building and growth in transition economies. *Journal of Economic Growth*, *11*, 157-186. doi:10.1007/s10887-006-9000-0

Campos, N. F., & Nugent, J. B. (2002). Who is afraid of political instability? *Journal of Development Economics*, *67*(1), 157-172. doi:10.1016/S0304-3878(01)00181-X

Castañeda, J. G. (2003). The forgotten relationship. *Foreign Affairs*, *82*(3), 67-81. doi:10.2307/20033579

Cooray, A. (2009). Government expenditure, governance and economic growth. *Comparative Economic Studies*, *51*, 401-418. doi:10.1057/ces.2009.7

Djankov, S., McLiesh, C., & Ramalho, R. M. (2006). Regulation and growth. *Economics letters*, *92*(3), 395-401. doi:10.1016/j.econlet.2006.03.021.

Duan, C., Zhou, Y., Cai, Y., Gong, W., Zhao, C., & Ai, J. (2022). Investigate the impact of human capital, economic freedom and governance performance on the economic growth of the BRICS. *Journal of Enterprise Information Management, 35*(4/5), 1323-1347. doi:10.1108/JEIM-04-2021-0179

Easterly, W., & Levine, R. (2003). Tropics, germs, and crops: how endowments influence economic development. *Journal of Monetary Economics*, *50*(1), 3-39. doi:10.1016/S0304-3932(02)00200-3

Fayissa, B., & Nsiah, C. (2013). The impact of governance on economic growth in Africa. *The Journal of Developing Areas*, 91-108. doi:10.1353/jda.2013.0009

Feng, Y. (1997). Democracy, political stability and economic growth. *British Journal of Political Science*, *27*(3), 391-418. doi:10.1017/S0007123497000197

Fosu, A. K. (1992). Political instability and economic growth: Evidence from Sub-Saharan Africa. *Economic Development and Cultural Change*, *40*(4), 829-841. doi:10.1086/451979

Fosu, A. K. (2001). Political instability and economic growth in developing economies: Some specification empirics. *Economics Letters*, *70*(2), 289-294. doi:10.1016/S0165-1765(00)00357-8

Gani, A. (2011). Governance and growth in developing countries. *Journal of Economic Issues*, *45*(1), 19-40. doi:10.2753/JEI0021-3624450102

Haggard, S., & Tiede, L. (2011). The rule of law and economic growth: where are we? *World Development*, *39*(5), 673-685. doi:10.1016/j.worlddev.2010.10.007

Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics*, *93*(2), 345-368. doi:10.1016/S0304-4076(99)00025-1

Hausmann, R., Rodrik, D., & Velasco, A. (2008). Growth diagnostics. In: N. Serra, & J. E. Stiglitz (Eds.), *The Washington Consensus Reconsidered: Towards New Global Governance* (pp. 324-355), Oxford, UK: Oxford University Press. doi:10.1093/acprof:oso/9780199534081.003.0015

Huang, C. J., & Ho, Y. H. (2017). Governance and economic growth in Asia. *The North American Journal of Economics and Finance*, *39*, 260-272. doi:10.1016/j.najef.2016.10.010

Huntington, S. P. (1968). *Political Order in Changing Societies*. New Haven, CT: Yale University Press.

Huynh, K. P., & Jacho-Chávez, D. T. (2009). Growth and governance: A nonparametric analysis. *Journal of Comparative Economics*, *37*(1), 121-143. doi:10.1016/j.jce.2008.08.003

Jakopin, E. (2018). Economic growth and the institutional transition of the Republic of Serbia. *Economic Horizons*, *20*(2), 95-108. doi: 10.5937/ekonhor1802095J

Jalilian, H., Kirkpatrick, C., & Parker, D. (2007). The impact of regulation on economic growth in developing countries: A cross-country analysis. *World Development*, *35*(1), 87-103. doi:10.1016/j.worlddev.2006.09.005

Karnane, P., & Quinn, M. A. (2019). Political instability, ethnic fractionalization and economic growth. *International Economics and Economic Policy*, *16*, 435-461. doi:10.1007/s10368-017-0393-3

Kaufmann, D., & Kraay, A. (2002). Growth without governance. *Economia*, *3*(1), 169-229. doi:10.1353/eco.2002.0016

Khan, M. H. (2004). Evaluating the emerging Palestinian state: 'Good governance' versus 'transformation potential'. In: I. Amundsen, G. Giacaman, & M. H. Khan (Eds.), *State Formation in Palestine: Viability and Governance during a Social Transformation* (pp. 13-63), London, UK: Routledge.

Khan, M. H. (2007). Governance, economic growth and development since the 1960s. *DESA Working Paper No. 54*. New York, NY: United Nations, Department of Economic and Social Affairs.

Kirkpatrick, C., Parker, D., & Zhang, Y. F. (2006). Foreign direct investment in infrastructure in developing countries: Does regulation make a difference? *Transnational Corporations*, *15*(1).

Kormendi, R. C., & Meguire, P. G. (1985). Macroeconomic determinants of growth: Cross-country evidence. *Journal of Monetary Economics*, *16*(2), 141-163. doi:10.1016/0304-3932(85)90027-3

Kurtz, M. J., & Schrank, A. (2007). Growth and governance: Models, measures, and mechanisms. *The Journal of Politics*, *69*(2), 538-554. doi:10.1111/j.1468-2508.2007.00549.x

Lash, N. A. (2004). Corruption and economic development. *The Journal of Economic Asymmetries*, *1*(1), 85-109. doi:10.1016/j.jeca.2004.01.007

Lui, F. T. (1985). An equilibrium queuing model of bribery. *Journal of Political Economy*, *93*(4), 760-781. doi:10.1086/261329

Manasseh, C. O., Abada, F. C., Okiche, E. L., Okanya, O., Nwakoby, I. C., Offu, P., & Nwonye, N. G. (2022). External debt and economic growth in Sub-Saharan Africa: Does governance matter? *Plosone*, *17*(3). doi:10.1371/journal.pone.0264082

Mauro, M. P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, *110*(3), 681-712. doi:10.2307/2946696

Mauro, M. P. (1996). The effects of corruption on growth, investment, and government expenditure. *International Monetary Fund WP Series 1996 (098)*. Washington, DC: International Monetary Fund. doi:10.5089/9781451852097.001

Mbaku, J. M. (1988). Political instability and economic development in Sub-Saharan Africa: Some recent evidence. *The Review of Black Political Economy*, *17*(1), 89-111. doi:10.1007/BF02900956

McGowan, P., & Johnson, T. H. (1984). African military coups d'état and underdevelopment: A quantitative historical analysis. *The Journal of Modern African Studies*, *22*(4), 633-666. doi:10.1017/S0022278X00056275

Méon, P. G., & Sekkat, K. (2005). Does corruption grease or sand the wheels of growth? *Public Choice*, *122*, 69-97. doi:10.1007/s11127-005-3988-0

Mokyr, J. (1992). Technological inertia in economic history. *The Journal of Economic History*, *52*(2), 325-338. doi:10.1017/S0022050700010767

Olson Jr, M. (1996). Distinguished lecture on economics in government: Big bills left on the sidewalk: Why some nations are rich, and others poor. *Journal of Economic Perspectives*, *10*(2), 3-24. doi:10.1257/jep.10.2.3

Olson, Jr. M., Sarna, N., & Swamy, A. V. (2000). Governance and growth: A simple hypothesis explaining cross-country differences in productivity growth. *Public Choice*, *102*, 341-364. doi:10.1023/A:1005067115159

Petreski, M. (2014). Regulatory environment and development outcomes: Empirical evidence from transition economies. *Ekonomický časopis*, *62*(3), 225-248.

Podobnik, B., Shao, J., Njavro, D., Ivanov, P. C., & Stanley, H. E. (2008). Influence of corruption on economic growth rate and foreign investment. *The European Physical Journal B*, *63*, 547-550. doi:10.1140/epjb/e2008-00210-2

Pushak, T., Tiongson, E. R., & Varoudakis, A. (2007). Public finance, governance, and growth in transition economies: Empirical evidence from 1992-2004. *World Bank Policy Research Working Paper No. 4255*. Washington, DC: The World Bank. doi:10.1596/1813-9450-4255

Rodrik, D. (2006). Goodbye Washington consensus, hello Washington confusion? A review of the World Bank's economic growth in the 1990s: Learning from a decade of reform. *Journal of Economic Literature*, *44*(4), 973-987. doi:10.1257/jel.44.4.973

Rosenberg, N., & Birdzell, L. E. (1986). *How the West Grew Rich: The Economic Transformation of the Industrial World*. New York, NY: Basic Books.

Sachs, J., McArthur, J. W., Schmidt-Traub, G., Kruk, M., Bahadur, C., Faye, M., & McCord, G. (2004). Ending Africa's poverty trap. *Brookings Papers on Economic Activity*, *2004*(1), 117-240. doi:10.1353/eca.2004.0018

The World Bank (WB). (2022a). *World Development Indicators*. Retrieved January 23, 2023, from https://databank.worldbank.org/source/world-development-indicators

The World Bank (WB). (2022b). *World Governance Indicators*. Retrieved January 20, 2023, from http://info.worldbank.org/governance/wgi/

Wolf, M. (2005, July 5). Aid is well worth trying. *Financial Times*. https://www.ft.com/content/d6775b0a-ed7e-11d9-ac0d-00000e2511c8

Nabil Alimi is an associate professor at the Faculty of Economic Sciences and Management of Tunis, Tunisia. He holds PhD and MA degrees in international economics from the University of Tunis El Manar. His research focuses on international economics.

Lassad Ben Dhiab is an assistant professor at the Higher Institute of Management of Gabes, Tunisia. He holds PhD in Economics from the University of Tunis El Manar, Tunisia. His research focuses on Insurance Economics.

APPENDIX

Table A1 The list of the developing countries

Argentina	El Salvador	Peru
Armenia	Estonia	Philippines
Bahamas, The	Gabon	Senegal
Belize	Honduras	Slovak Republic
Benin	India	Slovenia
Bolivia	Indonesia	South Africa
Botswana	Jordan	Sri Lanka
Brazil	Kenya	Tanzania
Burkina Faso	Malaysia	Thailand
Cambodia	Mali	Togo
Chile	Mauritius	Trinidad and Tobago
Colombia	Mexico	Tunisia
Czech Republic	Morocco	Turkey
Dominican Republic	Mozambique	Uganda
Ecuador	Nicaragua	Ukraine
Egypt	Pakistan	Uruguay

Source: Authors

Table A2 The governance components

1. Corruption control
It captures the perceptions of the extent to which public power is exercised private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.
2. Government effectiveness
It captures the perceptions of the quality of public services, the quality of the civil service and the degree of its independence of political pressures, the quality of the policy formulation and implementation, and the credibility of the government's commitment to such policies.
3. Political stability
It measures the perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.
4. Regulatory quality
It captures the perceptions of the government's ability to formulate and implement sound policies and regulations permitting and promoting the private sector development.
5. The rule of law
It captures the perceptions of the extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, property rights, the police, and courts, as well as the likelihood of crime and violence.
6. Voice and accountability
It captures the perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as the freedom of expression, the freedom of association, and the free media.

Source: The World Bank (2022b)