



Underlying the Relationship Between Governance and Economic Growth in Developed Countries

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Abstract

This paper uses panel data from 31 developed countries over the period 2002 to 2018 by applying a generalized method of moments (GMM) and system generalized method of moments (Sys GMM), pooled OLS, fixed effect, and random effect to look at the effect of six indicators of governance on economic growth. The study finds direct significant effect of rule of law, control of corruption, and voice and accountability on economic growth of developed countries which indicate that developed countries' economy increases due to increase in rule of law or control of corruption or voice and accountability. The study also finds indirect significant effect of government effectiveness, political stability, and regulatory quality on economic growth which imply decline in the economy of developed countries due to 1% increase in government effectiveness, political stability, and regulatory quality. The results of this study apparently demonstrate the importance of governance indicators to get better the developed countries' economy.

Keywords Governance · Panel data · Economic growth · Dynamic model

Introduction

In the current time, international organization, for example, the International Monetary Fund, economic cooperation and development organization, the United Nations, and the World Bank have highlighted the good governance importance. Governance plays a vital role in supporting a country competitiveness and get better quality of people's life.

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Therefore, the link of governance with economic growth is one of the very important areas of study in development (Grindle 2004).

Good governance has been broadly argued and used in different fields of research, while the World Bank first applied in 1989 report the perception of governance. International organization has created different indicators to determine governance; such as World Bank, World Governance Indicators (WGI) six indicators “control of corruption”, “government effectiveness”, “political stability and absence of violence/terrorism”, “regulatory quality”, “voice and accountability” and “rule of law”. The World Governance Indicators have broadly applied amid academics and policymakers.

One of the very important questions is whether governance is helpful to economic growth. There are a lot of studies which have observed the relationship of governance with economic growth and proposed that economic growth affects significantly due to governance indicators. Kaufmann et al. (1999) proposed that good governance is very helpful for economic growth, while Rigobon and Rodrik (2005) and Dollar and Kraay (2002) found significant effect of rule of law on economic growth, and Easterly and Levine (2003) found positive effect of six governance on economic growth. De Groot et al. (2004) also found positive relationship of regulatory quality with economic growth and trade in democratic countries, but Jalilian et al. (2006) suggested that government effectiveness and regulatory boost economic growth in developing countries, and Mari’a-Teresa et al. (2012) suggested that control of corruption, government effectiveness, voice and accountability, and rule of law have positive effect on economic growth. Fayissa and Nsiah (2013), Gani (2011), Huynh and Jacho-Chavez (2009), and Arusha (2009) investigated the relationship of six governance dimensions with economic growth. Fayissa and Nsiah (2013) suggested that governance plays very important role in economic growth and depends on income level in sub-Saharan African countries. Gani (2011) found that government effectiveness and political stability boost economic growth, while control of corruption and voice and accountability decrease economic growth. Huynh and Jacho-Chavez (2009) found positive effect of rule of law, government effectiveness, and political stability on economic growth, but Arusha (2009) suggested that good qualities of governance are very important for economic growth.

Economic growth has been connected to governance both directly and indirectly (Adams and Mengistu 2008; Ndulu and O’Connell 1999; Pradhan and Sanyal 2011). In addition, governance may be affected by economic growth. Przeworski et al. (2000) proposed that economic development affects political stability. Good governance is the use of power, or power over to handles a country’s resources and affairs Schneider (1999). Kaufmann and Kraay (2002), and Adams and Mengistu (2008) suggest that better-developed nations tend to have greater political stability than less-developed countries. Furthermore, governing processes are affected by economic crises (Furubotn and Richter 2005; Smith 2007). During economic crises, most governments focus more on economic growth than on governance development (Kaufmann et al. 2010; Reinhart and Rogoff 2009). In general, governments typically respond to crises with short-term remedial plans, potentially resulting in a harmful long-term economy recovery. Therefore, the short-term relationship between governance and economic growth may be different from the long-term relationship between governance and economic growth. The relationship may change over time.

This study investigates the effect of governance on economic growth in developed countries. Most of the studied on causality relationship between governance and economic growth has been conducted on specific regions and applied of pooled OLS, GLS, fixed effect, and random effect to observe the impact of good governance on economic growth (Rivera-Batiz 2002; Mira and Hammadache 2017; Bulte et al. (2005); Butkiewicz and Yanikkaya (2006); Ji et al. (2013); Olayungbo and Adediran (2017); Young and Sheehan (2014); Wilson (2016); Medina-Moral and Montes-Gan 2018; Kyriacou 2016; Huang and Ho 2017; Apergis and Payne 2014; Güney 2017; and Cooray 2009). The current studies use pooled OLS, fixed effect and random effect, generalized method of moments (GMM), and system generalized method of moments (Sys GMM). To fill this gap, we investigate the effect of six governance indicators on economic growth for thirty-one developed countries and find that control of corruption, strict rule of law, and voice and accountability boost economic growth in developed countries, but government effectiveness, political stability, and regulatory quality decrease economic growth in developed countries and suggest that all governance indicators play very important role in economic growth of developed countries. To increase the economic growth in developed countries, both external and domestic policy creators may have to place important emphasis on the preservation of the governance indicators.

The rest of the research study is organized as follows. Section 2 presents a review of selected literature. Section 3 presents the econometric method and data. Section 4 presents the empirical results and discussions. Section 5 presents the conclusion of the study.

Literature Review

The appearance of new endogenous growth theories has directed scholars to decide alternative sources of economic growth and dissimilarity among the countries' economic development levels. In this regard, the effect of public governance, in other expressions, the quality of public administration, on the economic growth has been examined empirically and theoretically. Good governance influences economic growth through several direct and indirect channels because it is the major determinant of the economic atmosphere and institutions that have an important effect on the decision-making process of economic achievement (Acemoglu et al. 2005) indicated that influence investments in both technology and physical and human capital, which are most important makers of economic growth. In addition, public governance may have positive effect on economic growth by contributing to the improvement of the financial sector, rising foreign direct investment inflows and get better corporate governance, which positively affect economic growth.

In Zimbabwe absence of violence and political stability have significant and positive effect on economic growth (Maune 2017), while control of corruption has significant and negative effect on economic growth. Political instability has negative significant effect on economic growth in Egypt (Abdelkader 2017). Government effectiveness has significant and positive effect on economic growth (Alam et al. 2017). Inflation rate and public debt influence the economic growth and political condition in Pakistan (Sallahuddin and Awan 2017). Corruption, democracy freedom, institutional quality, economic freedom, investment

rate, trade openness, and government expenditure positively affect the economic growth in Asian countries (Thach et al. 2017), but population has negative effect on economic growth. In Botswana YKT Pacific et al. (2017) investigate that exports of goods and services and government effectiveness have significant and positive relationship with economic growth, while control of corruption has positive but not significant relationship with economic growth. The corruption and democracy show positive and significant relationship with economic growth (Shabbir 2017). There is significant and positive relationship between private investment with economic growth (Ondo (2017), while corruption has significant and negative relationship with economic growth, but human capital, commercial opening, and public spending have no significant relationship with economic growth. Voice and accountability, political stability and absence of violence/terrorism, government effectiveness, rule of law, and control of corruption have positive and significant impact on economic growth (Bayar 2016). Political stability, regulatory quality and control of corruption have significant impact on economic growth in east Africa (Orayo and Mose 2016), indicated that voice and accountability has a significant effect on economic growth in Kenya and Uganda but regulatory quality significantly affects economic growth in Kenya and Tanzania while in Kenya, rule of law also significantly affects economic growth. Corruption, inflation, FDI, workers' remittances, external debt, and foreign aid have significant relationship with economic growth in OIC countries (Azam 2016). Capital and human capital have positive and significant impact on economic growth (Siddique et al. 2016), and population, trade openness, and FDI have negative significant effect on economic growth. Corruption, government effectiveness, and regulation significantly affect the economic growth in South and East Asia (Yerrabati and Hawkes 2015). Political stability positively affects economic development through human capital (Fraj and Lachhab 2015), indicated that corruption and public institutions have negative effect on economic growth. Therefore, any policy against corruption has significant effect on economic growth. Political stability has significant effect on economic growth in Pakistan (Zubair and Khan 2014). Voice and accountability, political stability, government effectiveness, rule of law, control of corruption, and regulatory quality positively and significantly affect economic growth in Africa (Fayissa and Nsiah 2013). Political stability, government effectiveness, rule of law, control of corruption, and regulatory quality have significant relationship with economic growth after the beginning of the global economic crisis (AlBassam 2013). Regulatory quality, responsibility democratic, and political stability have positive significant effect on economic growth in developing countries (Tarek and Ahmed 2013), while states law and corruption index have negative significant effect on economic growth. Corruption, political stability, institutional efficiency, and bureaucratic efficiency have significant relationship with economic growth (Ahmad et al. 2012).

Econometric Methods and Data

Econometric Modeling and Test

The objective of the current research study is to investigate the effect of governance on economic growth for 31 developed countries using annual data over the period 2002 to 2018. For this purpose, we use pooled OLS, fixed effect and

random effect, first difference GMM, and system GMM to examine the effect of governance on economic growth.

Static Model

The impact of governance on economic growth in developed countries can be estimated through the following equation:

$$\log\text{GDPPC}_{it} = \beta_0 + \beta_1\text{CC}_{it} + \beta_2\text{GE}_{it} + \beta_3\text{PS}_{it} + \beta_4\text{RQ}_{it} + \beta_5\text{RL}_{it} + \beta_6\text{VA}_{it} + \beta_7\text{INFL}_{it} + \beta_8\text{GDPG}_{it} + \beta_9\text{RIR}_{it} + \beta_{10}\text{GEOE}_{it} + \varepsilon_{it} \quad (1)$$

where log is used for logarithm, i denotes the country subscript, t is the time period, β_0 is constant, β_i is the coefficient related to different types of variables, and ε_{it} is the error term. GDPPC is GDP per capita US 2010 dollars, CC is control of corruption estimates, GE is government effectiveness estimates, PS is political stability and absence of violence estimates, RQ is regulatory quality estimates, RL is rule of law estimates, VA is voice and accountability estimates, INFL stands for inflation annual percentage of consumer prices, GDPG stands for annual percentage of GDP growth, RIR is percentage of real interest rate, and GEOE is total percentage of government expenditure on education.

Fixed Effect Model

We apply this model because this model gives the unnecessary results appropriate to absent variables and we use this model for the strength in the result. In this study, we selected 31 developed countries of developed regions via only if every subject 1 group, assumption coefficient of constant for independent variables with respective intercept and contented distinctions crosswise topic or group. This procedure is fixed effect least squares dummy variables. We use this model to estimate that either this model is appropriate for this study or not.

Random Effect Model

The random effect (RE) model is employed to assume that the heterogeneity of unobserved will not bias the estimation. Random effect model measures that the individual exact effect is a random factor that is unassociated with the explanatory indicators. We use this model for the robustness errors, wherever present heteroskedasticity in the data.

Hausman Specification Test

The Hausman specification test has proposed in 1978 for the purpose to prove whether random effect and fixed effect estimators are correct for the study. Basically the test is used to select random effect or fixed effect estimator for the study.

Dynamic Model

The effect of governance on economic growth is empirically observed by the use of the following equation.

$$\log\text{GDPPC}_{it} = \beta_0 + \beta_1 \log(\text{GDPPC})_{it-1} + \beta_2 \text{CC}_{it} + \beta_3 \text{GE}_{it} + \beta_4 \text{PS}_{it} + \beta_5 \text{RQ}_{it} + \beta_6 \text{RL}_{it} + \beta_7 \text{VA}_{it} + \beta_8 \text{INFL}_{it} + \beta_9 \text{GDPG}_{it} + \beta_{10} \text{RIR}_{it} + \beta_{11} \text{GEOE}_{it} + \mu_{it} \quad (2)$$

The above equation is a dynamic model where i denotes the country subscript, t is the time, β_0 is constant, β_i is the coefficients correlated with different types of variable, and μ_{it} is the error term. The GMM has two types; difference GMM estimator which is proposed by Arellano and Bond (1991) and the system GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998). However, for the first difference, GMM estimator presumes that the explanatory variables are weakly endogenous, that the error terms between themselves and with all of explanatory variables are uncorrelated, and that it affected from weak instruments. Furthermore, the differentiation of the rank equation eradicates intra-country variations and gets into intra-country variations of account. The GMM estimator is in universal operational process to calculate the factors with endogenous regresses and ignore individual precise heterogeneity. This deficiency could be removed via the system GMM estimator. Thus, Blundell and Bond (1998) acknowledge that the system GMM is extra well-organized than the first difference of GMM. Thus, the assessment through the system GMM will be retained, while the estimation through the difference GMM will also be executed to prove the domination of the system GMM estimator.

Data and Descriptive Statistics

Data

We use panel data of 31 developed countries for the period 2002 to 2018. All the data is collected from the official website World Bank, World development indicators, project reports aggregate and individual governance indicators. The dependent variable in the study is the economic growth, and the annual data on GDP per capita in constant 2010 US dollars are applied for economic growth. The GDP per capita data is collected from the World Development Indicators (WDI). The CC is control of corruption estimates and the control of corruption (CC) data is collected from World Governance Indicators (WGI). GE is government effectiveness estimates and government effectiveness (GE) data is collected from World Governance Indicators (WGI). PS is political stability and absence of violence estimates and political stability and absence of violence (PS) data is collected from World Governance Indicators (WGI). RQ is regulatory quality estimates and regulatory quality (RQ) data is collected from World Governance Indicators (WGI). RL is rule of law estimates and rule of law (RL) data is collected from World Governance Indicators (WGI). VA is voice and accountability estimates and voice and accountability (VA) is collected from World Governance Indicators (WGI). INFL is inflation annual percentage of consumer prices and inflation (INFL) data is collected from the World Development Indicators (WDI). GDPG is annual percentage of GDP growth and GDP growth (GDPG) data is collected from the World Development

Indicators (WDI). RIR is percentage of real interest rate and real interest rate (RIR) data is collected from the World Development Indicators (WDI). GEOE is total percentage of government expenditure on education and government expenditure on education (GEOE) data is collected from the World Development Indicators (WDI). See [Appendix](#) section.

Descriptive Statistics

Table 1 represents the descriptive statistics of the different governance and dependent variable for developed region. The uppermost average 10.573 is for the GDP per capita. The uppermost standard deviation 0.697 is for the control of corruption. The control of corruption and GDP per capita show the highest volatile in developed region because they have the highest average and standard deviation compared with the other variables.

Results and Discussions

In the current study, we investigate the effect of governance on economic growth for 31 developed countries using pooled OLS, fixed effect and random effect and dynamic model using the Arellano and Bond (1991) GMM estimator and Arellano and Bover (1995) and Blundell and Bond (1998) system GMM estimator. The diagnostic tests (Sargan test for over identification) in Table 3 show a superior statistical performance, and the AR (2) represents the test of Arellano Bond for the existence of autocorrelation of the second order. Furthermore, the Hausman test is significant in Table 2, which shows that Hausman rejected the correlated statement. The results prove that the random

Table 1 Descriptive statistics

Variables	N	Mean	Std. dev	Source
Dependent variable: GDP per capita	480	10.573	0.478	(World Bank, WDI)
Control of corruption	480	1.495	0.697	(World Bank, WGI)
Government effectiveness	480	1.481	0.504	(World Bank, WGI)
Political stability	480	0.773	0.659	(World Bank, WGI)
Regulatory quality	480	1.388	0.423	(World Bank, WGI)
Rule of law	480	1.444	0.505	(World Bank, WGI)
Voice and accountability	480	1.197	0.443	(World Bank, WGI)
Inflation	480	2.192	2.979	(World Bank, WDI)
GDP growth	480	2.142	3.207	(World Bank, WDI)
Real interest rate	247	3.341	2.386	(World Bank, WDI)
Government expenditure on education	350	5.397	1.218	(World Bank, WDI)

All variables are changed into growth rate. Mean, Std. dev., respectively. logGDPPC, log of per capita of GDP (in constant 2010 US\$); COC, control of corruption (estimate); GE, government effectiveness (estimate); PSAOV, political stability and absence of violence (estimate); RQ, regulatory quality (estimate); ROL, rule of law (estimate); VAA, voice and accountability (estimate); INFL, inflation GDP deflator annual %; GDGP, GDP growth annual %; RIR, real interest rate %; GEOE, government expenditure on education, total % of GDP

Table 2 Effect of governance on economic growth: static model

Dependent variable: economic growth	Pooled OLS	Fixed effect	Random effect
Control of corruption	0.383*** (0.083)	0.067 (0.043)	−0.035 (0.041)
Government effectiveness	−0.0112*** (0.110)	−0.071* (0.039)	−0.070* (0.039)
Political stability	−0.064** (0.032)	−0.002 (0.034)	0.013 (0.032)
Regulatory quality	−0.203** (0.093)	−0.042* (0.041)	0.032 (0.040)
Rule of law	0.090*** (0.147)	0.366*** (0.061)	0.382*** (0.059)
Voice and accountability	0.196*** (0.061)	0.014 (0.051)	0.002 (0.048)
Inflation	−0.022** (0.009)	−0.006* (0.003)	−0.007** (0.003)
GDP growth	0.007*** (0.006)	0.004** (0.002)	0.003** (0.002)
Real interest rate	−0.020** (0.008)	−0.012*** (0.003)	−0.013*** (0.003)
Government expenditure on education	−0.084*** (0.023)	−0.056*** (0.015)	−0.054*** (0.014)
Constant	10.51*** (0.131)	10.54*** (0.105)	10.45*** (0.115)
Hausman test		0.000	
Observations	193	193	193
R-squared	0.573	0.325	

***Significant at 0.01, **Significant at 0.05, *Significant at 0.1

effect is not correlated with the instructive variables. So the Hausman results point out in this study that fixed effect is the suitable model for the analysis in this study.

Table 2 shows the result of pooled OLS, fixed effect, and random effect, but Table 3 shows the results of difference GMM and system GMM. The control of corruption which determines the level of control of corruption from administration to parliament shows direct significant effect on economic growth in pooled OLS, GMM, and difference GMM but in fixed effect shows direct but insignificant effect on economic growth. The result of control of corruption indicates that decrease in corruption increases economic growth in developed countries. The previous studies of Slesman et al. (2015), d'Agostino et al. (2012a, b), and Chang and Hao (2016) found indirect association of corruption with economic growth, but Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) found direct significant link of corruption with economic growth. The government effectiveness which measures the civil service freedom from the pressure of political and quality of public good such as sanitation, health services, education, and infrastructure demonstrates

Table 3 Effect of governance on economic growth: GMM and system GMM models

Dependent variable: GDP per capita	GMM	System GMM
logGDPPC _{it-1}	0.963*** (0.006)	0.990*** (0.001)
Control of corruption	0.007** (0.004)	0.006*** (0.002)
Government effectiveness	-0.012*** (0.003)	-0.008*** (0.002)
Political stability	-0.006** (0.003)	-0.001*** (0.001)
Regulatory quality	-0.003*** (0.003)	-0.016*** (0.002)
Rule of law	0.009* (0.005)	0.009*** (0.003)
Voice and accountability	0.021*** (0.0034)	0.009*** (0.001)
Inflation	-0.001 (0.001)	-0.001*** (0.001)
GDP growth	0.009*** (0.001)	0.009*** (0.001)
Real interest rate	-0.001** (0.001)	-0.001*** (0.001)
Government expenditure on education	0.001 (0.001)	-0.002*** (0.001)
Constant		0.111*** (0.0154)
Observations	147	174
Sargan test	236.87*** (0.000)	396.81*** (0.000)
AR (2)	0.23 (0.786)	-0.88 (0.381)

Values in parenthesis are the Std. Err values. Sargan-test refers to the over identification test for the restrictions in the estimation of GMM and system GMM. The AR (2) represents the test of Arellano Bond for the existence of autocorrelation of the second order. ***Significant at 0.01, **Significant at 0.05, *Significant at 0.1

negative and significant effect on economic growth in all models such as pooled OLS, fixed effect, GMM, and system GMM. The result of government effectiveness specifies that a 1% increase in government effectiveness decreases economic growth. Our results contradict to the studies of Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) which indicated that a 1% increase in government effectiveness enhance economic growth. The political stability such as the absence of internal and external conflict, riots, and terrorism reveals indirect significant effect on

economic growth in pooled OLS, GMM, and system GMM estimators but shows negative but insignificant effect on economic growth in fixed effect. The result of political stability points out that a raise in political stability declines economic growth in developed countries. Our results contradict to the studies of Uddin et al. (2017), Ramadhan et al. (2016), d'Agostino et al. (2012a, b), Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), Yahyaoui and Bouchoucha (2020), and Nomor and Iorember (2017) which indicated direct significant effect of political stability on economic growth. The regulatory quality which calculates low level of government participation, economic independence as well as investment, entry, and regulated prices of government also shows indirect significant effect on economic growth in all four models. The result of regulatory quality denotes that increase in regulatory quality reduces economic growth in developed countries. Mehanna et al. (2010), d'Agostino et al. (2012a, b), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) found direct significant link of regulation quality with economic growth. The rule of law which measures crime such as the government mistreatment of law with civilians as well as incapability of the government to implement its law reveals direct significant effect on economic growth in all four model. The result of rule of law specifies that implementing strict rule of law boosts economic growth in developed countries. The previous studies of Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) found direct and significant association of rule of law with economic growth, but Slesman et al. (2015) found indirect association of rule of law with economic growth. The voice and accountability which captures government arbitrariness and transparency as well as democratic institutions demonstrates positive and significant effect on economic growth. The result of voice and accountability indicates that voice and accountability increases economic growth in developed countries. The previous studies of Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) indicated direct significant increase in economic growth due to voice and accountability. The control variable such as inflation shows negative and significant effect on economic growth in pooled OLS, fixed effect, and system GMM but demonstrates negative but insignificant effect on economic growth in GMM estimator, while the GDP growth reveals direct significant effect on economic growth in all four models, but real interest rate shows indirect significant effect on economic growth in all four models, and government expenditure on education demonstrates negative significant effect on economic growth in pooled OLS, fixed effect, and system GMM, but in GMM estimator shows positive but insignificant effect on economic growth. The results indicate that GDP growth increases economic growth, while inflation, real interest rate, and government expenditure on education decline economic growth in developed countries.

Observing the governance indicators as calculated by the World Governance Indicators, results are very perceptive. The economic growth increases due to increase in control of corruption from administration to parliament, strict rule of law such as government mistreatment of law with civilians as well as incapability of the government to implement its law, and voice and accountability which captures government arbitrariness and transparency but declines due to regulatory quality which explain how economic system and the government participation as well as investment, absence of civilian goods determined by government effectiveness as well as absence of internal and external conflict, riots and terrorism etc. or risk of violence calculated by political stability. The results of this study indicate that all six governance indicators play very

important role in economic growth of developed countries, so developed countries should better the quality of governance; therefore developed countries economic growth keeps increasing in the future.

Conclusion

The literature on governance and economic growth has better over the last few years; there is no such type of study that used pooled OLS, fixed effect and random effect, and dynamic model such as generalized method of moments (GMM) and system generalized method of moments (Sys GMM). The current study investigates the effect of governance on economic growth in developed countries by using pooled OLS, fixed effect and random effect, and dynamic model such as generalized method of moments (GMM) and system generalized method of moments (Sys GMM) over the period 2002 to 2018. We use the panel data to investigate the effect of governance on economic growth in developed region. The data is collected from official website of World Bank, World Governance Indicators, and World Development Indicators (WB, WDI). Our results show that control of corruption has positive and significant effect on economic growth in developed countries which indicate that increase in control of corruption implies increase in the developed countries' economy. The results are similar with the literature of Slesman et al. (2015), d'Agostino et al. (2012a, b), and Chang and Hao (2016). Government effectiveness has negative and significant effect on economic growth which indicates that increase in government effectiveness declines developed countries economy. Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) indicated that a 1% increase in government effectiveness enhances economic growth. Political stability has negative and significant effect on economic growth, and regulatory quality has also negative and significant effect on economic growth in developed region, while rule of law and voice and accountability have positive and significant effect on economic growth in developed region which identify that developed countries' economy declines due to increase in political stability or regulatory quality, while a 1% increase in rule of law or voice and accountability implies increase in developed countries' economy. The studies of Uddin et al. (2017), d'Agostino et al. (2012a, b), Yahyaoui and Bouchoucha (2020), and Nomor and Iorember (2017) found direct significant effect of political stability on economic growth, and d'Agostino et al. (2012a, b) and Mehanna et al. (2010) found direct significant link of regulation quality with economic growth. The studies of Mehanna et al. (2010) and Medina-Moral and Montes-Gan (2018) found direct and significant association of rule of law with economic growth, but Slesman et al. (2015) found indirect association of rule of law with economic growth, while the studies of Mehanna et al. (2010), Medina-Moral and Montes-Gan (2018), and Yahyaoui and Bouchoucha (2020) indicated direct significant increase in economic growth due to voice and accountability.

The results of the study suggest that good governance indicators are very important for the developed countries' economic growth. To increase the economic growth in developed countries, both external and domestic policy creators may have to place important emphasis on the preservation of the governance indicators. Policy makers should better the institutions quality and other infrastructure because good quality of institutions will raise the developed countries economy. As a result, developed countries

have to improve control on corruption and also improve rule of law and voice and accountability to increase the economic growth in the future.

This study has some limitations. First, we have unobserved cross-sectional dependency because GMM and system GMM estimators do not permit us for cross-sectional dependency. GMM and system GMM already solve the cross-sectional dependency issue. Second, this study samples are limited to developed countries, so we recommend that other researchers can enlarge this study to the global and also can use different specifications, for example, robustness check.

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Appendix

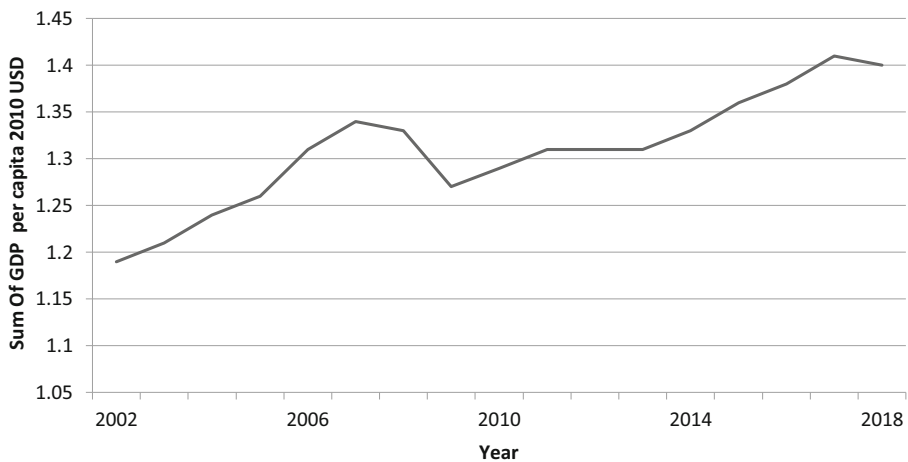


Fig. 1 The sum of per capita of GDP in developed countries. Based on World Development Indicators, 2018

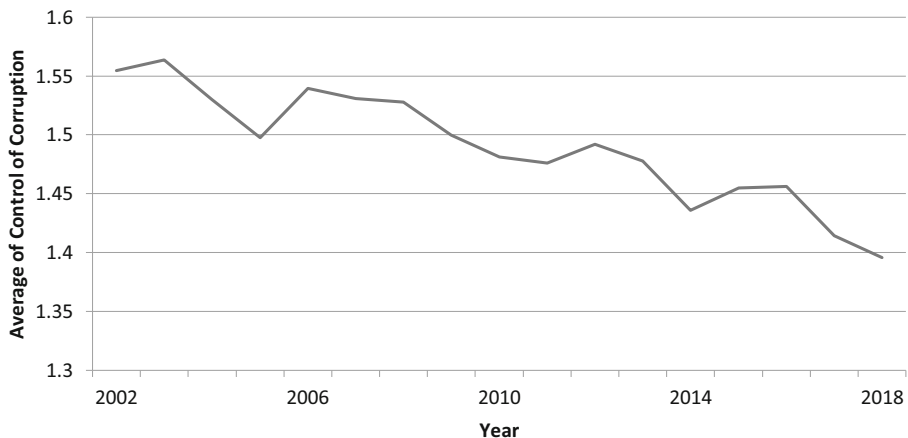


Fig. 2 The average of control of corruption in developed countries. Based on World Governance Indicators, 2018

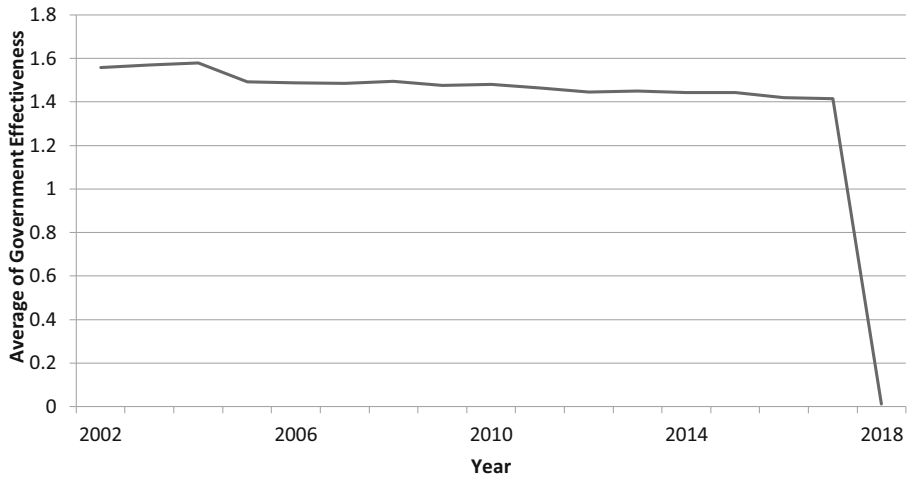


Fig. 3 The average of government effectiveness in developed countries. Based on World Governance Indicators, 2018

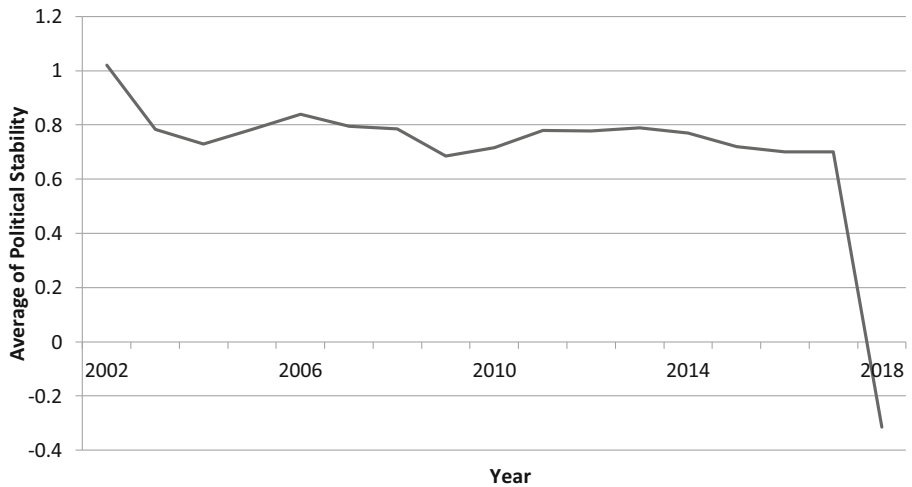


Fig. 4 The average of political stability in developed countries. Based on World Governance Indicators, 2018

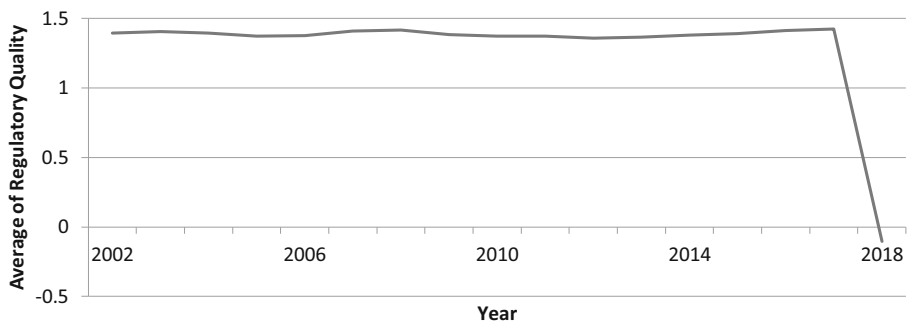


Fig. 5 The average of regulatory quality in developed countries. Based on World Governance Indicators, 2018

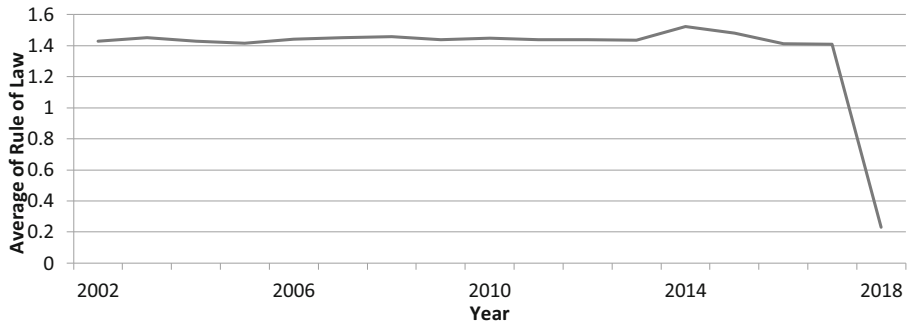


Fig. 6 The average of rule of law in developed countries. Based on World Governance Indicators, 2018

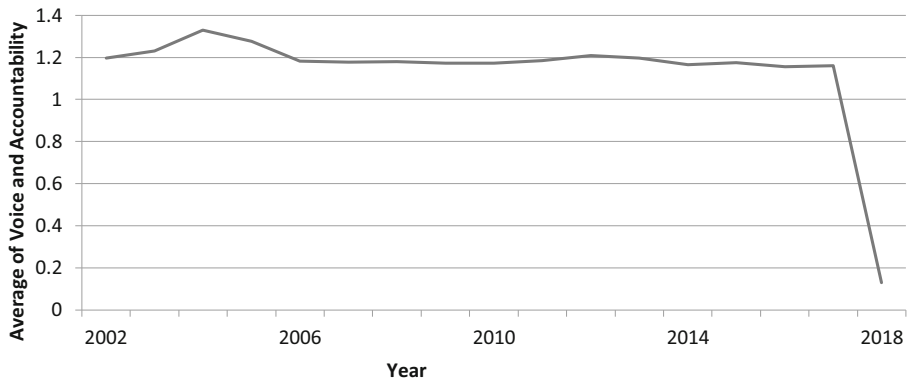


Fig. 7 The average of voice and accountability in developed countries. Based on World Governance Indicators, 2018

Table 4 List of developed countries included in this study

No.	Country	No.	Country
1	Australia	12	Greece
2	Austria	13	Iceland
3	Belgium	14	Ireland
4	Canada	15	Israel
5	Cyprus	16	Italy
6	Czech Republic	17	Japan
7	Denmark	18	Korea, Rep
8	Estonia	19	Luxembourg
9	Finland	20	Netherlands
10	France	21	New Zealand
11	Germany	22	Norway
		23	Portugal
		24	Singapore
		25	Slovenia
		26	Spain
		27	Sweden
		28	Switzerland
		29	Turkey
		30	UK
		31	USA

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