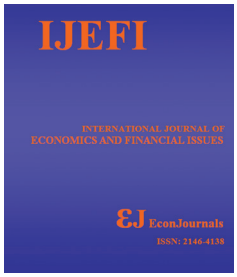

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Revisiting the Relationship between Governance Quality and Economic Growth

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ABSTRACT

This study provides evidence on the relationship between governance quality and economic growth. We use the six Worldwide Governance Indicators (WGI) published by the World Bank and a sample of 29 countries (23 developed countries and 6 emerging economies) covering the period. To account for the potential endogeneity problem, we employ panel GMM estimators. The analysis proceeds in three stages. Firstly, we examine the effect of these six governance indicators on economic growth for the whole sample. Next, we apply a principal component analysis (PCA) to these indicators to construct a global governance index (GGI) and test its impact on economic growth. Finally, to examine the effect of the GGI on economic growth in emerging economies relative to developed countries, we introduce an interaction dummy variable. The results show a positive relationship between governance quality and economic growth in both developed and emerging economies. Moreover, the contribution of the GGI to the economic growth of emerging economies is more than that of developed ones.

Keywords: Worldwide Governance Indicators, Economic Growth, Principal Component Analysis, Panel GMM Estimator
JEL Classifications: O40, O43, C36, C38

1. INTRODUCTION

In today's globalized business environment, countries guard against uncertainty by pursuing prudent macroeconomic policies, strengthening their financial systems, and improving their governance frameworks. While sound domestic policies and institutions may not entirely eliminate the panic and contagion brought about by a financial crisis, they undoubtedly cushion its advance and make a country more resilient to financial shocks. For instance, Demirguc-Kunt and Maksimovic (1998) show that firms in countries with a high rating for the effectiveness of their legal systems grow faster by relying more on foreign financing flowing into their capital markets. As such, the essentiality of good governance and institutions has been the key focus of development policy discussions over the past 25 years. Schneider (1999) defines good governance as the exercises of authority in controlling a country's affairs and resources, while Norris and Zinnbauer (2002) define it as striving for the rule of law, transparency, equity, effectiveness, accountability, and strategic vision in the exercises of political, economic, and administrative authority.

Over the past two decades, significant empirical research has aimed to improve our understanding of the long-term determinants of economic development (Acemoglu and Robinson, 2012). According to Pinar (2015), institutional quality is the main determinant of long-term development, followed by geography and macroeconomic policies. Indeed, several empirical works support the idea that institutional quality is the most important determinant of income differences among countries (Abrams and Lewis, 1995; Acemoglu et al., 2001; Arestis and Demetriades, 1997; Baltagi et al., 2007; Beck et al., 2003; Djankov et al., 2005; Easterly and Levine, 2003; Hall and Jones, 1999; Herger et al., 2007; Hodler, 2007; Kaldaru, 2008; Law and Habibullah, 2009; North, 1990; Rodrik et al., 2004; Rupasingha et al., 2002). Another

stream argues that the geographic characteristics of a country are the most direct determinants of development (Bloom and Sachs, 1998; Gallup et al., 1998; Sachs, 2003), whereas others consider international trade to be the major influencing factor (Diamond, 1997; Dollar and Kraay, 2003; Frankel and Romer, 1999; Sachs and Warner, 1995). Easterly (2006) argues that countries pursuing destructive policies such as high inflation, budget deficits, and black-market premiums may miss out on economic growth; however, that does not mean that growth can simply be generated through macroeconomic stability. Strong relations have also been found between financial development, specifically stock market development, and economic growth (Nannicini and Billmeier, 2011; Rousseau and Wachtel, 2001).

Moreover, ethnic diversity, income inequality, social capital, market economy freedom, religion, race, human capital, discriminatory governance mechanisms, political system, and interest group politics have all been shown to be determinants (Abrams and Lewis, 1995; Blaydes and Kayser, 2011; Dornbusch and Edwards, 1991; Doucouliagos and Ulubasoglu, 2006; Gerring et al., 2005, 2011; Kaldaru, 2008; Kohli, 2004; Kumar, 2013; Leftwich, 2005; Oster, 2009; Persson and Tabellini, 2006; Rajan and Zingales, 2003; Rupasingha et al., 2002; World Bank, 2006). Nevertheless, the possible connections among these variables remain unclear since causal pathways are difficult to identify and test empirically (Bohara et al., 2004; Kapstein and Converse, 2008; Keefer, 2003; Lederman et al., 2005; Montinola and Jackman, 2002).

Further, although political and economic freedom is an essential dimension for economic growth (Owens, 1987; Sen, 1999), the focus since the 1990s has been on the effects of good governance rather than its direct impact on economic growth, especially in emerging economies. Many economies globally have been undergoing significant reforms to move away from centrally planned economies to market-oriented ones. It is thus of interest to empirically investigate the consequences of such structural reforms, especially in emerging markets in comparison with developed economies. Therefore, determining the driving forces behind global economic development has become an important concern that warrants further investigation.

Based on the foregoing, this study provides empirical evidence of the significant contribution of governance to economic development and growth. Specifically, it studies the institutional determinants of economic development by controlling for inflation, real interest rates, and gross savings. By using a dynamic panel dataset of 29 countries from 1997 to 2014, comprising both developed and emerging markets, this study builds on the recent empirical literature in the following three main ways. First, we examine the relationship between the World Bank's Worldwide Governance Indicators (WGI) and economic growth for both developed and emerging economies. The WGI measure governance performance based on the following six categories: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. We then apply principal component analysis (PCA) to the WGI to construct a global governance index (GGI) and test its impact on economic growth. Finally, we introduce an interaction dummy variable to examine the contribution of emerging economies in the GGI.

Second, the study extends empirical research by illustrating the cross-country and cross-regional determinants of economic development; by contrast, previous studies have focused on either individual countries or regions over shorter periods. Therefore, it sheds light on several issues related to economic growth in a globalized world characterized by different institutional and macroeconomic environments. Third, in contrast to previous studies based on OLS regression analysis, the current study employs a modified GMM estimator following the work of Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998), and Blundell et al. (2000).

The remainder of the article is organized as follows. Section 2 discusses the theoretical background of the institutional factors on determining economic growth. Section 3 presents the empirical literature on the institutional and macroeconomic determinants of economic growth. Section 4 presents the data and methodology. Section 5 reports the results. Finally, Section 6 concludes.

2. ECONOMIC DEVELOPMENT AND GOVERNANCE INDICATORS

2.1. Institutional Environment: Global Overview

Institutions play an important role in supporting economic development and financial transactions by protecting property rights, enforcing contracts, and facilitating collective action to provide physical and organizational infrastructure. They create order, reduce uncertainty in the exchange of goods and capital, and help determine transaction and production costs. Thus, institutions determine the feasibility and profitability of engaging in economic activity (North, 1990). Among the positive effects of good institutions is the promotion of a country's integration into the world economy (Rodrik, 2008). Strong property rights protection, a high level of regulatory effectiveness, a strong rule of law, and strong control of corruption encourage capital flows and provide incentives for investment and capital exchange.

Fan et al. (2012) argue that when the law provides credit-holders with satisfactory legal protection, they become more willing to support a firm's investment and expansion by lending companies their savings (debt). However, in countries with weak legal protection and less protection of shareholders' rights, companies rely more on internal sources of funding (equity). Overall, more shareholder protection develops reliance on equity funding, while more creditor protection places more reliance on leverage.

An exploration of the quality of the institutional environment through legal and contractual factors might help predict the economic growth variations among countries. The quality of public governance is considered to be one of the most important determinants of confidence in protecting claims and property rights against expropriation by the government as well as private parties. In well-structured and well-governed countries, the rule

of law prevails, and sovereign institutions can be relied upon to protect property rights and enforce contracts.

2.2. Institutional Determinants of Economic Growth: Theories and Forecasted Impact

Although the importance of economic growth has gained significant focus in terms of research and policy discussions, limited theories and empirical work on the determinants of such growth exist, especially in emerging economies. A new stream of the economics literature has emerged as part of the continued search for determinants, which is known as new institutional economics, proceeding primarily from the work of North and focusing on the role of institutions in explaining long-term economic performance (North and Thomas, 1976; North, 1981, 1990, 2005). Weingast (1993) argues that a government sufficiently strong to protect property and enforce contracts is also sufficiently strong to confiscate the wealth of its citizens. Moreover, societies that fail to establish such formal institutions effectively face high costs in market transactions and are unable to control the "grabbing hand of the state" to support private initiatives, market exchanges and investments, and economic development. However, this does not preclude the possibility of reverse causality.

A complex and multifaceted concept, good public governance is commonly captured by critical dimensions such as the rule of law, public sector efficiency, control of corruption, and democracy. Studies of economic development from an institutional quality viewpoint date to the seminal contributions of La Porta et al. (1997, 1998, 1999) on how legal rules protect corporate shareholders and creditors. Rule of law reflects perceptions of agents' confidence in and abiding by the rules of society, particularly reflecting the quality of contract enforcement, property rights, police, courts, and the likelihood of crime and violence. In short, sustainable economic growth needs a legal and regulatory environment under which contracts can be enforced to ensure integrity, efficiency, transparency, and credibility (Black, 2001; Coffee, 1999). Regulatory quality reflects perceptions of the ability of the government to formulate and implement sound regulations on the acquisition of property, licensing of new businesses, hiring of workers, importing factors of production, exporting output or capital, contracting with suppliers for needed inputs, payment of taxes, government licenses and fees, and so forth. Moreover, control of corruption reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption. It also 'captures' the state of elites and private interests. Corruption can make it difficult to conduct business effectively. In such a case, the more control of corruption a country has, the more developed the economic environment will be. Finally, property rights reflect the degree to which a country's laws protect private property rights and its government enforces those laws. Therefore, the higher the level of property rights and control of corruption, the more developed the economy will be. The same argument might apply to political stability and government effectiveness.

To sum up, we argue that economic development and growth are functions of the determinants of institutional quality. Therefore, where the regulatory system is highly effective, confidence in the rules of society is high, corruption is controlled, political stability is high, and there is an absence of violence, the government is highly effective. This suggests that there is a high level of transparency and accountability and that property rights are well protected, leading to higher levels of economic development supported by macroeconomic factors (e.g., high savings, high income, economic stability, government spending, and business, labour, monetary, fiscal, trade, and investment freedom).

3. LITERATURE REVIEW

The concern in the economics literature over the role of governance and institutions has been searching for the determinants of economic growth and development since the beginning of the 1980s. The standard neoclassical growth model identifies capital accumulation or investment as the central factor in explaining per capita income. However, successive attempts to test the neoclassical model empirically have returned ambiguous results at best. This has led scholars to reconsider factors of production to include human capital (Becker, 1962). In the late 1980s and early 1990s, endogenous growth models that incorporated the level of technology and rate of innovation were developed (Grossman and Helpman, 1991).

At a more fundamental level, all growth models hitherto fail to address the nature of the causality among the major variables. North and Thomas (1973) argue that the listed factors (e.g., innovation, economies of scale, education, capital accumulation) are not causes of growth; they are growth. Against this background, new institutional economics attempts to extend neoclassical economics by incorporating institutional analysis, focusing on the role of institutions in explaining long-term economic performance.

The effectiveness of external assistance depends not only on the nature of the policies pursued, but also of the government (e.g., Burnside and Dollar, 2000). 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 growth, while Zhuang et al. (2010) emphasize that the involvement of larger structures in the determination of policy, its implementation, and outcomes is the entry point for governance.

An economy will experience rapid growth provided the WGI are moving in a positive direction. Low political instability, the existence of mechanisms for voice and accountability, control of corruption, and the prevalence of the rule of law contribute most toward economic growth. Knack and Keefer (1997) find that institutions such as property rights and contract enforcement positively influence economic growth. Kaufmann et al. (1999a, 1999b) identify the problems associated with the aggregation of good governance measures and find that good governance does matter for economic development. In a cross-sectional analysis of developing economies, Chauvet and Collier (2004) find that those countries suffering from poor governance, on average, experience 2.3% points less GDP growth per year relative to other developing countries with overall good governance (Acemoglu et al., 2004; Knack and Keefer, 1997). Further, the rule of law variable is particularly potent, suppressing the effects of the other governance

variables such as the control of corruption and quality of the bureaucracy (Barro and Sala-i-Martin, 1995). Zhuang et al. (2010) find mutually reinforcing aspects of growth-enhancing institutions. They show that economies with better government effectiveness grew faster than those with weak government capacity by 1.6% points annually during 1998–2008. An alternative view, supported by empirical evidence, predicts that a higher level of development generates the need and leads to better institutions (Paldam and Gundlach, 2008).

Campos and Nugent (1999) use GDP as the dependent variable and develop their own measures for determining the levels of rule of law and political stability by using various indices. They conclude that the rule of law and political stability are necessary to ensure clean systems and strong legal support to remove any hurdles in attracting foreign investment, which is considered to be a key determinant of economic growth. Covering 175 countries for 2000-2001, Kaufmann and Kraay (2002) find that a higher quality of governance is strongly positively correlated with per capita income. In particular, they report a strong positive causal effect running from better governance to higher per capita income and a weak and even negative causal effect running in the opposite direction from per capita income to governance. The first result confirms existing evidence on the importance of good governance for economic development. The second result is new and suggests the absence of "virtuous circles" in which higher incomes lead to further improvement in governance.

Mendez and Sepulveda (2006) conclude that a low level of corruption is beneficial for economic growth, a finding supported by Glaeser and Saks (2006). Lane (2010) divides the rule of law into two parts, namely judicial independence and constitutional democracy. The author concludes that legally and constitutionally safeguarding property rights is crucial for optimal market activity. Zubair and Khan (2014) confirm this finding, showing that political stability contributes significantly toward economic growth. On the contrary, Mauro (1995) finds bureaucratic quality to be significant in a growth equation, while corruption is not. More recently, Gründler and Potrafke (2019) provide strong evidence that corruption is negatively correlated with economic growth.

Easterly and Levine (2003) find that geographic endowments explain economic development through their impact on institutions, but do not have a direct impact on economic development. The study also finds no impact of economic development policies once institutions are controlled for. They further control for the main macroeconomic policies, namely inflation, real exchange rates over valuation, and trade openness. The results show that only institutions are the main significant variables in the model. Rodrik et al. (2004) empirically investigate the extent to which geography, institutions, and international trade affect income differences globally. The results confirm the direct impact of institutions on economic development, where geography has an indirect effect once institutions are controlled for.

Emara and Jhonsa (2014), using two-stage least squares regressions for cross-sectional observations of 197 emerging economies in 2009, suggest statistically significant causation from the quality of governance to per capita income and vice versa. However, despite such an array of support for the positive impact of good governance on economic growth, some empirical studies show contradictory results (Doornbos, 2003; Sachs et al., 2004), arguing that the focus on governance reforms is misleading at best. The next section describes the data and elaborates on the methodology used in the present study.

4. DATA, VARIABLES, AND METHODOLOGY

4.1. Data and Variables

The data used in the present study are obtained from the World Bank database for the period 1997-2014. We collect data on the six WGI (i.e., voice and accountability [VA], political stability and absence of violence [PS], government effectiveness [GE], regulatory quality [RQ], rule of law [RL], and control of corruption [CC]) and four macroeconomic variables (i.e., GDP per capita [the dependent variable], inflation [MS1], real interest rates [MS2], and gross savings [GS]). Our sample covers 29 countries across East Asia and Pacific (seven countries), Europe and Central Asia (20 countries), and North America (two countries). These countries are grouped into developed (23) and emerging (six) economies. The selected emerging countries have made important efforts in improving governance quality and structural reforms. Appendix A lists the countries included in the analysis.

4.1.1. Governance quality indicators

Each governance quality indicator is generated from a factor analysis based on multiple questions. A higher value of the factor indicates greater regulatory effectiveness (RQ), greater efficiency of the legal system (RL), strong control of corruption (CC), stronger degree of voice of accountability (VA), stronger degree of political stability (PS), and greater degree of government effectiveness (GE). For instance, the factor for RQ reflects perceptions of the ability of the government to formulate and implement sound regulations regarding the acquisition of property, licensing of new businesses, hiring of workers, importing factors of production, exporting output or capital, contracting suppliers for needed inputs, payment of taxes, government licenses and fees, and so forth. The RQ index in this study ranges from −2.5 (weak effectiveness) to 2.5 (strong effectiveness).

Likewise, RL reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, particularly the quality of contract enforcement, property rights, police, and courts as well as the likelihood of crime and violence. The index ranges from −2.5 (weak law) to 2.5 (strong law).

CC reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capturing" of the state by elites and private interests. The index ranges from −2.5 (weak control of corruption) to 2.5 (strong control of corruption).

4.1.2 Macroeconomic variables

Following the standard literature on economic growth, the present study used GDP per capita (dependent variable), expressed in natural logarithm form, as a measure for economic growth (e.g. Han et al., 2014; Le et al., 2016; Levine, 1997; Levine and Zervos, 1998). Other macroeconomic control variables are used including gross savings (GS) measured as a percentage of GDP, macroeconomic stability measured by inflation (MS1) and real interest rate (MS2).

4.2. Methodology

The purpose of this study is to examine the impact of governance and institutional quality on economic growth, utilizing WGI. To this end, we proceed in three stages. Firstly, we use a linear dynamic panel model to estimate the effect of governance indicators on economic growth, using both the developed and the emerging markets data. The specification of the dynamic panel data model is:

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

where Y_{it} is log real GDP per capita in country i at time t. G_{it} are the estimates of world bank governance indicators including voice and accountability (VA), political stability and absence of violence/terrorism (PS), governance effectiveness (GE), regulatory quality (RQ), rule of law (RL) and control of corruption (CC). Z_{it} are the control variables such as gross savings (GS) measured as percentage of GDP, inflation rate (MS1) and real interest rate (MS2). ε_{it} is an independent and identically distributed error term. In this stage, six models are developed, in which economic growth is modelled as a function of one institutional and macroeconomic factors. In all the models, the governance indicators are expected to have positive relationships with economic growth. In relation to macroeconomic control variables, GS is expected to have positive relationship with economic growth while MS1 and MS2 are hypothesised to be negatively correlated with growth.

Secondly, we apply principal component analysis (PCA) to the WGI to construct an index we call it the global governance index (GGI_{it}) after which we estimate the following Generalized Method of Moments (GMM) model:

$$Y_{it} = \alpha_i + \delta Y_{it-1} + \beta GGI_{it} + \gamma Z_{it} + \varepsilon_{it} \quad (2)$$

Thirdly, to account for the effect of the GGI on economic growth in emerging countries relative to developed countries, we include an interacting dummy term ($D_{Emerging}$) for emerging countries and the GGI that was constructed using PCA. That is, equation (2) is transformed into:

$$Y_{it} = \alpha_i + \delta Y_{it-1} + \beta D_{Emerging} \times GGI_{it} + \gamma Z_{it} + \varepsilon_{it} \quad (3)$$

Since we have a larger number of countries (n = 29) relative to the time period (T = 18), and in order to address the endogeneity problem between log GDP and the WGI, we estimate all three models by using the STATA 14 command xtdpd, which is a linear dynamic panel estimator based on the work of Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998), and Blundell et al. (2000). xtdpd is flexible and has more advantages over other linear dynamic panel estimators since it can fit models with low-order moving-average (auto) correlation in error term ε_{it} and it can also allow for predetermined variables with more complicated structure which is not the case for other linear dynamic panel estimator such as xtabond or xtdpdsys. Moreover, xtdpd can be used when the "estat abond" rejects the absence of second-order autocorrelation. Further, Wald's test statistics for the regression goodness-of-fit are applied along with other tests, namely Sargan's test for over-identifying restrictions and the Arellano-Bond (A-B) test for second- or third-order autocorrelations. If the null hypotheses of both tests are not rejected, then the required conditions for the GMM estimators to be consistent are satisfied and the model is supported. The next section elaborates on the findings and discussion of the results.

5. RESULTS

Table 1 presents the computed variance inflation factors (VIFs) for the six regressions. These VIFs aim to detect the presence of multicollinearity. As shown in Table 1, the low VIF values suggest that multicollinearity problem is not a serious concern in our regressions. All our VIF values are significantly below the threshold of 5, with mean values of 2 or less.

Table 2 reports the regression results using the GMM estimators. The table shows the six models used to assess the relationship between the six governance quality indicators and economic growth. The Wald test indicates that the regression coefficients in all models (1-6), are jointly statistically different from zero at the 1% level or better (P = 0.000). Recall that the GMM estimator is employed to correct for the potential endogeneity problem by using internal instruments (e.g. VA, PS, GE, RQ, RL, CC). To test if these instruments are valid, two tests are performed namely Sargan and A-B tests. In all models, the P-values of the Sargan test are 1, suggesting that the null hypothesis of over-identification is not rejected and therefore that the instruments used in the models are valid. Similarly, the A-B tests reject the null hypothesis that there is first- or second-order serial correlation of the differenced errors but not third-order correlation (this justifies the use of xtdpd). Therefore, our models are correctly specified.

Table 1: Variance inflation factor

Variable	1	2	3	4	5	6
MS1	2.79	2.82	2.68	2.85	2.82	2.87
GS	1.06	1.14	1.05	1.13	1.05	1.05
MS2	2.73	2.81	2.68	2.78	2.75	2.79
CC	1.11					
VA		1.21				
PS			1.06			
GE				1.20		
RQ					1.12	
RL						1.12
Mean VIF	1.92	2.00	1.87	1.99	1.94	1.96

CC is control of corruption. VA is voice and accountability. PS is political stability and absence of violence/ terrorism. GE is government effectiveness. RQ is regulatory quality. RL is rule of law. MS1 is macroeconomic stability (inflation). GS is gross savings. MS2 is economic stability (real interest rate)

Table 2: Dynamic panel GMM estimations (all countries)

Regressor	1	2	3	4	5	6
Constant	0.7278***	0.6776***	0.6816***	0.8552***	0.7330***	0.7863***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$GDPG_{t-1}$	0.9334***	0.9279***	0.9409	0.9176***	0.9322***	0.9254***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MS1	−0.0036***	−0.0019*	−0.0059***	−0.0018	−0.0048***	−0.0031***
	(0.002)	(0.050)	(0.000)	(0.107)	(0.000)	(0.001)
GS	0.0024***	0.0053***	0.0018***	0.0012***	0.0016***	0.0024***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MS2	−0.0246***	−0.0232***	−0.0238***	−0.0226***	−0.0233***	−0.0234***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CC	0.0208***					
	(0.000)					
VA		0.0507***				
		(0.000)				
PS			0.0275***			
			(0.000)			
GE				0.0567***		
				(0.000)		
RQ					0.0425***	
					(0.000)	
RL						0.0372***
						(0.000)
Wald test (P-value)	0.000	0.000	0.000	0.000	0.000	0.000
Sargan test (P-value)	1.000	1.000	1.000	1.000	1.000	1.000
A-B AR(1) (P-value)	0.022	0.0204	0.0104	0.0201	0.0211	0.0215
A-B AR(2) (P-value))	0.002	0.0017	0.0026	0.0017	0.0019	0.0019
A-B AR(3) (P-value)	0.282	0.3097	0.2786	0.2797	0.2725	0.2794
Observations	312	312	312	312	312	312

*, **, and *** denote statistical significance at P<0.10, P<0.05, and P<0.01, respectively. The first value for each estimate is the coefficient and P-values are in parentheses. CC is control of corruption. VA is voice and accountability. PS is political stability and absence of violence/terrorism. GE is government effectiveness. RQ is regulatory quality. RL is rule of law. GDPG is GDP per capita growth. MS1 is macroeconomic stability (inflation). GS is gross savings. MS2 is economic stability (real interest rate). The Wald test provides a test for the joint significance of all the regression coefficients except the constant. The Sargan test provides a test of over-identifying restrictions. A-B AR(1), AR(2), and AR(3) are the Arellano-Bond test for first-, second-, and third-order serial correlation in the first-differenced residuals

As shown in Table 2, for model 1, the first governance quality indicator namely the control of corruption (CC) is statistically significant and positively correlated with economic growth (z-stat. = 86.87, P = 0.000). This finding implies that CC improves institutional quality, which in turn contributes positively to economic growth. Mendez and Sepulveda (2006) and D'Agostino et al. (2016) provide evidence consistent with this finding. Moreover, in model 1, all the coefficients of the macroeconomic variables (MS1, MS2, GS) are statistically significant at the 1% level. Unsurprisingly, measures of macroeconomic stability, MS1 (inflation) and MS2 (real interest rates) are found to be negatively associated with economic growth, whereas gross savings (GS) is positively related, consistent with economic theories.

Similarly, for models 2-6, the coefficients of all the governance quality variables are positive and highly significant (P < 0.01; Table 2). This finding suggests that the existence of mechanisms for voice and accountability, low political instability, and the prevalence of the rule of law contribute positively to economic growth. Previous studies including Knack and Keefer (1997), Campos and Nugent (1999), Han et al. (2014), Zubair and Khan (2014), and more recently Emara and Chui (2016) provide evidence consistent with the findings reported in the present study. For example, Emara and Chui (2016) report that "per capita GDP grows by about 2% if the composite governance index increases by one unit" (p.31). Regarding the other macroeconomic control variables, as Table 2 shows, they are consistently statistically significant and possess the hypothesized relationship with economic growth. One exception is in model 4 when government effectiveness is used as a governance indicator, *MS1* is not significant.

In the second stage of our analysis, we construct the GGI by using PCA. Firstly, to assess the appropriateness of using PCA for the overall dataset, we use the Kaiser–Meyer–Olkin (KMO) test and Bartlett's test of sphericity. The KMO test measures the sampling adequacy of the overall model as well as for each variable in the model. KMO values close to 1 are highly desirable. However, KMO values less than 0.5 indicate that factor analysis is not relevant. Table 3 shows that the KMO value is 0.888, which indicates that the sampling is adequate.

Bartlett's test checks whether the variables are related and therefore suitable for factor analysis. It tests the hypothesis that the correlation matrix is an identity matrix. Table 3 shows that Bartlett's test has a P-value equal to zero, which indicates that the test is significant and the variables are related. Therefore, we can proceed with factor analysis.

The results in Table 4 shows that only one factor is extracted, namely the GGI. Note that only loading factors above 0.5 are reported. Furthermore, Table 5 shows that the loading factors explain about 80% of the total variance. Therefore, the PCA

Table 3: KMO and Bartlett's test of sphericity

KMO measure of sampling adequacy		0.888
Bartlett's test of sphericity	Approx. Chi-square	4184.324
	df	15
	Sig.	0.000

Table 4: Component matrix

	GGI
VA	0.768
PS	0.779
RQ	0.911
GE	0.948
RL	0.973
CC	0.965

Extracted method: Principal component analysis

Table 5: Eigenvalue, proportion variance, and cumulative variance

	Eigenvalue	% of variance	% of cumulative variance
GGI	4.801	80.014	80.014

Extraction method: Principal component analysis

clearly indicates that the world bank governance indicators are summarized in the one-factor GGI, which makes sense given that they are all indicators of governance quality.

Based on the PCA results, Table 6 reports the results of a second GMM model (equation 2) that includes the GGI as an independent variable and a proxy for governance quality. This table shows that the coefficient of the GGI is positive and highly significant (P = 0.000), suggesting that, overall, governance quality positively affects economic growth. Further, the macroeconomic control variables are all statistically significant and exhibit the expected relationships with economic growth.

The final stage of our analysis examines the extent to which the GGI affects economic growth in emerging economies relative to developed countries. We include an interacting dummy term ($D_{Emerging}$) for emerging countries and use the GGI constructed in stage 2. Table 7 shows that the coefficient of $D_{Emerging}$ is positive and statistically significant (P = 0.000), indicating that the contribution of the GGI to the economic growth of emerging economies is more than that of developed ones. This can be attributed to the serious efforts made by these countries to enhance governance quality and implement structural reforms.

Overall, the evidence presented in the current study is consistent with the literature. That is, good governance quality promotes economic growth. This effect is even more pronounced in emerging economies.

5. CONCLUDING REMARKS

This study provided evidence on the relationship between governance quality and economic growth. We used the six worldwide governance indicators published by the World Bank

Table 6: GMM results: GGI

Regressor	Coefficient	Std. error	P-value
Constant	1.0511***	0.0615	0.000
$GDPG_{t-1}$	0.9031***	0.0060	0.000
MS1	−0.0025*	0.0013	0.060
GS	0.0028***	0.0004	0.000
MS2	−0.0248***	0.0004	0.000
GGI	0.0422***	0.0029	0.000
Wald test (P-value)	0.000		
Sargan test (P-value)	1.000		
A-B AR(1) (P-value)	0.016		
A-B AR(2) (P-value))	0.003		
A-B AR(3) (P-value)	0.320		
Observations	312		

* and *** denote statistical significance at P<0.10 and P<0.01, respectively

Table 7: GMM results: Interaction variable ($D_{Emerging}$)

Regressors	Coefficient	Std. error	P-value
Constant	1.2252***	0.0877	0.000
$GDPG_{t-1}$	0.8870***	0.0090	0.000
MS1	−0.0017*	0.0009	0.065
GS	0.0034***	0.0005	0.000
MS2	−0.0249***	0.0011	0.000
$D_{Emerging}$	0.0815***	0.0068	0.000
Wald test (P-value)	0.000		
Sargan test (P-value)	1.000		
A-B AR(1) (P-value)	0.020		
A-B AR(2) (P-value))	0.002		
A-B AR(3) (P-value)	0.338		
Observations	312		

* and *** denote statistical significance at P<0.10 and P<0.01, respectively

and controlled for those macroeconomic variables that are believed to be related to economic growth such as gross savings, inflation, and real interest rates. Our sample consisted of 29 developed and emerging economies and covered the period from 1997 to 2014. To account for potential endogeneity problem, we employed the GMM estimator proposed by Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998), and Blundell et al. (2000). The results reconfirm the findings in the body of knowledge on this topic by revealing that enhancing institutional quality contributes positively to economic growth in both developed and emerging economies. Moreover, the findings are even more encouraging for emerging economies.

The presented findings suggest that policymakers should increase their efforts and take necessary actions to enhance governance quality to spur economic growth. In particular, the promising results for emerging economies should encourage policymakers in those countries to keep implementing governance reforms to promote such growth. Moreover, our findings show that increasing gross savings, as a percentage of GDP, and strengthening macroeconomic stability improve economic performance.

Despite the results presented in this study, some limitations and recommendations for future research can be proposed. First, the WGI are not perfect and have several limitations (Kaufman and Kraay, 2002). Second, future research can build on our study and focus on emerging countries from different regions. Finally, other indicators of governance quality could be considered.

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APPENDIX

Appendix A: Countries included in the analysis

S. No	Developed economies
1	Australia
2	Austria
3	Belgium
4	Spain
5	Canada
6	Denmark
7	Finland
8	France
9	Germany
10	United Kingdom
11	United States
12	Ireland
13	Italy
14	Japan
15	Switzerland
16	Luxembourg
17	Netherlands
18	New Zealand
19	Norway
20	Sweden
21	Portugal
22	Singapore
23	Hong Kong
	Emerging economies
24	Bulgaria
25	Greece
26	Poland
27	South Korea
28	Thailand
29	Turkey