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Does corruption boost economic growth in developing countries?

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ABSTRACT

Many countries with emerging economies suffer from a high level of corruption that hampers their overall development. Despite the abundance of literature scrutinizing the intricate relationship between corruption and economic growth, the precise nature of this connection remains elusive. To address this, this study rigorously examines the link between corruption and economic growth across 129 developing countries, spanning the years 2003 to 2021. The methodology relies on Transparency International's Corruption Perceptions Index (CPI) to gauge the extent of corruption within these nations. Employing the Plate-Corrected Standard Error (PCSE) estimator, we seek to derive a more robust and reliable measure of the correlation between corruption and growth. The noteworthy revelation of this investigation is that higher levels of corruption surprisingly correlate with increased economic growth in developing countries, thereby supporting the intriguing "grease the wheels" hypothesis. These findings challenge conventional assumptions and prompt a re-evaluation of the perceived negative impact of corruption on economic development. Furthermore, our analysis uncovers additional factors influencing economic growth in developing nations. Notably, Foreign Direct Investment (FDI) and revenues from oil contribute positively to economic growth, while augmented military expenditures emerge as a suppressant. These nuanced insights shed light on the multifaceted dynamics shaping economic trajectories in developing countries and underscore the complexity of the interplay between corruption and key economic indicators.

Contribution/ Originality: The originality of this paper lies in its comprehensive examination of the relationship between corruption and economic growth in developing countries. By analyzing data from 129 developing nations over the period 2003-2021, the study utilizes the CPI index employing the PCSE estimator to ensure robust and reliable measurements.

1. INTRODUCTION

Crafting an accurate and all-encompassing definition of corruption can be a challenging task. Given that different nations hold varying perceptions of corruption, constructing a universally accepted definition can be a formidable challenge (Gardiner, 2017). Nonetheless, for this study, we refer to corruption as the exploitation of authority by government officials or business owners to engage in unlawful practices such as bribery, fraud, forgery, and

favouritism for personal gain. Corruption exerts a significant impact on different aspects of the economy. It distorts the fair distribution of income, exacerbating poverty (Dimant & Tosato, 2018; Gyimah-Brempong, 2002). Additionally, studies have demonstrated that corruption is a barrier to FDI inflows (Castro & Nunes, 2013; Habib & Zurawicki, 2002) and impedes international trade (Achour & Hadji, 2020; Anderson & Marcouiller, 2002).

While investigating the connection between corruption and economic growth, we encountered a robust discussion. Numerous researchers say corruption slows economic growth (Jain, 2001). There are different arguments and interpretations regarding the detrimental effects of corruption on economic growth. One could argue that corruption is a type of taxation on profits, potentially discouraging investment in physical capital (Romer, 1994; Wei, 2000). Moreover, corruption can increase uncertainty about investment returns, which reduces investment spending and leads to a misallocation of resources between economic sectors (Pellegrini & Gerlagh, 2004). Corruption also tends to increase the completion, size, and complexity of government projects, which lowers productivity and growth (Mauro, 1995). Additionally, corruption can reduce governments' ability to increase their revenues (Ajaz & Ahmad, 2010), potentially dampening economic growth. This effect is most pronounced in developing countries, often characterized by bureaucracy and autocracy (Ehrlich & Lui, 1999; Gründler & Potrafke, 2019).

On the contrary, some theoretical studies have shown that corruption boosts economic growth. The positive role of corruption appears in its ability to cover up the shortcomings of governments (Huntington, 2006). It is possible to utilize bribery to speed up lines between clients and consumers, effectively distributing time between them (Lui, 1985). Numerous objections have been raised to the notion that corruption promotes economic growth (Campos, Dimova, & Saleh, 2010). Aidt (2009) says the "greasing the wheels" hypothesis is weak.

This paper assesses the influence of corruption on economic growth in developing nations between 2003 and 2021. The article contains five primary sections, apart from the introduction. In the second part, we will discuss the relevant literature. In the third section of the study, we provide information about the methodology used in the research and the data sources used. The estimation results are presented and discussed in the fourth section. The conclusion is presented in the fifth section.

2. LITERATURE REVIEW

Since the mid-1990s, research into how corruption affects economic growth has grown. This interest may result from the availability of novel and more reliable indicators. Researchers have employed two distinct approaches to determine the impact of corruption on growth.

2.1. Corruption Hinders Economic Growth

Despite widespread debate about the impact of corruption on growth, most studies confirm that corruption hinders economic growth. Mauro (1995) demonstrated that GDP per capita increases when corruption decreases. Numerous empirical studies have reinforced the argument for the negative impact of corruption on growth. In Asia (Farooq, Shahbaz, Arouri, & Teulon, 2013; Nguyen & Duong, 2021; Thach, Duong, & Oanh, 2017), in Africa (Anoruo & Braha, 2005; d'Agostino, Dunne, & Pieroni, 2016; Nwankwo, 2014), and in low-income countries (Ertimi, Dowa, Albisht, & Oqab, 2016; Ugur & Dasgupta, 2011).

Corruption's adverse effects on economic growth manifest through indirect channels, impacting areas such as investment, education, trade policy, and political stability (Bouteraa, Chekima, Lajuni, & Anwar, 2023). Pellegrini and Gerlagh (2004) demonstrated that corruption inhibits economic growth by 19%. Mo (2001) identified political instability as the most influential channel through which corruption hampers economic growth, slowing it down by 72%. The repercussions of corruption on economic growth become evident when considering measures of the rule of law, government efficacy, and the absence of violence (Bouteraa, 2020). Méon and Sekkat (2005) uncovered that corruption detrimentally affects both growth and investment. Interestingly, they found that its impact on growth is distinct from its impact on investment.

Endogenous growth models using the Generalized Method of Moment (GMM) estimator give important results. First, corruption and military spending diminish the GDP per capita growth rate. Removing corruption and military spending from the equation undervalues the impact of military spending on economic growth.

Second, the associations between corruption and investment, as well as corruption and military spending, significantly adversely impact economic growth.

Third, corruption severely hinders international investment in the host country. Fourth, developing economies benefit less from decreasing corruption, regardless of government size (see: (Afonso & de Sá Fortes Leitão Rodrigues, 2022; Cieślik & Goczek, 2018; d'Agostino, Dunne, & Pieroni, 2012, 2016)).

2.2. Corruption Promotes Economic Growth

Numerous studies have attempted to address the question of how certain countries can maintain high economic growth rates despite their elevated levels of corruption (Lada et al., 2023). Historical evidence reveals that during periods of economic expansion in various nations, including Indonesia, Thailand, and Korea, there was also an increase in corruption (Ibodullaevich & Kizi, 2021). However, the beneficial effect of corruption on economic growth is an anomaly and cannot be universally applied to all developed or developing countries.

Rock and Bonnett (2004) discovered that corruption has a peculiar effect: it decelerates growth and investment in developing countries but hastens growth in the large industrial economies of East Asia. This result contradicts the findings of other studies. For example, in Latin American countries, corruption positively influences economic growth (Spyromitros & Panagiotidis, 2022).

According to Ondo (2017), corruption promotes economic growth in the "Economic and Monetary Community of Central Africa." Although there are few studies indicating that corruption may aid economic growth, its effect may depend on the stability of the government. Corruption impedes countries with higher political stability, whereas it acts as a lubricant in countries with lower political stability, such as Nigeria and Pakistan (Bahattab, Azam, Gavrila, & Emiruallah, 2016). In the same context, Hoinaru, Buda, Borlea, Văidean, and Achim (2020) confirmed the existence of evidence of the positive effects of corruption in low-income countries on economic and sustainable development.

3. METHODOLOGY AND DATA

This study examines the influence of corruption on economic growth in 129 developing countries from 2003 to 2021. Appendix 1 provides a list of the 129 developing countries included in this study. Panel data is utilized to estimate the impact of corruption on economic growth.

To fulfil the objective of this study, we employ panel models. Our approach to estimating the impact of corruption on growth is two-stage. In the first stage, we utilize static panel models, while in the second stage, the PCSE method is applied. Equation 1 elucidates the proposed model in this study.

$$EG_{it} = n_0 + n_1 \mathrm{CPI}_{it} + n_2 FDI_{it} + n_3 RQ_{it} + n_4 PETR_{it} + n_5 MS_{it} + \varepsilon_{it} \quad (1)$$

Where: i represents a developing country; t denotes duration; EG is the dependent variable representing the country's Gross Domestic Product (GDP) growth; the CPI is an indication of corruption in a country, ranging from 0% to 100%. Countries with lower levels of corruption usually receive higher CPI scores. However, to facilitate statistical analysis, the index has been inverted so that the highest percentage is assigned to countries with the lowest levels of corruption. FDI expresses the FDI net inflows (% of GDP) in the nation; MS is the military expenditure (% of general government expenditure) in the country; $PETR$ measures Oil rents (% of GDP) in the nation; RQ expresses the regulatory quality Indicator, whose value ranges between -2.5 and 2.5 the closer to 2.5, the higher the degree of regulatory quality; ε_{it} is the error term.

Data on GDP growth, FDI, RQ, and military expenditures were obtained from the World Bank database. The CPI was obtained from Transparency International.

Table 1. Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
EG	1.000					
CPI	0.062	1.000				
FDI	0.108	-0.065	1.000			
RQ	-0.022	-0.493	0.060	1.000		
MS	-0.058	-0.100	-0.056	0.066	1.000	
PETR	0.103	0.059	-0.076	-0.120	0.440	1.000

4. RESULTS AND DISCUSSION

To estimate the effect of corruption on economic growth, we first extract the correlation matrix in Table 1. According to the results of the correlation matrix, there was a low-to-medium association between the variables included in the study model.

The initial phase of the test employs a static panel model to explore the relationship between corruption and economic growth. The panel data approach enables the author to account for country-specific effects that might influence the connection between corruption and growth. The findings of this analysis are subsequently showcased in Table 2, illustrating the estimated impact of corruption on economic growth through three distinct models: Ordinary Least Squares (OLS), Fixed Effect Model (FEM), and Random Effect Model (REM).

Table 2. The estimation results of the static panel model.

Dependent variable (EG)	OLS	FEM	REM
CPI	0.023**	0.038***	0.029***
	(0.01)	(0.011)	(0.01)
FDI	0.096***	0.113***	0.113***
	(0.019)	(0.022)	(0.021)
RQ	0.256	-0.096	0.442
	(0.233)	(0.628)	(0.312)
MS	-0.38***	-0.386**	-0.534***
	(0.081)	(0.177)	(0.103)
PETR	0.078***	0.386***	0.134***
	(0.012)	(0.032)	(0.016)
Constant	2.677***	0.051	2.379***
	(0.65)	(0.817)	(0.702)
Observations	1859	1859	1859
F-test	6.855***	41.756***	9.562***
BP LM test	70.46***	56.78***	27.87***
Hausman test	0.00	0.00	0.00

Note: Standard errors are in parentheses *** p<0.01 and ** p<0.05.

To select the appropriate estimation model, we will perform statistical tests. In the first stage, we will compare the FEM and the OLS based on the Fisher test. We select FEM based on the P-Value of the significant Fisher test (F-test), whose value was (0.000), which is less than 5%. In the second stage, we choose between the REM and the OLS; we shall run the Breusch and Pagan Lagrangian multiplier test (BP LM) (Breusch & Pagan, 1980). The BP LM test shows that the Chi-square value is statistically significant at less than 5%; this means that REM is the best. Finally, we will perform the Hausman (1978) to choose between REM and FEM. According to the outcome of the Hausman test, the P-value exceeds 5%, which leads to the rejection of the alternative hypothesis that the FEM is appropriate. This, in turn, accepts the null hypothesis that the REM is suitable.

In the next stage of estimating the model, we perform the standard evaluation of the REM. Table 3 describes the steps for evaluating a REM.

Table 3. Tests for econometric evaluation of residuals.

Autocorrelation Wooldridge test		Heteroskedasticity test		Cross-sectional independence Pesaran's test	
Coef.	2.942	Coef.	4.000	Coef.	103.864
P-value	0.089	P-value	0.021	P-value	0.000

We perform the Wooldridge test to verify the absence of autocorrelation between the residues (Wooldridge, 2010). The Wooldridge test confirms rejecting the alternative hypothesis that autocorrelation exists in the model. The Heteroskedasticity test was significant; therefore, we reject the null hypothesis. So, the model needs to address the problem of inhomogeneity in error variance. We perform Pesaran (2015) test to check for no correlation between cross-sections. The results of the Pesaran (2015) test confirm the existence of the problem of non-independence of the cross-sections.

The previous tests confirm that two issues, namely asymmetric interconnection and non-independence of the cross-sections, affect the REM. To address these problems in the estimated model, we employ the PCSE (Baltagi, 2008; Beck & Katz, 1995; Hoechle, 2007). Table 4 presents the outcomes of the model estimation using PCSE.

Table 4. Results of model estimation by PCSE.

Linear regression, independent panels corrected							
Group variable: ID				Number of obs. =			1,859
Time variable: Year				Number of groups =			106
Panels: Independent (Unbalanced)				Obs per group:			
Autocorrelation: No autocorrelation				Min. =			1
				Avg. = 17.537			
Estimated covariances = 1				Max. =			19
				R-squared = 0.039			
Estimated autocorrelations = 0				Wald chi2(5) = 76.855			
Estimated coefficients = 6				Prob > chi2 = 0.000			
EG	**Coef.**	**St. err.**	**z**	**P>|z|**	**[95% conf interval]**		**Sig.**
CPI	0.023	0.099	2.356	0.019	0.003	0.043	**
FDI	0.096	0.189	5.085	0.000	0.059	0.133	*
RQ	0.255	0.232	1.104	0.271	0.199	0.711	***
MS	-0.388	0.081	-4.686	0.000	0.539	-0.221	***
PETR	0.077	0.012	6.407	0.000	0.053	0.101	***
Constant	2.676	0.649	4.123	0.000	1.404	3.948	***

Note: *** p<0.01, ** p<0.05, * p<0.1.

Using the PCSE to estimate the model, we can confirm that increased rates of corruption in developing countries helped their economies grow. An increase of 100% in the CPI results in a 2.5% increase in economic growth. Among the arguments supporting corruption's positive impact on growth are: first, economic growth increases when companies operate more efficiently and more effectively after bypassing bureaucratic procedures by paying bribes (Denis & Bako, 2015; Lui, 1985; Mauro, 1995; Tanzi, 1998). Second, corruption helps growth by giving people access to resources and opportunities that might otherwise be unavailable. Third, corruption supports the development of infrastructure in emerging nations. For instance, government officials may receive bribes to speed up the construction of roads, bridges, and other infrastructure projects. This can stimulate economic growth by improving transportation and logistics, increasing opportunities for trade and investment. Finally, there may be a correlation between the beneficial effect of FDI on economic growth and high levels of corruption (Okada & Samreth, 2014), especially in developing countries (Qureshi, Qureshi, Vo, & Junejo, 2021). However, other studies found that controlling

corruption enhances the effects of FDI in explaining economic growth (Borja, 2017; Freckleton, Wright, & Craigwell, 2012).

Table 4 shows that FDI stimulates growth in developing countries. When FDI rises by 100 percent, growth increases by 9.62 percent. This result is consistent with several studies (Saidi, Ochi, & Maktouf, 2022; Tee, Larbi, & Johnson, 2017). FDI can contribute to economic growth by providing financing, transferring knowledge and technology, creating backward and forward linkages, creating employment opportunities, improving infrastructure, promoting innovation and entrepreneurship, and facilitating regional integration and trade. These benefits are supported by empirical evidence from various studies (e.g., (Baldwin, 1995; Blomstrom, Lipsey, & Zejan, 1992; Borensztein, De Gregorio, & Lee, 1998; Nxazonke & van Wyk, 2020; Wan, 2010)). However, the extent to which FDI promotes economic growth in the host country appears to be contingent on country-specific factors and qualities of FDI (Alfaro & Charlton, 2007; Zhang, 2001). Therefore, countries seeking to benefit from FDI must provide adequate institutional quality (Slesman, Abubakar, & Mitra, 2021).

Evidence suggests that regulatory quality affects economic growth (e.g., (Jalilian, Kirkpatrick, & Parker, 2007; Knack & Keefer, 1995)). A robust regulatory framework can provide firms with a stable and predictable environment, encouraging investment and boosting economic growth. Despite the lack of statistical significance, the estimated model suggests that regulatory quality enhances economic growth.

Despite the widespread debate among economists about the impact of military expenditures on economic growth, Dunne and Tian (2013) argue that recent research provides more robust evidence of the detrimental impact of military spending on economic growth. Our results are consistent with Deger and Smith (1983) and Dunne and Tian (2013), indicating that increased military spending slows economic growth in developing countries by 34%.

In 2020, the Stockholm International Peace Research Institute (SIPRI) reported that 2.4% of the world's GDP went to the military. However, some developing countries spent even more than that (Ansar, Chekima, Lada, Lim, & Bouteraa, 2023). In 2020, the Middle East allocated 4.1% of its GDP, while Sub-Saharan Africa spent 1.8%. Western Europe and North America spent 1.6% and 1.7%, respectively, of their GDP on the military. Some reasons developing countries tend to increase military spending include regional conflicts, security threats, political instability, and natural resources (Ali & Abdellatif, 2015; Deger & Sen, 1995; Maizels & Nissanke, 1968).

The degree to which developing economies depend on natural resources, including oil, varies. Nonetheless, many developing nations' economic progress primarily relies on oil exports (World, 2021). Oil revenues can have positive effects on economic growth in developing countries. Significant revenues from oil exports can finance investment and other development projects. These investments can create jobs, boost productivity, and stimulate economic growth (Hassan, Meyer, & Kot, 2019; Mohammed, Karimu, Fiador, & Abor, 2020). The estimated results support oil revenues' role in promoting economic growth by about 7%.

5. CONCLUSION

The literature on corruption and economic growth provides theoretical and empirical data on the relationship's direction, degree, and causation. Some studies suggest that corruption may hinder economic growth as the "sand on the wheels". Other research suggests corruption may promote economic growth by "greasing the wheels." The relationship may vary depending on the nature and level of corruption, the institutional context, the sample of countries and periods analyzed, and the estimation method. Therefore, additional research is required to better comprehend the intricate relationship between corruption and economic growth. In this study, we aim to investigate the impact of corruption on the economic growth of 129 developing countries from 2003 to 2021. The results of the REM suffer from two problems: asymmetric interconnection and non-independence of the cross-sections. We use PCSE to address these problems. The results of the assessment confirm the role that corruption plays in promoting economic growth in developing countries. Our results support the "greasing the wheels" hypothesis. However, it may be too dangerous to concede that developing countries should allow corruption to trump complex government

procedures. Leaving corruption to achieve little economic growth can devastate economic and social aspects. Nevertheless, politicians and decision-makers in developing countries have opportunities to move forward: first, towards supporting foreign direct investment and improving regulatory quality; second, to diversify the economy and reduce military expenditures.

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Appendix 1. Study countries.

Countries		Countries		Countries	
01	Argentina	44	Grenada	87	Oman
02	Afghanistan	45	Guatemala	88	Pakistan
03	Algeria	46	Guinea	89	Panama
04	Albania	47	Guinea-Bissau	90	Paraguay
05	Angola	48	Guyana	91	Peru
06	Armenia	49	Haiti	92	Philippines
07	Azerbaijan	50	Honduras	93	Poland
08	Bahamas	51	India	94	Qatar
09	Bahrain	52	Indonesia	95	Romania
10	Bangladesh	53	Iran	96	Rwanda
11	Belarus	54	Iraq	97	Samoa
12	Benin	55	Jamaica	98	Sao Tome and Principe
13	Bhutan	56	Jordan	99	Saudi Arabia
14	Bolivia	57	Kazakhstan	100	Senegal
15	Bosnia and Herzegovina	58	Kenya	101	Serbia

Countries		Countries		Countries	
16	Botswana	59	Kosovo	102	Seychelles
17	Brazil	60	Kuwait	103	Sierra Leone
18	Bulgaria	61	Kyrgyz Republic	104	Solomon Islands
19	Burkina Faso	62	Lao PDR	105	Somalia
20	Burundi	63	Lebanon	106	South Africa
21	Cabo Verde	64	Lesotho	107	Sri Lanka
22	Cambodia	65	Liberia	108	Sudan
23	Cameroon	66	Libya	109	Suriname
24	Central African Republic	67	Madagascar	110	Syrian Arab Republic
25	Chad	68	Malawi	111	Tajikistan
26	Chile	69	Malaysia	112	Tanzania
27	Colombia	70	Maldives	113	Thailand
28	Comoros	71	Mali	114	Togo
29	Costa Rica	72	Mauritania	115	Tonga
30	Djibouti	73	Mauritius	116	Trinidad and Tobago
31	Dominica	74	Mexico	117	Tunisia
32	Dominican Republic	75	Moldova	118	Turkiye
33	Ecuador	76	Mongolia	119	Turkmenistan
34	Egypt	77	Montenegro	120	Uganda
35	El Salvador	78	Morocco	121	Ukraine
36	Equatorial Guinea	79	Mozambique	122	Uruguay
37	Eritrea	80	Myanmar	123	Uzbekistan
38	Eswatini	81	Namibia	124	Vanuatu
39	Ethiopia	82	Nepal	125	Venezuela. RB
40	Gabon	83	Niger	126	Vietnam
41	Gambia	84	Nigeria	127	Yemen. Rep.
42	Georgia	85	North Macedonia	128	Zambia
43	Ghana	86	Nicaragua	129	Zimbabwe