International Economics 166 (2021) 58–70

Contents lists available at ScienceDirect

International Economics

journal homepage: www.elsevier.com/locate/inteco

Economic growth and corruption in emerging markets: Does economic freedom matter?

Leonardo Köppe Malanski *, Angela Cristiane Santos Póvoa

Pontifícia Universidade Católica do Paraná, 1155, Imaculada Conceição Street, Curitiba, State of Paraná, Brazil

ARTICLE INFO

JEL classification:
E02
O10
O40
O43
P51

Keywords:
Corruption
Growth
Economic freedom
Emerging countries

ABSTRACT

This study analyzes the effects of corruption on economic growth for different levels of economic freedom. The effects of corruption on the economy, which can increase or decrease growth, were tested in emerging countries in Latin America and Pacific Asia, between 2000 and 2017, through one-step System-GMM estimation panel data regressions. The results showed that economic freedom works as a moderator in the relationship between corruption and economic growth. On both continents, greater economic freedom, on average, supports the growth of GDP *per capita*. In Latin America, it was possible to corroborate the hypothesis that corruption damages countries with greater economic freedom but favors economic growth in countries with lower economic freedom levels. Regarding the Asian countries studied, there was only a negative effect of corruption on economic growth in countries with less economic freedom. When comparing this reality with the one in Latin America, it was observed that in terms of development, the countries in this continent are in earlier stages compared to the Asian countries, even though both country groups are called "emerging."

1. Introduction

Corruption is understood as a factor that interferes with market behavior, distorting its expected functioning and compromising proper competition (Rocha et al., 2016). Corruption undermines economic growth when the cost of doing business increases due to the price of bribes themselves, due to the cost of managing negotiations with employees, and due to the risk of breach of agreements or detection (Heckelman and Powell, 2010). It also decreases the government's ability to impose regulatory controls and measures to correct market failures; it distorts incentives because government intervention is motivated by corruption (bribes and kickbacks), in addition to the appearance of an arbitrary tax, since the "random nature of corruption" creates excessive costs (Tanzi and Davoodi, 1998, p.583). From another perspective, corruption can also contribute to reducing costs since it circumvents bureaucracy, favoring and smoothing negotiations (Graeff and Mehlkop, 2003; Gwartney and Lawson, 2003). Leff (1964) justifies this claim by stating that through a system of competition, corruption bypasses bureaucratic obstacles, favoring entrepreneurs' efficiency. Thus, the literature on this topic states that corruption can both harm and favor a nation's economic growth.

These two perspectives are summarized by two hypothetical aspects that analyze the effect of corruption on economic growth. They are defined as the "grease in the wheels" and "sand in the wheels" hypotheses (Aghion et al., 2016). The "grease in the wheels" hypothesis states that corruption emerges as a mechanism for deflecting bureaucratic dysfunctions, such as in the actions taken by those seeking to rush investment projects (Leff, 1964). In that sense, corruption favors business relations and the development of the economy.

* Corresponding author.
E-mail addresses: leonardokm@icloud.com (L.K. Malanski), angela.povoa@pucpr.br (A.C.S. Póvoa).

https://doi.org/10.1016/j.inteco.2021.02.001
Received 10 September 2020; Received in revised form 21 February 2021; Accepted 26 February 2021
Available online 13 March 2021

The "sand in the wheels" hypothesis asserts that corruption slows economic growth as corrupt agents depend on the income from these actions to survive, changing rules and weakening institutions.

However, a third element seems to moderate the theoretical relationship between corruption and economic growth, which is fundamental in causing the "grease or sand in the wheels" effects: the degree of economic freedom. The construct of economic freedom is directly related to freedom for individual actions, referring to the choice for competition and action, and voluntary exchanges and negotiations, ensuring the right to property. This means that individuals enjoy economic freedom when they are able to transact goods without using illicit means, coercion, or external influence (Gwartney et al., 2004). Economic freedom can also be defined as one's right to control his/her property and personal abilities (labor, production, consumption, investment) (Miller et al., 2019; Quoos, 2017).

Thus, this study sought to answer the following question: To what extent is the relationship between corruption and economic growth moderated by the degree of economic freedom? To conduct this study, secondary data were used, from two blocks of emerging countries: Latin America and Pacific Asia. This choice was motivated by the similarities and differences that exist between the two continents.

In Latin America, corruption is a topic of recurring discussion, mainly due to the most recent events in Brazil with the case of Petrobras and Odebrecht; in Argentina, with the scandal related to ex-president Cristina Kirchner; and, in Venezuela, with the Cartel dos Sóis and the former President Nicolás Maduro's case (Llorente and Cuenca, 2016). Asiedu and Freeman (2009) presented empirical evidence showing the significant influence of corruption on the growth of companies' investment in emerging economies (countries in transition), showing that corruption provides advantages even before the opening of an enterprise (a phenomenon called structural corruption).

On the Asian continent, Kaufmann and Wei (1999, p.10) admit that "corruption has been part of Asian culture for a long time and does not seem to hamp the business there." Still, a positive and statistically significant relationship has been found between corruption and economic growth in recently industrialized countries, such as Indonesia and China (Rock and Bonnett, 2004).

The paper is organized as follows. Section 2 presents an overview of the literature on the effect of corruption on growth moderated by economic freedom. Section 3 details the method strategy. Section 4 presents and discusses the empirical results. Section 5 concludes.

2. Corruption, economic growth and economic freedom

The provocative debate on the role of corruption on the economic growth as "sand" or "grease" in the wheels is supported by several theoretical justifications. Regarding the "sand in the wheels" hypothesis, corruption weakens economic growth, increasing the cost of doing business. Mauro (1995) found a significant negative relationship between corruption and investment, with impacts extended to growth. According to Méon and Sekkat (2005), the impact of corruption on economic growth is negative, however, this impact is dependent on the quality of governance. They found that weak rule of law, inefficient government and political violence tend to worsen the negative impact of corruption on investment. They claim that reducing corruption would be more profitable to countries where other aspects of governance are poor, reinforcing the role of corruption as "sand in the wheels" of the economic activity. Kunieda, Okada and Shibata (2014) observed that highly corrupt countries impose higher tax rates when compared to less corrupt countries, showing a negative impact of corruption on economic growth.

Although corrupt activities have been identified as one of the main obstacles to develop and economic growth, positive effects of corruption cannot be ignored, being summarized in the "grease the wheels" hypothesis. Nye (1967), Leff (1964), and Huntington (1968) show that corruption ends up generating some benefits for a given society. A bribe can help reduce the bureaucracy imposed on companies, such as through bypassing complicated regulations, reducing long waiting times, and accelerating the distribution of licenses and authorizations (Leff, 1964). Nye (1967) admits that, in underdeveloped countries, corruption benefits the political development, since it can solve the problems of economic development, national integration, and government capacity. Corruption exhibits three aspects that simplify the resolution of problems related to economic development: capital formation, reduction in bureaucracy, and entrepreneurship incentives (as the entrepreneur is the basis for achieving growth (Schumpeter, 1997). Bardhan (1997) justifies the idea that corruption "greases the wheels" in the sense that it serves as an instrument of allocative efficiency, as it manages to benefit the most efficient investors since, in a price discriminating market, the companies with the highest returns can pay the largest bribes. Dreher and Gassebner (2007) studied the phenomenon where corruption emerges to reduce the negative impacts of regulation on entrepreneurial activity.

However, the role of corruption on economic growth, whether acting as sand or grease, seems to be closely related to a third element: the economic freedom. Swaleheen and Stansel (2007) explain that in countries where people have low economic freedom, controlling corruption will have growth benefits. This happens because under low economic freedom, government control is pervasive, and people have very few choices, and a reduction in corruption by public officials releases resources and leads to higher growth rate. Thus, countries where people have low economic freedom, controlling corruption will benefit economic growth. On the other hand, if economic freedom is relatively high, then reducing corruption will lower the growth rate, because without restrictions, people can reach the most efficient allocation possible by bribing officials, however, if officials become more honest (lower corruption) the policies in place are implemented more faithfully and growth is adversely affected.

Similarly, Heckelman and Powell (2010) utilized the economic freedom index to examine if corruption can facilitate growth by allowing entrepreneurs to avoid inefficient policies and regulations when economic freedom is limited. They observed that corruption is more beneficial to economic growth when economic freedom is low, and these benefits diminish as economic freedom improves. Neeman et al. (2003) found that government corruption has a negative impact on economic growth in highly open countries but has almost no effect in strongly closed countries.

Osterfeld (1992) claim that where economic freedom is high (e.g. Hong Kong), higher levels of corruption will benefit the economic

growth, however, corruption will lower economic growth when bribes reduce competition and increase market rigidities, which is more likely to happen in countries where economic freedom is low. This happens due to the state ownership of assets, high tariff barriers and the state-run market. Thus, an increase in corruption in low-freedom countries is more likely to lead to a decline in economic growth because it reduces competition. According to Swaleheen and Stansel (2007), in a country where corruption is the highest, an increasing in economic freedom will be growth augmenting while in countries where corruption is relatively low, an increase in economic freedom reduces economic growth.

Goel and Nelson (2005) found that greater levels of economic freedom is usually associated with market mechanism working more effectively, being a deterrent to corruptive activities, thus, international bodies interested in reducing corruption might consider devoting more efforts at bringing about economic freedom.

However, far from being a straightforward relationship, the effects of corruption on economic growth moderated by economic freedom should be examined taking into account a set of other relevant variables. Graeff and Mehlkop (2003) identify a stable pattern of aspects of economic freedom influencing corruption that differs depending on whether countries are rich or poor, pointing out the relevance of a country's level of development. Richer countries tend to be less corrupt, and corrupt economies tend to be poorer (Neeman et al., 2003). In poor countries, corruption seems necessary to get things done, and if corruption is reduced without corresponding changes to eliminate bureaucracy and inefficient rules, economic growth may slow down. Besides, poor countries are usually associated with high fertility rates and lower level of education (Nargund, 2009) which suggest that lack of corruption underlies desirable conditions for child rearing (Yamamura and Andrés, 2011).

Llorente and Cuenca (2016), claim that for an effective fight against corruption, it is necessary to have a strong institutional apparatus, a solid legal body, and a clear and decided political will. Only after strong economic institutions set in place would reducing corruption be likely to improve growth prospects, and the benefits of corruption will diminish as economic freedom improves (Heckelman and Powell, 2010). Baungarte et al. (2019) and Lambsdorff (1999) admit that institutional quality affects the existence of corrupt activities since the presence of transparent and reliable institutions ends up discouraging such activities. Aidt et al. (2008) claim that when political institutions are of low quality, corruption has little impact on growth. Mo (2000) found that the most important channel through which corruption affects economic growth is political instability. He observed that corruption is most prevalent where other forms of institutional inefficiency, such as bureaucratic red tape and weak legislative and judicial systems, are present.

Democracy seems to be another relevant aspect to be considered on this topic. Authoritarian leaders, contrary to democratic regimes, have few checks on their power and thus engage in corruption more frequently (Bueno de Mesquita et al., 2001). According to Miller et al. (2019), there is a direct relationship between the state's economic intervention and the prevalence of corruption. Excessive and redundant government regulations provide opportunities for the development of corrupt practices. For Moraes (1996), among the problems that arise from state intervention, one could mention corruption, inefficiency, waste, and poor administration. However, Huntington and Nelson (1976) argued that democracy in developing countries also generate high levels of government spending, reducing the surplus available for investment, with negative effect on economic growth. According to Bengoa and Sanchez-Robles (2003), an excessive role for the state in the economy can crowd out private activity, lead to corruption and rent seeking activities that result in large deficits and hyperinflation. Drury et al. (2006) found that corruption has no significant effect on economic growth in democracies, while non-democracies suffer significant economic harm from corruption. Nevertheless, Méndez and Sepúlveda (2006) and Heckelman and Powell (2010) found that corruption is more beneficial to growth for greater levels of democracy. The reverse, however, was found when considering economic institutions.

As observed in the literature (Angulo-Guerrero et al., 2017; Bengoa and Sanchez-Robles, 2003; Goel and Nelson, 2005; Gwartney et al., 2004; Rocha et al., 2016; Zhu and Zhu, 2017), it is estimated that a country's level of economic freedom can influence the context in which business organizations exist and, therefore, affecting investment rate. Mauro (1995) finds empirically that corruption reduces private sector investment even in countries featuring cumbersome economic regulations, where corruption might be expected to spur investment. Foreign Direct Investment (FDI) is closely associated with economic growth (Bengoa and Sanchez-Robles, 2003), being strictly associated with the transmission of advanced technology from leaders to developing countries, and the degree of economic freedom, macroeconomic stability, political climate and human capital are points out as the main determinants for a developing country to atract foreign investment. On the other hand, investors tend to avoid countries where corruption is prevalent, due to an increase of risk perception, which directly affects the economic growth. In Latin America, Bengoa and Sanchez-Robles (2003) found evidence of a positive relationship between economic freedom and FDI.

3. Methodology

This study investigated the extent to which the relationship between corruption and economic growth is moderated by the degree of economic freedom. Economic growth was measured by the growth in income *per capita* (GDP *per capita* growth) (Angulo-Guerrero et al., 2017; Bengoa and Sanchez-Robles, 2003; Goel and Nelson, 2005; Gwartney et al., 2004; Nur-tegin and Jakee, 2019; Rocha et al., 2016; Xu et al., 2017; Zhu and Zhu, 2017).

Méon and Weill (2010) establish that the "grease in the wheels" hypothesis can take two forms: a "strong" and a "weak" form, which depend on the moderation between corruption and a country's level of quality of governance. The "strong" hypothesis applies to instances when the governance index reaches low values and corruption can reduce inefficiency in some countries. The "weak" hypothesis, on the other hand, refers to instances where corruption is only less damaging in countries that exhibit sufficiently low institutional quality. Thus, corruption remains positively correlated with inefficiency in all countries. Therefore, the weak form states that corruption is less harmful in countries with weak institutions while the strong form says that corruption is truly beneficial in a deficient institutional environment.

Based on the idea that higher levels of economic freedom allow a more effective resource allocation, as well as a reduction in costs, it is estimated that the performance of organizations located in more liberal environments tends to be better, which makes the business environment more beneficial to economic activity. Therefore, the acceleration in economic activity positively impacts the GDP *per capita*. The hypotheses proposed in this study are as follows:

H1. The level of economic freedom positively influences an economy's GDP *per capita*.

H2.A. Corruption negatively influences economic growth ("sand in the wheels" hypothesis).

H2.B. Corruption positively influences economic growth ("grease in the wheels" hypothesis).

H3. Economic freedom moderates the relationship between corruption and GDP *per capita*.

The study is focused on the emerging economies of Latin American and Pacific Asian countries (between 2000 and 2017). The growth of these economies was measured by an economic indicator, namely, GDP *per capita*. Countries were divided into tropical or non-tropical, developed or underdeveloped, and Latin American or Pacific Asian (Gallup et al., 1999; The World Bank, 2020). The sample consisted of 19 countries in Latin America (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic, Uruguay, and Venezuela), 9 countries in Asia (China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, Thailand, and Vietnam), and 2 in Oceania (Australia and New Zealand).

The procedures, estimates, and statistical tests were performed through the Gnu Regression, Econometrics and Time-series and StataMP softwares. Multipe linear regressions were performed using panel data. The estimations used one-step System-GMM, with a lagged variable of the GDP *per capita*, with robust standard errors and time effect control. For the one-step estimator, it is assumed that the error terms are independent and homoscedastic for each cross-section over time. The lag of the dependent variable was added in order to eliminate endogeneity problems. System-GMM estimators blend regressions in differences and in levels in a system of equations, utilizing the lagged differences instruments for the level series and the lagged levels of instruments for the differenced series (Arellano and Bover, 1995). To check the panel series stationarity, the Im-Pesaran-Shin and Fisher-type tests were used, and the variables used in the model adequately satisfied the stationarity assumption. The estimated equation for the regression model is given by equation (1):

$$\ln\left(Y_{i,t}\right) = \alpha_0 + \alpha_1 \ln\left(Y_{i,t-1}\right) + \alpha_2 CPI_{i,t} + \alpha_3 CPI_{i,t-k} + \alpha_4 EF_{i,t} + \alpha_5 (CPI \times EF)_{i,t} + \alpha_6 D_{tropical_i} + \alpha_7 D_{Development_{i,t}} + \alpha_n \delta_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where ln ($Y_{i,t}$) is natural logarithm of the GDP *per capita* of country *i* in period *t* and period *t-1*, $CPI_{i,t,k}$ is the Corruption Perception Index (CPI) of country *i* in period *t* (with *k* representing the lag length), $EF_{i,t}$ is the economic freedom index of country *i* in period *t*, $Dtropical_i$ is the dummy variable for whether country *i* is tropical, $DDevelopment_{i,t}$ is the dummy variable for the level of development of country *i* in period *t*, and $\delta_{i,t}$ is a control variables vector (see Appendix A). The regressions analyze Latin America and Pacific Asia separately, to obtain more accurate results for each continent. Countries from Oceania were included in the Pacific Asia group.

The moderation of the influence of corruption on economic growth by economic freedom is measured by the magnitude and direction of the interaction coefficient (α_5), combined with the direction and magnitude of the coefficients for the independent variable (CPI) (α_2) and the moderating variable (EF) (α_4), according to the methodology of Aiken and West (1991) and Hayes (2013). The use of this method has already been established in the literature (Cieślik and Goczek, 2018; Kunieda et al., 2014; Méon and Sekkat, 2005; Méon and Weill, 2010; Prado et al., 2014; Vieira, 2015). It is important for such a relationship to be tested because when interaction effects are present, it means that the interpretation of the effects of individual variables may be incomplete or incorrect (Pedhazur and Schmelkin, 1991). "In more complex study areas, the independent variables might interact with each other. Interaction effects indicate that a third variable influences the relationship between an independent and dependent variable. This type of effect makes the model more complex, but if the real world behaves this way, it is critical to incorporate it in your model" (Frost, 2019, pp. 111–112).

The control variables incorporated in the regression model were those observed in the literature. The addition of the control variable *inflation* is justified given that in Latin American countries, economic growth is closely linked to inflation rates, due to the great social inequality (Bengoa and Sanchez-Robles, 2003). There is also empirical evidence for the influence of the following variables on economic growth: FDI (Cieślik and Goczek, 2018), available human capital (level of education and life expectancy) (Barro and Lee, 2013; Park, 2012), and geographic location in the region between the Tropic of Cancer (23° 26′ 14″ N) and the Tropic of Capricorn (23° 26′14″ S) (Gallup et al., 1999).

A country's geographical proximity to large economic centers has also been shown to be a variable that influences economic growth (Gallup et al., 1999). Therefore, since a nation's geographic location can also influence its economic and social development, this study used a variable referring to the location of each country as a control variable, according to the methodology of Gallup et al. (1999). Thus, the influence of economic freedom can be measured more precisely.

Regarding inflation, a higher inflation rate appears as a symptom of a country's lack of commitment and discipline regarding monetary policy. A high rate of inflation compromises competitiveness and exports, and can also be a symptom of the presence of market distortions or low macroeconomic stability (Fischer, 1993). In Latin American countries, economic growth is closely linked with inflation rates, due to the large degree of social inequality. In cases of widespread loss of currency power at an increasing rate, the aggregate demand component of "consumption" is the first to suffer the impact, as individual household consumption decreases (Bengoa and Sanchez-Robles, 2003). Therefore, the addition of the variable *inflation* in the model is justified, as it allows measuring economic growth without the influence of the monetary volatility that permeates a country.

Bengoa and Sanchez-Robles (2003) also observed the increase in economic growth due to high FDI rates, which, as justified by the authors, are responsible for increases in corporate innovation. Similarly, Cieślik and Goczek (2018) show that FDI is individually responsible for increasing economic growth. Therefore, FDI was added as a control variable to remove its influence on the economic growth. Concerning the available human capital, it can be measured based on the evidence in the existing literature (Barro and Lee, 2013; Park, 2012) that level of education and life expectancy can be used as proxies for these.

4. Results

After collecting and processing the data, descriptive statistics were tabulated to illustrate the sample characteristics. The results are shown in Tables 1 and 2.

The CPI functions as a scale for each country, with 0 and 100 representing an extremely corrupt country and a non-corrupt country, respectively. When the two continents are compared, it is observed that the mean CPI of Pacific Asia has experienced greater improvement between the first and last observation, than the mean CPI of Latin America (20.1% and 7.4%, respectively).

The EFI variable is a scale with 0 and 100 representing an extremely closed country and an extremely liberal country, respectively. The EFW index measures the same relationship; however, it has a scale from 0 to 10. Regarding the variation in levels of economic freedom among different countries, low variability was observed since Latin America exhibited a coefficient of variation of 14.38% for the EFI and 13.28% for the EFW. Likewise, the countries in the Pacific Asian sample had a variability of 19.55% for the EFI and 12.54% for the EFW. Further, it was observed that Latin American countries have higher inflation rates than Pacific Asian countries.

Concerning GDP *per capita*, the natural logarithm was used to smoothen the series. From the results in Tables 1 and 2, it can be seen that the mean for both continents was very similar. However, the dispersion of observations for Pacific Asian countries was larger. This is a reflection of Pacific Asia's large income gap.

By comparing the statistics in Tables 1 and 2, it was possible to identify some similarities and other differences between both continents. Concerning perceived corruption, the Latin American continent had a lower average and variability (35.23; 39.83%) than the Asian continent (52.51; 49.75%). For the FDI variable, similar means (3.58 and 3.88) were observed, but in the Asian continent, FDI reached a maximum value of 28.02% of GDP. Life expectancy, in both scenarios, was approximately 75 years old with low variability. Concerning the level of urbanization of the population, higher concentration rates were observed for cities in Latin America (70.1%) than for those in Pacific Asia (61%). Finally, when examining the education levels in the two continents, a certain degree of improvement in Pacific Asian countries: 8.93 average years of education received by people ages 25 and older, while Latin American countries have 7.44 years for the same indicator.

Before the regression analysis was conducted, the assumptions for ordinary least squares regression were checked. The Shapiro-Francia test was performed and the p-values were 0.0521 and 0.094 for Latin America and Pacific Asia, respectively. For the heteroscedasticity analysis of the residuals, the Breusch-Pagan test was performed, where the null hypothesis assumes the homoscedasticity of the residues. The p-value for the test was 0.1222 for Latin America and 0.001 for Pacific Asia. As mentioned in the methodology section, robust standard errors were used to correct this problem. The autocorrelation of the panel data was tested by the Arellano-Bond test for correlation of the first differenced residuals, where the null hypothesis is a lack of autocorrelation of order 2. The null hypothesis was not rejected, in either continent. All models took in consideration time effect in the estimations.

As noted in Equation (1), the interaction term of the corruption variable and the economic freedom variable (EFI or EFW) was added, to measure the moderation of the influence of corruption on economic growth by economic freedom. Both indexes of economic freedom were used as a robustness check. The results found for Latin America are shown in Table 3 (models A1 and B1).

As regards the results for models A1 and B1 (Table 3), it should be noted that the coefficients related to economic freedom and

Table 1
Descriptive statistics of variables – Latin America.

Variable	Obs.	Mean	Stand. Dev.	CV	Minimum	Maximum
CPI	341	35.23	14.03	39.83%	14.00	75.00
EFI	342	60.72	8.73	14.38%	27.00	79.00
EFW	342	6.74	0.89	13.28%	2.58	7.93
FDI	342	3.58	2.77	77.57%	−5.01	16.23
GFCF	342	19.78	5.78	2.92%	0.00	40.63
Inflation rate	288	5.13	7.32	142.70%	−0.73	96.09
Level of education	342	7.44	1.68	22.55%	3.50	11.10
Urban population	342	70.10	14.48	20.66%	35.60	95.24
Life expectancy	342	73.01	4.30	5.89%	57.13	79.91
Fertility rate	342	2.60	0.59	22.64%	1.68	4.60
Population growth	342	1.32	0.53	40.26%	−1.54	2.73
Voice	323	0.09	0.56	614.19%	−1.34	1.29
Political stability	323	−0.33	0.66	−200.43%	−2.37	1.09
Government effectiveness	323	−0.32	0.63	−199.43%	−2.08	1.28
Regulatory quality	323	−0.13	0.68	−515.06%	−2.00	1.54
Rule of law	323	−0.51	0.71	−139.22%	−2.26	1.43
Democracy	342	7.51	2.44	32.42%	−3.00	10.00
ln GDP *per capita*	339	8.47	0.80	9.45%	6.50	9.61

Source: Research data (2020).

Table 2
Descriptive statistics of variables – Pacific Asia.

Variable	Obs.	Mean	Stand. Dev.	CV	Minimum	Maximum
CPI	198	52.51	26.12	49.75%	17.00	96.00
EFI	198	65.50	12.81	19.55%	43.70	89.40
EFW	195	7.21	0.90	12.54%	5.59	8.81
FDI	198	3.88	5.43	139.96%	−3.81	28.02
GFCF	198	26.81	5.91	22.06%	18.18	44.52
Inflation rate	198	3.88	3.08	79.29%	−1.35	14.24
Level of education	198	8.93	2.33	26.04%	4.40	12.80
Urban population	198	60.99	24.46	40.10%	24.37	100.00
Life expectancy	198	75.05	5.54	7.38%	62.51	84.10
Fertility rate	198	2.03	0.61	29.79%	1.15	3.81
Population growth	198	1.19	0.76	64.10%	−1.47	5.32
Voice	187	0.04	1.00	2313%	−1.75	1.68
Political stability	187	0.01	1.03	7043%	−2.09	1.62
Government effectiveness	187	0.73	0.89	121.54%	−0.48	2.44
Regulatory quality	187	0.53	0.94	177.73%	−0.80	2.26
Rule of law	187	0.47	0.97	204.94%	−0.91	2.01
Democracy	198	4.23	6.61	156.36%	−7.00	10.00
ln GDP *per capita*	198	8.94	1.44	16.08%	6.64	10.95

Source: Research data (2020).

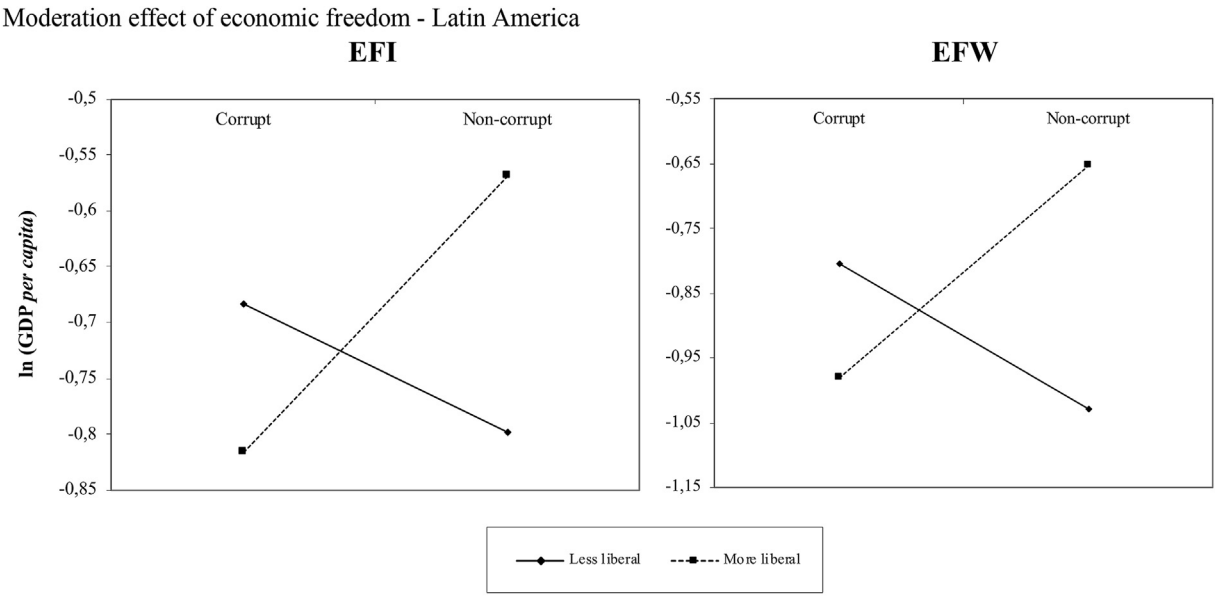
perceived corruption exhibited negative signs. However, the interaction term has a positive sign. Therefore, an increase in the corruption index (a country being less corrupt), implies a negative effect on GDP *per capita* growth. This result suggests that the "grease in the wheels" hypothesis is valid. It is necessary to observe that, after a certain point, the coefficient of the interaction of the variables reflects positive marginal variations greater than the negative marginal variations of the CPI, EFW, or EFI. Therefore, using the coefficients and other statistics on the independent variable (CPI), the moderating variable (EFW or EFI), and their interaction, it was possible to assess the moderation relationship graphically. The results for Latin America are shown in Fig. 1.

Fig. 1 shows evidence that supports hypotheses H2.A and H2.B since it illustrates the impact of corrupt activity on the variation of GDP *per capita*. From the results for both models A1 and B1 in Table 3, moderative influence of corruption on economic growth by economic freedom is confirmed, supporting hypothesis H3. The dashed lines in Fig. 1 support hypothesis H2.A, showing that corruption is detrimental to economic growth in countries with greater economic freedom. Based on the solid lines, H2.B is supported, confirming that in countries with less economic freedom, the variation of GDP *per capita* is greater than in countries with higher levels of corruption.

Table 3
Regression results for Latin America – One-step Level GMM Estimation.

Independent variables	EFI (A1)		EFW (B1)	
	Coefficient	p-value	Coefficient	p-value
Constant	−0.388946***	0.000	−0.332552*	0.069
Lagged ln(Y_{t-1})	0.977992***	0.000	0.973366***	0.000
Economic freedom	−0.006113**	0.046	−0.091182**	0.020
Corruption	−0.009244*	0.078	−0.016271**	0.027
Economic freedom × corruption	0.000168*	0.060	0.002729**	0.018
FDI	−0.001049	0.610	−0.002702	0.241
GFCF	0.000023	0.962	−0.000628	0.352
Inflation rate	0.000598	0.125	0.001015*	0.072
Level of education	−0.003566	0.410	−0.009963	0.106
Urban population	0.003036***	0.010	0.004587***	0.003
Life expectancy	0.005808***	0.004	0.006207***	0.001
Fertility rate	0.042723**	0.036	0.052128**	0.019
Population growth	−0.018810*	0.073	−0.011384	0.418
Voice	−0.031474	0.118	−0.082666**	0.018
Political stability	0.013128	0.103	0.025686**	0.016
Government effectiveness	−0.020125**	0.048	−0.026143	0.125
Regulatory quality	0.000068	0.995	−0.006906	0.494
Rule of law	0.001111	0.931	0.017509	0.322
Democracy	0.005006**	0.032	0.005909**	0.046
D *development*	0.071535	0.117	0.126281**	0.022
D *tropical*	0.190698**	0.026	0.274145***	0.002
AR (2)		0.438		0.341
Sargan-Hansen test		0.849		0.559

Note: This table shows the regression Latin America (models A1 and A2). Dependent variable: ln (GDP *per capita*).
***, **, and * denotes significance at the 1%, 5%, and 10% levels, respectively. AR (2) test for autocorrelation of order 2. Sargan-Hansen test of the overidentifying restrictions, one-step moment functions. Lags for Corruption were removed due to autocorrelation problems. All estimations included time dummies and used robust standard errors.



Note: The left side shows the case of a corrupt country and the right side presents the case of a non-corrupt country. The solid lines show economic growth for a less liberal country for the two scenarios (a corrupt vs. non-corrupt country). The dashed lines show economic growth in a more liberal country for these two scenarios. Source: Research data (2020).

Fig. 1. Moderation effect of economic freedom - Latin America.

Further, the observations from Latin America exhibit a quadratic pattern. According to the regression coefficients for Latin America, the increase in economic freedom, combined with the reduction in corruption levels, is responsible for the increase in economic growth. It is worth highlighting that in countries with no economic freedom, when this is combined with the absence of corruption, the values tend toward a decrease in economic growth, according to the estimates from models A1 and B1. The results for different combinations of values of the coefficients can be seen in Fig. 2.

For a combination of low values of economic freedom and corruption, the presence of corruption, according to the estimates, favors economic growth (red color on the scale). This validates the "grease in the wheels" hypothesis. However, such a relationship is only observed until a certain point. When the value of economic freedom exceeds 80.0 and is combined with a value of 80.0 or higher for the CPI, *ceteris paribus*, economic growth begins to increase again. It is worth noting that, in countries with no economic freedom, when this is combined with the absence of corruption, the values tend towards the purple color of the scale, representing a decrease in economic growth, according to the estimates.

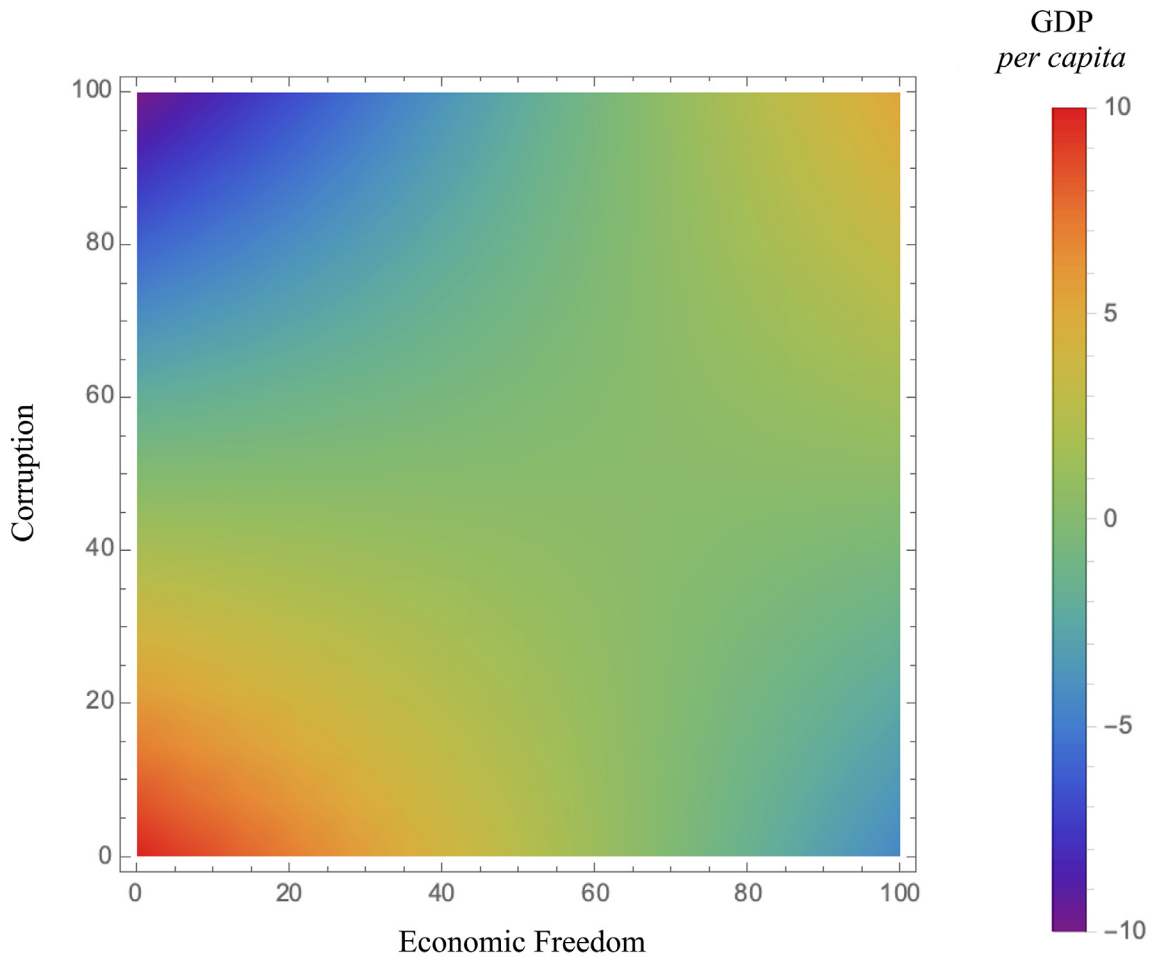
Greater economic growth was observed in countries with less economic freedom and simultaneous high corruption (low values for the CPI). Countries with high CPI levels (where there is no prevalence of corrupt activity), the result is an estimated negative variation of GDP *per capita*. In other words, as soon as a country's level of economic freedom increases, corruption stops to function as "grease in the wheels" and starts to function as "sand in the wheels," preventing economic growth. Thus, the fight against corruption is only reflected in greater economic growth if followed by greater economic freedom.

Regarding the democracy level influencing the GDP *per capita*, as shown by its variable on Table 3, it can be seen that the higher levels of democracy also favor economic growth (as the democracy variable it is a scale ranging from a complete autocratic regime on its lower point and a complete democratic regime on its higher point). These results corroborate what has been said by Drury et al. (2006, p.133), as "democratic regimes are likely to provide greater political independence for the judiciary, which provides yet another check on the quantity and composition of corruption".

For Pacific Asia, regression models were estimated also with System-GMM, but lags of the CPI were included, as an improvement for the model estimation. The results are shown on Table 4.

Based on models A2 and B2, FDI was found to be statistically significant at the 1% level of significance. A positive relationship was found between FDI and economic growth, similar to the results of Bengoa and Sanchez-Robles (2003). An explanation for this is that new technology is developed in some countries but reaches other countries through FDI. Thus, an increase in FDI reduces the technical limitations of Pacific Asian countries and, with better technology, greater investment in research and development, and better *know-how*, in the efficiency of production processes increases. Consequently, GDP *per capita* increases.

In models A2 and B2, a statistical difference (significant at the 10% level) was observed between countries located in tropical vs. non-tropical regions, with the former tending to show lower rates of economic growth. These results corroborate the negative relationship observed between the incidence of malaria and economic growth, according to Gallup et al. (1999). Gwartney et al. (2004) admit that a hot and humid climate can compromise labor productivity and energy production levels, thus negatively influencing economic growth.



Note: The graph shows the estimated economic growth for combinations of different values of the perceived corruption index and economic freedom index. Source: Research data (2020).

Fig. 2. Interaction of coefficients: Models A1 and B1 - Latin America.

However, in models A1 and B1, the dummy coefficient shows a positive and significant relationship. This can be justified as Latin American countries dependent to an agricultural production of tropical items. Therefore, the localization inside the tropical region can be promising to these countries, according to the models results.

Regarding the countries' level of development, according to models A2 and B2, during the analyzed period, countries with an HDI larger than 0.800 exhibited a statistically lower growth of GDP *per capita* on average. Thus, developed countries have reached higher economic activity levels and, therefore, have less possibility for growth, unlike underdeveloped economies which, with favorable conditions, have a great opportunity for development. This result is consistent with the assumption of the "catch-up effect": the GDP *per capita* of less developed economies tends to grow at higher rates than that in more developed economies. Therefore, in the long run, it is estimated that all economies will converge to the same level of GDP *per capita* (Bishop, 2004).

In models A2 and B2, the coefficient related to the variable named *voice*, as a proxy for "perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media" (The World Bank, 2021), it shows that the greater the freedom of expression, the greater the GDP *per capita*, according to the models estimates. Results corroborates with previous results that state that press freedom "play a vital role in the development of the economy" (Alam and Ali Shah, 2013, pp. 17-18).

Regarding the level of urbanization in each country, the results show a positive and significant coefficient at the 1% level in all models. Gallup et al. (1999) explain this as follows: the significant increase in the percentage of the population living in the urban area. According to the results, a high urban population density favors economic growth. Life expectancy coefficients appear to be positive and significant in models A1, B1 (both at 1% level), A2 (at 10% level) and B2 (at 1% level). This shows that higher life expectancy relates to greater GDP *per capita*, as a proxy for developed countries.

Table 4
Regression results for Pacific Asia – One-step Level GMM Estimation.

Independent variables	EFI (A2)		EFW (B2)	
	Coefficient	p-value	Coefficient	p-value
Constant	0.965762***	0.001	0.944578***	0.000
Lagged ln(Y_{t-1})	0.882664***	0.000	0.885389***	0.000
Economic freedom	−0.009289*	0.052	−0.131949***	0.000
Corruption	−0.010765**	0.025	−0.026047***	0.000
Lagged Corruption$_{t-1}$	0.010648*	0.067	−0.011659**	0.046
Lagged Corruption$_{t-2}$	−0.002125	0.623	−0.003373	0.437
Lagged Corruption$_{t-3}$	−0.006205	0.140	−0.004696	0.273
Economic freedom × corruption	0.000136**	0.012	0.003020***	0.000
FDI	0.002739***	0.005	0.004354***	0.000
GFCF	−0.002210**	0.041	−0.002010	0.204
Inflation rate	0.000754	0.520	0.002914	0.123
Level of education	−0.002032	0.748	−0.005288	0.413
Urban population	0.004659***	0.009	0.005130***	0.000
Life expectancy	0.009725*	0.092	0.015359***	0.005
Fertility rate	−0.067064***	0.001	−0.048751***	0.007
Population growth	−0.000315	0.954	−0.002276	0.413
Voice	0.075359**	0.042	0.122128***	0.000
Political stability	−0.022095	0.157	−0.015545	0.277
Government effectiveness	−0.021995	0.235	−0.001937	0.947
Regulatory quality	0.064412**	0.036	0.007449	0.755
Rule of law	0.033267	0.189	0.037863	0.133
Democracy	−0.002275	0.427	−0.004514**	0.046
D *development*	−0.313462***	0.001	−0.469283***	0.000
D *tropical*	−0.098984***	0.005	−0.131283***	0.000
AR (2)		0.329		0.788
Sargan-Hansen test		0.605		0.763

Note: This table shows the regression Pacific Asia (models A2 and B2). Dependent variable: ln (GDP *per capita*).
***, **, and * denotes significance at the 1%, 5%, and 10% levels, respectively. AR (2) test for autocorrelation of order 2. Sargan-Hansen test of the overidentifying restrictions, one-step moment functions. All estimations included time dummies and used robust standard errors.

Viewing the fertility rate coefficients for all models, it can be seen a positive coefficient for the Latin America models (both at 5% level) and a negative coefficient for the Pacific Asia models (both at 1% level). The contrast in the continents can be explained by their economy's base production. As the economy of many Latin American countries are related to agricultural production and commodities, this kind of production requires more a manual labor than the production of the Pacific Asian countries, which have more aggregated-value industries that requires more high-qualified labor force.

In model A2 and B2 the coefficients of economic freedom, corruption and the interaction of them were statistically significant. Based on the estimated interaction of the EFI (or EFW) and CPI, the moderating effect of economic freedom was statistically significant. The moderation effect is illustrated in Fig. 3.

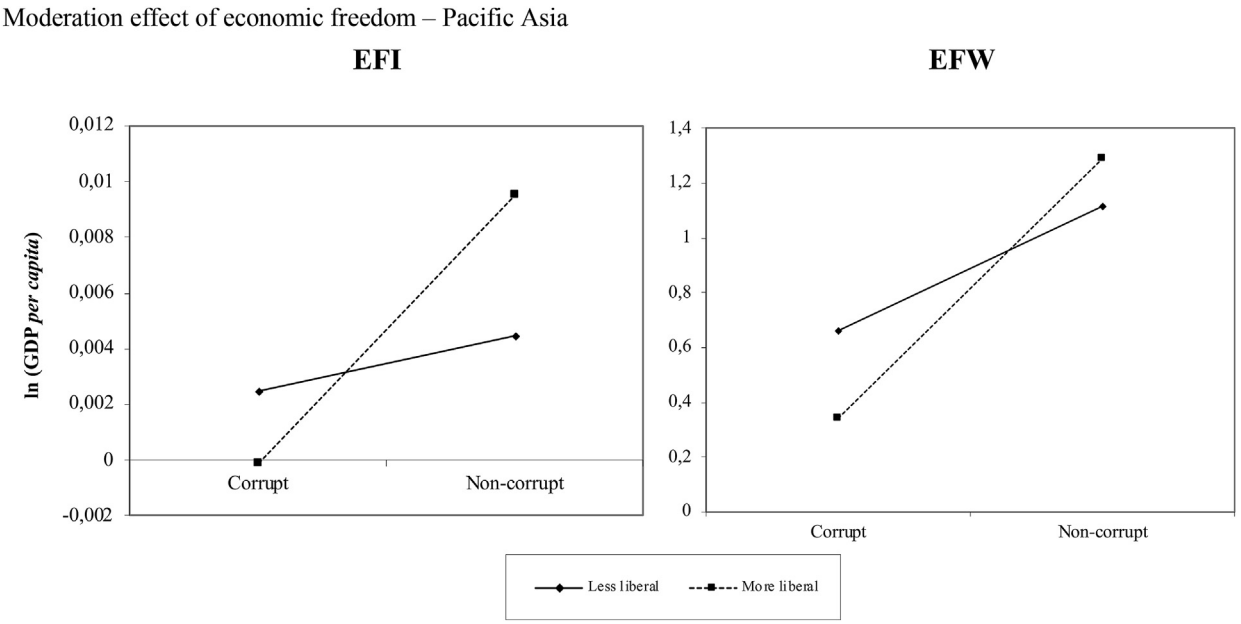
The results of model A2 and B2 in Table 4 show the negative influence of corruption on economic growth: countries with higher levels of economic freedom and low levels of corruption exhibit a higher GDP *per capita*. In other words, in both cases, corruption was seen as a factor that decreases economic growth. Therefore, for the countries analyzed in Pacific Asia, only hypothesis H2.A ("sand in the wheels" hypothesis) was supported. The negative impact of corruption was more noticeable in countries with greater economic freedom. Therefore, in this case, a slight moderation of the influence of corruption on economic growth by economic freedom was determined, corroborating hypothesis H3.

Differences in the effects of corruption are associated with distinct patterns of development: countries farther to the technological frontier depend on more strategic investments in innovation, making the innovation environment more susceptible to the negative influence of corruption (Aghion et al., 2016). For all models, the lag of GDP *per capita* was statistically significant, indicating the series persistency and the motivation for a dynamic panel. As for domestic capital, represented by the Gross Fixed Capital Formation (GFCF) as percentage of GDP, in neither models this variable appeared to be statistically significant.

5. Concluding remarks

The objective of this study was to verify the extent to which the relationship between corruption and economic growth is moderated by a country's degree of economic freedom. Through secondary data, variables that portrayed the reality of the economies studied in the most accurate way possible were used, such as GDP *per capita* and indices of economic freedom and perceived corruption. In the analysis, 30 countries were studied, 19 from Latin America and 11 from Pacific Asia, for the period from 2000 to 2017. The estimations used one-step System-GMM, with a lagged variable of the GDP *per capita*, used for Latin America and for Pacific Asia.

It was observed that changes only in the level of economic freedom were not determinants of economic growth. However, the moderation effect of economic freedom on the relationship between corruption and economic growth was statistically significant, showing that for both continents, greater economic freedom favors, on average, GDP growth *per capita*.



Note: The left side shows the case of a corrupt country and the right side presents the case of a non-corrupt country. The solid line shows economic growth in a less liberal country for the two scenarios (a corrupt vs. non-corrupt country). The dashed line shows economic growth in a more liberal country for these two scenarios. Source: Research data (2020).

Fig. 3. Moderation effect of economic freedom – Pacific Asia.

The important finding in this study is the result of the comparison between Latin America and Pacific Asia regarding the influence of corruption on economic growth. For Latin America, both the "grease in the wheels" and the "sand in the wheels" hypotheses were confirmed. The distinction between which of the two types of relationship between corruption and economic growth is observed depends on economic freedom. Corruption causes damage to countries with greater economic freedom and also favors economic growth in less liberal countries. As regards the countries in the Asian continent, only the negative influence of corruption on the countries with less economic freedom was observed, so only the "sand in the wheels" hypothesis was corroborated for this continent.

As previously shown in the literature (Vial and Hanoteau, 2010), in Pacific Asia, between 1975 and 1995, corruption facilitated economic growth in several countries. However, in a more recent study, Huang (2016) observed that this "grease in the wheels" influence of corruption has been mitigated, or even, removed. When comparing this reality with that of Latin American countries, one notices that these countries are in earlier stages of development than Asian countries, even though both are called "emerging." For Latin America, the corruption paradox was observed, suggesting that an increase in corrupt activity can facilitate economic growth.

Thus, the institutional quality of a country's government structure, measured in a sub-item of the economic freedom indexes, had a great influence on the economic performance that a country can achieve over the years. In countries with greater quality in institutions and an improvement in economic freedom, corruption appears as a factor that reduces investment, spending on education and health, tax revenue, and, mainly, a country's infrastructure and productivity of public investment (Tanzi, 1998). In other words, the fight against corruption is only reflected in greater economic growth if accompanied by greater economic freedom.

Although critics argue that market-oriented reforms such as privatizations cause the emergence of corrupt opportunities, it has been observed that with good institutional quality, an increase in economic freedom favors economic development. Despite the impeachment processes in Latin America, in both Brazil and Venezuela, these processes were motivated by a pursuit to restore political stability, instead of effectively inaugurating a new era in governmental conduct (Manzetti and Blake, 1996).

Regarding the issue of governmental institutional quality, it is important to encourage reforms that reduce discretion in public administration areas, such as reducing the number of unnecessary procedures, rules, or regulations. Further, consistent efforts must be made to promote competition, especially in the public sector through bidding and contracting of public works or services, and democracy inside the countries.

The results also agree with the evidence from Bengoa and Sanchez-Robles (2003), that foreign investment (in Pacific Asia) and political and economic stability should be stimulated alongside a market-oriented environment (through measures that increase economic freedom). Likewise, the ideal theoretical level would be reached when the marginal social benefits of corruption are equal to the marginal social costs it incurs. However, in practice, these marginal costs and benefits are difficult to measure.

Future research and studies can be conducted using other econometric procedures, a different analysis period, or by adding other countries to the sample, such as African or eastern European nations, or even by contrasting underdeveloped with already-developed

economies. Similarly, other indexes measuring economic freedom or a country's institutional quality level, or other indicators of corruption, can be used.

Declaration of competing interest

None.

Acknowledgements

We would like to thank Pontifícia Universidade Católica do Paraná (PUCPR) and Coordenação de Aperfeiçoamento de Pessoal de Ensino Superior (CAPES) for funding our research.

Appendix A. Variables, Indicators, and Sources

Variable	Indicator	Sources
Economic growth	GDP *per capita*	The World Bank; United Nations
Economic freedom	Economic Freedom Index; Economic Freedom of the World	The Heritage Foundation; The Fraser Institute
Corruption	Corruption Perception Index	Transparency International
Urbanization	% of the population living in urban areas	UN Urbanization Prospects; The World Factbook CIA
Foreign direct investment	% of GDP (net inflows)	The World Bank
Domestic capital	Gross fixed capital formation as % of GDP	The World Bank
Economic development	Human Development Index	The World Bank
Inflation rate	Δ% of consumer price indices	The World Bank; IMF
Level of education	Average number of years of education received by people ages 25 and older	United Nations Development Programme
Life expectancy	Number of years a newborn infant would live	The World Bank
Fertility rate	Number of births per woman (average)	The World Bank
Population growth	Annual population growth rate (%)	The World Bank
Voice	Index that reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression/media	Worldwide Governance Index
Political stability	Index that reflects perceptions of the likelihood of political instability or politically motivated violence, including terrorism	Worldwide Governance Index
Government effectiveness	Index that reflects perceptions of the quality of public and civil services.	Worldwide Governance Index
Regulatory quality	Index that reflects perceptions of the ability of the government to formulate and implement policies and regulations that promote the development of the private sector	Worldwide Governance Index
Rule of law	Index that reflects perceptions of the extent to which agents have confidence in and abide by the rules of society (contract enforcement, property rights, police and justice)	Worldwide Governance Index
Democracy	Index that measures a mature and internally coherent democracy *vs*. autocracies sharply restrict that suppress competitive political participation.	Polity IV Project, Systemic Peace
Geographic location	% of the country located between the Tropics of Cancer and Capricorn	The World Bank; Esri ArcGIS Online

Source: Analysis by the authors.

Appendix B. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.17632/8zcxr9wvrm.5 and https://doi.org/10.1016/j.inteco.2021.02.001.

References

Aghion, P., Akcigit, U., Cagé, J., Kerr, W.R., 2016. Taxation, corruption, and growth. Eur. Econ. Rev., Econ. Entrepren. 86, 24–51. https://doi.org/10.1016/j.euroecorev.2016.01.012.

Aidt, T., Dutta, J., Sena, V., 2008. Governance regimes, corruption and growth: theory and evidence. J. Comp. Econ. 36 (2), 195–220. https://doi.org/10.1016/j.jce.2007.11.004.

Aiken, L.S., West, S.G., 1991. Multiple Regression: Testing and Interpreting Interactions, 1st. SAGE Publications, Inc, Newbury Park, Calif.

Alam, A., Ali Shah, S.Z., 2013. The role of press freedom in economic development: a global perspective. J. Media Econ. 26 (1), 4–20. https://doi.org/10.1080/08997764.2012.755986.

Angulo-Guerrero, M.J., Pérez-Moreno, S., Abad-Guerrero, I.M., 2017. How economic freedom affects opportunity and necessity entrepreneurship in the OECD countries. J. Bus. Res. 73, 30–37. https://doi.org/10.1016/j.jbusres.2016.11.017.
Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. J. Econom. 68 (1), 29–51. https://doi.org/10.1016/0304-4076(94)01642-D.
Asiedu, E., Freeman, J., 2009. The effect of corruption on investment growth: evidence from firms in Latin America, sub-Saharan Africa, and transition countries*. Rev. Dev. Econ. 13 (2), 200–214. https://doi.org/10.1111/j.1467-9361.2009.00507.x.
Bardhan, P., 1997. Corruption and development: a review of issues. J. Econ. Lit. 35 (3), 1320–1346.
Barro, R.J., Lee, J.W., 2013. A new data set of educational attainment in the world, 1950–2010. J. Dev. Econ. 104, 184–198. https://doi.org/10.1016/j.jdeveco.2012.10.001.
Baungarte, B.T., Orellana, V.S.Q., Fernandez, R.N., Menezes, G., 2019. Pé no freio ou no acelerador? Uma análise empírica dos efeitos da corrupção sobre o empreendedorismo. RACE - Rev. Adm. Contab. E Econ. 18 (1), 87–112. https://doi.org/10.18593/race.19261.
Bengoa, M., Sanchez-Robles, B., 2003. Foreign direct investment, economic freedom and growth: new evidence from Latin America. Eur. J. Polit. Econ. 19 (3), 529–545. https://doi.org/10.1016/S0176-2680(03)00011-9.
Bishop, M., 2004. Essential Economics, 1st. Bloomberg Press, London.
Bueno de Mesquita, B., Morrow, J.D., Siverson, R.M., Smith, A., 2001. Political competition and economic growth. J. Democr. 12 (1), 58–72. https://doi.org/10.1353/jod.2001.0011.
Cieślik, A., Goczek, Ł., 2018. Control of corruption, international investment, and economic growth – evidence from panel data. World Dev. 103, 323–335. https://doi.org/10.1016/j.worlddev.2017.10.028.
Dreher, A., Gassebner, M., 2007. Greasing the Wheels of Entrepreneurship? Impact of Regulations and Corruption on Firm Entry (SSRN Scholarly Paper No. ID 989301). Social Science Research Network, Rochester, NY. https://doi.org/10.2139/ssrn.989301.
Drury, A.C., Krieckhaus, J., Lusztig, M., 2006. Corruption, democracy, and economic growth. Int. Polit. Sci. Rev. 27 (2), 121–136. https://doi.org/10.1177/0192512106061423.
Fischer, S., 1993. The role of macroeconomic factors in growth. J. Monetary Econ. 32 (3), 485–512. https://doi.org/10.1016/0304-3932(93)90027-D.
Frost, J., 2019. Regression Analysis an Intuitive Guide, 1st. Statistics By Jim Publishing, State College, Pennsylvania.
Gallup, J.L., Sachs, J.D., Mellinger, A.D., 1999. Geography and Economic Development. Int. Reg. Sci. Rev. 22 (2), 179–232. https://doi.org/10.1177/016001799761012334.
Goel, R.K., Nelson, M.A., 2005. Economic freedom versus political freedom: cross-country influences on corruption. Aust. Econ. Pap. 44 (2), 121–133. https://doi.org/10.1111/j.1467-8454.2005.00253.x.
Graeff, P., Mehlkop, G., 2003. The impact of economic freedom on corruption: different patterns for rich and poor countries. Eur. J. Polit. Econ. 19 (3), 605–620. https://doi.org/10.1016/S0176-2680(03)00015-6.
Gwartney, J., Lawson, R., 2003. The concept and measurement of economic freedom. Eur. J. Polit. Econ. 19 (3), 405–430. https://doi.org/10.1016/S0176-2680(03)00007-7.
Gwartney, J.D., Holcombe, R.G., Lawson, R.A., 2004. Economic freedom, institutional quality, and cross-country differences in income and growth. Cato J. 24 (3), 205–233.
Hayes, A.F., 2013. Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach, 1st. Guilford Publications, New York.
Heckelman, J.C., Powell, B., 2010. Corruption and the institutional environment for growth. Comp. Econ. Stud. 52 (3), 351–378. https://doi.org/10.1057/ces.2010.14.
Huang, C.-J., 2016. Is corruption bad for economic growth? Evidence from Asia-Pacific countries. N. Am. J. Econ. Finance 35, 247–256. https://doi.org/10.1016/j.najef.2015.10.013.
Huntington, S.P., 1968. Political Order in Changing Societies. Yale University Press, New Haven, CT.
Huntington, S.P., Nelson, J.M., 1976. No Easy Choice: Political Participation in Developing Countries, 1st. Harvard University Press, Cambridge, MA.
Kaufmann, D., Wei, S.-J., 1999. "Grease Money" Speed up the Wheels of Commerce? Working Paper No. 7093), Working Paper Series National Bureau of Economic Research. https://doi.org/10.3386/w7093.
Kunieda, T., Okada, K., Shibata, A., 2014. Corruption, capital account liberalization, and economic growth: theory and evidence. Int. Econ. 139, 80–108. https://doi.org/10.1016/j.inteco.2014.03.001.
Lambsdorff, J., 1999. Corruption in empirical research: a review. Transpar. Int. Process.
Leff, N.H., 1964. Economic development through bureaucratic corruption. Am. Behav. Sci. 8 (3), 8–14. https://doi.org/10.1177/000276426400800303.
Llorente, J.A., Cuenca, O., 2016. A corrupção, o calcanhar de Aquiles das democracias latino-americanas. In: Desenvolvendo ideias, Desenvolvendo ideias. Madrid.
Manzetti, L., Blake, C.H., 1996. Market reforms and corruption in Latin America: new means for old ways. Rev. Int. Polit. Econ. 3 (4), 662–697. http://www.jstor.org/stable/4177207.
Mauro, P., 1995. Corruption and growth. Q. J. Econ. 110 (3), 681–712. https://doi.org/10.2307/2946696.
Méndez, Fabio, Sepúlveda, Facundo, 2006. Corruption, growth and political regimes: Cross country evidence. Eur. J. Polt. Econ. 22 (1), 82–98. https://doi.org/10.1016/j.ejpoleco.2005.04.005.
Méon, P.-G., Sekkat, K., 2005. Does corruption grease or sand the wheels of growth? Publ. Choice 122 (1), 69–97. https://doi.org/10.1007/s11127-005-3988-0.
Méon, P.-G., Weill, L., 2010. Is corruption an efficient grease? World Dev. 38 (3), 244–259. https://doi.org/10.1016/j.worlddev.2009.06.004.
Miller, T., Kim, A.B., Roberts, J.M., 2019. 2019 Index of Economic Freedom, 1st. The Heritage Foundation, Washington, DC.
Mo, P.H., 2000. Income inequality and economic growth. Kyklos 53 (3), 293–315. https://doi.org/10.1111/1467-6435.00122.
Moraes, R., 1996. A democracia mal comportada: a teoria política do neoliberalismo econômico. Rev. Univ. e Soc. 6 (11), 121–129.
Nargund, G., 2009. Declining birth rate in Developed Countries: a radical policy re-think is required. Facts Views Vis. ObGyn 1 (3), 191–193.
Neeman, Z., Paserman, M.D., Simhon, A., 2003. Corruption and Openness (SSRN Scholarly Paper No. ID 466320). Social Science Research Network, Rochester, NY. https://doi.org/10.2139/ssrn.433262.
Nur-tegin, K., Jakee, K., 2019. Does corruption grease or sand the wheels of development? New results based on disaggregated data. Q. Rev. Econ. Finan. https://doi.org/10.1016/j.qref.2019.02.001. S1062976918302175.
Nye, J.S., 1967. Corruption and political development: a cost-benefit analysis. Am. Polit. Sci. Rev. 61 (2), 417–427. https://doi.org/10.2307/1953254.
Osterfeld, D., 1992. Prosperity versus Planning: How Government Stifles Economic Growth. New York.
Park, J., 2012. Corruption, soundness of the banking sector, and economic growth: a cross-country study. J. Int. Money Finance 31 (5), 907–929. https://doi.org/10.1016/j.jimonfin.2011.07.007.
Pedhazur, E.J., Schmelkin, L.P., 1991. Measurement, Design, and Analysis: an Integrated Approach, 1st. Psychology Press.
Prado, P.H.M., Korelo, J.C., Silva, D.M.L. da, 2014. Análise de Mediação, Moderação e Processos Condicionais. Rev. Bras. Mark. 13 (4) https://doi.org/10.5585/remark.v13i4.2739.
Quoos, L.R.S., 2017. Liberdade econômica e pobreza: uma análise empírica (Master's Dissertation). Universidade Federal de Viçosa, Viçosa, MG. https://locus.ufv.br//handle/123456789/18786. (Accessed 20 May 2019).
Rocha, L.A., Khan, A.S., Lima, P.V.P.S., Poz, M.E.S.D., 2016. Corrupção e Crescimento: os impactos da corrupção ponderados pelos diferentes graus de eficiência entre as firmas. Estud. Econômicos São Paulo 46 (4), 783–822. https://doi.org/10.1590/0101-4161464782lapm.
Rock, M.T., Bonnett, H., 2004. The comparative politics of corruption: accounting for the East Asian paradox in empirical studies of corruption, growth and investment. World Dev. 32 (6), 999–1017. https://doi.org/10.1016/j.worlddev.2003.12.002.
Schumpeter, J.A., 1997. In: Teoria do desenvolvimento econômico: uma investigação sobre lucros, capital, crédito, juro e o ciclo econômicoOs Economistas, 4th, 1. Nova Cultural, São Paulo.
Swaleheen, M. us, Stansel, D., 2007. Economic freedom, corruption, and growth. Cato J. 27, 343–358.
Tanzi, V., 1998. Corruption around the world: causes, consequences, scope and cures. IMF Staff Pap. 559–594.

Tanzi, V., Davoodi, H., 1998. Corruption, public investment, and growth. In: Shibata, H., Ihori, T. (Eds.), The Welfare State, Public Investment, and Growth. Springer Japan, Tokyo, pp. 41–60. https://doi.org/10.1007/978-4-431-67939-4_4.
The World Bank, 2020. World Bank Open Data. World Bank. https://data.worldbank.org/. (Accessed 29 November 2020).
The World Bank, 2021. Voice and Accountability: Estimate. Data Cat. World Bank. https://datacatalog.worldbank.org/voice-and-accountability-estimate. (Accessed 19 February 2021).
Vial, V., Hanoteau, J., 2010. Corruption, manufacturing plant growth, and the Asian paradox: Indonesian evidence. World Dev. 38 (5), 693–705. https://doi.org/10.1016/j.worlddev.2009.11.022.
Vieira, V.A., 2015. Análise de Mediação e Moderação. ANPAD, Belo Horizonte, MG. https://marketinganpad.files.wordpress.com/2015/09/mediacao-e-moderacao-anpad-valter-afonso-vieira.pdf. (Accessed 7 February 2020).
Xu, G., Zhang, D., Yano, G., 2017. Can corruption really function as "protection money" and "grease money"? Evidence from Chinese firms. Econ. Syst. 41 (4), 622–638. https://doi.org/10.1016/j.ecosys.2017.03.001.
Yamamura, E., Andrés, A.R., 2011. Trust and Fertility: Evidence from OECD Countries. MPRA Paper 29978. University Library of Munich, Germany.
Zhu, H., Zhu, S.X., 2017. Corporate innovation and economic freedom: cross-country comparisons. Q. Rev. Econ. Finance 63, 50–65. https://doi.org/10.1016/j.qref.2016.04.003.