Research Article

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Does Perceived Corruption Converge? International Evidence

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Abstract: This article analyses the evolution over time of perceived corruption for a large set of countries worldwide. To proxy corruption, we use the recently proposed Bayesian Corruption Index (Standaert, S. (2015). Divining the level of corruption: A bayesian state space approach, *Journal of Comparative Economics*, 43(3), 782–803). We employ the test developed by (Phillips, P., & Sul, D. (2007). Transition modeling and econometric convergence tests. Econometrica, 75, 1771–1855) that enables the endogenous determination of convergence clubs for countries over time. Having divided countries into convergence clubs, we explore whether each club differs from the others in terms of their competitiveness ranking. In particular, drawing on the 2019 Global Competitiveness Report, we focus not only on the global competitiveness score, but also on the first and the fifth pillars of competitiveness: institutions and health, respectively. Mean and median scores for clubs confirm the general rule that low perceived corruption levels tend to be associated with high-income countries with established democracies, high-quality healthcare systems, and relatively low-income inequality. However, countries such as Spain and Italy, which are innovation-driven economies with excellent scores in the health pillar, are in the worst club for perceived corruption, suggesting there are additional idiosyncratic aspects that could drive perceived corruption levels.

Keywords: perceived corruption, convergence, competitiveness

JEL code: C33, I30, P37

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1 Introduction

From an economic theory perspective, corruption could lead to a misallocation of resources and talent, undermining social welfare and justice. The seminal paper by Acemoglu (1995) proposes a theoretical model centred around the allocation of talent between productive and unproductive activities, such as rent seeking, and shows how allocations of past generations as well as expectations of future allocations influence current rewards, and may lead to society becoming trapped in a "rent-seeking" steady state equilibrium.

High corruption levels represent a constraint on development; they have adverse effects on tax revenues, therefore affecting the quality of public services provided by governments, especially health care and universal education. Under such a scenario, citizens' confidence in public institutions and governments is significantly eroded, weakening democratic systems. Though corruption has a disproportionate impact on poor countries, where the increasing globalisation of the world economy has had no significant impact on the fight against corruption (Lalountas, Manolas, & Vavouras, 2011), rich countries should also be concerned about its collateral costs (for example, Graeff & Mehlkop, 2003). Thus, corruption should be a concern not only for poor nations but also for wealthy economies. Indeed, both the Millennium Development Goals and the more recent Sustainable Development Goals highlight the need to address corruption in order to enable economic growth compatible with economic and environmental sustainability.

Despite major global efforts to prevent and fight corruption, worldwide cross-sectional data collected by The Quality of Government Institute show that corruption is still a problem that significantly affects nations' wealth. Based on a sample of 181 countries in 2018, Figure 1 below displays the relationship between GDP per capita (purchasing power parity [PPP], constant 2011 international dollars) and the control of corruption index provided by the World Bank, which measures perceptions of corruption, conventionally defined as the exercise of public power for private gain (Table 1).

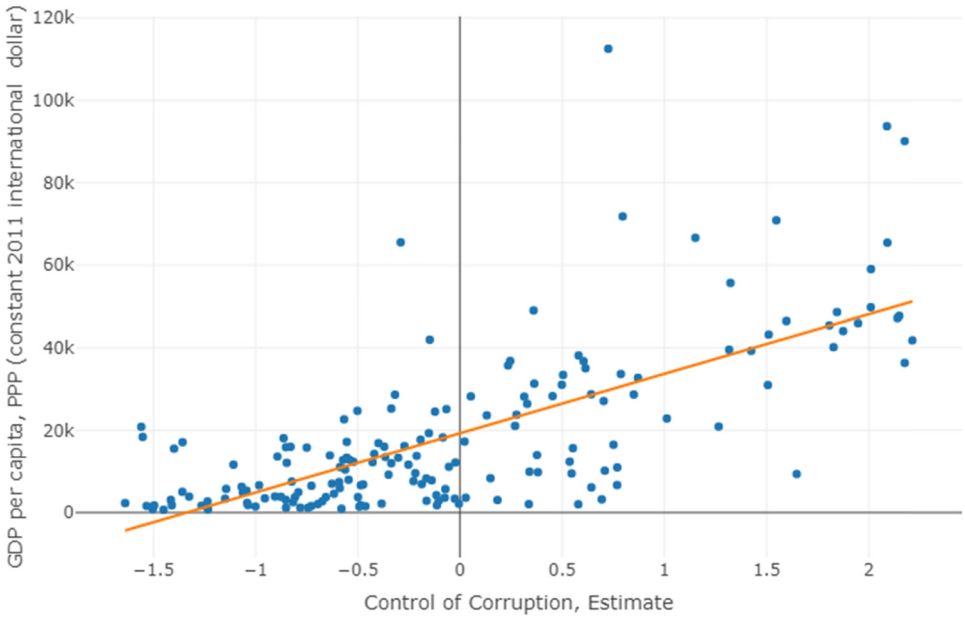

Figure 1: Control of corruption vs real GDP. Source: The Quality of Government Institute.

It is readily apparent that higher control of corruption tends to be associated with higher levels of GDP per capita. The pattern in the correlations in 2018 displayed in the figure above includes low and high-income countries with qualitative differences across their pillars of competitiveness[1]. This article seeks to provide additional insights about the negative covariance between the level of perceived corruption and the stage of economic development by exploring common factors in terms of specific pillars of competitiveness. To the best of our knowledge, this article constitutes the first attempt to analyse the nature of such a relationship using the Bayesian corruption index for a large set of countries: specifically, 136 economies, including developed, developing, and underdeveloped countries in the period 1984–2017. Previous papers have explored the nature of the causal relationship focusing on a specific sector or activity. For example, Samanta and Sanyal (2010) examine the relationship between a nation's economic competitiveness and the perceived level of corruption in the form of bribe-taking in that country. They analysed 51 countries (developed and developing economies) for the period 2000–2003 and concluded that improving national competitiveness is a prerequisite for reducing bribery in the conduct of international business. Das and Dirienzo (2010), using the 2008 Travel and Tourism Competitiveness Index and the Corruption Perception Index published by Transparency International and data from 119 countries, provided evidence that a reduction in corruption levels impacts positively on the level of tourism competitiveness across nations. They also showed that the marginal gain is greater for developing countries than for developed countries. It should be noted that their study only used the information from the Corruption Perception Index for a single year, due to the fact that the index is not comparable over time. We will return to this issue in the data section.

Table 1: Regression results: Control of corruption against real GDP

	Dependent variable **GDP per capita, PPP (constant 2011 international dollars)**
Control of corruption, estimate	14425.680***
	(1,119.389)
Constant	19284.780***
	(1072.764)
Observations	172
R^2	0.494
Adjusted R^2	0.491
Residual std. error	14055.000 (df = 170)
F Statistic	166.077*** (df = 1; 170)

Note: $^{*}p < 0.1$; $^{**}p < 0.05$; and $^{***}p < 0.01$.

1 The Global Competitiveness Index produced by the World Economic Forum is a composite indicator based on 12 drivers that affect country's competitiveness.

Aidt (2009) proposed at least three conditions needed for corruption to arise and persist. To that end, he took the definition of corruption provided by Jain (2001), who stated that corruption is an act in which the power of public office is used for personal gain in a manner that contravenes the rules of the game. These conditions are as follows:

a) Discretionary power: public policy makers must possess the authority to administer regulations and policies in a discretionary manner,
b) Economic rents: the discretionary power must allow extraction of existing rents or creation of rents that can be extracted, and
c) Weak institutions: the incentives embodied in political, administrative, and legal institutions must be such that officials are left with an incentive to exploit their discretionary power to extract or create rents.

Given the renewed interest in the role played by inclusive institutions sparked by the book of Acemoglu and Robinson (2012), we explore similarities in the institutional factor for countries clustered according to perceived corruption. To that end, we initially analyse the evolution of perceived corruption – which, as we will see in Section 3, is an enhanced proxy for corruption control – for a representative set of countries over time. Once the countries have been grouped solely on the basis of perceived corruption, we extract from the Global Competitiveness Report not only the overall score for competitiveness, but also the corresponding score for the institutions pillar. According to the World Economic Forum, the institutional environment is determined by the legal and administrative framework within which individuals, firms, and governments interact to generate wealth. Moreover, given that corruption could affect the quality of health services and income inequality, we also look at the score of the fifth pillar of competitiveness: health. Where available, we also refer to the Gini Index.

To determine clusters in terms of perceived corruption, we use the econometric approach proposed by Phillips and Sul (2007, 2009). Said procedure allows us to endogenously identify a broad spectrum of transitional behaviour among economies in terms of perceived corruption, such as convergence to a common steady state, divergence, and club convergence. This heterogeneity is modelled through a nonlinear time-varying factor model, which provides flexibility in studying idiosyncratic behaviours over time and in cross section. Once the countries have been divided into convergence clubs, we explore whether each club differs from the others in terms of their competitiveness ranking. Our empirical findings show that, beyond in-group heterogeneity in terms of the stage of development, competitiveness is related to perceived corruption. In particular, the higher the competitiveness of each club, the lower the perceived corruption. The country scores for the competitiveness pillar of institutions corroborate this pattern, suggesting that corruption could partially explain the crisis of political representation that recently arose in Europe. In addition, higher perceived corruption is associated with rising inequality in both emerging and advanced economies, which significantly affect social cohesion. The relationship between the average scores for the health pillar and perceived corruption is even much clear. In sum, our empirical evidence suggests that countries that are in the first stage of development (factor-driven economies where competitiveness is based on low-cost unskilled labour and/or abundant natural resources) show room for remarkable progress to be made in fighting and preventing corruption. Without allocating resources from economic growth to deal with these two aspects, the circular nexus between income inequality and economic growth in early stages of development will not be overcome.

The remainder of the article is organised as follows. The next section presents the methodology, while Section 3 describes the data used. Section 4 discusses our empirical findings, and finally, Section 5 summarises and provides concluding remarks.

2 Methodology

The time-series approach to convergence analysis can be found in the seminal papers by Bernard and Durlauf (1995, 1996) and Carlino and Mills (1993). These authors developed the concept of stochastic convergence based on the stationarity properties of the variables under analysis. Thus, two non-stationary variables converge if there is a cointegrating relationship between them. In other words, two non-stationary series converge if they share the same stochastic trend.

This definition of convergence can be empirically tested by means of time-series econometric techniques. However, as pointed out by Phillips and Sul (2009), traditional convergence tests are inadequate when technology is heterogeneous across countries and the speed of convergence is time-varying. To account for temporal and transitional heterogeneity, Phillips and Sul (2007, 2009) introduced cross-sectional and time-series heterogeneity

in the parameters of a neoclassical growth model. The starting point for the test is the following time-varying representation:

$$X_{it} = \delta_{it}\mu_t, \quad (1)$$

where X_{it} is the dependent variable observed across $i = 1, 2,...,N$ individuals over the period $t = 1, 2,...,T$. δ_{it} is an idiosyncratic time-varying factor loading capturing convergence to a common factor μ_t, which represents the common stochastic trend in the panel. In other words, δ_{it} measures the share of the common factor μ_t each individual in the panel experiences. The simple econometric representation in equation (1) can be used to analyse convergence by testing whether the factor loadings δ_{it} converge. The idiosyncratic element is defined as:

$$\delta_{it} = \sigma_i \varepsilon_{it} L(t)^{-1} t^{-\alpha}, \quad (2)$$

where σ_i is fixed, $\sigma_i > 0$, ε_{it} is i.i.d (0, 1) across i but weakly dependent on t[2], and $L(t)$ is a slowly varying function for which $L(t)$ tends to infinity as t also goes to infinity.

The null hypothesis of convergence can be written as $H_o : \delta_{it} = \delta$ and $\alpha \geq 0$ against the alternative of no convergence $H_A : \delta_{it} = \delta \; \forall i$ and $\alpha < 0$. The alternative hypothesis includes divergence but can also include the possibility of club convergence. For example, if there are two convergent clubs, the alternative is:

$$H_A : \quad \delta_{it} \to \begin{cases} \delta_1 \text{ and } \alpha \geq 0, & \text{if } i \in G_1, \\ \delta_2 \text{ and } \alpha \geq 0, & \text{if } i \in G_2, \end{cases} \quad (3)$$

where G stands for a specific club.

Phillips and Sul (2007) show that these hypotheses can be statistically tested by means of the following "log (t)" regression model:

$$\log(H_1/H_t) - 2\log(\log(t)) = a + b\log(t) - u_t, \quad (4)$$

for $t = [rT], [rT] + 1,..., T$ with some $r > 0$, $L(t) = \log(t + 1)$, $\hat{b} = 2\hat{a}$, and H_1/H_t is the cross-sectional variance ratio defined as $H_t = \frac{1}{N}\sum_{i=1}^{N}(h_{it} - 1)^2$ and $h_{it} = \frac{X_{it}}{\frac{1}{N}\sum_{i=1}^{N} X_{it}} = \frac{\delta_{it}}{\frac{1}{N}\sum_{i=1}^{N}\delta_{it}}$ which measures the loading coefficient δ_{it} in relation to the panel. The variable h_{it} is called the relative transition path and traces out an individual trajectory for each i relative to the panel average. The regression is run starting at $t = [rT]$, which is the integer part of rT for some fraction $r > 0$. Phillips and Sul (2007) recommend using $r = 0.3$. Rejection of the null implies that there is no overall convergence, but there may be cluster convergence. The convergence patterns within groups (that is, the existence of club convergence and clustering) can be examined using log(t) regressions. The so-called "core group", G_k, is chosen by maximising t_k over k individuals according to the criterion:

$$K^* = \arg\max\{t_k\}, \text{ subject to } \min\{t_k\} > -1.65.$$

The convergence approach proposed by Phillips and Sul (2007) presents a number of clear advantages. First, it is a test for relative convergence, as it measures convergence to some cross-sectional average, in contrast to the concept of level convergence analysed by Bernard and Durlauf (1996). Second, this approach outperforms the standard panel unit root tests, since in the latter case $X_{it} - X_{jt}$ may retain non-stationary characteristics even though the convergence condition holds. In other words, panel unit root tests may classify the difference between gradually converging series as non-stationary. As a further problem, a mixture of stationary and non-stationary series in the panel may bias the results of unit root tests. Finally, sometimes these test results are not particularly robust. This is in contrast to the Phillips and Sul (2007) test, which does not depend on any particular assumption concerning the trend stationarity or stochastic non-stationarity of the variables to be tested.

3 Data

Corruption is difficult to measure directly because individuals engaging in such activities and the shadow economy do not want to be discovered. To overcome this problem, surveys focus on perceptions of corruption rather than corruption itself. However, this raises the question of how survey respondents form their perceptions and how accurate such perceptions actually are (Olken, 2009). In the 1990s, some institutions became interested in attempting to construct measures of countries' corruption perception. Transparency International's Corruption Perceptions Index (CPI) was initially widely used by policymakers and academics as a proxy of corruption levels within countries, and closely related to economic growth and democratic governance. The CPI has been published yearly since 1995.

However, as pointed out by Standaert (2015), the methodology used to create the index has three important drawbacks. First, the CPI cannot be used for comparisons over time. Second, the CPI uses only a subset of the available corruption indicators and does not include countries for which there are fewer than three sources available in a given year. Finally, the selection of

2 These conditions imply that the stochastic component declines asymptotically so that the trend vanishes and each coefficient converges to δ_{it}.

indicators is not independent of the level of corruption, giving rise to a selection bias issue (Treisman, 2007). Standaert's (2015) basic point is that the level of perceived corruption in 1 year could be correlated with the level of the previous year. To achieve a tractable estimation problem, the author assumes that, while the year-to-year correlation could differ across countries it remains stable over time for each country. This stability over time reduces the dimensionality of the parameter set associated with the statistical model.

The recent paper by Budsaratragoona and Jitmaneeroj (2020) re-examines the CPI's equal weighting system for the aggregation of data sources, which relies on the assumption that all data sources are equally important and independent of one another. The authors use a novel four-stage interdisciplinary methodology that combines machine learning and business management. Their study, which focuses on the 2016 CPI, shows not only unequal impacts of data sources on the CPI but also the existence of causal interrelations between the CPI's data sources. Moreover, they report an endogenous relationship between levels of corruption perception indicated by the CPI and levels of economic development, with emerging countries having greater perceived corruption than developed economies.

Given the abovementioned shortcomings of the CPI, in this article we use the Bayesian Corruption Index based on the Worldwide Governance Indicators. This composite indicator of corruption uses six dimensions organised into three blocks. It is worth recalling here these six dimensions organised into three blocks (a, b, and c) as summarised by Kauffman, Kraay, and Mastruzzi (2010, p. 4):

a) The process by which governments are selected, monitored, and replaced:

   1. Voice and Accountability (VA), capturing perceptions to 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.

   2. Political Stability and Absence of Violence/Terrorism (PV), capturing perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

b) The capacity of the government to effectively formulate and implement sound policies:

   3. Government Effectiveness (GE), capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

   4. Regulatory Quality (RQ), capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

c) The respect of citizens and the state for the institutions that govern economic and social interactions among them:

   5. Rule of Law (RL), capturing perceptions to the extent to which agents have confidence in and abide by the rules of the society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

   6. Control of Corruption (CC), capturing perceptions to the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests."

Taking the abovementioned aspects as key indicators to measure the abuse of public power for private gain, the Bayesian Corruption Index proposed by Standaert (2015) is a composite index of the perceived overall level of corruption estimated using the state-space framework to exploit the information in the time-structure of corruption data. This index can be seen as the outcome of an augmented version of the Worldwide Governance Indicators' methodology. In particular, the underlying source data are entered without any ex-ante imputations, averaging or other manipulations, avoiding selection biases introduced through any modelling choices of the composer. Interestingly, the index makes it possible to determine whether or not the level of corruption significantly increased or decreased over time.

To better understand the relative importance of each dimension, we now show the regressions between the Control of Corruption Index computed by the World Bank and the Bayesian Corruption Index in 1996 and in 2017, the first and the last year reported by the Quality of Government Institute (Figure 2 and Table 2).

While the explanatory power of a simple linear model is high, revealing high correlation between the two variables, the qualitative aspects included in the Bayesian Corruption Index go beyond the perceptions of the extent to which public power is exercised for private gain, that is control of corruption. The remaining non-explained variability is likely related to important aspects such as political stability, government effectiveness, and regulatory quality, among others. The assumption of a linear model between the two variables in 1996 can be easily

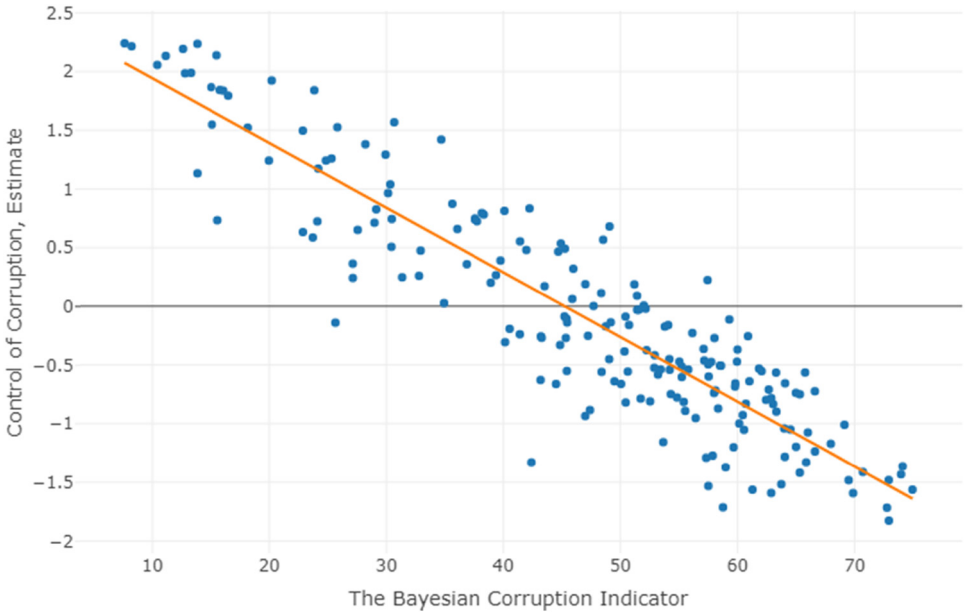

Figure 2: Control of corruption vs the Bayesian Corruption Index. Source: The Quality of Government Institute. Year 2017.

Table 2: Regression results: The Bayesian Corruption Index against control of corruption

	Dependent variable Control of corruption, estimate
The Bayesian corruption indicator	−0.055***
	(0.002)
Constant	2.495***
	(0.090)
Observations	192
R^2	0.829
Adjusted R^2	0.828
Residual std. error	0.411 (df = 190)
F Statistic	920.819*** (df = 1; 190)

Note: *$p < 0.1$; **$p < 0.05$; and ***$p < 0.01$.

extrapolated to 2017. The point estimates for the slope and the constant, and the R-squared remain fairly stable over time. Therefore, while the Bayesian Corruption Index could be considered a good proxy for control of corruption, there are additional aspects perceived by the citizens that the index account for.

4 Empirical Results

The club convergence test developed by Phillips and Sul (2007, 2009) is applied to the Bayesian Corruption Index values. The authors showed that eliminating the cyclical components of the data improves the power and size of the club convergence test in finite samples. Therefore, we have eliminated the cyclical components by means of the HP filter (Hodrick & Prescott, 1997). The test for overall panel convergence is rejected with a log *t*-stat of −57.27. The absence of convergence for the panel leads us to consider the possible existence of club convergence.

Table 3 presents the results for the club convergence analysis. Overall convergence can be rejected in favour of club convergence, with the analysis identifying eight clubs, plus two non-convergent countries (Finland and New Zealand). Given that the clustering procedure tends to find more groups than may actually exist we have tested whether adjacent clubs can be merged into larger groups. Table 4 shows the results, according to which clusters 1 and 2, 3 and 4, and 5 and 6 can be merged. The final composition of the clubs is shown in Table 5.

The first noteworthy finding is the unexpected non-convergence of Finland and New Zealand, two small countries that are similar in terms of GDP, population, surface area, and religion. It is not immediately apparent why the cluster convergence technique used cannot classify these two countries, but given the final composition of clusters, the most natural assignment from the algorithm would have been either the fourth or the fifth club. According to the composition of each club, and using the information from the Global Competitiveness Report 2019, we compute the median and mean scores for each group in the Global Competitiveness Index, institutions, health

Table 3: Cluster convergence analysis (1984–2017)

log *t*	*t* statistic	Clubs
0.019	0.166	First club: Angola, Guinea, Guinea-Bissau, Korea PDR, Malawi, Somalia, Tunisia, and Venezuela
−0.005	−0.047	Second club: Algeria, Argentina, Bangladesh, Bolivia, Brazil, Burkina Faso, Cameroon, Colombia, Congo, Congo DR, Dominican Republic, El Salvador, Greece, Guatemala, Guyana, Haiti, Italy, Kyrgyzstan, Lebanon, Libya, Madagascar, Mali, Mexico, Moldova, Mozambique, Myanmar, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Paraguay, Russian Federation, Sierra Leone, Slovakia, South Africa, Spain, Suriname, Syria, Tanzania, Thailand, Togo, and Uganda
0.099	0.569	Third club: Albania, Bulgaria, Cote d'Ivoire, Czech Republic, Ecuador, Ethiopia, Gabon, Ghana, Honduras, Hungary, Iran, Iraq, Kazakhstan, Kenya, Korea, Kuwait, Liberia, Malta, Mongolia, Panama, Peru, Philippines, Romania, Serbia, Sudan, Trinidad and Tobago, Vietnam, Zambia, and Zimbabwe
0.118	0.662	Fourth club: Armenia, Azerbaijan, Costa Rica, Cyprus, Egypt, India, Indonesia, Jamaica, Senegal, and Sri Lanka
0.196	1.497	Fifth club: Austria, Botswana, China, Cuba, Latvia, Lithuania, Malaysia, Morocco, Niger, Portugal, and Turkey
0.004	0.027	Sixth club: Belarus, Jordan, Oman, Poland, and United States
0.004	0.026	Seventh club: Australia, Bahamas, Bahrain, Belgium, Brunei, Chile, Estonia, France, Georgia, Germany, Iceland, Israel, Saudi Arabia, Sweden, Taiwan, and Uruguay
−0.132	−0.856	Eighth club: Canada, Denmark, Hong Kong, Ireland, Japan, Luxembourg, Netherlands, Norway, Qatar, Singapore, Switzerland, United Arab Emirates, and United Kingdom
−4.145	−3.713	No club convergence: Finland and New Zealand

Table 4: Testing for club merging (1984–2017)

log *t*	*t* statistic	Clubs
−0.091	0.487	Club 1 + 2
−0.250	−10.172	Club 2 + 3
−0.094	−0.707	Club 3 + 4
0.021	0.435	Club 4 + 5
−0.293	−9.582	Club 5 + 6
−0.680	−6.665	Club 7 + 8
−0.754	−6.665	Club 8 + non-convergent

and, when available, the Gini Index. These statistics are reported in Table 6.

For any given club, the mean and the median are very similar, meaning the degree of asymmetry in each club is low and therefore both statistics are representative of the behaviour of the group as a whole. Looking at the Global Competitiveness Index, we observe a negative correlation between perceived corruption and competitiveness. This empirical finding is consistent with previous papers in the literature that found a negative impact of corruption on wealth and welfare proxied by GDP per capita (for example, Aidt, 2009; Ehrlich & Lui, 1999; Neeman, Paserman, & Sihmon, 2004; Ugur & Dasgupta, 2011; Wei, 1999; Welsch, 2004). The best-performing club is about 50% more competitive than the worst club. It is also clearly a smaller group, suggesting that fighting corruption, which involves passing regulation against rent seeking, prosecution of the shadow economy, and education, is no easy task.

A similar pattern arises in terms of institutions. The average score increases by about 60% when comparing the first and the fifth club. While disentangling the correlation and causality between economic growth and better institutions is a difficult task, as pointed out by Lehne, Mo, and Plekhanov, (2014), the link between the quality of economic and political institutions is further reinforced as better economic institutions tend to support economic development. Furthermore, current economic development may lead in the future to social demand for better political institutions.

We also check the relationship with the health pillar of competitiveness. Corruption in the health sector arises in several ways, such as in health facility construction and pharmaceutical distribution and use (Vian, 2008), and potentially threatens efforts to make health services accessible. For example, in low-income countries, informal payments aimed at gaining admission, securing a hospital bed, and avoiding long wait times for surgery,

Table 5: Final cluster convergence analysis (1984–2017)

log *t*	*t* statistic	Clubs
−0.091	−0.895	First club: Algeria, Angola, Argentina, Bangladesh, Bolivia, Brazil, Burkina Faso, Cameroon, Colombia, Congo, Congo DR, Dominican Republic, El Salvador, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Italy, Korea PDR, Kyrgyzstan, Lebanon, Libya, Madagascar, Malawi, Mali, Mexico, Moldova, Mozambique, Myanmar, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Paraguay, Russian Federation, Sierra Leone, Slovakia, Somalia, South Africa, Spain, Suriname, Syria, Tanzania, Thailand, Togo, Tunisia, Uganda, and Venezuela
−0.094	−0.775	Second club: Albania, Armenia, Azerbaijan, Bulgaria, Costa Rica, Cote d'Ivoire, Cyprus, Czech Republic, Ecuador, Egypt, Ethiopia, Gabon, Ghana, Honduras, Hungary, India, Indonesia, Iran, Iraq, Jamaica, Kazakhstan, Kenya, Korea, Kuwait, Liberia, Malta, Mongolia, Panama, Peru, Philippines, Romania, Senegal, Serbia, Sri Lanka, Sudan, Trinidad and Tobago, Vietnam, Zambia, and Zimbabwe
0.021	0.197	Third club: Austria, Belarus, Botswana, China, Cuba, Jordan, Latvia, Lithuania, Malaysia, Morocco, Niger, Oman, Poland, Portugal, Turkey, and United States
0.004	0.026	Fourth club: Australia, Bahamas, Bahrain, Belgium, Brunei, Chile, Estonia, France, Georgia, Germany, Iceland, Israel, Saudi Arabia, Sweden, Taiwan, and Uruguay
−0.132	−0.856	Fifth club: Canada, Denmark, Hong Kong, Ireland, Japan, Luxembourg, Netherlands, Norway, Qatar, Singapore, Switzerland, United Arab Emirates, and United Kingdom
−4.145	−3.713	No club convergence: Finland and New Zealand

Table 6: Median and mean scores

	Global competitiveness index 4.0	Institutions	Health	Gini Index	Club
Panel A. Average					
	53.3	46.2	68.4	40.3	1
	58.8	52.3	74.6	38.4	2
	68.2	61.8	81.8	38.2	3
	72.9	67.3	90.0	34.6	4
	79.5	74.9	93.6	31.2	5
Panel B. Median					
	53.5	47.0	73.5	41.2	1
	61.0	52.0	78.0	38.1	2
	68.5	61.0	83.5	37.4	3
	75.5	69.0	91.0	34.3	4
	81.0	75.0	94.0	32.0	5

Source: Own elaboration from data of The Global Competitiveness Report 2019.

among others, are viewed as a necessary source of financing health care. Additionally, corruption leads to drug stockouts and increases the probability of having to pay bribes (Kankeu, Boyer, Toukam, & Abu-Zaineh, 2016). As pointed out by García (2019), world spending on health services is estimated at over US$7 trillion, with the percentage of resources lost due to corruption ranging between 10 and 25% of the total. Moreover, this quantity exceeds the World Health Organisation's estimates for the resources needed annually until 2030 in order to achieve universal health coverage. As expected, perceived corruption is also negatively correlated with health quality and efficiency. But the impact appears to be less important once the country reaches a relatively low level of perceived corruption, as indicated by the smaller differences observed between the fourth and the fifth club. Finally, while our empirical findings show that greater inequality tends to arise in more corrupt countries, the lower range of variation across clubs suggest that the effect is not as severe as differences in terms of institutions and health might suggest.

Beyond the general trend seen in the negative correlation between perceived corruption and competitiveness, the analysis of individual scores inside each club could reveal additional insights, especially regarding to the specific pillars of institutions and health. Tables 7 and 8 below show the scores for each country in each club.

Corruption is a typical consequence of poor governance characterised by a lack of transparency, weak accountability and inefficiency, and lack of citizen participation. However, it is striking that Spain and Italy, two established democracies in the euro area, are perceived by their citizens as countries with high levels of

Table 7: Country scores. Institution's pillar

Panel A. Clubs									
Club 1		Club 2		Club 3		Club 4		Club 5	
Country	**Institutions**	**Country**	**Institutions**	**Country**	**Institutions**	**Country**	**Institutions**	**Country**	**Institutions**
Venezuela	26	Gabon	41	Botswana	54	Brunei	58	Qatar	63
Haiti	31	Ethiopia	42	Turkey	54	Georgia	61	Japan	72
Congo	33	Zimbabwe	42	Poland	56	Uruguay	62	Ireland	73
Angola	38	Côte d'Ivore	42	China	57	Bahrain	63	United Arab Emirates	73
Bolivia	38	Iran	43	Latvia	59	Saudi Arabia	63	Canada	74
Mozambique	39	Honduras	44	Morocco	60	Chile	64	United Kingdom	74
Madagascar	40	Zambia	45	Jordan	60	Israel	66	Luxembourg	76
El Salvador	40	Ecuador	48	Oman	62	Belgium	69	Norway	77
Mali	41	Trinidad and Tobago	48	Lithuania	63	Taiwan	69	Denmark	77
Nigeria	41	Jamaica	49	Portugal	65	Estonia	70	Switzerland	78
Nicaragua	42	Peru	49	Malaysia	69	France	70	Hong Kong	78
Guatemala	42	Mongolia	50	United States	71	Germany	72	Netherlands	79
Cameroon	44	Philippines	50	Austria	74	Australia	73	Singapore	80
Paraguay	44	Vietnam	50			Iceland	74		
Lebanon	44	Egypt	51			Sweden	75		
Malawi	46	Panama	51						
Guinea	46	Sri Lanka	52						
Bangladesh	46	Albania	52						
Algeria	46	Serbia	52						
Tanzania	48	Senegal	53						
Uganda	48	Ghana	54						
Pakistan	48	Kenya	55						
Brazil	48	Armenia	56						
Mexico	48	Kazakhstan	56						
Burkina Faso	49	Hungary	56						
Kyrgyzstan	49	Kuwait	56						
Colombia	49	India	57						
Argentina	50	Costa Rica	57						
Dominic Republic	50	Bulgaria	57						
Moldova	51	Azerbaijan	58						
Greece	51	Romania	58						
Tunisia	53	Indonesia	58						
Russian Federation	53	Malta	61						
Thailand	55	Czech Republic	61						
Slovakia	56	Cyprus	64						

(*Continued*)

Table 7: *Continued*

Panel A. Clubs									
Club 1		**Club 2**		**Club 3**		**Club 4**		**Club 5**	
Country	**Institutions**	**Country**	**Institutions**	**Country**	**Institutions**	**Country**	**Institutions**	**Country**	**Institutions**
South Africa	57	Korea	66						
Italy	59								
Spain	65								

Panel B. Non-convergent countries	
	Institutions
Finland	81
New Zeeland	79

Source: The Global Competitiveness report 2019.

Table 8: Country scores. Health pillar

Panel A. Clubs									
Club 1		**Club 2**		**Club 3**		**Club 4**		**Club 5**	
Country	**Health**	**Country**	**Health**	**Country**	**Health**	**Country**	**Health**	**Country**	**Health**
Mozambique	33	Zimbabwe	41	Botswana	59	Georgia	74	United Arab Emirates	72
Guinea	40	Cote d'Ivore	44	Morocco	72	Brunei	82	Qatar	89
Mali	41	Zambia	47	Lithuania	76	Saudi Arabia	82	United Kingdom	92
Congo	42	Ghana	53	Latvia	77	Estonia	84	Luxembourg	93
Burkina Faso	42	Kenya	55	Oman	81	Uruguay	85	Denmark	93
Cameroon	45	Gabon	59	Malaysia	81	Bahrain	87	Norway	94
Angola	47	Senegal	59	United States	83	Chile	90	Netherlands	94
Malawi	47	Ethiopia	61	Poland	84	Germany	92	Ireland	95
Nigeria	47	India	61	Jordan	87	Belgium	93	Canada	95
Madagascar	48	Mongolia	63	Turkey	87	Taiwan	94	Japan	100
Haiti	51	Egypt	65	China	88	Australia	95	Switzerland	100
Uganda	53	Philippines	66	Portugal	94	Sweden	97	Hong Kong	100
South Africa	53	Azerbaijan	69	Austria	95	Iceland	98	Singapore	100
Pakistan	56	Kazakhstan	71			Israel	98		
Tanzania	57	Indonesia	71			France	99		
Russian Federation	69	Romania	77						
Bangladesh	72	Honduras	78						
Moldova	72	Trinidad and Tobago	78						
Kyrgyzstan	73	Bulgaria	78						
Bolivia	74	Serbia	79						
Guatemala	74	Iran	80						
Dominic Republic	76	Jamaica	80						
El Salvador	78	Armenia	81						
Brazil	79	Vietnam	81						
Paraguay	81	Hungary	81						
Venezuela	82	Ecuador	85						
Lebanon	82	Albania	86						
Mexico	82	Czech Republic	86						
Slovakia	82	Sri Lanka	87						
Algeria	83	Panama	92						
Argentina	84	Costa Rica	93						
Tunisia	85	Malta	93						
Thailand	89	Peru	95						
Nicaragua	90	Kuwait	96						
Greece	94	Cyprus	96						
Colombia	95	Korea	99						
Italy	100								
Spain	100								

Panel B. Non-convergent countries	
	Health
Finland	93
New Zeeland	91

Source: The Global Competitiveness report 2019.

corruption; their scores are not bad in either the institutions pillar (with values typical of the third club, or even the fourth in the case of Spain) or the health pillar (with Spain notably achieving the maximum score possible). Alongside Spain and Italy in this worst club are the Russian Federation, Moldova, and Slovakia, yet all these countries score lower in the institutional factor. This result is in line with the evidence reported by Iwasaki and Suzuki (2012), who use a country-year panel data for 32 transition economies in the regions of Central

and Eastern Europe, the former Soviet Union, and Asia for the period covering 1998–2006. They show how the strong institutional inertia of the centralised administrative system of the communist regimes in these countries is their most important drawback to mitigate corruption. As suggested by Krueber (1974), the reason for this could be the existence of excessive regulation that encourages rent seeking strategies by firms; that is, restrictive regulation is an incentive for firms to compete for privileges from the authorities rather than seeking to achieve windfall gains by anticipating market shifts and adopting new technologies.

Another interesting aspect worth highlighting is the presence of the United States in the third club. The United States is shown to be the second most competitive country in the world in the Global Competitiveness Report 2019, behind only Singapore. With respect to the pillars analysed, it performs worst in the institutions pillar. The last two national elections in the United States have certainly not helped to build public confidence in institutions, and have even sparked doubts among researchers. For example, the recent article by Nobel laureate Paul Krugman entitled "Is America becoming a failed state?" published in the New York Times on 7th November 2020 discusses how unrepresentative of the American people the current US Senate is, and the problems this is likely to cause for the governance of the country.

Regarding the composition of club 4 in terms of institutions, it is worth noting the presence of three countries: Saudi Arabia, Estonia, and Uruguay. Although they all register similarly high scores in the health factor, they differ in terms of both their global competitiveness position and institutional quality. The first two are countries with levels of competitiveness similar to Spain and Italy, which points to specific regulation or the governance regime as elements that affect the control of corruption and therefore perceived corruption. Uruguay, on the other hand, occupies the 54th position in the global ranking and does not score high in the institutions pillar. It may be the case that this is a country where cultural and historical elements (high variation in governance systems and political leanings of governments, which can promote the control of corruption) can shed more light on this specific pattern in perceived corruption.

Lastly, regarding the fifth club, it is not surprising that Singapore stands out in all components: it is the most competitive country in the world in 2019, while also registering the top scores in both the health pillar and the institutions pillar. The rest of the countries are all members of the European Union or the Economic and Monetary Union, with the exception of Qatar and the United Arab Emirates. These last two economies differ from the others within the club in terms of their form of government and their religion. Qatar is technically a constitutional monarchy, but in reality, the ruler (the Emir) possesses executive power to approve or reject the legislation. The Emir appoints his own Prime Minister (usually a family member) and the members of legislative bodies. On the other hand, the United Arab Emirates is a Federal State made up of seven emirates with Dubai playing a leading role. Within each emirate, local governments are based on traditional patriarchal monarchies and ruled by sheikhs from royal families who long held the leadership position of tribal confederations. In both countries, Islam is the majority religion. The United Arab Emirate's legal code is based on a dual system comprising Sharia (Islamic law) courts and civil courts, and does not accept the jurisdiction of the International Court of Justice. Although exploring the importance of these specific characteristics in more depth could provide additional insights that would help to prevent and control corruption, it is beyond the scope of this article.

5 Conclusion

Countries are likely to become more effective at controlling corruption as they develop economically. However, the World Bank Group currently considers corruption a major challenge to its twin goals of ending extreme poverty and promoting shared prosperity. In this article, we examine the relationship between perceived corruption and the elements of competitiveness for each country, using the information provided in the Global Competitiveness Report (2019). Using a complete panel of 136 countries for the period 1984–2017, this article explores whether perceived corruption exhibits convergence patterns over time and across countries. As a proxy of perceived corruption, we use the Bayesian Corruption Index, which resolves some of the methodological issues in the approach used to compute the CPI index, such as the lack of independence among data sources.

Our econometric approach identifies five groups of countries in terms of their perceived corruption, with the first club being the worst group. As a general rule, we observe that countries with low perceived corruption tend to be stable, established democracies with a high standard of welfare and a long record of openness to international trade. The same pattern emerges in two

basic pillars of competitiveness: health and institutions. Low perceived corruption also appears to be associated with low-income inequality, but differences across clubs are less notable. However, due to potential reverse causality, we cannot confidently state that most of these factors cause corruption perceptions to be high or low.

Interestingly, beyond this general pattern, there are exceptions or outliers. For example, while Spain and Italy are two euro area countries that appears in the first quartile of global competitiveness in the year 2019, and in the case of Spain having the maximum score for the health pillar, they unexpectedly appear in the worst club of perceived corruption. Furthermore, the United States, the second most competitive country in the 2019 Global Competitiveness Report, is in the third club with a score for the Institutions pillar that is clearly above the observed score for the next best group. It is probably the case that the scandals that afflicted the presidential elections in 2016 and 2020 significantly eroded trust in American institutions. On the contrary, Qatar and the United Arab Emirates, countries with autocratic government systems, appear in the best club, suggesting that the combination of high wealth per capita and strict rules could be an effective anticorruption package. In sum, in order to design mechanisms for preventing corruption it is important to implement institutional systems and incentives at a country level.

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