The effects of mega-events on perceived corruption

Lorena Olmos[*]   Héctor Bellido[†]   Juan A. Román-Aso[‡]

Abstract

In recent decades, the media have reported many cases of corruption related to the celebration of mega-events. In most of these cases, politicians and other high officials are involved. This paper analyses the effect of hosting mega-events on the level of perceived corruption in 34 OECD countries, during the period 1996 to 2017. Summer and Winter Olympic Games, FIFA World Cups, and Universal Expositions are considered. Results show that, when we take the year of the celebration of the event as the turning point, there is no robust evidence in favour of a positive impact on perceived corruption. However, when we take the date of the selection of the host country as the threshold, the magnitude of the effect is lasting, reaching its maximum value 1-2 years before the event itself, and increasing the perceived level of corruption by about 4%.

[*] Departamento de Análisis Económico, Universidad de Zaragoza, Zaragoza (Spain).
[†] Departamento de Análisis Económico, Universidad de Zaragoza, Zaragoza (Spain).
[‡] Universidad San Jorge, Zaragoza (Spain).

1. Introduction

Does the opportunity make the thief? One can argue that the temptation to steal increases with the potential gains, and that human nature tends to succumb to temptation. This incentive game could play an important role in the corruption panorama, a term denoting the level of "abuse of public or entrusted power for private gain". When the public budget of the incumbent increases, the funds that can potentially be diverted also increase. In fact, the classic principal-agent problem describes bureaucrats as seekers of larger budgets in order to increase their power. But is bureaucratic power the only decisive element, or do the potential monetary gains, illegally obtained, also matter? In this context, the question arises: are politicians encouraged to engage in corrupt activities when the public budget increases temporarily? Such budget increases can originate from many causes, whether associated with expansionary public policies, or changes in the structure of public expenditures, or simply in response to an expansionary business cycle. One source, not necessarily included in these categories, is the hosting of mega-events, such as the Olympic Games, the FIFA World Cups, and the Universal Expositions, which seem to be a perfect breeding ground for bribery or, at least, to increase citizens' suspicions of politicians' behaviour. Investment opportunities, mainly linked to the building of communication infrastructures, arenas, venues, or residential buildings, and other concession contracts, generate under-the-counter opportunities for both public and private participants.

Some recent examples spring to mind. At the international level, the so-called *FIFA Gate* investigates bribery, money laundering, and other frauds committed by officials of this international association, from the early 1990s, related to various FIFA World Cup championships. Even the selection of the next World Cup, which will be held in Qatar in 2022, has given rise to suspicion about the possible purchase of votes of the electors. Furthermore, several members of the International Olympic Committee (IOC) have been

prosecuted for accepting bribes from the Salt Lake Organizing Committee, responsible for hosting the 2002 Winter Olympic Games. Broadcasting TV rights are also in the public eye, with scandals such as the "International Sport and Leisure" case of fraud. Another common scheme is the commissioning of incumbents from private companies, mainly to win construction or services contracts. We will focus on this kind of corruption because it directly affects the perceived corruption at the country level, in contrast to the illegal or unethical behaviours of other stakeholders, such as individuals and international corporations that spread their effects across the globe.[1] There are examples of illicit activities (with the trial underway or completed), for almost all recent mega-events, and it only requires a glance at the local media of a host country to realize the magnitude of the problem. Huge contracts awarded by two friends of the Russian Prime Minister for the Sochi Winter Olympics Games, or the allegations of bribery against Lula Da Silva involving the company Odebrecht after the 2014 FIFA World Cup and the 2016 Summer Olympic Games, are just two examples of this kind of corruption (Matheson et al., 2018). Sometimes, the illegal activities do not directly implicate politicians, but the lack of public regulation and control encourages public speculation, as is the case of the allegations of anticompetitive behaviour of multinational companies in South Africa and Brazil concerning the celebration of the FIFA World Cup and the Olympic Games, respectively. Nevertheless, developing countries and sports competitions are not the only affected cases. For example, the investigation of the recent Universal Exposition held in Milan (Italy), resulted in the arrest of several ex-members of the parliament accused of influencing public tenders.

---

[1] Other examples of corruption related to sports events, which are beyond our present scope because they do not involve public incumbents, include innumerable match-fixing cases, player-doping, and other scandals and breaches of rules. Maennig (2005) and Maennig (2008) review the most important cases of corruption in sport of the 20th century, at both the management and competition level.

The Academic literature is aware of the severe effects of corruption. The consequences of corruption are innumerable and, generally, negative (against the so-called "greasing hypothesis"). Economic consequences of corruption are quite varied and well-documented: corruption erodes economic growth (Mauro, 1995, Méon and Sekkat, 2005, and Aidt, 2009), mainly through the effects on investment and productivity (Salinas-Jiménez and Salinas-Jiménez, 2007), hinders economic development (Bardhan, 1997), worsens equality in the distribution of income (Gupta et al., 2002), affects the composition and efficiency of public expenditure (Del Monte and Papagni, 2001, and Hessami, 2014), and increases the inflation rate (Al-Marhubi, 2000). A review of these economic effects can be found in Gupta and Abed (2002). Another victim of corruption is political stability, one of the transmission channels that, in turn, affects economic growth. Prior studies have analysed this issue, from the early work of Johnston (1986), on reconciling the various - and contradictory - lines of research into the political consequences of corruption, to the more recent contributions of Anderson and Tverdova (2003) and Bowler and Karp (2004), who shed light on the social crisis generated by corruption, and on the discredit of political institutions. Corruption is not restricted to the socio-economic and institutional spheres, but spreads its tentacles across the environment (Oliva, 2015) and public health (Ambraseys and Bilham, 2011, and Hanf et al., 2011).[2]

For all of these concerns, and in order to get to the heart of the problem, many existing papers have tried to identify the causes of corruption. Though we do not pretend to provide a comprehensive review of the literature, we can highlight several determinants. Most of the existing literature agrees that per capita income is the main factor in the level of corruption, maintaining a negative relationship (Ades and Di Tella, 1999, and Treisman, 2000, among

---

[2] See Tanzi (1998), Rose-Ackerman (1999), Jain (2001), and Dimant and Tosato (2018) for extensive reviews of the consequences of corruption.

many others). Other analyses highlight the trade-off between perceived corruption and factors such as the distribution of income (Paldam, 2002), commercial trade (Ades and Di Tella, 1997), financial flows (Wei and Shleifer, 2000), and globalization (Badinger and Nindl, 2014). On the other hand, the inflation rate (Braun, 2004) and the size of government (Kotera et al., 2012), especially in weak democracies, positively impact the country-level of perceived corruption. As for institutional determinants, the transparency of government (Elbahnasawy, 2014), its efficiency, the degree of intervention (Goel and Nelson, 2010), the level of political decentralization (Fan et al., 2009), and the social rights attained in the country (Brunetti and Weder, 2003) can all affect perceived corruption. Cultural factors may have an influence on corruption, since it has been demonstrated that ex-British colonies, countries ruled by common law (Herzfeld and Weiss, 2003) and countries where Protestantism is widespread (North et al., 2013), have lower levels of perceived corruption. Other determinants that appear in the literature include the level of education (Glaeser and Saks, 2006), ethnic diversity (Dincer, 2008), political stability (Lederman et al., 2005), and the availability of natural resources (Bhattacharyya and Hodler, 2010).

Hosting mega-events results in a *chiaroscuro* set of effects. The positive consequences of the celebration of mega-events for the host country are related to the tangible and intangible legacy (Gratton and Preuss, 2008). For the tangible legacy, the large amount of money spent on the organization of mega-events and other involved expenditures and changes exert an impact on the main economic variables.[3] Brückner and Pappa (2015) identify some important macroeconomic outcomes of hosting the Olympic Games: investment, consumption, and output increase before the event in bidding and hosting countries, and continue to grow after

---

[3] For example, we note that during the Olympic Summer Games in London in 2012, the capital investment exceeded $9 billion, and the total cost was almost $14 billion (Müller, 2015). Some years earlier, Barcelona, Sidney, and Athens had hosted the Olympics with non-negligible budgets, as we can check in Flyvbjerg et al. (2016).

the event in hosting countries. Rose and Spiegel (2011) study the trade effects, finding that a country where a mega-sport event is held, or simply if the country bids to host the event, increases exports by 30%. However, Langer et al. (2018) remark that these studies suffer from mis-specification problems, since they do not account for certain relevant determinants of income growth, and problems of comparison among heterogeneous countries (also noted in Maennig and Richter, 2012). Coates and Humphreys (2008) review the economic literature, showing that related analyses, nearly unanimously, do not find increases in wages, sales, or taxes when a mega-event is celebrated. Preuss (2004) states that the economic impacts of the Olympic Games are often overestimated, and Baade and Matheson (2016) assert that only under specific circumstances does a host city not lose money. In addition, there are other negative consequences: from social criticism arising from urban regeneration, to tourism sectors that do not benefit (Mitchell and Stewart, 2015) and cost overruns (which are always present in the Olympic Games, according to Flyvbjerg and Stewart, 2012). In fact, the population is aware of these adverse consequences and the recently-proposed public referenda in Vienna or Hamburg have decided against the hosting of the Olympic Games (Maennig, 2017), which could discourage politicians from bidding for such mega-sport events (Zimbalist, 2016).

The relationship between the hosting of mega-events and the level of perceived corruption has attracted academic interest but, generally, the analyses focus on specific case-studies, or evaluate the relationship from a normative perspective. For example, the OECD postulates that deficiencies in materials and worker conditions could be a result of payment of bribes by concessional companies (OECD, 2016). Maennig (2016) notes that mega-sport events financed without public funds lead to lower levels of corruption, because the opportunities for bribery are reduced, while identifying other proposals to reduce corruption in the context of hosting sports events. When control mechanisms work, non-monetary costs grow, so expected

net utility decreases. However, to the best of our knowledge, scholarly attention has not focused on the quantitative relationship between the hosting of mega-events and the level of corruption perceived by citizens. Thus, on the face of it, the study and quantification of this potential relationship seems sensible.

In this research, we analyse the relationship between perceived corruption and the timing of the mega-events hosted by 34 OECD members, from 1996 to 2017. The selection of developed countries allows us to consider a homogeneous sample and, therefore, to choose the appropriate determinants of the perceived corruption, in order to isolate the effects of hosting mega-events. The estimation results of the empirical model show that, in countries where a mega-event has taken place, the level of corruption perceived by citizens increases, not after the opening of the event, but before, from the first announcement of the choice of the host country. This effect is dynamic, since perceived corruption increases, from the selection date, to reach the maximum, about 4% above the previous level, 1-2 years before the event takes place. Estimates suggest that the impact on the perceived corruption extends to the long run. This outcome is confirmed when several robustness checks are performed, which include changes in the sample, in the indicator of the perceived corruption, and the inclusion of additional covariates. Our results confirm the hypothesis previously established: opportunity increases illegal behaviours or, at least, increases the public perception of corruption.

The paper is organized as follows. Section 2 presents the data and the methodology employed. Section 3 shows the main results and the robustness checks applied. Finally, Section 4 summarizes our main conclusions. Appendix A details the variables included in the empirical models, and their sources.

2. Data and methodology

2.1. Data

Our sample covers 34 OECD countries for 1996-2017, a period subject to the availability of data about corruption.[4] As we have noted, we choose these countries because developed economies share the same determinants of the corruption level, so a homogeneous sample will facilitate a proper choice of the fundamentals. To build the database, the selection of the type of events considered is a key issue. International events can be distinguished among giga- and mega-events, major events, and minor events, according to different criteria that determine the scale of the event and, consequently, its impact. The duration of the event, the number of participants (active or mere assistants), and the importance or significance of the event itself, are all measured, for example, through the media attractiveness, which in turn can determine the size. However, for our purpose, the economic dimension is the best indicator to differentiate among the various events.[5] For those involving large budgets, the potential gain of incumbents derived from illegal activities is greater; there are more companies and (public and private) managers involved and, therefore, the opportunities to hide an increase in "black accounting". Prior literature has routinely considered as mega-events the Olympic Summer Games and the FIFA World Cups, the competitions with the greatest costs. Nevertheless, Müller (2015) analyses the most recent events and categorizes them according to four dimensions: visitor attractiveness, mediated reach, total cost, and capital investment. This approach identifies as mega-events the Olympic Summer Games (classified as a giga-event), UEFA European Championships, FIFA World Cups, Universal Expositions, the Asian Games, and the Olympic Winter Games. We choose to follow an alternative approach,

---

[4] In 2018, the OECD had 36 members. However, Latvia joined the organization in 2016, at the end of our sample period, and Lithuania in 2018, so we exclude these countries. The remaining countries have been considered from 1996, though some of them (Slovakia, Chile, Slovenia, Israel, and Estonia) joined the OECD in later years. We have re-estimated our baseline results shown in Table 3, including these five countries as and when they joined the OECD, and our main results are not altered.
[5] Though Taks (2013) reveals that major events also have a large social influence.

considering only those giga- and mega-events that have an international nature: Olympic Summer Games, FIFA World Cups, Universal Expositions, and Olympic Winter Games. Data about these events is displayed in Table 1, where we categorize them by type of event, and show the host country, the year of the event, and the date when the host country was selected. The list incorporates those events considered to have an impact on the level of perceived corruption during the sample period (1996-2017), which includes events held in that period as well as events held during the decade prior to the sample period. This selection considers the results obtained in the existing literature, such as Brückner and Pappa (2015) and Rose and Spiegel (2011), where the economic consequences are detected before the opening of the event. Thus, the list is composed of 7 Winter and 6 Summer Olympic Games, 5 FIFA World Cups and 3 Universal Expositions, where 8 of these events occur before 1996, and 13 events during 1996 to 2017.[6]

Table 1: List of mega-events

Event	Host Country	Year Held	Election Date
Olympic Games	Korea	1988	30/09/1981
	Spain	1992	17/10/1986
	United States	1996	18/09/1990
	Australia	2000	23/09/1993
	Greece	2004	05/09/1997
	United Kingdom	2012	06/07/2005
Winter Olympic Games	Canada	1988	30/09/1981
	France	1992	17/10/1986
	Norway	1994	15/09/1988
	Japan	1998	15/06/1991
	United States	2002	16/06/1995
	Italy	2006	16/06/1999
	Canada	2010	02/07/2003
FIFA World Cup	Italy	1990	19/05/1984
	United States	1994	04/07/1988
	France	1998	02/07/1992
	Korea and Japan	2002	31/05/1996
	Germany	2006	06-07/07/2000
Universal Exposition	Spain	1992	08/12/1982
	Germany	2000	14/06/1990
	Italy	2015	31/03/2008

Note: Events considered to have an impact on the level of perceived corruption during the sample period (1996-2017) in the 34 OECD countries considered.

---

[6] We consider Universal Expositions and International Registered Exhibitions, which are currently equivalents.

Our main variable of interest is the level of corruption. Unfortunately, actual corruption cannot be easily and objectively measured (Galtung, 2006). Because of that, and following most of the literature already mentioned, we use the level of perceived corruption as a proxy for the actual corruption. There are several alternative indices to measure the country-level perceived corruption. The three most widely-used, which are highly correlated, are the International Country Risk Guide (ICRG), designed by the Political Risk Services Group, the Corruption Perceptions Index (CPI), elaborated by Transparency International, and the Control of Corruption Index (CCI), provided by the World Bank. Treisman (2000) highlights some counterintuitive results of the ICRG, and the change in the methodology of the CPI conducted in 2012 makes it inappropriate to compare data from the two sub-periods. Therefore, we will use the CCI proposed by the World Bank in the Worldwide Governance Indicators (Kaufmann et al., 2011), which measures perceptions of the illicit behaviour of public incumbents for private gain, and other behaviours aimed at favouring economic elites. The CCI is constructed on the basis of expert and citizen opinions, from different sources, and makes use of an unobserved components model that ensures a good performance of the indicator (Treisman, 2007).[7] This index is published biannually until 2002, so we linearly interpolate years 1997, 1999, and 2001.[8] It ranges from -2.5 (weak governance performance) to 2.5 (strong governance performance) so, in order to make the index and the estimation results more intuitive, we re-scale it from 0 (low perceived corruption) to 10 (high perceived corruption). In this way, we obtain the Modified CCI (M-CCI hereafter), which is our dependent variable.

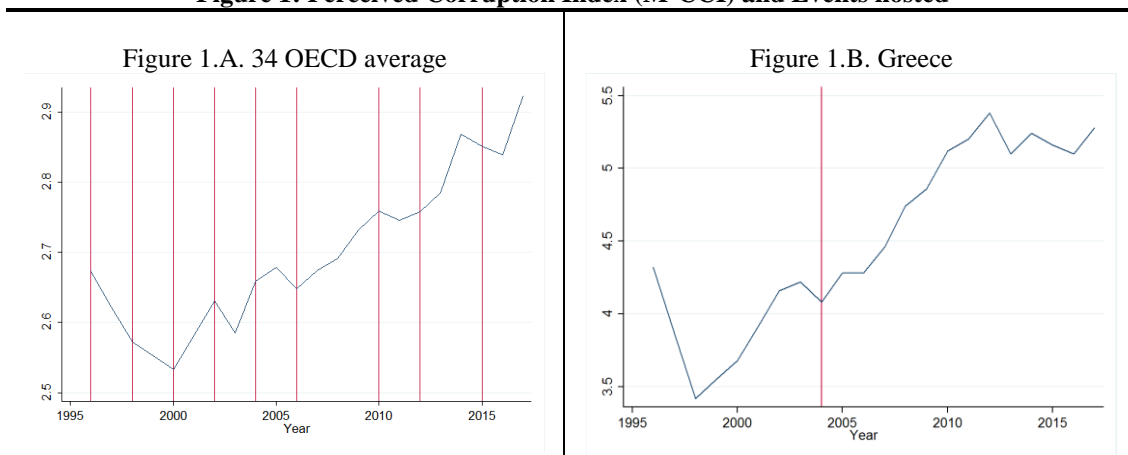Figure 1.A shows the evolution of the M-CCI average for the 34 OECD countries included in the sample, with vertical lines representing the timing of events displayed in Table 1.

---

[7] We must note that these sources have changed over time, which affects the over-time variation of the data (Kaufmann et al., 2006).
[8] Results without interpolating the index for years 1997, 1999 and 2001 do not show significant differences.

Though visual inference is difficult to establish, since average M-CCI is not correlated with national events, Figure 1.B shows that, when we focus on a specific country, such as Greece, a certain correlation can be seen between the M-CCI and the hosting of mega-events.

Figure 1: Perceived Corruption Index (M-CCI) and Events hosted

Figure 1.A. 34 OECD average   Figure 1.B. Greece

Note: This figure shows the evolution of the Modified Control of Corruption Index (M-CCI) and the mega-events (vertical lines) hosted in the 34 OECD members included in the sample (Figure 1.A) and in Greece (Figure 1.B). In each of the years 1998, 2000, 2002, and 2006, two mega-events are celebrated.

Obviously, we cannot draw robust conclusions from mere correlations, so we must consider other determinants of the level of corruption. Table 2 displays some descriptive statistics for the main determinants of the level of perceived corruption, following Serra (2006). The inclusion in the empirical model of these variables will be justified in the next section, along with a detailed description of each factor. The average M-CCI for the 34 OECD members reaches a value of 2.36, but the variance is relatively high: from values higher than 5 in Mexico, Turkey, and Greece during the sample period, to values close to zero in Denmark, Finland, and New Zealand. The mean for the per capita GDP is in accordance with the nature of the sample, where all countries are high-income economies, except for

Mexico and Turkey.[9] The average weight of Protestants in the total population in 1995 is not negligible, though there are countries, such as Greece, Israel, Italy, and Spain, where this percentage is zero. One third of the considered countries have a colonial heritage, either British (21%), Spanish or Portuguese (12%). Institutional variables show that political institutions have been maintained from 1950 to 1995 in 59% of the countries. The average for the index of political stability, ranked from 0 to 10, is relatively high, although some countries get very low values, as is the case of Turkey in 2016.

Table 2: Descriptive statistics. 1996-2017.

Variable	Mean	Std.	Min.	Max.
Corruption index (M-CCI)	2.36	1.57	0.06	6.86
Per capita GDP	34,974	14,375	11,300	97,864
Protestant rate 1995	22.10%	29.86%	0%	91.34%
Colonial heritage	0.32	0.47	0	1
Preserved institutions	0.59	0.49	0	1
Political stability	6.56	1.36	0.98	8.52

Note: This table displays the main descriptive statistics for the variables included in Table 3, where the baseline results are shown.

2.2. Methodology

A common way to measure the effect of a treatment, in this case the effect of hosting a mega-event on the perceived level of corruption, is the application of the difference-in-differences (DID) methodology. This technique allows for measuring the underlying disparities in the variable of interest between a treatment group and a control group. However, the standard version of this method is not suitable in this framework, since in our case the treatment is applied to each unit at different moments. Besides, other drawbacks of the DID

---

[9] Mexico and Turkey are the only countries not considered high-income countries, according to the income criteria established by the World Bank. This could bias our results, since we do not include proper independent variables for less economically-developed countries, such as the level of natural resources. This issue could give rise to mis-specification problems, so we replicate our baseline estimates shown in Table 3, excluding these two countries. Results are very similar and, hence, all our conclusions are maintained.

methodology are well-known (Bertrand et al., 2004). We could also define a dummy for each country with value 1 from the turning point, but this static model would only identify a discrete series break, the average change in the level of perceived corruption that can be attributed to the hosting of the event, obviating that hosting these events may have very different short- and long-run effects on the level of perceived corruption. Moreover, the complexity of separating pre-existing trends from the own dynamics of the treatment invalidates this approach. To tackle this issue, we apply an alternative but related methodology, the specification suggested by Wolfers (2006). This author proposes the following specification, where the dynamic effect of the shock is modelled:

$$corruption_{i,t} = \sum_{k \geq 1} \delta_k event'_{i,t,k} + country_i + year_t + \mu_{i,t} \qquad (1)$$

In which *corruption*$_{i,t}$ is the M-CCI, the level of corruption perceived by individuals described in the previous section. $event'_{i,t,k}$ is a set of dummy variables that take value 1 in period t when k years have passed since country *i* has hosted the event (for the year of the event and the following one, for years two and three after the event, and so on), and 0 otherwise. With this set, we capture the entire dynamic response of the perceived corruption to the celebration of the event. When parameters included in δ_k are negative (positive), they indicate that the level of perceived corruption has decreased (increased) after *k* periods following the celebration of the event in country *i*. As explained above, these parameters are expected to show a positive sign, due to the increase in the public budget as a consequence of the celebration of the event, which may encourage incumbents to commit illegal activities or, at least, arouse suspicions in citizens. $\mu_{i,t}$ is the error term.

Most of the related literature tries to identify the determinants of the level of corruption. With the aim of reconciling that line of research with our exercise, we add to Equation (1) a

set of control variables, in order to properly isolate the effect that hosting mega-events could exert on the level of perceived corruption:

$$corruption_{i,t} = \sum_{k \geq 1} \rho_k event'_{i,t,k} + \gamma X'_{i,t} + country_i + year_t + \mu_{i,t} \qquad (2)$$

where $X_{i,t}$ is a vector of explanatory variables that may have an impact on the level of perceived corruption for reasons independent of the hosting of events, and with ρ_k being the corresponding vector of coefficients.

Equations (1) and (2) could be estimated by applying the standard fixed effects model, but some of the interesting control variables are time-invariant and so their effect would be captured by the fixed effects component. To explicitly estimate the impact that these time-invariant variables may exert on the level of perceived corruption, we make use of the Least Squares Dummy Variables (LSDV) approach, which removes one country from the fixed effects component. This slight modification allows us to incorporate time-invariant explanatory factors and yields the same results as a standard fixed effects model for the rest of the variables. We also incorporate time fixed effects, to capture the aggregate trend generated by unmodeled time-specific and group-invariant effects. To deal with potential autocorrelation and heteroskedasticity problems, we estimate our panel models using White-Huber robust standard errors. Meanwhile, one could argue that the level of corruption in a specific country affects the selection of that country in the bidding process, so endogeneity concerns would be present in the estimation results. However, Maennig and Vierhaus (2016) discard this possibility and find that the level of corruption is not a determinant of the selection of the host country, so the estimation approach does not have to correct for a potential endogeneity bias.

Before moving ahead, we must note that the effect of hosting mega-events on perceived corruption could appear not only from the event opening, but also from the date of selection

of the country, analogously to the economic impact detected by the literature. Countries involved in the celebration of a sport or cultural event must build infrastructure, venues, arenas, and other facilities. In addition, all the service contracts, broadcasting TV rights, and marketing and merchandising contracts must have already been signed before the inauguration. Consequently, opportunities for illicit activities are maximized before the event itself, which may be perceived by citizens. Therefore, we will consider two scenarios. The dummy variables included in Equations (1) and (2) take value 1 in period t when k years have passed since the selection of the host and, alternatively, since the country actually hosted the event.

Now, we discuss the determinants included in vector $X_{i,t}$. In Appendix A, we provide a more detailed description of the variables and the sources of the data. With the aim of departing from an objective set of control variables, we rely on the outcome found in Serra (2006), which analyses the empirical determinants of corruption, testing for the robustness of a large number of potential factors that prior literature has found to be related to corruption. Serra's findings identify five variables with a robust relationship: the per capita income, a variable that captures whether the institutions have existed for a long time, the rate of Protestants in the total population, an index of political stability, and whether the country has a colonial heritage. We meticulously follow the terms of Serra (2006) to include these variables, with only one minor variation: we consider the Protestant rate in 1995, which is closer to our sample period.[10] All these variables are expected to be negatively correlated with the level of perceived corruption. We note that conducted tests do not show signs of multicollinearity concerns among these variables.

---

[10] As in Serra (2006), we control for the joint effect of the different colonial heritages, but we differentiate among mother countries in a robustness check. In addition, we do not account for French colonies, since there are none of them in the OECD.

3. Results

3.1. Main results

We present the estimation results of Equations (1) and (2) in Table 3. This table is split: in Panel A, we consider the year that countries were chosen to host the events as the cutoff point at which perceived corruption can be affected. Column (1.A) presents the estimation of Equation (1): the dynamic response shows a positive impact of the selection of the country on the level of perceived corruption, and this effect does not fade over subsequent years, reaching its maximum value, about 4%, 4 or 5 years after the selection of the country as host country, which is 1 to 2 years prior to the celebration of the event. The specification that adds control variables (Column 2.A) confirms this outcome, although the magnitude of the effect is slightly lower. As stated above, the years prior to the opening are when countries' budgets increase to implement all the necessary expenditures and make the largest investments, especially in infrastructure. Therefore, it can be argued that, between the selection of the host country and the celebration of the event (a period that, generally, lasts 6-7 years. See Table 1), the level of perceived corruption could be affected, since the potential gains from bribery are greater.

In Panel B, we consider the year in which the event was celebrated as the key moment to have an impact on the level of perceived corruption. Column (1.B) shows that hosting mega-events is associated with a temporary increase in the level of perceived corruption, with the magnitude of this impact being low, about 2%. The dynamic estimates show a limited and finite effect on perceived corruption, only statistically significant at 10% after the fifth year, which then utterly disappears. However, when control variables are incorporated (Column 2.B), the estimated coefficients do not support this finding, since they lose statistical

significance. If this is true, we should pay attention to the year of the selection of the country, rather than to the year of celebration of the event.

Table 3: Baseline Regressions

	Panel A Year in which countries were selected to host the events		Panel B Year in which events were hosted	
	(1.A)	(2.A)	(1.B)	(2.B)
Event 0-1	0.252**	0.229**	0.210**	0.114
	(0.105)	(0.098)	(0.092)	(0.087)
Event 2-3	0.326***	0.265***	0.186**	0.091
	(0.101)	(0.092)	(0.081)	(0.076)
Event 4-5	0.420***	0.346***	0.190**	0.092
	(0.082)	(0.072)	(0.082)	(0.080)
Event 6-7	0.336***	0.260***	0.170*	0.055
	(0.091)	(0.084)	(0.099)	(0.089)
Event 8-9	0.327***	0.251***	0.117	-0.024
	(0.072)	(0.068)	(0.116)	(0.099)
Event ≥10	0.293***	0.189***	0.094	-0.078
	(0.071)	(0.065)	(0.099)	(0.088)
Per capita GDP		-1.116***		-1.187***
		(0.170)		(0.170)
Protestant rate 1995		-0.012***		-0.012***
		(0.002)		(0.002)
Colonial heritage		-0.923***		-0.753***
		(0.142)		(0.146)
Preserved institutions		-1.273***		-1.820***
		(0.120)		(0.283)
Political stability		-0.087**		-0.085**
		(0.035)		(0.035)
Constant	0.808***	15.472***	1.009***	16.777***
	(0.084)	(1.729)	(0.096)	(1.591)
Observations	748	748	748	748
R-squared	0.963	0.967	0.963	0.967

Note: the sample covers the period 1996-2017. Columns (1.A) and (1.B) refer to the Wolfers (2006) estimation (Equation 1), and Columns (2.A) and (2.B) add control variables (Equation 2). Country and time fixed effects are included in all models (more details in the main text). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

According to these results, it is not the moment when events are celebrated that makes a difference in terms of perceived corruption, but the time of the selection of the country as host country. From a theoretical point of view, this is not surprising: the increase in the budget that may promote corruption is greater in the years prior to the celebration of the event, when the majority of infrastructures are developed, and the concession contracts are signed. Figure 2

shows the dynamic response of our dependent variable to the hosting of the event and to the selection of the country. It can be seen that the effect is greater and more prolonged when the selection date is considered as the turning point.

Figure 2: Estimated coefficients - Event dummies

Note: this figure shows the estimated coefficients of the set of dummies specified in Equations (1) and (2) when they are statistically significant, at least, at 5%.

Turning our attention to the set of socio-economic, political, and institutional covariates included in the analysis, we find no striking results. The estimated coefficients for all the control variables have the expected sign and are statistically significant and not sensitive to the inclusion or exclusion of any of them. Richer countries experience lower levels of corruption, a conclusion in line with the literature mentioned earlier. Thus, we find empirical evidence in favor of the "sand the wheels" hypothesis against the "grease the wheels" hypothesis (Méon and Sekkat, 2005). The dominance of Protestantism is also an obstacle for corruption, thus supporting the results of La Porta et al. (1997, 1999), among others. According to Treisman (2000), an egalitarian religion (against the more hierarchical ones, such as Catholicism, Islam, and Eastern Orthodoxy), affects the cultural attitudes towards the

social structure, and public incumbents' incentives to commit illicit activities are lower. Besides, nepotism is stronger when other religions dominate, and the relationship between religion and the State is less heightened in predominantly Protestant countries, so the church may act as an oversight body. Colonial heritage is a determinant that lessens corruption, thus confirming the results of Serra (2006). Continuity of institutions is also a fundamental. In mature democracies (maintained during 1950-1995, at least), public officers may have less probability of losing their position of power than in countries with younger institutions, so the costs of illicit activities are augmented. Finally, political stability establishes a solid institutional environment and increases the efficacy of the monitoring systems, thus increasing the potential costs of corruption (Lederman et al., 2005).

3.2. Robustness checks

To reinforce the consistency of the previous results, in this section we apply some robustness checks to our benchmark estimates. First, we replicate the baseline estimation by using an alternative indicator of the level of perceived corruption, the CPI developed by Transparency International. As noted above, the main problem of this indicator, built on the opinions of businesspeople, analysts, and experts, is that it suffered a methodology shift in year 2012, which invalidates comparisons between periods 1996-2011 and 2012-2017.[11] For this reason, we replicate our benchmark models only for the period not affected by the methodological shift (before 2012). Table 4 shows the results. The dynamic response of perceived corruption is, again, positive and statistically significant in Panel A, when the selection of the host country is considered as the turning point. The same can be said if our set

---

[11] The range of this index before 2012 is from 0 to 10, the mean for all countries during 1996-2011 being 6.99. From 2012, the range of the index is from 0 to 100, and the mean is 69.02. Thus, the two subperiods seem quite uniform. When we rescale the index (so it ranges from 0 to 10 during the entire period) and replicate the results shown in Table 3, estimated coefficients are quite similar. However, we recognize that both sub-periods are not comparable so, being conscious of this limitation, we have preferred estimates until 2011.

of control variables is included in the specification. Overall, these effects are greater than those obtained in the baseline estimation, reaching values over 6%, 2 to 3 years after the selection date. This result strengthens the previous outcome: there is a before and an after when a country is chosen to host a mega-event, when the level of perceived corruption increases, and does not return to its previous level during subsequent years. When the celebration of the mega-event is considered as the break point (Panel B), results are also in line with baseline estimates. In Column 1.B, we observe again a positive impact that is diluted 5 years after the celebration of the event, not going beyond that point. However, when other determinants are considered (Column 2.B), the effect is not statistically significant. Finally, the estimated coefficients of the rest of the control variables are similar to those obtained in Table 3.

Table 4: Robustness Check I. Control of Corruption Index, Transparency International

	Panel A Year in which countries were selected to host the events		Panel B Year in which events were hosted	
	(1.A)	(2.A)	(1.B)	(2.B)
Event 0-1	0.411***	0.391***	0.294***	0.216*
	(0.130)	(0.131)	(0.113)	(0.117)
Event 2-3	0.649***	0.607***	0.289**	0.186
	(0.148)	(0.141)	(0.122)	(0.120)
Event 4-5	0.532***	0.483***	0.325**	0.207
	(0.121)	(0.114)	(0.142)	(0.143)
Event 6-7	0.506***	0.449***	0.141	0.013
	(0.118)	(0.115)	(0.177)	(0.169)
Event 8-9	0.584***	0.536***	-0.097	-0.204
	(0.149)	(0.150)	(0.155)	(0.153)
Event ≥10	0.461***	0.390**	0.059	-0.115
	(0.165)	(0.167)	(0.166)	(0.159)
Per capita GDP		-0.918**		-1.097***
		(0.412)		(0.411)
Protestant rate 1995		-0.016***		-0.008***
		(0.004)		(0.003)
Colonial heritage		-1.417***		-1.217***
		(0.327)		(0.331)
Preserved institutions		-2.113***		-1.734***
		(0.711)		(0.244)

Political stability		-0.210*** (0.050)		-0.194*** (0.049)
Constant	1.088*** (0.170)	15.908*** (3.873)	1.459*** (0.136)	17.343*** (4.480)
Observations	561	561	561	561
R-squared	0.952	0.955	0.952	0.955

Note: Sample: 1996–2011. 34 OECD Countries considered in the analysis. Columns (1.A) and (1.B) refer to the Wolfers (2006) estimation (Equation 1), and Columns (2.A) and (2.B) add control variables (Equation 2). Country and time fixed effects are included in all models (more details in the main text). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

The next exercise attempts to address the issue of the moderate number of mega-events included in the sample. Since the availability of the data about perceived corruption is restricted to the considered period, the only possible solution requires increasing the number of countries included in the sample. Although this procedure has the disadvantage of forming a more heterogeneous sample, it could overcome the aforementioned shortcoming. Therefore, we incorporate in the sample the countries that have celebrated a mega-event in the considered period or in the previous decade: China, Brazil, South Africa, and Russia.[12] Thus, we account for six more mega-events, and the number of observations of our panel data increases. Panel A of Table 5 evidences the robustness of the previous outcome regarding the effect of the selection of the host country, both from the approach of Wolfers (2006) and when additional covariates are incorporated. Results are similar, though the inclusion of our set of control variables pushes the estimated coefficients up. In Panel B, the main difference from our main estimates is that coefficients representing the effect of the celebration of the event become statistically significant when control variables are included. This effect would disappear after the seventh year. Nonetheless, empirical evidence found throughout the battery of estimations is weak, so we must interpret this result carefully. Again, estimates of control variables yield very similar results to those obtained in the benchmark analysis.

---

[12] The new events considered are six: Summer Olympic Games of China (2008) and Brazil (2016); Winter Olympic Games of Russia (2014); FIFA World Cups of South Africa (2010) and Brazil (2014); and the Universal Exposition of Shanghai, China (2010).

Table 5: Robustness check II. Extended sample

	Panel A Year in which countries were selected to host the events		Panel B Year in which events were hosted	
	(1.A)	(2.A)	(1.B)	(2.B)
Event 0-1	0.201***	0.304***	0.251***	0.298***
	(0.076)	(0.076)	(0.069)	(0.069)
Event 2-3	0.292***	0.417***	0.181**	0.233***
	(0.085)	(0.080)	(0.078)	(0.078)
Event 4-5	0.400***	0.527***	0.188**	0.236***
	(0.065)	(0.064)	(0.075)	(0.073)
Event 6-7	0.346***	0.478***	0.144	0.193**
	(0.076)	(0.076)	(0.088)	(0.078)
Event 8-9	0.346***	0.485***	0.115	0.117
	(0.080)	(0.082)	(0.108)	(0.097)
Event ≥10	0.263***	0.399***	0.091	0.071
	(0.070)	(0.073)	(0.090)	(0.084)
Per capita GDP		-0.789***		-0.762***
		(0.109)		(0.120)
Protestants rate 1995		-0.009***		-0.008***
		(0.001)		(0.002)
Colonial heritage		-0.903***		-0.562***
		(0.133)		(0.137)
Preserved institutions		-1.643***		-1.253***
		(0.090)		(0.147)
Political stability		-0.091***		-0.066**
		(0.032)		(0.033)
Constant	0.822***	12.230***	0.990***	11.293***
	(0.081)	(1.135)	(0.089)	(1.273)
Observations	836	836	836	836
R-squared	0.973	0.975	0.972	0.974

Note: Sample: 1996–2017, 34 OECD + China, Brazil, South African and Russia. Columns (1.A) and (1.B) refer to the Wolfers (2006) estimation (Equation 1), and Columns (2.A) and (2.B) add control variables (Equation 2). Country and time fixed effects are included in all models (more details in the main text). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

Finally, we extend the set of control variables included in vector $X'_{i,t}$ of Equation (2). In order to draw from a solid basis, we have followed Serra (2006) until now. Nevertheless, some of the prior empirical studies have found other determinants of perceived corruption. By incorporating these additional factors, we can test the robustness of our main results and determine whether these new variables do, in fact, exert an impact on the level of perceived corruption. We will consider the potential determinants more often accepted by prior

literature. Table 6 displays the results, and details of these series and statistical sources can be found in Appendix A. Before analyzing the new control variables, we note that the main conclusions about the dynamic effects of hosting mega-events do not change, although coefficients are lower, since additional variables with explanatory capacity are capturing part of the variation in perceived corruption. This could also be the reason behind the loss of statistical significance of the covariates political stability and preserved institutions. Further, the coefficient of this last variable becomes positive in Panel B. This suggests that stability of political institutions and, especially, the feature of being an uninterrupted democracy for a long time, are not robust determinants of the perceived corruption when the sample includes high-income economies. Most of these countries reach high levels of stability, and democracies are generally long-lasting, so the differences in the levels of perceived corruption originate from other factors.

Table 6: Robustness check III. Additional covariates

	Panel A Year in which countries were selected to host the events	Panel B Year in which events were hosted
Event 0-1	0.264**	0.118
	(0.104)	(0.083)
Event 2-3	0.262***	0.053
	(0.100)	(0.073)
Event 4-5	0.333***	0.043
	(0.091)	(0.081)
Event 6-7	0.284***	-0.002
	(0.099)	(0.096)
Event 8-9	0.228***	-0.103
	(0.085)	(0.089)
Event $\geq$10	0.151*	-0.147*
	(0.089)	(0.086)
Per capita GDP	-1.302***	-1.368***
	(0.216)	(0.210)
Protestants rate 1995	-0.004**	-0.026***
	(0.002)	(0.002)
British colonial heritage	-0.578***	-2.021***
	(0.102)	(0.113)
Spanish or Portuguese colonial heritage	0.271	1.202***
	(0.206)	(0.217)
Preserved institutions	0.023	1.759***
	(0.163)	(0.150)

Political stability	0.005	0.010
	(0.036)	(0.036)
Voice and accountability	-0.678***	-0.682***
	(0.061)	(0.060)
Decentralization	0.256***	0.248**
	(0.088)	(0.104)
Government consumption (% of GDP)	-3.516***	-3.600***
	(1.199)	(1.199)
Index of globalization	0.014**	0.011
	(0.007)	(0.007)
Years in office	0.003**	0.003**
	(0.001)	(0.001)
Elections	0.001	-0.000
	(0.009)	(0.010)
Constant	20.314***	21.479***
	(2.106)	(2.057)
Observations	684	684
R-squared	0.973	0.973

Note: Sample: 1996–2017. Columns refer to the estimation of Equation (2). Country and time fixed effects are included in all models (more details in the main text). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

If the dummy "colonial heritage" is split into British and Spanish or Portuguese, we find that countries with British colonial heritage undergo lower levels of corruption. This impact could arise not only from the predominance of the common law in the UK and former British colonies, but also from forces related to other aspects of the "legal culture", whose administration of justice is more effective against public abuse (Treisman, 2000). By contrast, the effect of the Spanish or Portuguese cultural inheritance is unstable through the battery of estimations we have run, showing positive or negative signs that depend on the set of control variables. This variability is also observed by Triesman (2000).

We also incorporate the index "voice and accountability", an indicator that measures civil participation and freedom of expression, association, and media. This index is expected to be negatively correlated with the level of perceived corruption, since higher levels of civil participation and freedom increase the possibility of exposure, so the expected utility of corrupt practices decreases (Bhattacharyya and Hodler, 2015). Results agree with this

negative relationship. not only in the estimates shown in Table 6, but also for all the combinations we have estimated.

The measure of decentralization of the country consists of a dummy that takes value 1 if there are autonomous regions in the country. There is strong evidence in favour of a positive relationship between the existence of self-governing regions and the perceived corruption, so our outcome is consistent with that of Fan et al. (2009).

The size of government is captured by the percentage of government expenditures over GDP. The existing literature has found mixed results regarding the relationship between the size of government and the level of corruption, and the findings depend on the sample studied. A clarifying paper by Kotera et al. (2012) states that, if the democracy is weak, greater government expenditure increases corruption, and vice versa. Therefore, we expect a negative relationship, since our sample mostly includes stable democracies with a long history. Estimated coefficients, very robust throughout the battery of estimations, show a negative impact on the level of perceived corruption, so the results of Kotera et al. (2012) are supported.

Adding the KOF index of globalization, we would expect a negative relationship (Sandholtz and Koetzle, 2000), but results show that globalization positively impacts the level of perceived corruption.[13] This finding is counterintuitive, so we split the index into its three dimensions: economic, political, and social globalization. By doing so, we can analyze the potential reasons for this result. Economic globalization positively impacts perceived corruption, while the estimated coefficients of the other two sub-indices are barely statistically significant. Therefore, the total impact of the index is dominated by the economic

[13] Nevertheless, the recent literature supports non-linear relationships between globalization and corruption (Das and Dirienzo, 2009). When we incorporate a squared term for globalization, both coefficients become statistically insignificant in most of the estimations, which is in line with the outcome found in Lalountas et al. (2011) when high-income countries are considered.

globalization factor. Though research has mostly found a positive relationship between international trade and corruption, there are other results supporting ours: Ahrend (2002), highlighting the potential gains for corrupt incumbents originated by international trade, and Knack and Azfar (2003), who discuss the ambiguity of the theoretical relationship between trade and corruption, and the sensitivity of the empirical results to the sample selection.

Finally, certain political factors could be playing an important role in the evolution of corruption. The illicit networks necessary for committing corrupt activities are intensified and become more powerful when the political authority is not renewed for a long time. Because of that, the empirical model incorporates the variable "years in office", which accounts for the number of years that the political party of the current chief executive has been in office, and is expected to have a positive impact on the perceived corruption. We confirm this hypothesis; it takes time to build the structures necessary to defraud public resources. The last additional variable we incorporate represents the schedule of the general elections. Potrafke (2019) ascertains that perceived corruption is greater in election years so, to stand for this relation, we create a variable that diminishes as the following elections come closer:

$$Elections_{i,t} = \text{Years left in the current term}_{i,t} + \frac{\text{Month when the elections take place}_{i,t}}{12}$$

A positive value for this variable would indicate that citizens perceive opportunistic behavior of the public incumbents in election periods. However, the empirical analysis does not support the notion that the electoral calendar affects the level of perceived corruption, since the estimated coefficient is not statistically significant in any specification. This notable contrast with the findings of Potrafke (2019) may come from the differences in the sample, inasmuch as Potrafke includes a larger number of countries during a more restricted period (2012-2016).

4. Conclusions

The causes of corruption have been widely studied in the literature, where economic, demographic, cultural, and institutional factors are highlighted as drivers of the level of perceived corruption. Nonetheless, a specific temporary cause, the hosting of mega-events, has not been quantitatively studied until now. Politicians and other officials see their budgets increase, which enlarges their potential earnings derived from illegal practices, and could lead to increased corrupt activity. This hypothesis is tested for 34 OECD countries for the period 1996-2017. The empirical model considers sport competitions (Summer and Winter Olympic Games and FIFA World Cups) and cultural events (Universal Expositions) as mega-events, and includes the standard determinants for the level of perceived corruption. Results show that the selection of the host country, rather than the celebration of the mega-event itself, positively impacts the corruption perceived by citizens. When the celebration of the event is the breaking point, empirical evidence is weak, but when we consider the selection date as the threshold, perceived corruption is increased by 4% about 2 years before the opening, and the effect is permanent. These results are confirmed when several robustness checks, which change the sample and the specification, are applied. In line with prior literature, normative recommendations would include control mechanisms of public and private managers, which would decrease the net utility of diverting funds for private gain, and a greater transparency in the decision-making process, especially in the selection of service and construction contracts.

References

Ades, A., and Di Tella, R. (1997). The new economics of corruption: a survey and some new results. *Political Studies*, 45, 496-515.

Ades, A., and Di Tella, R. (1999). Rents, competition, and corruption. *American Economic Review*, 89, 982-993.

Ahrend, R. (2002). Press freedom, human capital and corruption. *DELTA, working paper* vol. 11.

Aidt, T. S. (2009). Corruption, institutions, and economic development. *Oxford Review of Economic Policy*, 25, 271-291.

Al-Marhubi, F. A. (2000). Corruption and inflation. *Economics Letters*, 66, 199-202.

Ambraseys, N., and Bilham, R. (2011). Corruption kills. *Nature*, 469, 153.

Anderson, C. J., and Tverdova, Y. V. (2003). Corruption, Political Allegiances, and Attitudes toward Government in Contemporary Democracies. *American Journal of Political Science*, 47, 91-109.

Baade, R. A., and Matheson, V. A. (2016). Going for the Gold: The economics of the Olympics. *Journal of Economic Perspectives*, 30, 201-18.

Badinger, H., and Nindl, E. (2014). Globalisation and corruption, revisited. *The World Economy*, 37, 1424-1440.

Bardhan, P. (1997). Corruption and development: a review of issues. *Journal of Economic Literature*, 35, 1320-1346.

Beck, T., Clarke, G., Groff, A., Keefer, P., and Walsh, P. (2001). New tools in comparative political economy: The Database of Political Institutions. *World Bank Economic Review*, 15, 165-176.

Bertrand, M., Duflo, E., and Mullainathan, S. (2004). How much should we trust differences-indifferences estimates? *Quarterly Journal of Economics*, 119, 249-275.

Bhattacharyya, S., and Hodler, R. (2010). Natural resources, democracy and corruption. *European Economic Review*, 54, 608-621.

Bhattacharyya, S., and Hodler, R. (2015). Media freedom and democracy in the fight against corruption. *European Journal of Political Economy*, 39, 13-24.

Bowler, S., and Karp, J. A. (2004). Politicians, scandals, and trust in government. *Political Behavior*, 26, 271-287.

Braun, M. (2004). Inflation, inflation variability, and corruption. *Economics and Politics*, 16, 77-100.

Brückner, M., and Pappa, E. (2015). News shocks in the data: Olympic Games and their macroeconomic effects. *Journal of Money, Credit and Banking*, 47, 1339-1367.

Brunetti, A., and Weder, B. (2003). A free press is bad news for corruption. *Journal of Public Economics*, 87, 1801-1824.

Coates, D., and Humphreys, B. R. (2008). Do economists reach a conclusion on subsidies for sports franchises, stadiums, and mega-events. *Econ Journal Watch*, 5, 294-315.

Das, J., and DiRienzo, C. (2009). The nonlinear impact of globalization on corruption. *International Journal of Business and Finance Research*, 3, 33-46.

Del Monte, A., and Papagni, E. (2001). Public expenditure, corruption, and economic growth: the case of Italy. *European Journal of Political Economy*, 17, 1-16.

Dimant, E., and Tosato, G. (2018). Causes and effects of corruption: what has past decade's empirical research taught us? A survey. *Journal of Economic Surveys*, 32, 335-356.

Dincer, O. C. (2008). Ethnic and religious diversity and corruption. *Economics Letters*, 99, 98-102.

Dreher, A. (2006). Does Globalization Affect Growth? Evidence from a new Index of Globalization. *Applied Economics*, 38, 1091-1110.

Elbahnasawy, N. G. (2014). E-government, internet adoption, and corruption: an empirical investigation. *World Development*, 57, 114-126.

Fan, C. S., Lin, C., and Treisman, D. (2009). Political Decentralization and Corruption: Evidence from around the World. *Journal of Public Economics*, 93, 14-34.

Flyvbjerg, B., and Stewart, A. (2012). Olympic proportions: Cost and cost overrun at the Olympics 1960-2012. *Saïd Business School WP*, 1-23.

Flyvbjerg, B., Stewart, A., and Budzier, A. (2016). The Oxford Olympics study 2016: cost and cost overrun at the games. *Saïd Business School WP*, pp. 1–27.

Galtung, F. (2006). Measuring the immeasurable: boundaries and functions of (macro) corruption indices. *Measuring Corruption*, 101.

Glaeser, E. L., and Saks, R. E. (2006). Corruption in America. *Journal of Public Economics*, 90, 1053-1072.

Goel, R. K., and Nelson, M. A. (2010). Causes of corruption: History, geography and government. *Journal of Policy Modeling*, 32, 433-447.

Gratton, C., and Preuss, H. (2008). Maximizing Olympic Impacts by Building up Legacies. *International Journal of the History of Sport*, 25, 1922-1938.

Gupta, S., and Abed, G. T. (2002). *Governance, corruption, and economic performance*. International Monetary Fund.

Gupta, S., Davoodi, H., and Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty?. *Economics of Governance*, 3, 23-45.

Gygli, S., Haelg, F., Potrafke, N., and Sturm, J. E. (2019). The KOF globalisation index– revisited. *Review of International Organizations*, 14, 543-574.

Hanf, M., Van-Melle, A., Fraisse, F., Roger, A., Carme, B., and Nacher, M. (2011). Corruption kills: estimating the global impact of corruption on children deaths. *PLoS One*, 6, e26990.

Herzfeld, T., and Weiss, C. (2003). Corruption and legal (in) effectiveness: an empirical investigation. *European Journal of Political Economy*, 19, 621-632.

Hessami, Z. (2014). Political corruption, public procurement, and budget composition: Theory and evidence from OECD countries. *European Journal of Political Economy*, 34, 372-389.

Jain, A. K. (2001). Corruption: A review. *Journal of Economic Surveys*, 15, 71-121.

Johnston, M. (1986). The political consequences of corruption: a reassessment. *Comparative Politics*, 18, 459-477.

Kaufmann, D., Kraay, A., and Mastruzzi, M. (2006). *Measuring governance using cross-country perceptions data*. International handbook on the economics of corruption, 52.

Kaufmann, D., Kraay, A., and Mastruzzi, M. (2011). The worldwide governance indicators: methodology and analytical issues. *Hague Journal on the Rule of Law*, 3, 220-246.

Knack, S. and Azfar, O. (2003). Trade intensity, country size and corruption. *Economics of Governance*, 4, 1-18.

Kotera, G., Okada, K., and Samreth, S. (2012). Government size, democracy, and corruption: An empirical investigation. *Economic Modelling*, 29, 2340-2348.

Lalountas, D. A., Manolas, G. A., and Vavouras, I. S. (2011). Corruption, globalization and development: How are these three phenomena related?. *Journal of Policy Modeling*, 33, 636-648.

Langer, V. C. E., Maennig, W., and Richter, F. J. (2018). The Olympic Games as a News Shock: Macroeconomic Implications. *Journal of Sports Economics*, 19, 884-906.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R.W. (1997). Trust in Large Organisations. *American Economic Review, Papers and Proceedings*, 87, 333-338.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., and Vishny, R.W. (1999). The Quality of Government. *Journal of Law, Economics and Organization*, 15, 222-79.

Lederman, D., Loayza, N. V., and Soares, R. R. (2005). Accountability and corruption: Political institutions matter. *Economics and Politics*, 17, 1-35.

Maennig, W. (2005). Corruption in international sports and sport management: Forms, tendencies, extent and countermeasures. *European Sport Management Quarterly*, 5, 187-225.

Maennig, W. (2008). Corruption in international sports and how it may be combated. *International Association of Sports Economists & North American Association of Sports Economists, Working Paper Series*, 08-13.

Maennig, W. (2016). Preventing corruption in the planning of major sporting events: Open issues. In Transparency International (Ed.), *Global Corruption Report* (pp. 169–173).

Maennig, W., and Richter, F. (2012). Exports and Olympic Games: Is there a signal effect?. *Journal of Sports Economics*, 13, 635-641.

Maennig, W., and Vierhaus, C. (2019). Which Countries Bid for the Olympic Games? The Role of Economic, Political, Social, and Sports Determinants. *International Journal of Sport Finance*, 14, 110-128.

Maennig, W. (2017). Public referenda and public opinion on Olympic Games. *Hamburg Contemporary Economic Discussions*, 57

Matheson, V. A., Schwab, D., and Koval, P. (2018). Corruption in the Bidding, Construction and Organisation of Mega-Events: An Analysis of the Olympics and World Cup. In The Palgrave Handbook on the Economics of Manipulation in Sport (pp. 257-278). Palgrave Macmillan, Cham.

Mauro, P. (1995). Corruption and growth. *Quarterly Journal of Economics*, 110, 681-712.

Méon, P. G., and Sekkat, K. (2005). Does corruption grease or sand the wheels of growth?. *Public Choice*, 122, 69-97.

Mitchell, H., and Stewart, M. F. (2015). What should you pay to host a party? An economic analysis of hosting sports mega-events. *Applied Economics*, 47, 1550-1561.

Müller, M. (2015). What makes an event a mega-event? Definitions and sizes. *Leisure Studies*, 34, 627-642.

North, C. M., Orman, W. H., and Gwin, C. R. (2013). Religion, corruption, and the rule of law. *Journal of Money, Credit and Banking*, 45, 757-779.

OECD (2016). Preventing Corruption in Public Procurement. Report. Paris: OECD Publishing.

Oliva, P. (2015). Environmental regulations and corruption: Automobile emissions in Mexico City. *Journal of Political Economy*, 123, 686-724.

Paldam, M. (2002). The cross-country pattern of corruption: economics, culture and the seesaw dynamics. *European Journal of Political Economy*, 18, 215-240.

Potrafke, N. (2019). Electoral cycles in perceived corruption: International empirical evidence. *Journal of Comparative Economics*, 47, 215-224.

Preuss, H. (2004). The economics of staging the Olympics: a comparison of the Games, 1972-2008. Edward Elgar Publishing.

Rose, A. K., and Spiegel, M. M. (2011). The olympic effect. *Economic Journal*, 121, 652-677.

Rose-Ackerman, S. (1999). Corruption and Government: Causes, Consequences, and Reform. New York: Cambridge University Press.

Salinas-Jiménez, M., and Salinas-Jiménez, J. (2007). Corruption, efficiency and productivity in OECD countries. *Journal of Policy Modeling*, 29, 903-915.

Sandholtz, W., and Koetzle, W. (2000). Accounting for corruption: economic structure, democracy, and trade. *International Studies Quarterly*, 44, 31-50.

Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126, 225-256.

Taks, M. (2013). Social sustainability of non-mega sport events in a global world. *European Journal for Sport and Society*, 10, 121-141.

Tanzi, V. (1998). Corruption around the World: Causes, Consequences, Scope, and Cures. *Staff Papers*, 45, 559-594.

Treisman, D. (2000). The causes of corruption: a cross-national study. *Journal of Public Economics*, 76, 399-457.

Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research?. *Annual Review of Political Science*, 10, 211-244.

Wei, S. J., and Shleifer, A. (2000). Local corruption and global capital flows. *Brookings Papers on Economic Activity*, 2, 303-346.

Wolfers, J. (2006). Did unilateral divorce laws raise divorce rates? A reconciliation and new results. *American Economic Review*, 96, 1802-1820.

Zimbalist, A. (2016). Circus maximus: The economic gamble behind hosting the Olympics and the World Cup. Brookings Institution Press.

Appendix A

Table A.1: Description and source of data

Variable	Source	Description
Corruption index	World Bank	Prepared by the authors on the basis of data supplied by Worldwide Governance Indicators (WGI). It ranges from 0 (low) to 10 (high) perceived corruption.
Per capita GDP	World Bank	Gross Domestic Product converted to international dollars using purchasing power parity rates. Data are in constant 2011 international dollars.
Protestants rate 1995	Association of Religion Data Archives and United Nations	Number of people practising the Protestant religion in 1995 (Association of Religion Data Archives) divided by the total population (United Nations, World Population Prospects). In percentage terms.
British colonial heritage	Treisman (2000)	Australia, Canada, Ireland, Israel, New Zealand, United Kingdom, United States, and South Africa
Spanish and Portuguese colonial heritage	Treisman (2000)	Chile, Mexico, Spain, Portugal, and Brazil
Preserved institutions	Treisman (2000)	Dummy variable that takes value 1 if the country has had an uninterrupted democracy for the period 1950-1995, and 0 otherwise: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Iceland, Ireland, Israel, Italy, Germany, Luxembourg, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom, and United States
Political stability	World Bank	Prepared by the authors on the basis of data supplied by Worldwide Governance Indicators (WGI). It ranges from 0 (low) to 10 (high) political stability.
Voice and accountability	World Bank	Prepared by the authors on the basis of data supplied by Worldwide Governance Indicators (WGI). Extent to which a country's citizens are able to participate in selecting their government, freedom of expression, freedom of association, and a free media. It ranges from 0 (minimum freedom) to 10 (maximum freedom).
Autonomous regions	Database of Political institutions (Beck et al., 2001)	Dummy variable that takes value 1 if the country has autonomous regions, and 0 otherwise. Updated until 2017.
Government expenditure (% GDP)	World Bank	General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees) and most expenditure on national defence and security, but excludes government military expenditures that are part of government capital formation. This variable has been considered as a percentage of the GDP.
Index of globalization	Dreher (2006) and Gygli et al. (2019)	Measures the economic, social, and political dimensions of globalization.
Years in office	Database of Political institutions (Beck et al., 2001)	This variable measures the number of years that the party of the current chief executive has been in office. Updated until 2017.
Elections	Database of Political institutions (Beck et al., 2001)	Prepared by the authors on the basis of the Database of Political institutions (Beck et al., 2001). Updated until 2017. More details in the main text.