Corruption in OECD countries: are mega-events the perfect excuse?

Lorena Olmos[*] Héctor Bellido[†] Juan Antonio Román[‡]

Abstract

In recent decades, the media have covered many cases of corruption related to the celebration of mega-events around the globe. 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 1996-2016. 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 a positive impact on perceived corruption that disappears within five years. However, when we take the election date of the host country as the threshold, the magnitude of the positive effect is greater and more lasting, reaching its maximum value 1-2 years before the celebration itself, and increasing the perceived level of corruption by about 5%.

JEL codes: Z20, C23, D73, H83

Keywords: corruption; mega-events; panel data.

---

[*] Departamento de Análisis Económico, Universidad de Zaragoza, Zaragoza (Spain).
[†] Departamento de Análisis Económico, Universidad de Zaragoza, Zaragoza (Spain).
[‡] Universidad San Jorge, Zaragoza (Spain).
The usual disclaimer applies. The authors bear sole responsibility for the analysis and conclusions presented in this article. They acknowledge the financial support of the Regional Government of Aragon and the European Fund of Regional Development (CASSETEM research group, grant S-124; Population Economics, Labor Market and Industrial Economics research group, grant S32-17R).

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 are bureaucratic power or the potential monetary gains illegally obtained the only decisive elements? In this context, this 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, or the Universal Expositions, which seem to be the perfect breeding ground for bribery or, at least, to raise 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 finally disposed), for almost all recent mega-events, and it only requires a glance at the local media of each host country to see 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.

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:

[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.

corruption erodes economic growth (Mauro, 1995, and Méon and Sekkat, 2005), 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 different lines of research that contradict each other about 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 over 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 prior 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 the level of per capita income is the main factor of the level of corruption, maintaining a negative relationship (Ades and Di Tella, 1999, and Treisman, 2000, among 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).

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

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 high 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 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 only bids to host the event, increases exports by 30%. However, Preuss (2004) shows that the economic impacts of the Olympic

[3] For example, we can mention that, during the Olympic Summer Games in London 2012, the capital investment overcame 9 USD billion and the total cost was up to 14 billion USD (Müller, 2015). Some years before, Barcelona, Sidney or Athens had received the Olympic family with non-negligible budgets, as we can check in Flyvbjerg et al. (2016).

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 criticisms derived 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 compensation of bribes by concessional companies (OECD, 2016). Maennig (2016) asserts 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 the public interest, 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 held by 34 OECD members, from 1996 to 2016. 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 only after the opening of the event, but also before, since the first announcement of the choice of host country. This effect is dynamic, since perceived corruption increases, from the election date, to reach the maximum, about 5% above the previous level, 1-2 years before the event takes place, and then gradually decreases. 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 methodology, in the sample, in the indicator of the perceived corruption, and the inclusion of additional covariates. Our results confirm the hypothesis previously established: opportunity enhances 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 model and their sources.

2. Data and methodology

2.1. Data

Our sample covers 34 OECD countries for 1996-2016, period subject to the availability of data about corruption.[4] As we have noted, we choose these countries because developed economies share the 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

[4] In 2018, the OECD members were 37. However, Latvia joined the organization in 2016, at the end of our sample period, and Lithuania and Colombia in 2018, so we exclude these three countries.

of events considered is a key issue. International events can be distinguished among giga and mega-events, major events, and other minor events, according to different criteria, which will determine the scale of the event and, consequently, its impact. The duration of the event, the number of participants (actively 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 that involve 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 a "black accounting" increase. Prior literature has routinely considered as mega-events the Olympic Summer Games and the FIFA World Cups, the competitions with the highest 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, considering only those giga and mega-events that have an international nature: Olympic Summer Games, FIFA World Cup, Universal Expositions, and Olympic Winter Games. Data about these events is displayed in Table 1, where we categorize them by type of event, and we 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 (1996-2016), which includes events held in that period as well as events held during the decade prior to the sample period. This election considers the results obtained in the existing literature,

[5] Though Taks (2013) reveals that major events also have a large social influence.

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 6 Winter and 6 Summer Olympic Games, 5 FIFA World Cups and 3 Universal Expositions, where 8 of these events are celebrated before 1996, and 12 events during 1996-2016.

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
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 (1996-2016) in the 34 OECD countries considered.

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 subperiods. 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). This index is published biannually until 2002, so we linearly interpolate years 1997, 1999, and 2001.[6] 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: Perceived Corruption Index (M-CCI) and Events hosted

Figure 1.A. 34 OECD average

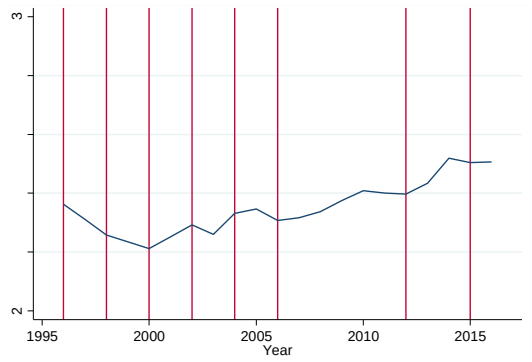


Figure 1.B. Greece

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.

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. Though

[6] Results without interpolating the index for years 1997, 1999 and 2001 do not show significant differences.

visual inference is difficult to establish, since average M-CCI has not to be 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.

Table 2: Descriptive statistics. 1996-2016.

Variable	Mean	Std.	Min.	Max.
Corruption index (M-CCI)	2.38	1.56	0.06	6.54
Per capita GDP	33,541	13,463	11,470	91,367
Population (thousands)	36,259	56,724	270.15	322,179
Urban population (%)	76.67	11.46	49.63	97.90
Years in office	6.37	7.64	1	71
Voice and accountability	7.32	0.83	3.74	8.6
Regulatory quality	7.54	0.90	5.08	9.2
Trade Openness (%)	85.98	54.10	19.85	382.45
Government expenditures (%	19.14	3.71	9.93	27.94

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

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, according to the existing literature.[7] 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 2.38, but the variance is relatively high: from values higher than 5 in México, Turkey, and Greece during the sample period, to values close to zero in Denmark, Finland, and New Zealand. Demographic variables show that countries included in the sample, all of them high-income economies, except for Mexico and Turkey, are mainly urban and get high values of the other institutional variables, which are voice and accountability, and regulatory quality, with a relatively low dispersion.[8] Meanwhile, on average, the political party of the current chief

[7] All variables properly defined in Appendix A.

[8] Mexico and Turkey are the only countries not considered as 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 or some measure of

executive has been in office for more than 6 years. Other factors indicate that the sample is formed by trade-opened countries, where public revenues are almost 20% of GDP.

2.2. Methodology

Our empirical approach isolates the effect that hosting mega-events could exert on the level of perceived corruption. In order to do that, we propose the following model:

$$corruption_{i,t} = \beta event_{i,t} + \lambda X'_{i,t} + country_i + year_t + \mu_{i,t} \quad (1)$$

where $corruption_{i,t}$ is the M-CCI, the level of corruption perceived by individuals described in the previous section. The explanatory variable $event_{i,t}$ is a dummy variable that takes value 1 from the moment when country i hosted an event, onwards, and 0 otherwise. Hence, the coefficient β can be interpreted as the average change in the level of perceived corruption that can be attributed to the hosting of the event. As explained above, β is 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. $X_{i,t}$ 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, with λ being the corresponding vector of coefficients. Equation (1) also includes country fixed effects to control for time-invariant characteristics, such as if the country is an ex-British colony, or is ruled by common law, and time fixed effects, to capture the aggregate trend generated by unmodeled time-specific and group-invariant effects. $\mu_{i,t}$ is the error term. To deal with potential autocorrelation and heteroskedasticity problems, we estimate our panel model using White-Huber robust standard errors. Meanwhile, one can argue that the level of corruption in a specific

political stability. This issue could give rise to misspecification problems, so we replicate our baseline estimates, shown in Table 3, to exclude these two countries. Results are almost identical to those displayed in Table 3 and, hence, all our conclusions are maintained.

country could affect 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 for the selection of a country in the bidding process, so the estimation approach does not have to correct a potential endogeneity bias.

The main concern with this approach is that it only identifies a discrete series break (static model), obviating that hosting these events may have very different short- and long-run effects on the level of perceived corruption. To tackle this issue, we incorporate a set of dummy variables for the year of the event and the following one, for years two and three after the event, and so on. Following this approach, we capture the entire dynamic response of perceived corruption to the events hosted. We use the following equation:

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

where $event_{i,t,k}$ 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, and 0 otherwise. With this set, we capture the entire dynamic response of the perceived corruption to the celebration of the event. Parameters included in δ_k are interpreted as follows: when they are negative (positive), they indicate that the level of perceived corruption has decreased (increased) after k periods since the celebration of the event in country i. Equation (2) also includes $X_{i,t}$, the set of covariates with its corresponding set of parameters γ, in addition to the country- and time-fixed effects, and the error term.

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 since the date of election 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. In Equation (1), the *event* dummy takes value 1 from the year of the opening of the event, and alternatively from the year of the election date; and in Equation (2), the set of dummy variables takes value 1 in period *t* when *k* years have passed since the country hosted the event, and alternatively since it has been elected to host the event.

Now, we discuss the determinants included in vector $X_{i,t}$. We consider the standard variables that the prior literature has found to be determinants of perceived corruption in industrialised countries, since less-developed countries have other specific fundamentals.[9] With very few exceptions, the literature reaches consensus on the role of per capita income in corruption. These two measures have a negative relationship, as noted in the Introduction; high income countries show a greater willingness to combat corruption (Lučić et al., 2016). The size of the country may also affect the level of corruption, since the organizational systems in highly-populated countries are more complex, so more incumbents are involved in the political decision-making and, subsequently, there are more opportunities for corrupt activities (Xin and Rudel, 2004). The degree of urbanization also affects the level of corruption, since urban population is more aware of public corruption than rural inhabitants, which acts as a control mechanism (Billger and Goel, 2009). Institutional factors are, definitively, key determinants of the level of corruption. On the one hand, we 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,

[9] In Appendix A, we include a more detailed description of the variables and the sources of the data.

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). On the other hand, the "regulatory quality" index reflects the ability of the government to regulate and implement policies aimed at developing the private sector. As Tanzi (1998) notes, countries with inefficient policies, toothless regulations, and wasteful bureaucracy, generally suffer from a lack of administrative transparency, and politicians and bureaucrats have an unfounded power to enhance illegal transactions. Therefore, the impact on the perceived corruption would also be negative. These illicit networks intensify 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. The degree of exports and imports of a country is related to its integration in the world economy which, in turn, affects the political structure and ethical norms (Sandholtz and Koetzle, 2000). Open economies have fewer bureaucratic obstacles (including trade taxes and tariffs), so officials maintain less control, and corruption schemes are discouraged. Finally, the size of the government is measured by the percentage of government expenditures over GDP. The existing literature has obtained mixed results regarding the relationship between the size of the government and the level of corruption, and the outcome obtained depends 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 democracies with a long history.

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 3.A, 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) shows the static response of perceived corruption: hosting mega-events is associated with an average increase in the level of perceived corruption, with the magnitude of this impact being slight, about 1.5%. However, to study the entire dynamic response of perceived corruption to hosting these events, we develop an alternative strategy. Column (2) presents the results for Equation (2). In this specification, the dynamic estimates show a limited and finite effect on perceived corruption, only statistically significant at 10% after the second year, and it disappears over the five years following the celebration of the event. However, 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 election 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 of bribery are higher. If this is true, we should pay attention to the year of the election of the country, instead of to the year of celebration of the event. For this reason, we show Panel 3.B, where we consider the year that countries were elected to host the events, as the cutoff point at which perceived corruption can be affected. In Column (3), we show the static response of perceived corruption to the election of the country to host the event, and the effect is almost triple that found in Panel 3.A, being statistically significant at 1%. In Column (4), the dynamic response shows a positive impact of the election of the country on the level of perceived corruption, and this effect does not fade over subsequent years, reaching its maximum value, about 5%, 4 or 5 years after the election of the country as host country, which is 1 to 2 years prior to the celebration of the event. According to these results, it is not the moment in which events are celebrated that makes a difference in terms of perceived corruption, but the time of

the election 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.

Table 3: Baseline Regression

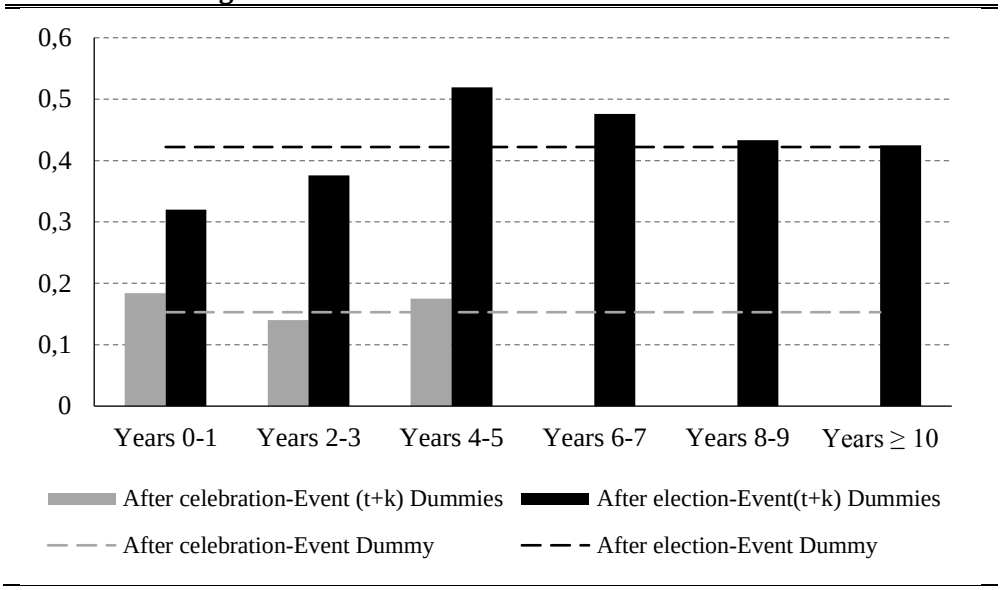
	Panel 3.A Year in which events were hosted		Panel 3.B Year in which countries were elected to host the events	
	(1)	(2)	(3)	(4)
Event	0.153**		0.422***	
	(0.075)		(0.090)	
Event 0-1		0.184**		0.320***
		(0.079)		(0.115)
Event 2-3		0.140*		0.376***
		(0.078)		(0.111)
Event 4-5		0.175*		0.519***
		(0.089)		(0.094)
Event 6-7		0.124		0.476***
		(0.096)		(0.099)
Event 8-9		0.024		0.433***
		(0.086)		(0.096)
Event ≥ 10		-0.005		0.425***
		(0.086)		(0.101)
Per capita GDP (log)	-0.848***	-0.916***	-0.888***	-0.886***
	(0.175)	(0.174)	(0.175)	(0.174)
Population (log)	-0.032	-0.090	-0.076	-0.063
	(0.323)	(0.317)	(0.319)	(0.321)
Urban population	-0.034***	-0.031***	-0.033***	-0.033***
	(0.007)	(0.007)	(0.007)	(0.007)
Years in office	0.003***	0.004***	0.003***	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Voice and accountability	-0.529***	-0.539***	-0.554***	-0.551***
	(0.057)	(0.057)	(0.058)	(0.058)
Regulatory quality	-0.300***	-0.286***	-0.277***	-0.282***
	(0.036)	(0.035)	(0.036)	(0.036)
Trade openness	-0.001	-0.002*	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Govt. expenditure	-0.014	-0.018	-0.021*	-0.023*
	(0.012)	(0.012)	(0.012)	(0.012)
Constant	19.957***	21.046***	20.515***	20.406***
	(3.327)	(3.248)	(3.273)	(3.264)
Observations	686	686	686	686
R-squared	0.976	0.977	0.976	0.977

Note: the sample covers the period 1996–2016 for the 34 OECD countries considered in the analysis. Columns (1) and (3) refer to the estimation of Equation (1), and Columns (2) and (4) to the estimation of Equation (2).

Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

In sum, we find that the election of the country to host a mega-event has a greater impact on the perceived corruption than the event itself. Figure 2 shows both the static and the dynamic response of our dependent variable to the hosting of the event and to the election of the country. It can be seen that the effect is greater and more prolonged when the election date is considered as the turning point.

Figure 2: Estimated coefficients - Event dummies



Note: this figure shows the estimated coefficients of the dummies included in Table 3 when they are statistically significant, at least, at 10%.

Turning our attention to the set of socio-economic, political, and institutional covariates included in the analysis, we find no striking results. The per capita GDP, the percentage of urban population, the "voice and accountability" index and the "regulatory quality" index, all show a negative and statistically significant impact on the level of perceived corruption, which has also been stated in the literature. On the contrary, some determinants previously highlighted are not statistically significant, or they are not so in all specifications. The size of the population does not affect the perceived corruption, and the negative relationship between this variable and

commercial openness is found only in Column (2). Estimated coefficients of the size of government, measured as the percentage that government expenses represent of the GDP, show that it barely has an impact on the level of perceived corruption, or the effect is not consistently found, so the results of Kotera et al. (2012) are only partially supported. We also find that the longer the party of the current chief executive has been in office, the greater the level of perceived corruption, which suggests that it takes time to build the structures necessary to defraud public resources.

3.2. Robustness checks

To reinforce the consistency of the previous results, in this section we apply some robustness checks to our previous 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 2012-2016.[10] Although we recognize this issue, we think that it is justified to use this alternative index for robustness purposes. Being conscious of this limitation, and with a comparative intention, we use this index and rescale it, so it ranges from 0 (the lowest level of perceived corruption) to 10 during the entire period. We show the estimates using this indicator for perceived corruption in Table 4.[11]

The static response of perceived corruption is positive and statistically significant in Panels 4.A and 4.B (Columns (1) and (3), respectively), and the magnitude of the impact is, again, almost doubled in Panel 4.B. As regards the dynamic response, there are significant differences.

[10] However, both subperiods seem quite uniform. The range of this index before 2012 is from 0 to 10, the mean for all countries during 1996-2011 being equal to 6.99. From 2012, the range of the index is from 0 to 100, and the mean is equal to 69.02.

[11] In order to increase the confidence in our estimates, we replicate the results shown in Table 4 only for the period not affected by the methodological shift (before 2012). Main conclusions are maintained.

In Column (2), we again observe a positive impact, that is diluted 6 years after the celebration of the event, not going beyond that point, which is in line with results shown in Panel 3.A of Table 3. When we analyse the dynamic response of perceived corruption to the election of the country as host country (Panel 4.B, Column (4)), we observe that there is a positive impact that does not disappear over subsequent years, with the magnitude of the impact always being greater than in Panel 4.A. Overall, these effects are greater than those obtained in the baseline estimation, reaching values over 6%, 2 to 3 years after the election date. This result strengthens the previous outcome: there is a before and an after when a country is elected to host a mega-event, when the level of perceived corruption increases, and does not return to its previous level of perceived corruption during the subsequent years. Finally, the estimated coefficients of the rest of the exogenous variables are similar to those obtained in Table 3, except for the population, which would positively impact the perceived corruption, as prior literature has found. Besides, the percentage of urban population loses its statistical significance when the dynamic response is evaluated.

Table 4: Robustness Check I
(Dependent variable: Control of Corruption Index, Transparency International)

	Panel 4.A Year in which events were hosted		Panel 4.B Year in which countries were elected to host the events	
	(1)	(2)	(3)	(4)
Event	0.310***		0.569***	
	(0.109)		(0.112)	
Event 0_1		0.405***		0.451***
		(0.113)		(0.149)
Event 2_3		0.296***		0.679***
		(0.106)		(0.158)
Event 4_5		0.335**		0.598***
		(0.143)		(0.124)
Event 6_7		0.209		0.598***
		(0.168)		(0.125)
Event 8_9		0.011		0.556***
		(0.121)		(0.122)
Event ≥ 10		-0.000		0.450***
		(0.130)		(0.147)
Per capita GDP (log)	-1.904***	-2.032***	-1.984***	-1.977***

	(0.303)	(0.308)	(0.301)	(0.308)
Population (log)	3.821***	3.665***	3.698***	3.600***
	(0.468)	(0.475)	(0.464)	(0.476)
Urban population	-0.026**	-0.018	-0.023*	-0.020
	(0.013)	(0.013)	(0.013)	(0.013)
Years in office	0.011***	0.012***	0.011***	0.011***
	(0.003)	(0.003)	(0.003)	(0.003)
Voice and accountability	-0.254**	-0.274**	-0.293***	-0.302***
	(0.106)	(0.107)	(0.105)	(0.107)
Regulatory quality	-0.268***	-0.241***	-0.232***	-0.217***
	(0.059)	(0.059)	(0.057)	(0.059)
Trade openness	0.000	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Govt. expenditure	-0.023	-0.033*	-0.033*	-0.034*
	(0.018)	(0.018)	(0.018)	(0.018)
Constant	-10.014*	-7.607	-8.323	-7.719
	(5.970)	(6.117)	(5.902)	(6.136)
Observations	676	676	676	676
R-squared	0.956	0.957	0.956	0.956

Note: Sample: 1996–2016. 34 OECD Countries considered in the analysis. Columns (1) and (3) refer to the estimation of Equation (1), and Columns (2) and (4) to the estimation of Equation (2). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

We also extend the set of exogenous variables included in vector $X'_{i,t}$ of Equations (1) and (2). These variables have been excluded from the baseline estimates because of their restricted availability, or their lack of statistical significance, but prior empirical studies have found that they are determinants of the perceived corruption. By incorporating these additional factors, we can test the robustness of our main results and examine if they do, in fact, exert an impact on the perceived corruption. In Table 5, we add the unemployment rate, the percentage of women over the total employment, the percentage of individuals over age 65, and an indicator of decentralization of the country, which consists of a dummy that takes value 1 if there are autonomous regions in the country following Beck et al. (2001). Details of these series and statistical sources can be found in Appendix A. High unemployment rates are associated with bad governance and lead to discontented citizens, who could blame possibly corrupt politicians for the unfavorable situation in the labor market. Estimations of our amplified model coincide

with this argument, although the statistical significance is low. As Dollar et al. (2001) find, women are less prone to commit illegal activities, so a higher presence of female public incumbents reduces the level of corruption. We use an alternative measure, also analysed in Swamy et al. (2001), the female share of the labour force, which can have a negative effect on the perceived corruption. However, the outcome does not support this hypothesis, since estimated coefficients are not statistically significant. With respect to the proportion of the elderly in the population, there are two transmission mechanisms that affect corruption. The first is that older individuals interact less frequently with government officials (Mocan, 2008), so they do not deal with bribery and other illicit procedures. The second states that older citizens are less actively informed, for example, via the internet (Goel et al., 2012), so they may be less aware of corrupt affairs. Results are ambiguous, since Columns (1) and (2) are in line with this idea, but when the election date is considered as a break point, estimates are not statistically significant. Regarding the level of decentralisation of the country, there is some evidence in favour of a positive relationship between the existence of self-governing regions and the perceived corruption, so our outcome partly agrees with that of Fan et al. (2009). A more complex political structure, with more administrative tiers, enhances the opportunity to commit fraud by government employees. Finally, we note that the static and dynamic effects of hosting mega-events almost disappear when we consider the celebration of the event as a threshold, but the main conclusions do not change when the election date is examined. In the same way, the impact of the rest of the exogenous variables is similar to our baseline estimates in both scenarios.

Table 5: Robustness Check II
(Additional covariates)

	Panel 5.A Year in which events were hosted		Panel 5.B Year in which countries were elected to host the events	
	(1)	(2)	(3)	(4)
Event	0.100 (0.074)		0.420*** (0.097)	

Event 0_1		0.130*		0.378***
		(0.078)		(0.117)
Event 2_3		0.102		0.342***
		(0.078)		(0.117)
Event 4_5		0.123		0.475***
		(0.090)		(0.103)
Event 6_7		0.053		0.431***
		(0.093)		(0.108)
Event 8_9		-0.036		0.392***
		(0.084)		(0.105)
Event ≥ 10		-0.083		0.353***
		(0.085)		(0.114)
Per capita GDP (log)	-0.521**	-0.568**	-0.538**	-0.564**
	(0.237)	(0.232)	(0.238)	(0.238)
Population (log)	-0.415	-0.528	-0.305	-0.348
	(0.430)	(0.427)	(0.426)	(0.429)
Urban population	-0.027***	-0.021***	-0.029***	-0.027***
	(0.007)	(0.007)	(0.007)	(0.007)
Years in office	0.004***	0.004***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Voice and accountability	-0.465***	-0.473***	-0.491***	-0.496***
	(0.058)	(0.057)	(0.059)	(0.059)
Regulatory quality	-0.285***	-0.270***	-0.265***	-0.263***
	(0.038)	(0.038)	(0.039)	(0.039)
Trade openness	-0.003***	-0.003***	-0.002***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Govt. expenditure	-0.020	-0.025**	-0.025**	-0.027**
	(0.012)	(0.012)	(0.012)	(0.012)
Unemployment Rate	1.175*	1.167*	1.253*	1.156*
	(0.646)	(0.631)	(0.652)	(0.657)
Female labor participation	0.008	0.007	0.010	0.009
	(0.006)	(0.006)	(0.006)	(0.006)
Elder population (%)	-2.780*	-3.580**	-1.049	-1.284
	(1.658)	(1.639)	(1.668)	(1.746)
Autonomous regions	0.197***	0.205**	0.115	0.156*
	(0.075)	(0.085)	(0.077)	(0.084)
Constant	19.044***	20.383***	17.775***	18.470***
	(4.518)	(4.414)	(4.483)	(4.548)
Observations	663	663	663	663
R-squared	0.977	0.977	0.977	0.977

Note: Sample: 1996–2016. 34 OECD Countries considered in the analysis. Columns (1) and (3) refer to the estimation of Equation (1), and Columns (2) and (4) to the estimation of Equation (2). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

Universal Expositions are the smallest events in terms of media reach, according to Müller (2015) implying that citizens are less aware of the specific features of the organization and

management of these events because they are less well-informed. Therefore, the civil control mechanism is weakened and the potential loss of public exposure and judicial penalties from committing illegal practices is lower. Thus, the hosting of such Expositions could exert a softer impact on the level of corruption perceived by citizens, and this could alter the results. Consequently, we re-estimate our empirical model to exclude Universal Expositions from the list of events under consideration. As can be seen in Table 6, estimated coefficients are very similar to those shown in Table 3. When we also exclude Winter Olympic Games because of their limited budget, since illicit behaviors would be enhanced with larger cost balances, the sample of events under consideration is only composed of Summer Olympic Games and FIFA World Cup championships, the two mega-events most commonly analyzed by prior literature. In this case, results are maintained.[12]

Table 6: Robustness Check III
(Without Universal Expositions)

	Panel 6.A Year in which events were hosted		Panel 6.B Year in which countries were elected to host the events	
	(1)	(2)	(3)	(4)
Event	0.142**		0.366***	
	(0.067)		(0.066)	
Event 0_1		0.160**		0.212**
		(0.074)		(0.102)
Event 2_3		0.135*		0.303***
		(0.072)		(0.097)
Event 4_5		0.177**		0.479***
		(0.085)		(0.078)
Event 6_7		0.113		0.440***
		(0.089)		(0.083)
Event 8_9		0.023		0.426***
		(0.080)		(0.078)
Event ≥ 10		-0.009		0.420***
		(0.080)		(0.080)
Per capita GDP (log)	-0.847***	-0.933***	-0.832***	-0.804***
	(0.175)	(0.177)	(0.174)	(0.172)
Population (log)	-0.011	-0.084	0.020	0.109
	(0.325)	(0.320)	(0.320)	(0.326)

[12] We do not show these estimates because they are very similar to the case of the exclusion of Universal Expositions.

Urban population	-0.034***	-0.031***	-0.032***	-0.033***
	(0.007)	(0.007)	(0.007)	(0.007)
Years in office	0.003***	0.004***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Voice and accountability	-0.530***	-0.534***	-0.560***	-0.547***
	(0.057)	(0.057)	(0.058)	(0.058)
Regulatory quality	-0.300***	-0.290***	-0.285***	-0.303***
	(0.036)	(0.035)	(0.035)	(0.036)
Trade openness	-0.001	-0.002*	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Govt. expenditure	-0.013	-0.018	-0.017	-0.020*
	(0.012)	(0.012)	(0.011)	(0.011)
Constant	19.743***	21.199***	19.037***	17.997***
	(3.369)	(3.349)	(3.324)	(3.332)
Observations	686	686	686	686
R-squared	0.976	0.976	0.977	0.977

Note: Sample: 1996–2016. 34 OECD Countries considered in the analysis. Columns (1) and (3) refer to the estimation of Equation (1), and Columns (2) and (4) to the estimation of Equation (2). Robust standard errors in parentheses. ***, **, * denote statistical significance at 1%, 5% and 10% level, respectively.

The last robustness check that we apply is a change in the estimation methodology. Panel data models are prone to show cross-dependence concerns. In fact, the Pesaran (2004) test rejects the null hypothesis of cross-sectional independence in our baseline models.[13] There, we prefer to show White-Huber robust standard errors in order to remove autocorrelation and heteroskedasticity problems but, in this section, we replicate our main estimation by using Driscoll-Kraay standard errors (Driscoll and Kraay, 1998), which avoid biased coefficients derived from this feature because they are robust to temporal and cross-sectional (spatial) dependence. Table 7 displays the results, which confirm the outcome of previous estimates, since the statistical significance of the estimated coefficients is supported.

Table 7: Robustness Check IV
(Driscoll-Kraay standard errors)

	Panel 7.A Year in which events were hosted		Panel 7.B Year in which countries were elected to host the events	
	(1)	(2)	(1)	(2)

[13] Pesaran (2004) CD test for specification of Columns (1), (2), (3) and (4) of Table 3 are -3.137, -3.091, -3.133 and -3.112, respectively.

Event	0.153**		0.422***	
	(0.067)		(0.123)	
Event 0_1		0.184**		0.320**
		(0.071)		(0.124)
Event 2_3		0.140		0.376***
		(0.084)		(0.121)
Event 4_5		0.175**		0.519***
		(0.075)		(0.120)
Event 6_7		0.124		0.476***
		(0.079)		(0.118)
Event 8_9		0.024		0.433***
		(0.061)		(0.127)
Event ≥ 10		-0.005		0.425***
		(0.073)		(0.146)
Per capita GDP (log)	-0.848***	-0.916***	-0.888***	-0.886***
	(0.149)	(0.141)	(0.145)	(0.138)
Population (log)	-0.032	-0.090	-0.076	-0.063
	(0.301)	(0.299)	(0.313)	(0.282)
Urban population	-0.034***	-0.031***	-0.033***	-0.033***
	(0.009)	(0.009)	(0.009)	(0.009)
Years in office	0.003**	0.004***	0.003**	0.003**
	(0.002)	(0.001)	(0.002)	(0.001)
Voice and accountability	-0.529***	-0.539***	-0.554***	-0.551***
	(0.066)	(0.071)	(0.070)	(0.073)
Regulatory quality	-0.300***	-0.286***	-0.277***	-0.282***
	(0.027)	(0.025)	(0.040)	(0.038)
Trade openness	-0.001	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.001)	(0.002)
Govt. expenditure	-0.014	-0.018**	-0.021**	-0.023**
	(0.008)	(0.009)	(0.009)	(0.010)
Constant	19.957***	21.046***	20.515***	20.406***
	(3.675)	(3.540)	(3.791)	(3.424)
Observations	686	686	686	686
R-squared	0.976	0.977	0.976	0.977

Note: Sample: 1996–2016. 34 OECD Countries considered in the analysis. Columns (1) and (3) refer to the estimation of Equation (1), and Columns (2) and (4) to the estimation of Equation (2). Driscoll-Kraay standard errors in parentheses. ***, **, * Statistical significance at 1%, 5% and 10% level, respectively.

4. Conclusions

The causes of corruption have been widely studied in the literature. 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 1996-2016. 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 both the election of the host country and the celebration of the mega-event itself positively impact the corruption perceived by citizens, but the effect is greater when the election date is taken into consideration as a turning point. When the celebration of the event is the breaking point, effects on the perceived corruption disappear after 5 years, but when we consider the election date as the threshold, perceived corruption can increase by 5% 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 methodology, 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 process 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.

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.

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.

Billger, S. M., and Goel, R. K. (2009). Do existing corruption levels matter in controlling corruption?: Cross-country quantile regression estimates. *Journal of Development Economics*, 90, 299-305.

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.

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.

Dollar, D., Fisman, R., and Gatti, R. (2001). Are women really the "fairer" sex? Corruption and women in government. *Journal of Economic Behavior and Organization*, 46, 423-429.

Driscoll, J. C., and Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics*, 80, 549-560.

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.

Goel, R. K., Nelson, M. A., and Naretta, M. A. (2012). The internet as an indicator of corruption awareness. *European Journal of Political Economy*, 28, 64-75.

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

Gupta, M. S., and Abed, M. 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.

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

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

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

Lučić, D., Radišić, M., and Dobromirov, D. (2016). Causality between corruption and the level of GDP. *Economic research-Ekonomska istraživanja*, 29, 360-379.

Maennig, W. (2005). Corruption in international sports and sport management: Forms, tendencies, extent and countermeasures. *European Sport Management Quartely*, 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 Vierhaus, C. (2016). Which countries bid for the Olympic Games? Economic, political, and social factors and chances of winning. *Hamburg Contemporary Economic Discussions*, 55.

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.

Mocan, N. (2008). What determines corruption? International evidence from microdata. *Economic Inquiry*, 46, 493-510.

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.

Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels. *Cambridge Working Papers in Economics* 0435.

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.

Swamy, A., Knack, S., Lee, Y., and Azfar, O. (2001). Gender and corruption. *Journal of Development Economics*, 64, 25-55.

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, Working Paper no. 45-4, International Monetary Fund.

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.

Xin, X., and Rudel, T. K. (2004). The Context for Political Corruption: A Cross-National Analysis. *Social Science Quarterly*, 85, 294-309.

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	Worldwide Governance Indicators	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	OECD	Per capita GDP in US$ at constant prices, expenditure approach. Constant PPPs reference year 2010. The per capita GDP has been included in the model in logs.
Population	The United Nations; Population Division; World Population Prospects	Total population by country, expressed in thousands. Population has been included in the model in logs.
Urban population (%)	The United Nations; Population Divisions; World Urbanization Prospects.	Percentage of individuals living in urban areas over the total in the country.
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.
Voice and accountability	Worldwide Governance Indicators	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).
Regulatory quality	Worldwide Governance Indicators	Prepared by the authors on the basis of data supplied by Worldwide Governance Indicators (WGI). Ability of government to implement regulations that promote private sector development. It ranges from 0 (minimum ability) to 10 (maximum ability).
Trade Openness	OECD	Ratio of the sum of exports and imports over the total GDP.
Government expenditure (% GDP)	World Bank national accounts data, and OECD National Accounts data files	General government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes 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.
Unemployment rate	OECD	Number of unemployed persons as a percentage of the labour force. The definitions of employment and unemployment conform with the definitions adopted by the 13th Conference of Labour Statisticians (ILO guidelines) with the exception that

		employment and unemployment estimates are based on labour force surveys which cover only private households and exclude all people living in institutions.
Female labour force (%)	The World Bank Data. International Labour Organization, ILOSTAT database	Percentage of the female population aged 15 and older that is economically active: all women who supply labour for the production of goods and services during a specified period.
Elder population	United Nations, Department of Economic and Social Affairs, Population Division	Share of population older than 65 years old on the total population
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.