How political competition and electoral rules affect grand and petty corruption? Evidence from the Italian regional panel data

Abstract

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Which kind of effects political system has on corruption? Literature has not reached an agreement on this. In fact, different studies show different results and, thus, a nuanced evidence arises about the effects of the main political variables, such as political competition (i.e. party system) and electoral formula, on corruption. This heterogeneity of results may be due to a sub-optimal operationalization of the corruption variable, since it refers to different phenomena. Starting from the idea that the political system is strictly related to the corruption activities arising in the high spheres of government, our paper aims to shed light on previous nuanced evidence through the investigation of different types of corruption depending on a different public power of the corrupt civil servants. Exploiting different corruption related crimes in the Italian penal code, we manage for the first time to discriminate among grand and petty corruption. As we expected, the empirics on the Italian regional elections among 2000 and 2015, show that political system variables have a significant effect on grand corruption only, and none on petty corruption. In addition, an electoral formula with more disproportional outcomes (i.e. a more majoritarian system), and a more competitive party system decrease grand corruption, while the majoritarian system in the presence of high competitiveness among parties has a triggering effect on grand corruption. The results enforce a branch of the literature, and are compatible with the idea that the shorter the horizon of a politician in charge is (due to the lack of political stagnation) the stronger the incentive to be corrupted is.

Keywords: Grand corruption; Petty corruption; Political competition; Electoral formula; Gallagher index; Herfindhal-Hirshman index.

JEL classification: C23; D72; H57; K16; R50

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1. Introduction

Corruption is a complex and multifaceted phenomenon representing a common issue for the vast majority of countries. Since the increasing awareness of corruption's harmful effects on political, social and economic aspects, a vast body of literature has addressed the study of corruption-related problems. Along these lines, several studies have found that corruption may dampen investment in physical capital (Mauro, 1995; Wei, 2000), reduce the quality of infrastructures and public services (Mauro, 1997; Haque and Kneller, 2015; Blane D. Lewis, 2016) and trigger political instability (Mo, 2001) and social inequality (Gupta, et al., 2001).

Although there seems to be a consensus on the negative effects of corruption, the main problems remain to measure and define it. The literature suggests many definitions of corruption depending on the specifics forms, acts or contexts underlying the phenomenon. What really is corruption and which are the different forms it may assume? Starting from the general definition provided by the World Bank (1997) of corruption as "the abuse of public office for private gain", this phenomenon may assume different forms and, thus, different names, such as administrative corruption, political corruption, kickbacks, bribery and so forth. Finally yet importantly, Transparency International (2016) provides an interesting distinction between grand and petty corruption mainly depending on a different level of the public apparatus in which corrupt activities appear. In other words, based on different public power of the corrupt civil servant, grand corruption occurs at a high level of the state apparatus (e.g. at political level), while petty corruption refers to everyday abuse of public power by low- and mid-level of public servants.

Taking into account these two different forms of corruption, our paper aims to shed some light on the relationship between grand and petty corruption, on the one hand, and the political system on the other hand. Although the political systems are not direct causes of corruption, they represent the institutional framework in which corruptive phenomena arise and take different forms. However, it is easy to argue that the elements of a political system, such as the political competition and the electoral formula, may be related to grand corruption rather than to petty corruption. In fact, the political system may create rent-seeking opportunities mainly for the politicians and, thus, increases grand corruption more than petty corruption that occurs at low level of public apparatus.

This insight is confirmed through the empirical results and represents the main contribution to the existing literature on corruption and the political system. The second contribution of our paper consists of the using of political data referring to regional elections rather regional data referring to national elections as in a previous similar study in Italy (Alfano et al., 2013). This aspect allows us to link corruption-related crimes committed at regional level with political system variables referring to the same region: a private corruptor is more likely to engage in rent-seeking activities with a corrupt politician belonging to the government of his/her region rather than with a member of the national parliament.

The study of the political environment in which corruption spreads is not a new research field, however a debated finding in the literature arises. Some studies (Persson et al., 2003; Kunikova and Rose-Ackerman, 2005) suggested that the proportional system triggers the opportunistic behaviour of politicians is more than the majoritarian system does, while other works (Myerson, 1993; Ceron and Mainenti, 2016) highlighted how a proportional system allow reducing corruption. The same puzzle arises in relation with the corruption-related effects of the political competition. Geddes (1997) and Bardhan and Yang (2004) found a triggering effect of the political competitiveness on corruption, while other author (Persson et al., 1997; Mulligan and Tsui, 2006) highlighted a hampering effect of the political competition on corruption. More recently, Alfano et al. (2013) found that the proportional system may contribute to reduce corruption both directly and indirectly, through a greater political competition.

The two above original contribution of our paper may allow solving a debated finding in the literature: does an electoral formula more proportional increase or decrease grand corruption? We further contribute to the literature on the topic, which has in past presented mixed results, with an explanation that helps to understand this heterogeneity of results. Our paper, in fact, shows that higher levels of political competitiveness and disproportionality (a more majoritarian electoral formula) have an isolated and direct dampening effect on grand corruption. However, in the presence of a greater political competition, the effect of the electoral formula is inverted: a more disproportional electoral formula increases grand corruption, ceteris paribus. The nuanced evidence in the literature could be addressed through adopting this new approach, analysing the effect of the political systems on grand and petty corruption separately, and employing regional data about the political factors.

The paper is organized as follow. In the next section there is a review of the existent literature on the topic, both in terms of relationship among corruption and political systems, and of grand and petty corruption. Section three briefly discusses the Italian scenario in the examined years, while section number four describes the data employed to perform the econometric analysis. In section five, we expose the estimation strategy. Section six shows and discusses the results and section seven concludes.

2. Literature review

2.1 Corruption and political systems

Corruption activities occur within a political system: the factors constituting this system, such as electoral formula and party system represent the framework in which the main government decision (e.g. the public spending allocation or the legislative activities) are taken. In fact, several rent-seeking opportunities for bureaucrats and politicians may arise from these government decisions. Consequently, the study of the relationship among corruption, political competition and electoral rules is crucial to understand the context in which corruption starts and takes roots. We can easily assume that the political system is mainly defined by the relative strength of the parties in a region, and thus the political offer, and by the electoral formula, defining how much political power these parties may obtain by running in the election. Electoral formulas and party system influence each other, and the Duverge (1972) attempt to write in stone rules defining a cause-effect relationship among the two, has been since the end of last century debated and often criticized for lack of empirical feedback of his theory.

In a democratic environment, political accountability may be ensured by different electoral rules that allow citizens choosing their political representatives, weighting the final decision on the political corrupt behaviour also. The main two families of electoral formulas are the majoritarian and the proportional systems that are characterised by different size of electoral districts and voting mechanisms. The majoritarian system is usually characterised by small electoral districts and the political party with a greater number of votes obtains the relative majority and the absolute majority of seats. In this political system, citizens directly express their preference through voting for a particular candidate.

On the other hand, in the proportional systems with wider districts and a proportional correspondence between votes obtained by a party and number of seats reserved for it, citizens may vote for different lists of candidates prepared by the political parties. In the real political environment, no system is entirely proportional or majoritarian: thus a number of indexes to measure the effect of the transformation of votes in legislative seats (which is what an electoral formula does) have been designed to measure the degree of proportionality between votes and seats in the outcome of elections, such as the Gallagher (1991) or Rae (1967) indexes.

The effect of the electoral systems on corruption is ambiguous, and the literature shows a nuanced picture. According to Myerson (1993), a proportional system with large electoral districts and small entry barriers entails a reduction of corruption, allowing the candidature of even honest political competitors. Considering the effect of corruption on the parties' vote shares, Ceron and Mainenti (2016) found that in a system with indirect appointment of politicians, such as the proportional system, corruption has a greater negative impact on the party's electoral performance. Consequently, party leaders would pay more attention when creating the party closed-list to avoid that rotten apples damage the party image and, thus, they will end up choosing less corrupt candidates. In contrast with these arguments, Chang and Golden (2007), found that a closed-list system, where the selection of candidates is controlled by the party leadership at national level, determines a level of corruption lower than an open-list system if the size of electoral district exceeds a threshold level.

Other empirical evidences (Persson et al., 2003; Kunikova and Rose-Ackerman, 2005) suggested that the rent-seeking behaviour of politicians is more likely to occur in the proportional system rather than in the majoritarian system. In fact, in the latter a greater responsibility of politicians towards their constituency due to a more direct selection of the candidates may lead to a less opportunistically behaviour of politicians. These arguments have been also supported by Ferraz and Finan (2011) that pointed out how electoral rules enhancing political accountability may better constrain the rent-seeking activities of politicians.

The degree of proportionality underlying the two different electoral systems may indirectly affect the rent-seeking activities of politicians through the political competition that represents one of the most powerful means of discouraging the corrupted behaviour of political parties. In fact, a strong political competition may lead to a greater accountability for the incumbent politicians that would honestly carry out their office in order to increase the likelihood of being re-appointed (Persson et al., 1997) or to avoid of being removed or replaced (Mulligan and Tsui, 2006). On the other hand, Bardhan e Yang (2004) pointed out that political competition may be so excessive as to reduce the likelihood of re-election and, thus, the incumbent politicians may adopt short-sighted behaviour and maximise rent-seeking opportunities until the end of their mandate, thereby leading to a higher level of corruption. Along these lines, Heywood (1996) and Geddes (1997) argued that an excessive political competition might generate further incentives for corrupt behaviour. In fact, more competitive political elections entail the need to collect greater campaign funds that, in turn, may lead politicians to abuse of their public power to better finance their electoral campaign.

In the light of the above nuanced evidences about the direct effects of electoral rules and political competition on corruption, the need for investigating these phenomena in an integrated manner arises. Nevertheless, the literature has neglected to study these interconnections up until now. Only one study (Alfano et al., 2013) attempted to test the role played by political competition in the relationship between electoral rules and corruption. The so called ABC framework proposed by the authors allows analysing the integrated effect of electoral rules and degree of political competition on corruption offences. The authors found that a proportional system may contribute to reduce corruption both directly and indirectly, through a greater political competition.

However, the effects of political competition and electoral rules on the politicians' opportunistic behaviour should be investigated through focusing on grand corruption only, since petty corruption usually refers to the opportunistic behaviour of bureaucrats or civil servants rather than to politicians. As highlighted further on, the differentiation between the two above types of corruption is useful to understand their different roots and, thus, planning the most suitable instruments to fight them.

2.2 Grand and petty corruption

Corruption is certainly a crime that endangers the stability and security of societies; nevertheless, it is a concept hard to be defined clearly, and it is even harder to operationalise it in a scientific work. Over the years, several definitions of corruption have been provided and adopted to study this multifaceted phenomenon. A general definition widely adopted by the literature (Rose-Ackerman, 1999; Lambert-Mogiliansky et al., 2007) is provided by the World Bank (1997) that defines corruption as "the abuse of public office for private gains". The vast majority of interviews via surveys use similar definitions or derived by the one used by Transparency International (2016), i.e. "the misuse of public power for private benefit".

Furthermore, different countries define corruption in different ways and the underlying legal criteria to define it in a cross country framework are slippery and fragile to analysis, since different legal systems and different cultures pose indeed different ideas of corruption. To complicate even more the topic, there are also some legal form of corruption (Kaufmann and Vicente, 2005). Most notably, the United Nations (2003) does not provide a comprehensive and universally accepted definition of corruption in its convention against corruption.

In the light of the above considerations, it can be concluded that the concept of corruption is elusive and it has many faces and this is the main reason that has pushed scholars to distinguish corruption into different forms. Among these distinctions, one of the most accepted is the one between petty and grand corruption. According to the Swedish International Development Cooperation (SIDA, 2011), petty corruption usually refers to bureaucratic corruption, whereas grand corruption to political corruptive activities, and state capture to the corruption activities which affect the entire state apparatus. Another distinction between the two kinds of corruption is provided by Transparency International (2016) and it is based on different typologies of civil servant engaged in the corruption agreement. Accordingly, grand corruption refers of acts committed at a high level of the state apparatus and it may distort policies or the central functioning of the state, enabling leaders to gain high value benefits, for example through diverting public funds. On the other hand, petty corruption refers to everyday abuse of public power by low- and mid-level of public servants in their deed to provide basic goods or services, such as in hospitals, schools, and so forth.

In the last decades, some studies have attempted to investigate corruption, taking into account the distinction between grand and petty. Among these, Bohn (2012) analysed the nexus among inflation and, respectively, grand and petty corruption, by extending the Barro and Gordon (1983) model. The author found that the grand corruption allows weakening the dangerous effect of the inflationary bias, both in developing countries and in advanced Western economies. In the conclusion, there is an interesting reference to the "state corruption" under the Democratia Cristiana and Craxi's socialist-DC coalition government in Italy. Kenny (2009) examined the impact of corruption in infrastructures, and concludes that corruption perception indexes are just proxies for petty corruption, rather than for grand corruption, at least in the context of infrastructures. This is of interest for our work, since it underlines the difference among grand and petty, and the problems underlying their proxies in the scientific works. More recently, Sommer (2017) studied the link between grand and petty corruption and the loss of forest in a cross section of many different nations. He explicitly proxies the two different kinds of corruption, that may lead to a deforestation and a loss of environmental quality through different channels. Then estimating the different coefficients, he argues that grand and petty corruption have different impact on loss of forest. His proxy of corruption is based on the executive corruption and the public sector indicators from V-Dem dataset (Coppedge et al. 2016).

There are also a number of regional studies that can be interesting in our framework that employs grand and petty corruption differences to discriminate their results.

Specifically, Blunt (2009) studied the grand and petty corruption in Timor-Leste, analysing it in a framework of bureaucratic and political accountability. His work argued that a significant anticorruption progress is achievable principally through sustained impartial service delivery that undermines beliefs in patronage, hastening the emergence of leaders of integrity and the growth of a middle class and the establishment of the rule of law.

Mashali (2012) analysed the relationship among perceived grand and petty corruption in Iran, finding out that the higher the perceived grand corruption in Iran is, the higher the petty corruption is.

Nystrand (2014) studied the dynamics of conflict caused by petty and grand corruption in North Uganda. His study highlights how different kind of corruption affect conflict dynamics in different ways. The work show how in northern Uganda while grand corruption is related to the conflict dynamics, petty is generally not.

Although there are several papers treating with grand and petty corruption, there are few works that measure them. Furthermore, there are no paper that singles out the effect of grand corruption within political systems that are the framework in which higher level of civil servants divert the vast majority of public fund.

3. The Italian Scenario

In the time span under investigation (2000-2015), Italy had just faced several interesting reforms. First, in 2001 Italy implemented a more complete form of federalism, via the so-called "Riforma del titolo V", a Constitutional change that allowed more legislative power and, ultimately, more independence, to each of the Italian region. This also means that each region could choose its own regional electoral formula, in order to elect their legislative and executive representatives. This implies that the alternation of different electoral systems, with different degrees of (dis)proportionality among votes received by parties and seats granted, allows us to test the impact of the electoral formula on corruption in a legal and socio-economic homogeneous framework. The twenty Italian regions are also characterized by different story of political culture, ideological roots and overall electoral strength of the different political parties. Indeed, some regions are typically more centre-right winged, especially in the richer north. A history of federalism and separatism characterizes other regions, such as the major islands (Sicilia and Sardegna) and the peripheral and bilingual regions (Valle d'Aosta, Friuli Venezia-Giulia and Trentino Alto Adige), that also have a special regional Constitution and specific autonomies granted. Finally, in the centre there are the so called "red regions", such as Toscana, Emilia-Romagna, Umbria and Marche, in which left winged parties are and were historically very strong. The Italian political context also represents a well suited scenario to test the hypotheses about the relationship among political competition and corruption, since there is variability both over time (with the rise and fall of some parties) and in space (due to the different sensibility to political issues in the different regions). It is remarkable that in the examined years Italy had rebuild from scratch its party system, after the collapse of pretty much all the parties due to the *Mani Pulite* operation (1992-1993) and the *Tangentopoli* scandal. This brought to the collapse of the Christian Democrat party (Democrazia Cristiana) ruling over Italy uninterruptedly since 1946, and the creation of new political subjects, that we can suppose have already found a steady state in the year 2000. To measure the level of political competition in the different Italian regions in the different years, we build an inverse *normalized Herfindahl concentration index*, as a proxy of the political competition in the given election. Unlike previous analysis, that exploited the national elections data (e.g. Alfano et al., 2013), our analysis focus on the regional dimension. Since 2000, the regional spending has grown more and more, making the regional government an attractive hub for rent-seeking activities, interested into gaining rents from the public spending. Furthermore, if is true that "…the political mechanism in Italy was characterized by the political patronage that allowed groups of citizens linked directly to politicians to reap high rewards through special laws or through political appointments …" (Alfano et al., 2013), it can strongly be argued that the interaction between politicians and groups of citizens, which is the basis for corrupt behaviour, happens within the same region. In other words, citizens of a region are willing to elect corrupt politicians in the same region. Therefore, at regional level the link between our measure of per capita corruption and the political indexes can be justified. The most interesting level to analyse is the one of the regional elections rather than the national ones. Thus, we calculate both the political competition index and the disproportionality index from data on the regional elections, and not using regional data about the national elections. Indeed, the regional government is a very interesting sector of rent-seeking activities, and it represents a political environment in which the probability that the supply and demand of grand corruption will match up is higher.

Finally, the use of regional data, instead of a cross-countries sample, allow us better addressing another issue. In fact, the interpretation of regressions based on cross-country data are usually affected by an unobserved heterogeneity. This happens because different countries greatly differ in many aspects related to corruption, such as culture, levels of government efficiency, socio-economic variables and effectiveness of economic policies. In the light of these considerations, using data from Italian regions

let us to analyse a much more homogeneous sample and it is easier to control for such heterogeneities in regressions based on within country data, rather than cross-countries analysis.

4. Data

A multiple set of sources are used to collect the data that allow performing the econometric analysis for a panel of 20 Italian regions in the time span 2000-2015. Table 1 summarises the description and the sources of each variable employed in the econometric analysis and the related summary statistics.

Tab. 1 - Variable definitions, sources and summary statistics

Variable	Description	Sources	Obs.	Mean	Std. Dev.	Min	Max
Grand corruption	Number of crimes reported for artt. 318 and 319 of the Italian penal code per 100,000 inhabitants	Criminal justice statistic yearbook (Istat)	320	0.565	0.428	0.000	2.770
Petty corruption	Number of crimes reported for artt. 320 of the Italian penal code per 100,000 inhabitants	Criminal justice statistic yearbook, (Istat)	320	0.032	0.066	0.000	0.789
INHHI	Inverted Herfindahl-Hirschman Index, Normalized between 0 and 1	Authors calculation from Historic Archive of elections (Ministry of the Interior - Department for Internal and Territorial Affairs). Regional Councils and Special Constitution regions website	320	0.889	0.048	0.779	0.971
GDI	Gallagher Disproportionality Index	Same sources of INHHI	320	0.055	0.026	0.019	0.172
Rae	Rae disproportionality index	Same sources of INHHI	320	1.406	0.605	0.589	4.440
Econ. Backwarness	Share of agricultural value added on GDP	Archive of the Regional Economic Accounts (Istat)	320	2.690	1.313	0.860	5.985
Publ. Investment	Capital public spending as percentage of GDP	Department of the General Accounting of the State of the Ministry of Economics and Finance (MEF)	320	1.651	1.140	0.172	8.351
Women	Women in regional government over men.	Same sources of INHHI	320	0.282	0.308	0.000	2.000
Ln Population	Natural logarithm of the annual resident population at 1st January.	Demographic Statistics (Istat)	320	14.464	1.062	11.686	16.118
Cooperativism	Percentage of employees of cooperative companies on the total of employees.	Archive of Territorial indicators for development policies (Istat)	320	4.305	1.086	2.715	7.248

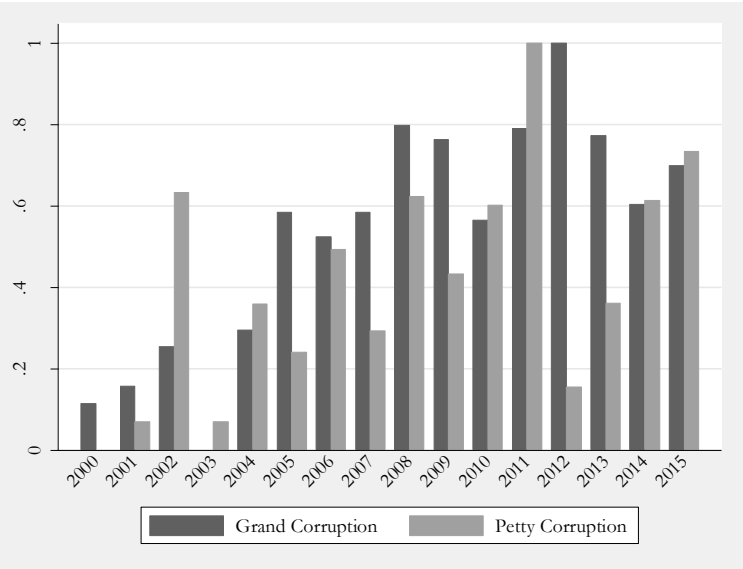
The judicial data on corruption-related crimes are provided by the Italian national institute of statistics (Istat) in the Criminal justice statistics yearbook. These data have been widely used in previous empirical studies (Del Monte and Papagni, 2001; Acconcia and Cantabene, 2008; Alfano et al., 2013) but in an aggregated form that conveys several crimes against the Public Administration (Book II, Title II of the Italian Penal Code). In this aggregate, in addition to the specific crimes of corruption, other crimes against the public administration are also included, such as embezzlement and misappropriation. In order to distinguish between Grand and Petty corruption, we employ regional data from the Criminal justice statistics yearbook (Istat) only concerning the complaints for specific corruption-related crimes. More specifically, we use an aggregate of the articles 318 ("corruption for official deeds") and 319 ("corruption for deeds contrary of official duties") of the Italian Penal Code as a proxy for Grand corruption, and the article 320 ("corruption of a party in charge of a public service") as a proxy for Petty corruption.[1]

The different law provisions of the above crimes are well suited to the hypothesis of a different level of public apparatus in which corruption occurs, distinguish the rent seeking activities depending on a different power of the public counterpart involved in the corruption agreement.

In fact, the articles 318 and 319 punish the corrupt public official that exercises deliberative, authoritative and certifying powers, and politicians that have legislative power. Accordingly, these kinds of corruption-related crimes refer to rent-seeking activities committed at a high level of government (e.g. large public procurement contracts) and, thus, represent a suitable proxy for Grand corruption. On the other hand, the article 320 refers to the same crimes mentioned in the articles 318 and 319, but it punishes a person in charge of a public service that does not has the above mentioned public powers of the public official. Accordingly, the corruption activities punished by the article 320 will refer to everyday abuse of public power by low- and mid-level public servants in the implementation of their public duties usually referring to the provision of basic goods or services (e.g. hospitals, schools, etc.) or the simple issuing of public authorisations or documents. Consequently, the article 320 of the Italian penal code represents a suitable proxy for Petty corruption.

Figure 1 shows that grand corruption has an increasing trend from 2000 to 2012, followed by a relative decrease. Petty corruption on the other hand follows a much more volatile trend. The year with the greater petty corruption is 2011, while 2012 is the one with the higher grand corruption. The year with the lower level of petty corruption is 2003, while 2000 is the one with lower grand corruption.

Fig. 1. – Grand and Petty corruption in Italy (average by year).

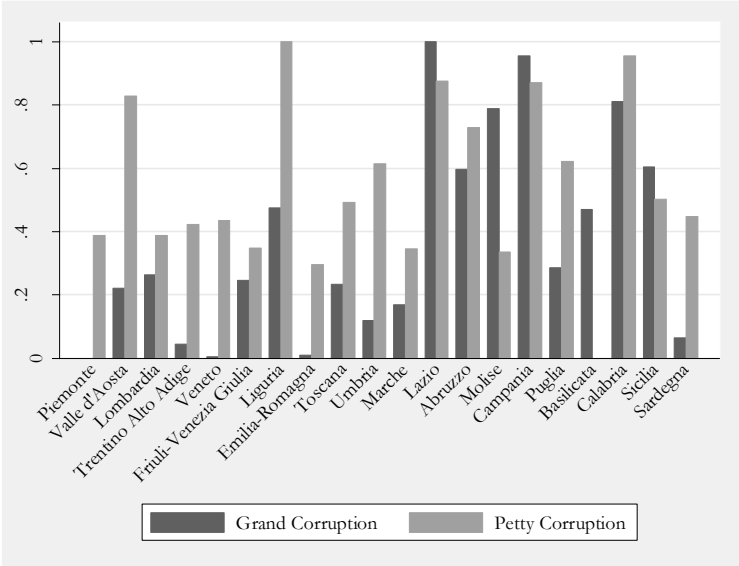


Source: elaborations of authors on ISTAT data related to corruption crimes reported per 100,000 inhabitants (Annals of Judicial Statistics). All values are normalized between 0 and 1.

[1] Because of the Italian reform of law on the crimes against the public administration (law n. 190 of 6 November 2012), for time span 2013-2015, the previous article art. 318 has become "corruption to perform the duties". However, the kind of white collar crime and the underlying legal obligations have not been changed.

In order to allow a comparison among different regions, data related to the total number of crimes reported in a given year for Grand and Petty corruption are expressed per 100,000 inhabitants. Figure 2 shows that Liguria is the region with the higher petty corruption, while Lazio is the one with more grand corruption. These results are coherent with previous studies (Capasso and Santoro, 2018). Especially the latter result is interesting, since Lazio is the region hosting the bigger share of central power (all the Government Departments are in Rome, and so are the main and most important public decision seats), thus a higher grand corruption was expected. On the other hand, Emilia-Romagna is the region with less grand corruption and petty corruption. This is in line with anecdotal and previous scientific evidences that usually draws Emilia-Romagna as a region with very high social capital and civic virtues, and with a history of very good and efficient local government.

Fig. 2. – Grand and Petty corruption in Italy (average by region).



Source: elaborations of authors on ISTAT data related to corruption crimes reported per 100,000 inhabitants (Annals of Judicial Statistics). All values are normalized between 0 and 1.

The Database - Historic Archive of elections (Ministry of the Interior - Department for Internal and Territorial Affairs) – Regional Councils provides data about the Regional elections. This database is employed in order to calculate the political variables such as political competition, electoral formula and presence of women in the regional government.[2] The index of Political competition among the Italian political parties at regional levels obtained through the Inverted Normalized Herfindahl-Hirschman Index (INHHI). In formal terms:

$$INHHI = 1 - \frac{HHI - \frac{1}{n}}{1 - \frac{1}{n}} \tag{1}$$

where $HHI = \sum_{i=1}^{n} v_i^2$ is the Herfindahl-Hirshman index with v representing the share of votes, expressed as a percentage, that each political party has obtained with respect to the total valid votes; n is the number of political parties in a given poll. This normalized index varies between 0 (perfect competition with n parties of equal size) and 1 (absence of political competition).

Another variable used to describe the political system is a normalized Gallagher index. Gallagher (1991) described this index to assess the disproportionality in a political election. By definition, any electoral formula transform votes into seats. This can be done in a more or less proportional way:

[2] For the five Special Constitution Regions of Italy (Valle d'Aosta, Trentino Alto Adige, Friuli Venezia Giulia, Sardegna and Sicilia), data are extracted from the institutional website of each Regional Councils.

Gallagher index measure exactly that. Thus instead of ranking electoral formula by their theoretical proportionality (or lack of) via this index we can assess the overall (dis)proportionality of an election confronting the outcome (in seats) with the input (in votes). In formal terms, the Gallagher Dis(proportionality) Index is equal to

$$GDI = \sqrt{\frac{1}{2}\sum_{i=1}^{n}(v_i - s_i)^2} \tag{2}$$

where *v* is the amount of votes obtained by each party *i*, and *s* is the amount of seat granted (and thus *v-s* is the difference among votes and seats). Thus the Gallagher index ranges among 0 (perfect proportionality, each party gets a share of seats exactly equal to the shares of votes obtained) and 100 (complete disproportionality in the assignment of seats). The Gallagher index is a proxy of the degree of proportionality in the outcome of the elections. We transformed this variable in a normalized 0-1 index, by dividing Gallagher per 100, to have the same range for GDI and INHHI (and thus their interaction). While many studies (Persson et al. 2003) have used a dummy variable to observe the effect of different electoral systems, in this way we take in account with a continuous variable of the proportionality of the election in the different regions and years, and as already said also taking in the account the real effects on the outcome of the election and not theoretical effects of the law that could not happen in the specific case.

As a further control for the (dis)proportionality outcome of electoral formula, we also calculate the disproportionality in election outcomes with another disproportionality index, the Rae index. Rae (1967) is the oldest disproportionality index, and is calculated as

$$RAE = \frac{1}{n}\sum_{i=1}^{n}|v_i - s_i| \tag{3}$$

where once again *v* are the share of votes and *s* the number of seats obtained by each party *i*. This index is more sensitive of Gallagher (1991) one to small parties, and it is usually considered worst then Gallagher (1991) in discriminating between few big deviations among votes and seats rather then many small deviations. The presence of women in the regional government is expressed as the number of women in regional government over the number of men.

Data on public investment are provided by the Department of the General Accounting of the State of the Ministry of Economics and Finance (MEF) and are measured as a percentage of regional GDP.

The Archive of the Regional Economic Accounts (Istat) provides data about Agricultural value added and regional GDP that allow measuring the variable Economic backwardness as a share of agricultural value added in the total GDP. This variable represents an inverted measure of the economic development in the Italian regions. The cooperativism is calculated as the percentage of Employees of cooperative companies out of the total number of employees and the data are retrieved by the Archive of Territorial indicators for development policies (Istat).

Finally, data on the annual resident population at 1 January are retrieved from the archives of Demographic Statistics (Istat).

5. Estimation strategy

In order to test a different effect of the above-discussed political factors on Grand and Petty corruption, a dynamic panel data econometric model is applied in two main different specifications, depending on the type of corruption. An Autoregressive Distributed Lag (ADL) model represents the basis for the econometric analysis:

$$Y_{jt} = \beta_0 + \sum_{i=1}^{n}\beta_i Y_{jt-1} + \sum_{i=1}^{m} d_i X_{jt-1} + f_i + u_{jt} \tag{4}$$

where $\boldsymbol{j}$ and $\boldsymbol{t}$ refer respectively to the twenty Italian regions and time (2000-2015); f_i are region-specific unobserved effects; $\boldsymbol{u_{jt}}$ is the error term; the dependent variable $\boldsymbol{Y}$ represents, alternatively, Grand and Petty corruption.

This econometric model allows us to describe dynamics of variables whose current levels strongly depend on their past values. According to previous studies on the determinants of corruption-related crimes in the Italian regions (Del Monte and Papagni, 2001, 2007; Capasso and Santoro, 2018), we employ an ADL (1,1). We use a one-year lag for the dependent variable, since corrupt bureaucrats or politicians usually tend to commit other corruption-related crimes in order to cover up or increase the original public misconducts in a short-time horizon. Moreover, we use a one-year lag for all the other regressors, because the corruption-related crimes are on average reported to the Italian Judicial Authority after a lapse of one year from their occurrence. We do not expect any large systematic differences among regions about the relationship between corruption offenses reported and those actually committed, since many previous studies on the corruption among the Italian regions (e.g. Del Monte and Papagni, 2007; Capasso and Santoro, 2018) have yet highlighted a significant spatial homogeneity in the Italian judicial data.

As far as the independent variables are concerned, $\boldsymbol{X}$is a vector of explanatory variables that includes the two variables proxy for political competition and electoral rules, as well as other control variables. We measure political competition through an *Inverted Normalized Herfindahl-Hirshman Index* (INHHI) and the different types of electoral formulas the Gallagher (dis)proportionality index and, for a robustness check, we also employ the Rae index as an alternative measure of political (dis)proportionality. In order to test both direct and indirect effects of the electoral formula on corruption through its influence in presence of different levels of political competition, the Gallagher and Rae indexes enter in the model in two ways: as isolated regressors and in the interaction terms among the (dis)proportionality index (Gallagher or Rae) and the political competition index (INHHI).

Other control variables include measurements of economic development, public intervention in the economy, gender gap, region size and social capital.

In order to control for the level of economic development, we employ a measure of *Economic backwardness* that has been widely employed by previous studies on corruption (Del Monte and Papagni, 2007; Capasso and Santoro, 2018).

As a measure of public intervention in the economy, we use the regional *Public investment* that is widely recognised as a source of rent-seeking activities for bureaucrats and politicians (Del Monte and Papagni, 2007; Alfano et al., 2013; Acconcia et al., 2014; Capasso and Santoro, 2018).

In order to take in account the gender gap dimension in the region and to control for the (over)representation of women in the regional government, we use ratio between female and male in the regional executive council, since some of the elections in the time span considered employed an anti-gender gap electoral law. This law allowed the voter to express two votes instead of one, as long as those where given to politicians of two different genders. This may lead to a bias in the amount of women in the legislative branch, since many of them were running in tickets with many male politicians. Furthermore, the representation into the government of the region is a very good proxy of the effective gender gap in the region, since the amount of members of the government is much smaller of the member of the chambers, and thus women representation in it expresses the real state of gender issue in politics in the region. Generally, the presence of women in public life has been found to reduce the level of corruption by previous studies (Dollar et. al., 1999; Sung, 2003; Alfano et al., 2013). Nevertheless, this finding is highly questioned, and we still do not have a main theory on why the presence of women should reduce corruption.

Following the approach adopted by previous studies (Persson et al., 2003; Alfano et al., 2013), we also employ as a control variable the *natural logarithm of population*, in order to check for the size heterogeneity of the twenty different Italian regions.

In order to capture the effect of the civic virtues on corruption, we include among the regressors the variable *cooperativism* that measures the percentage of cooperative business forms over the total number of firms. This variable is well suited to the concept of social capital proposed by Putnam (1994), since it represents the inclination arising from the social network to do things for each other, such as in the case of cooperative firms.

Finally, a geographical dummy "Special regions" is employed in all econometric specifications, in order to take into account for possible bias due to the legislative and fiscal autonomy characterizing the five Special Constitution regions of Italy.

The equation (3) is dynamic in the sense that it encompasses lagged values of the independent variable. This could entail an endogeneity bias whether correlation between individual fixed effects and the lagged explanatory variables arises. Following the recent empirical literature on corruption (Dollar and Kraay, 2004; Aidt et al., 2008; Alfano et al., 2013; d'Agostino et al., 2016), we estimate the basic econometric model in eq. (1) through adopting the generalised method of moments (GMM) in order to control for endogeneity bias. We employ the system-GMM estimators, introduced by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998) that take into account for possible endogeneity, treating the model as a system of equations in first-differences and in levels. The endogenous variables in the first-differences equation are instrumented with lagged values of their levels, whereas the endogenous variables in the levels equation are instrumented with lags of their first differences. According to Roodman (2009), the main concern is that the set of potential instruments conveys all sufficiently lagged variables, which exponentially increase with the number of times. However, an excessive number of instruments may lead to an over-fitting of the instrumented endogenous variables and, thus, lower the consistency of the GMM estimators. In order to use a lower number of instruments, the first suitable lag of the explanatory variables is adopted, and the instrumental variable set is collapsed, if necessary.

As a further robustness check, we also applied the two-step variant to the GMM estimators that is more efficient than one-step estimator, especially for system-GMM. Although the two-step is asymptotically more efficient, the two-step standard errors tend to be downward biased (Arellano and Bond, 1991; Blundell and Bond, 1998). In order to overcome this bias, a finite-sample correction to the two-step covariance matrix (Windmeijer, 2005) is applied.

An advantage of using these estimation methods is to avoid heteroskedasticity and serial correlation and of the errors. In order to control for the exogeneity of instruments in the presence of robust standard errors, the Hansen (1982) J-test of over-identifying restrictions is applied. Moreover, the Arellano and Bond (1991) test is applied to control for serial correlation of residues up to the second/third order, which can cause a bias to both the coefficients and to the estimated standard errors. Usually this test confirms the absence of second order serial correlation only, since the first differences induce serial correlation of the errors of the first order processed.

6. The estimation results

We first estimate the effect of the same political factors and control variables on Grand corruption and, then, on Petty corruption in order to verify our theoretical hypothesis about a closer relationship between political system and Grand corruption. Secondly, we test how the two kinds of corruption are differently affected by the political variables also indirectly through the interaction term between political competition (INHHI) and electoral formula (Gallagher disproportionality index). Finally, we put our estimates at robustness checks, both adopting a further index of disproportionality (Rae index) and two variants of system GMM estimator.

At first glance, Table 3 shows that grand corruption is affected by the political competition (INHHI) and the electoral formula (GDI and Rae) both directly and indirectly. At the same time, petty corruption is not. This is what we expected, since the former is a better proxy for political corruption that is widespread among politicians and political party, while the latter mainly occurs among low and low-middle level bureaucrats.

More specifically, grand corruption is lower when there is an electoral formula that generates a more disproportional outcome. In other words, higher levels of GDI (columns 1-2) or Rae (columns 5-6) directly decrease grand corruption, while no significant effect is found on petty corruption (columns 3-4 and 7-8). This evidence is in line with the study of Alfano et al. (2013), but it suggests that an electoral formula with more majoritarian effects only lowers grand corruption. This may be the case since in a more proportional system (i.e. less majoritarian one) the political campaign is typically more centred to the candidate rather than on the party. This may increase corruption through two possible channels. On one hand, the electoral campaign is more expensive for the candidate and, thus, he/she may be more interested into getting bribes to finance his or her campaign. On the other hand, in a proportional system

each vote is more relevant for the possible outcome, since each votes becomes a percentage of another seat (while in a majoritarian system with a number of seats granted for the winner, may be indifferent in terms of seats for the first party to win by 1% or 10%). In the light of the above considerations, it is easy to argue that in proportional system there is more grand corruption since a greater incentive to "buy" votes for the political entrepreneur. Finally, a majoritarian system can create the conditions for political stagnation, especially at a regional level, since it is harder for the opposition party to win elections. This also may have an effect on grand corruption, since in more majoritarian (proportional) systems, the politicians in charge have a longer (shorter) horizon of power that creates an incentive to exploit rent-seeking bribes in the long (short) term.

Table 3 - Grand and Petty corruption in political systems

	Gallagher index (GDI)				Rae index			
Dependent variables	Grand corruption		Petty corruption		Grand corruption		Petty corruption	
	S-GMM	2STEP	S-GMM	2STEP	S-GMM	2STEP	S-GMM	2STEP
Grand corruption (t-1)	0.358***	0.351***			0.360***	0.356***		
	(0.0838)	(0.0940)			(0.0834)	(0.0944)		
GDI (t-1)	-26.59*	-36.94**	-1.088	0.00775				
	(14.57)	(15.49)	(2.315)	(3.206)				
Rae (t-1)					-1.127**	-1.557**	0.0192	0.119
					(0.571)	(0.591)	(0.123)	(0.141)
INHHI (t-1)	-2.275*	-3.070*	0.0576	0.129	-2.267*	-3.243**	0.155	0.315
	(1.330)	(1.518)	(0.203)	(0.293)	(1.197)	(1.336)	(0.275)	(0.346)
GDI*INHHI (t-1)	30.41*	43.63**	1.404	0.0481				
	(17.83)	(19.21)	(2.893)	(3.955)				
Rae*INHHI (t-1)					1.325**	1.809**	-0.0167	-0.132
					(0.628)	(0.647)	(0.147)	(0.169)
Econ. Backwarness (t-1)	-0.118***	-0.145**	-0.0119	-0.0135	-0.130***	-0.144**	-0.0114	-0.0144
	(0.0448)	(0.0609)	(0.00745)	(0.00958)	(0.0431)	(0.0592)	(0.00739)	(0.00990)
Publ. Investment (t-1)	0.291***	0.320**	0.0112	0.0213	0.298***	0.327**	0.0107	0.0222
	(0.112)	(0.127)	(0.0121)	(0.0198)	(0.115)	(0.127)	(0.0120)	(0.0210)
Women (t-1)	0.0854	0.0160	0.0123	0.00939	0.0861	0.0433	0.0123	0.0100
	(0.124)	(0.124)	(0.0127)	(0.0132)	(0.135)	(0.132)	(0.0124)	(0.0133)
Ln Population (t-1)	0.0295	0.0240	0.000130	0.000152	0.0261	0.0219	0.000653	-8.55e-05
	(0.0186)	(0.0243)	(0.00330)	(0.00470)	(0.0190)	(0.0255)	(0.00341)	(0.00501)
Cooperativism (t-1)	0.0240	0.0313	0.000146	-0.00369	0.0245	0.0299	0.000418	-0.00336
	(0.0476)	(0.0562)	(0.00512)	(0.00485)	(0.0497)	(0.0588)	(0.00561)	(0.00546)
Special regions (Dummy)	0.121	0.103	0.00431	0.00997	0.0924	0.101	0.00474	0.00981
	(0.0872)	(0.102)	(0.00915)	(0.0127)	(0.101)	(0.114)	(0.00893)	(0.0120)
Petty corruption (t-1)			-0.0436	-0.0569			-0.0442	-0.0524
			(0.0330)	(0.0382)			(0.0327)	(0.0389)
Observations	300	300	300	300	300	300	300	300
No. of groups	20	20	20	20	20	20	20	20
No. of instruments	15	15	15	15	15	15	15	15
Hansen J-test (p-value)	0.091		0.405		0.091		0.335	
AR(1) test (p-value)	0.012	0.023	0.065	0.073	0.011	0.021	0.066	0.071
AR(2) test (p-value)	0.699	0.814	0.475	0.224	0.752	0.838	0.445	0.236

Notes: The time span is 2000–2015. The regressions are based on one-step (S-GMM) and on two steps (2STEP) Blundell and Bond System-GMM estimators. In all regressions the constant terms are not reported; significant coefficients are indicated by *** (<1% level), ** (<5% level) and * (<10% level); robust standard errors in parentheses.

The estimation results also suggest that the party system has a significant effect on grand corruption only. The more political competition there is in a region (a higher level of INHHI), the higher the number of political parties and candidates, which more equally share the votes market. The competitiveness among political parties, in turn, increases the incumbents' accountability toward the electorate, since the probability of being re-appointed is weakened by wider political alternative for voters.

Accordingly, the opportunity cost of being corrupt, which includes the probability of being exposed as corrupt to the electoral body and being not re-elected, is higher. This may lower corruption. This evidence is in line with some of previous studies (Persson et al., 1997; Mulligan and Tsui, 2006), but once again, our estimations confirm that the political variables, such as the party system, affect grand corruption only, while any significant effect is not found for petty corruption.

We included in the analysis an interaction variable among electoral formulas and party system. This allows us studying the indirect effect on corruption of a change in the electoral formula in a region, given a party system and, vice versa, a change in the party system, given an electoral formula. The regressions suggest that, within a degree of political competitiveness (INHHI), and increase in the disproportionality (a higher level of GDI or Rae), drives up grand corruption. This has two possible explanations. First, given the party system, a modify in the electoral formula in a majoritarian sense increases corruption because the first party now has more political power and it faces with a weaker opposition than it used to have. At the same time, given the party system a modify in the electoral formula towards a more proportional outcome decrease corruption, since new political subject, "new to the game" get in charge of the government, and the relative strength of the greater party, more likely to be in power to manage rent-seeking activities, is reduced.

The positive effect of the above interaction variable on grand corruption may be also explained adopting a different perspective. Under more majoritarian electoral rules (a higher level of GDI or Rae), where the candidate is more directly elected by voters, an increase in the political competition may lead the incumbent to myopic strategies. In fact, he/she may chooses to extract all the possible bribes until the end of their mandate, since a lower probability of being re-elected and, thus, leading to an increase in grand corruption. On the contrary, it is easy to argue that in a more proportional electoral system, where the list of candidates is chosen by the party at national level, an increase in the political competition may lead the incumbent to behave honestly. In this case, his/her opportunity cost of being detected in rent-seeking activities may be represented by the lack of his/her re-appointment by the party that is more concerned about its integrity image in the next round of elections. This may entail a reduction of grand corruption.

Following the arguments suggested by previous studies (Heywood, 1996; Geddes, 1997), another explanation of the positive effect of the interaction term on grand corruption may be related to the different characteristics of the electoral campaign under the two electoral formula. It could be argued that under majoritarian political system, a pressing political competitiveness undermines the re-appointment likelihood and may lead the incumbent to be more heavily committed in the electoral campaign, since the re-election is ensured by his/her own preferences. Accordingly, he/she may be engaged in fund raising or looking for votes also through rent-seeking activities and, thus, the level of grand corruption would rise. On the contrary, under a more proportional electoral system, there is a lower need of funds or direct preferences and, thus, an increasing political competition would not encourage the incumbent to engaged in corruption activities in order to ensure his/her re-appointment.

The estimation results also show a different effect of the control variables on grand and petty corruption. According to previous studies (Del Monte and Papagni, 2007; Capasso and Santoro, 2018), the coefficients on the variable measuring the degree of economic development, *economic backwardness*, are negative. As the economic development of the regions enhances (economic backwardness decreases), the opportunity to extract economic rents increases and so does corruption. However, the effect of the economic backwardness is significant (at 1% and 5% levels) for grand corruption only (columns 1-2, 5-6), while the effect on petty corruption is lower and not significant (columns 3-4, 7-8).

Table 3 shows similar results for the regional *public investments* that is our proxy for the degree of government intervention in the economy and it has been widely recognized as a source of rent-seeking activities by the literature (e.g. Mauro, 1998; Alfano et al. 2013; Haque and Kneller, 2015). Interestingly, an increase in the amount of *public investment* significantly triggers grand corruption rather than petty corruption, by implying that the funds for public investments are mainly diverted at high-level of public apparatus. Despite being insignificant and with the same signs, also the coefficients of *cooperativism*, our proxy for social capital, and the size of *population*, our proxy for the size of the regions, are a different magnitude for grand and petty corruption. Similarly, any significant difference on the two kinds of corruption is not found for the presence of *women* in the regional government. The dummy *special regions*

has an insignificant effect both on grand and petty corruption, confirming that our estimates on the twenty Italian regions are not affected by any bias introduced by different degree of autonomy underlying the five Special Constitution regions in Italy.
Finally, the Hansen (1982) J-test of over-identifying restrictions confirms the exogeneity of our instruments, while the Arellano and Bond (1991) test confirms the absence of serial correlation of the disturbances to the second order.

7. Conclusions

The main aim of the paper is to study the effects of political system on grand corruption that is more suitable to investigate the multifaceted phenomenon of corruption within a political environment. Focusing on the Italian regions in the first fifteen years of the century, our empirical analysis shows how an increase in disproportionality of the outcome of election (i.e. a more majoritarian electoral formula) decreases corruption. This result holds to two different disproportionality measures. The same deterring effect on grand corruption is also found for the proxy of political competitiveness (e.g. more parties with a similar electoral power). However, in the presence of high levels of competition, a majoritarian system is found to trigger the corruptive activities of the high spheres of public apparatus.
Both these results show how the horizon of politicians (i.e. how long they expect to stay in power) affects their incentives in extracting value from rent-seeking activities. Indeed, politician who predicts to have a longer horizon in power, reduce the extraction of value from rent-seeking activities, while a shorter horizon, mainly due to a pressing political competitiveness, trigger the opportunistic behaviour of politicians to maximize the rent extraction until the end of their mandate.
Our findings allow disentangling ambiguous results in previous literature that typically employs aggregated measures of corruption, without discriminating between grand and petty corruption.
The paper contributes to the literature on the effect of political system on corruption, adopting a new approach and using regional data on regional elections rather than regional data on national elections. This allow to better linking the corruption crimes with the related (regional) political system.
In addition, the use of reliable proxies of grand and petty corruption for the Italian regions represents a novelty both for the specific strand of literature on corruption and political systems and for the literature on corruption generally. In fact, the discrimination between grand and petty corruption lays the foundations for future research directions on corruption. Future studies may apply our findings to a different setting, increasing its robustness, or also explore the effects of administrative reforms or social capital on petty corruption, to study the other side of the coin.
Our results may also represent a useful contribution for improving political systems, especially in countries with high levels of corruption. For these countries, taking into account the effects of a political system or another on corruption, it is of the uttermost importance. Finally yet importantly, approach and results of this study may be generalized and applied in other countries also. In fact, better understanding how a country's political system affect different types of corruption may help to detect the deep roots of a country's corruption phenomenon and leads its anti-corruption policies towards specific (such as high, middle or low level bureaucrats) spheres of the public apparatus.

References

Acconcia, A., Cantabene, C. (2008). A Big Push To Deter Corruption: evidence from Italy. *Giornale degli Economisti, 67*, 75-102.

Acconcia, A., Corsetti, G., Simonelli, S. (2014). Mafia and Public Spending: Evidence on the Fiscal Multiplier from a Quasi-experiment. *American Economic Review, 104* (7), 2185-2209.

Aidt, T., Dutta, J., Sena, V. (2008). Governance regimes, corruption and growth: theory and evidence. *Journal of Comparative Econonomics, 36*, 195–220.

Alfano, M.R., Baraldi, A.L., Cantabene C. (2013). The role of political competition in the link between electoral systems and corruption: The Italian case. *The Journal of Socio-Economics, 47*, 1-10

Arellano, M., Bond S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies 58*, 277-297

Arellano, M., Bover O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics 68*, 29-51.

Bardhan, P., Yang, T. (2004). Political Competition in Economic Perspective. Bureau for Research and Economic Analysis of Development, Working Paper, 78.

Barro, R. J., Gordon, D. B. (1983). Rules, discretion and reputation in a model of monetary policy. *Journal of Monetary Economics 12*(1), 101-121. https://doi.org/10.1016/0304-3932(83)90051-X

Blundell, R., and Bond S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics 87*, 115-43.

Blunt, P. (2009). The political economy of accountability in timor-leste: Implications for public policy. *Public Administration and Development, 29*(2), 89-100. https://doi.org/10.1002/pad.522

Bohn, F. (2012). Grand corruption instead of commitment? Reconsidering time-inconsistency of monetary policy, *Journal of International Money and Finance, 32*, 478–490.

Capasso, S., and Santoro, L. (2018). Active and passive corruption: theory and evidence. *European Journal of Political Economy, 52*, 103-119. doi:10.1016/j.ejpoleco.2017.05.004

Ceron, A., Mainenti, M. (2016). When rotten apples spoil the ballot: The conditional effect of corruption charges on parties' vote shares. *International Political Science Review*, 1-14.

Chang, E., Golden, M. (2007). Electoral systems, district magnitude and corruption. *British Journal of Political Science, 37*, 115–137

Coppedge, M., Lindberg, S., Skaaning, S-E. (2016). Measuring High Level Democratic Principles Using the V-Dem Data. *International Political Science Review 37*(2), 1-14.

d'Agostino, G., Dunne, J., and Pieroni, L. (2016). Corruption and growth in Africa. *European Journal of Political Economy, 43,* 71-88.

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

Del Monte, A., Papagni, E. (2007). The determinants of corruption in Italy: regional panel data analysis. *European Journal of Political Economy, 23*, 379–396.

Dollar, D., Fisman, R., Garri, R. (1999). Are Women Really the Fairer Sex? Corruption and Women in Government. World Bank Working Paper Series No. 4.

Dollar, D., Kraay, A. (2004). Trade, growth, and poverty. *Economic Journal, 114*(493), F22-F49.

Duverger, M. (1972). Factors in a Two-Party and Multiparty System. *Party Politics and Pressure Groups*. New York: Thomas Y. Crowell. pp. 23–32.

Ferraz, C., Finan F. (2011). Electoral Accountability and Corruption: Evidence from the Audits of Local Governments. *American Economic Review 101*, 1274–1311.

Gallagher, M. (1991). Proportionality, disproportionality and electoral systems. *Electoral Studies, 10*, 33–51.

Geddes, B. (1997). The Political Uses of Corruption and Privatization. Paper prepared for presentation at the annual meeting of the APSA, Washington DC.

Gupta, S., de Mello, L., Sharan, R. (2001). Corruption and military spending. *European Journal of Political Economy, 17*(4), 749-777.

Hansen, L. (1982). Large Sample Properties of Generalized Methods of Moments Estimators. Econometrica 50, 1029-1054.

Haque, M. E., Kneller, R. (2015). Why does public investment fail to raise economic growth? The role of corruption, *Manchester School, 83*(6), 623-651.

Heywood, P. (1996). Continuity and change: analysing political corruption in modern Spain. In: Little, W., Posada-Carbo´, E. (Eds.), Political Corruption in Europe and Latin America, St. Martin's Press, New York.

Kenny, C. (2009). Measuring corruption in infrastructure: Evidence from transition and developing countries. *Journal of Development Studies, 45*(3), 314-332.

Kaufmann, D., Vicente, P.C. (2005). Legal Corruption. Retrieved 24 May 2018. from http://www.worldbank.org/wbi/governance/pubs/legalcorporate corruption.html.

Kunicova, J., Rose-Ackerman, S. (2005). Electoral rules and constitutional structures as constraints on corruption. *British Journal of Political Science, 35*(4), 573–606.

Lambert-Mogiliansky, A., Majumdar, M., Radner, R. (2007). Strategic analysis of petty corruption: Entrepreneurs and bureaucrats. *Journal of Development Economics, 83*, 351-367.

Lewis, D. (2016). Local government spending and service delivery in Indonesia: the perverse effects of substantial fiscal resources, *Regional Studies, 51*(11), 1695-1707.

Mashali, B. (2012). Analyzing the relationship between perceived grand corruption and petty corruption in developing countries: case study of Iran, International Review of Administrative Science, 78(4) 775–787.

Mauro, P. (1995). Corruption and Growth. *Quarterly Journal of Economics, 110*(3), 681–712.

Mauro, P. (1998). Corruption and the composition of government expenditure. *Journal of Public Economics, 69*(2), 263–279.

Mo, P.H. (2001). Corruption and economic growth. *Journal of Comparative Economics, 29*(1), 66–79.

Mulligan, C., Tsui, K. (2006). Political Competitiveness, NBER Working Paper, No.12653.

Myerson R. (1993). Effectiveness of Electoral Systems for Reducing Government Corruption: A Game-Theoretic Analysis. *Games and Economic Behavior, 5*(1), 118-132. doi: 10.1006/game.1993.1006.

Nystrand, M. J. (2014). Petty and grand corruption and the conflict dynamics in Northern Uganda. *Third World Quarterly 35,* (5), 821-835. https://doi.org/10.1080/01436597.2014.921432

Persson, T., Torsten, G.R., Tabellini, G. (1997). Separation of powers and political accountability. *Quarterly Journal of Economics, 112*, 1163–1202.

Persson, T., Tabellini, G., Trebbi, F. (2003). Electoral rules and corruption. *Journal of European Economic Association, 1*, 958–989.

Putnam, R. (1994). Making Democracy Work: Civic Traditions in Modern Italy. Prince-ton University Press, New Jersey.

Rae, D.W. (1967). The political consequences of electoral laws, New Haven: Yale University

Roodman, D. (2009). How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata. *Stata Journal 9*(1), 86-136.

Rose-Ackerman, S. (1999). Political Corruption and Democracy. Faculty Scholarship Series. 592. http://digitalcommons.law.yale.edu/fss_papers/592

SIDA (2011). Joint Evaluation of Support to Anti-Corruption Efforts 2002-2009. Report 6/2011 – Synthesis.

Sommer, J. M. (2017). Grand and petty corruption: a cross-national analysis of forest loss in low- and middle-income nations, *Environmental Sociology 3* (4), 414-426, doi: 10.1080/23251042.2017.1348569

Sung, H. (2003). Fairer sex or fairer system? Gender and corruption revisited. *Social Forces 82* (2.1), 703–723.

Transparency International (2016). What is corruption. Transparency International Berlin - Germany

United Nations (2003). Convention against corruption, resolution 58/4, 31 October 2003

Wei, S. J. (2000). How taxing is corruption on international investors? *Review of Economics and Statistics, 82*(1), 1-11.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics, 126*, 25-51.

World Bank (1997). Helping Countries Combat Corruption: The Role of the World Bank - Poverty Reduction and Economic Management.