

Decentralization, Transparency of Public Procurement, and Corruption in MENA Countries

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OF PUBLIC PROCUREMENT, AND CORRUPTION
IN MENA COUNTRIES**

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Abstract

This paper aims to study the effect of decentralization on corruption in the MENA region during the period 2001-19. We adopt the model of Fisman and Gatti (2002) and use two econometric methods: the instrumental variable method and the system Generalized Method of Moments (system GMM method). Firstly, we show that decentralization in these economies favors rent-seeking behavior and cannot be a mechanism to fight corruption. This result is robust for these two estimation methods and different corruption and decentralization indicators. Secondly, we introduce an interactive variable to the baseline model, which links the indicator of decentralization to that of transparency in public procurement. Likewise, we estimate this model by using the instrumental variable method and the system GMM method. We show that a threshold level of transparency in public procurement is necessary for successful decentralization and the reduction of corruption in MENA countries. This result is robust for the two estimation methods and different corruption and decentralization indicators.

Keywords: Corruption, decentralization, transparency in public procurement, panel data, instrumental variables method, system GMM method.

JEL Classifications: D73, H70, H57, C23, C26.

ملخص

الغرض من هذه الورقة هو دراسة تأثير اللامركزية على الفساد في منطقة الشرق الأوسط وشمال إفريقيا، خلال الفترة 2001-2019. نعتمد نموذج فيسمان وجاتي (Fisman and Gatti (2002) ونستخدم طريقتين للاقتصاد القياسي: طريقة المتغير الآلي وطريقة تحليل البيانات متعددة الأبعاد على مدى زمني محدد (GMM). أولاً، نبين أن اللامركزية في هذه الاقتصادات تفضل سلوك البحث عن الربح ولا يمكن أن تكون آلية لمكافحة الفساد. هذه النتيجة قوية بالنسبة لهاتين الطريقتين من طرق التقدير ولمختلف مؤشرات الفساد واللامركزية. ثانياً، ندخل إلى نموذج خط الأساس، وهو متغير تفاعلي، يربط مؤشر اللامركزية بمؤشر الشفافية في المشتريات العامة. وبالمثل، فإننا نقوم بتقدير هذا النموذج باستخدام طريقة المتغير الآلي وطريقة تحليل البيانات متعددة الأبعاد على مدى زمني محدد (GMM). وقد أوضحنا أن مستوى الحد الأدنى من الشفافية في المشتريات العامة ضروري لنجاح اللامركزية والحد من الفساد في بلدان الشرق الأوسط وشمال إفريقيا. وهذه النتيجة قوية بالنسبة لطريقتي التقدير ولمختلف مؤشرات الفساد واللامركزية.

Introduction

For more than three decades, international financial institutions have been encouraging developing countries to promote institutions of good governance that are capable of ensuring confidence and securing the transactions and expectations of actors. Thus, decentralization policies are inscribed in this context. They aim to democratize the decision-making process, limit the stakes of power, and restrict the scope of political authority against corrupt and rent-seeking practices. However, theoretical and empirical contributions on the impact of decentralization on corruption do not all point in the same direction. Many authors show that decentralization curbs corruption, and others argue that decentralization promotes opportunistic practices and stimulates corruption.

In this paper, we focus on the countries of the Middle East and North Africa (MENA) region. Indeed, initiatives aimed at strengthening subnational governance systems, as well as neoliberal reforms, have been part of the political agenda of MENA countries since the 1980s. Thus, the purpose of this paper is to study whether decentralization in MENA countries effectively improves institutions of good governance and the fight against corruption in these economies.

To do this, our work is divided into two sections. In the first section, we conduct a literature review on the effect of decentralization on corruption. We study the mechanisms through which decentralization restricts the discretionary power of public leaders and fights against their opportunistic behavior. We also show that decentralization does not undoubtedly lead to reducing corruption and that there are difficulties and constraints in putting decentralization policies in practice in some economies. For decentralization to be effective and successful, there are many support conditions. In this paper, we demonstrate that transparency in public procurement management is a necessary condition for successful decentralization and good local governance in MENA countries. In fact, one of the main goals of decentralization is to make public management transparent, as it is seen as opaque and corrupt at the central level. Likewise, the public market constitutes a decisive instrument, which materializes the local development project. The quality of management of municipal budgets manifests itself in the quality of management of its various procedures. The lack of predictability and transparency in public procurement reflects opportunistic behavior, patronage, and favoritism. In this regard, the OECD (2007) states that “corruption in public procurement is a structural problem that the term ‘public procurement’ seems synonymous with ‘corruption,’” in one of its reports on Corruption in Public Procurement. Therefore, establishing the institutions of good governance through decentralization policies can only be successful if it is accompanied by measures that ensure the integrity and efficient management of municipal public markets.

In the second section, we develop an empirical study on the effect of decentralization on corruption in MENA countries. First, we carry out a descriptive study of the preponderance of corruption in these economies as well as the decentralization reforms adopted in the different countries constituting our sample. We show that these economies are characterized

by pervasive corruption, the persistent authoritarian domination of the central state, and the insufficient provision of local services. We then conduct an econometric study on the effect of decentralization on corruption in the MENA region. By adopting the model of Fisman and Gatti (2002), we consider a balanced panel of countries in the MENA region during the period 2001-19 and apply two econometric methods: the instrumental variable method and the system Generalized Method of Moments (system GMM method). First, we show that decentralization in these economies promotes rent-seeking behavior and cannot be a mechanism for reducing corruption. This result is robust for these two econometric methods and for different corruption and decentralization indicators. Next, we introduce an interactive variable to the baseline model, which links decentralization to transparency in public procurement. Likewise, we use the instrumental variable method and the system GMM method. We show that a minimum of integrity and transparency in public procurement is necessary for successful decentralization and the fight against corruption in the MENA region. This result is robust for different corruption and decentralization indicators and different estimation methods.

Our contribution to the literature consists of introducing the temporal dimension into the model of Fisman and Gatti (2002). These authors develop a cross-sectional data study to examine the impact of fiscal decentralization on corruption for a sample of 57 countries of unequal levels of development. Furthermore, and unlike previous empirical works, we use a measure of decentralization that takes into account both the decentralization of decision-making and the degree of local government autonomy. This measure is taken from the Institutional Profiles database, which is based on an approach that focuses more on the degree of application and the prevalence of an institution than on its existence and legal form. Finally, and according to our knowledge, there is no previous work showing that transparency and integrity in public procurement are prerequisites for successful decentralization and the establishment of good local governance.

1. Decentralization and corruption: A literature review

In general terms, decentralization consists of a transfer of authority, resources, and competencies from a central government to a subnational entity. Likewise, decentralization can come in different forms (fiscal, political, and administrative). According to Faguet (2014), decentralization is one of the most important reforms of past generations, given the profound implications it has in terms of the quality of governance. Campbell (2001) assimilates decentralization with a “quiet revolution,” as it generates a new model of governance based on competent leadership, strong popular participation, and a reduction in the abuse of power by public authorities. Likewise, multilateral organizations argue that decentralization helps fight public corruption by shifting certain functions and resources from the central government to lower levels. Furthermore, numerous empirical studies in many countries show the existence of a negative relationship between corruption and decentralization. Thus, Fisman and Gatti (2002) conduct a cross-sectional data study on 57 countries with unequal levels of development and show that fiscal decentralization makes it possible to reduce corruption in these economies. In addition, Arikan (2004) conducts an

empirical study in cross-sectional data for 40 countries and shows the existence of a negative and significant relationship between fiscal decentralization and corruption. Gurgur and Shah (2005) also develop an empirical study for a sample of 30 countries (developing and industrial countries) using the weighted least squares (WLS) method. They show that decentralization has a negative impact on corruption. Likewise, the authors conclude that the centralization of decision-making and the presence of underdeveloped democratic institutions reinforce corruption in these economies. Similarly, while using an empirical study of a set of countries, Altunbaş and Thornton (2012) confirm the existence of a negative and significant relationship between fiscal decentralization and corruption.

However, many other empirical studies show that this negative relationship between decentralization and corruption is nuanced and that the success of decentralization depends on the existence of preconditions. Thus, Kilkon Ko and Hui Zhi (2012) carry out an empirical study on 31 provinces in China during the period 1998 and 2008 and show that fiscal decentralization aggravates corruption in local Chinese governments, which are characterized by poor compliance with the rule of law. In contrast, the negative relationship between corruption and decentralization is maintained in local governments, characterized by strong legal systems and political goodwill to fight corruption. These results are robust to different estimation methods and different measures of decentralization and corruption. In addition, Alfada (2019) studies the effect of fiscal decentralization on corruption in the local governments of 19 provinces located in Indonesia during the period 2004 and 2014. Thus, the author applies the method of dynamic panel data and shows that fiscal decentralization increases corruption in local governments. This result is explained by a lack of competent human resources, low transparency, limited accountability, and the high dependence of local governments on central government grants.

Therefore, decentralization cannot inevitably lead to good local governance and constitute a tool to fight corruption unless it is accompanied by numerous conditions. In this context, several questions arise. Through what mechanisms does decentralization make it possible to reduce corruption in local administrations? What are the difficulties and constraints that inhibit the transmission of the beneficial effects linked to decentralization in certain economies?

Based on numerous theoretical and empirical works, we distinguish different channels of transmission of the effects of decentralization on corruption. First, and according to the theoretical predictions of Tiebout (1956) and Oates (1972), it can be said that competition between local governments improves the efficiency of public administration and reduces corruption. If elected officials in one jurisdiction behave corruptly, investors and citizens will move to other jurisdictions.² This leads to a reduction in fiscal resources. This situation encourages political decision-makers to improve the effectiveness of their policies and adopt

² It should be noted that Tiebout (1956) asserts that the effectiveness of decentralization is limited by the perfect mobility of economic agents, the existence of economies of scale, and spillover effects (the costs and benefits of public goods do not spill over from one community to another).

adequate behavior so as not to be sanctioned in the next elections. Furthermore, Weingast (1995) shows that competition between jurisdictions reduces corruption and increases the efficiency and honesty of the government. Similarly, Breton (1996) argues that decentralization reduces corruption in democratic regimes through inter-jurisdictional competition. The author shows that corruption is vulnerable to the number of jurisdictions. The lower this number, the greater the corruption because it is easier for a small number of centers to regroup and defraud the population. In contrast, Bardhan and Mookherjee (2006) point out that competition between jurisdictions is similar to electoral competition between political parties. The existence of a dominant party can lead to greater coordination between interest groups and can foster corruption at the local level.

Decentralization brings about a geographical rapprochement between political decision-makers and citizens. In this regard, Fan et al. (2009) and Kolstad et al. (2014) show that this proximity could reduce information asymmetries between them and increase the responsibility and accountability of such decision-makers. This consequently reduces their incentive to adopt opportunistic or rent-seeking behavior. However, this proximity can also induce a higher risk of corruption, particularly in developing countries, where controls are weak. Tanzi (1995) argues that in developing economies, corruption is more prevalent at the local level since it is stimulated by the proximity of citizens to decision-makers. This helps encourage favoritism and nepotism. Likewise, Prud'homme (1995) and Bardhan (2002) underline that the proliferation of public decision-making centers in developing countries makes local decision-makers more sensitive to pressure from interest groups and pushes them to establish privileged relationships.

Finally, the control and direct accountability of political decision-makers involved in decentralization improve the performance of politicians. This consequently reduces corruption (Persson and Tabellini, 2003). In a decentralized system, each agent is held directly responsible for a specific task within their own jurisdiction. In contrast, in a centralized system, politicians are responsible for a multitude of tasks affecting many jurisdictions. However, improving the accountability of public decision-makers through decentralization requires a fairly advanced level of education, political awareness of citizens, local democracy, and an absence of distributional conflicts at the local level (Galasso and Ravallion, 2005). According to Bardhan and Mookherjee (2006), these conditions may appear unfulfilled in poor countries. Thus, it is not certain that decentralization curbs corruption in these economies. According to Batterbury and Fernando (2006), decentralization has often been carried out in an incomplete manner, giving way to hybrid forms closer to “deconcentration.” This latter term means “the transfer of functions and powers to ‘antennas’ of the central government” (Olsen, 2007), which further reinforces corruption and rent-raising strategies. Olsen (2007) also asserts that if “decentralization” has not been successful, the fault does not lie with decentralization per se but with the decentralization model implemented, referred to as deconcentration. In the same vein, Froger et al. (2008) state that the insufficiency of really transferred powers, accountability mechanisms vis-à-vis the local population, and the financial resources associated with

decision-making act as brakes to decentralization policies. Furthermore, Lecuna (2012) shows that countries with a high number of first-level subnational governments relative to their population are more corrupt. Indeed, civil servants in smaller jurisdictions tend to be more captured by economic and political elites since oversight and whistleblowing mechanisms are relatively weak. In addition, officials in regional governments are less reliable because they are underpaid, uncooperative, and demotivated compared to those at the central level. Thus, the offering and acceptance of bribes, conflicts of interest, collusion, favoritism, and nepotism are situations that may compromise integrity in public management, particularly in the awarding of municipal public contracts. In fact, public procurement is a major issue for local communities. Therefore, in order to promote local investment and satisfy the operating needs of the municipal public service, the municipality concludes public contracts, which are the legal means used by the public authorities to procure the goods and services which are essential to them, with the most advantageous price/quality ratio. However, the abuse of power in local communities leads the elected authority to surround itself with collaborators with whom it shares ties of kinship, friendship, or political affiliation. In this regard, the OECD (2007) asserts that “corruption can occur at any stage of this process, from the moment when one decides on the need for a project, until its completion, in through the drafting of specifications and the launch of the call for tenders.” As a result, local development policies are then emptied of their content, offering no chance of success. In this regard, several development partners require local communities in most developing economies a minimum of transparency in public procurement procedures before intervening or strengthening their technical and financial support.

2. Decentralization and corruption: An empirical study

The purpose of this section is to study the effect of decentralization on corruption in the MENA region. This section is divided into two subsections. In the first one, we develop a descriptive study of the decentralization policy followed in the countries of the MENA region. In the second subsection, we conduct an econometric study on a panel of MENA countries during the period 2001-19. The constraint of data limits our sample to four MENA countries: Algeria, Egypt, Morocco, and Tunisia. We apply different estimation methods (the instrumental variable method in panel data and the system GMM method) to show that decentralization in these economies favors rent-seeking behavior and cannot be a mechanism to fight corruption. This result is robust for different corruption and decentralization indicators and different estimations. Then, we insert an interactive variable into the baseline model, which links the indicator of decentralization to that of transparency in public procurement. We show that a threshold level of transparency in public procurement is necessary for successful decentralization and the reduction of corruption in MENA countries. This result is robust for different corruption and decentralization indicators and different estimation methods.

This empirical study is based on the article of Fisman and Gatti (2002), who examine the impact of fiscal decentralization on corruption for a sample of 57 countries. They conduct a cross-sectional study and show a negative and significant relationship between corruption and

decentralization. Also, according to Fisman et al. (2002), decentralization is expressed as the share of regional spending in total public spending. However, this measure does not undoubtedly reflect a real decentralization of decision-making and does not necessarily correspond to local government autonomy in the allocation of resources. Given this constraint, we use a measure of decentralization, which considers both the decentralization of decision-making and the degree of autonomy of the local government. This measure is extracted from the Institutional Profiles database, which is based on an approach that focuses more on the degree of application and prevalence of an institution than on its existence and legal form. To our knowledge, there are no indicators in the empirical literature allowing for a comparative analysis at the transnational level, as an extent of an effective decentralization of decision-making. Therefore, our decentralization indicator is the best available proxy. Moreover, our contribution in this paper is to introduce the time dimension in Fisman et al. (2002) and conduct an empirical study on panel data. We also introduce another indicator variable to the model, which takes into account the degree of transparency in public procurement.

2.1 Decentralization policies in the MENA region: A descriptive study

According to Transparency International, the MENA region is still perceived as highly corrupt, with an average score of 39 out of 100 and little progress made toward controlling corruption (knowing that 0 indicates a high level of corruption and 100 indicates no corruption). The United Arab Emirates and Qatar have recently been the top regional performers on the Corruption Perceptions Index (CPI), while Libya, Yemen, and Syria are among the worst performers.

Furthermore, a common feature of MENA countries is the concentration of authority and resources in a single state. As a result, participation and citizenship rights are denied, and unequal growth is observed within the same country. Since the 1980s, initiatives to develop subnational governance systems have been part of the political agenda in MENA countries. However, decentralization attempts were a façade, strictly controlled by increasing the center's power through deconcentrated state agents. What most MENA countries have implemented as decentralization in recent years is merely a “deconcentration,” which is a process by which the central government relocates and disposes of its agents geographically, from the capital down to the region. Deconcentration does not imply a complete transfer of responsibility, decision-making, and resources to local governments; rather, some administrative and management responsibilities for specific functions are delegated. While political decentralization supports strong local leadership, deconcentration aims to maintain or even reinforce authority and financial resources in the central government; the influence of local authorities on local public policies remains limited (Jari, 2010).

MENA regimes promote decentralization but tend to oppose developments that could endanger their dominance. Central-state governments have also expressed concerns about sharing power with elected subnational governments, or even their own regional branches

(Kherigi, 2017; Harb and Atallah, 2015). Subnational governments alone are not responsible for the success of local governance reforms in MENA. It relies on major changes in the political structure that must be prepared for decentralization. The recently restructured subnational councils in Morocco, Tunisia, and Jordan hint at issues with inexperienced and badly qualified representatives who are not always prepared to face key local administrators or administrative overseers (Vollmann et al., 2020; Kherigi, 2020). Though often treated as a separate form of decentralization, fiscal decentralization is a necessity for effective political decentralization; legislative goodwill and vast competencies on paper are of little use to subnational actors. However, many MENA decentralization processes are characterized by massive underfunding problems.

This predicament is further augmented by problems of understaffing, leading to the inability of local governments to effectively spend their sparse funds (Vollmann et al., 2020; Yerkes and Muasher, 2018). Moreover, most decentralized actors in the MENA region still depend on central government transfers for most of their funding. Local tax collection does not yet adequately contribute to subnational funding. While local governments in some countries have the right to raise and collect taxes, most face problems with tax collection, be it through insufficient enforcement power or decisions to not tax constituencies due to political reasons (Harb and Atallah, 2015a; Kherigi, 2017; Kherigi, 2020).

In Lebanon, communities collect a wide array of fees, but the collection costs surpass the revenue. In Jordan, Morocco, and Yemen, local governments often decide not to collect taxes to please their political bases (Harb and Atallah, 2015a; Vollmann et al., 2020). The new decentralization process in Tunisia still suffers from citizens' refusal to pay local taxes, and there is little interest to incentivize their collection (Yerkes and Muasher, 2018).

In 2008, public spending on local governance averaged five percent in the MENA region compared to 35 percent in OECD countries (Harb and Atallah, 2015b; Kherigi, 2017; UCLG, 2009). Morocco and Tunisia are among those that established decentralization laws following the Arab protests of 2010/11. While they show some individual progress, there are no sufficient efforts toward fiscal decentralization. Tunisia has taken massive steps in turning from a highly centralized autocratic system toward a decentralized democracy but only spent 7.8 percent of total government spending (2.1 percent of its GDP) and 3.4 percent of public staff expenditure on its local governments in 2016 (Bohn et al., 2018; UCLG, 2009). Morocco, as one of the “forerunners” of decentralization in the region, spent 3.4 percent of its GDP, or 11.8 percent of its total government expenditure, on its different subnational governments in 2016. Jordan also accelerated its decentralization process after the Arab uprisings, spending 2.3 percent of its GDP (eight percent of its total public expenditure) on local governments. The share of staffing costs in the Jordanian case is surprisingly high, with local governments accounting for 22.6 percent of public staff expenditure.

2.2 The effect of decentralization on corruption: An econometric study

The specification of the model

As mentioned above, in this study, we adopt the model of Fisman and Gatti (2002), which is presented as follows:

$$\begin{aligned} CORRUPT_{it} = & \beta_0 + \beta_1 DECENT_{it} + \beta_2 GOVSHARE_{it} + \beta_3 CIVIL_{it} + \beta_4 \ln(POP_{it}) \\ & + \beta_5 SCHOOL_{it} + \beta_6 \ln(GDP_{it}) + \alpha_t + \mu_i + \varepsilon_{it} \end{aligned} \quad (1)$$

Where,

CORRUPT: Corruption index

DECENT: Decentralization

GOVSHARE: Government share

CIVIL: Civil liberty

POP: Population size

SCHOOL: Tertiary education rate

GDP: Gross domestic product

We note that the index *i* designates the country *i* and the index *t* designates the date *t*. β_0 is a constant of the model, and $\beta_1, \beta_2, \dots, \beta_6$ are the coefficients to estimate. μ_i is country-fixed effects, α_t is the year dummy or time fixed-effects to account for common shocks affecting all countries in the entire sample period, and $\varepsilon_{i,t}$ is a random term.

For the corruption index, we use two corruption indices that are commonly used in the economic literature. These include the CPI and the Control of Corruption index (CC). These indexes focus on corruption in the public sector and rank countries according to the degree of perceived corruption in government and politics. The scores of the CPI are based on a scale³ ranging from 0 (very corrupt) to 10 (no corruption). The CC index ranges from -2.5 (low governance performance) to 2.5 (high governance performance). Therefore, the higher each of these corruption indices, the healthier the institutional environment and the lower the corruption.

The decentralization is approximated by two indicators: the fiscal decentralization index and the political decentralization index. The fiscal decentralization index (FISCAL) is extracted from the Institutional Profiles database. This index is a composite index since it includes other sub-indices, which indicate the degree of fiscal autonomy of sub-national authorities (states in case of federation, regions, provinces...etc.). Moreover, this measure varies between 0 and 4, where 0 indicates that there is no fiscal autonomy and 4 indicates that all local resources are collected locally. The political decentralization measure (POLITICAL)

³ In this study, the CPI indicator is rescaled. In the International Transparency database, it varies from 0 to 100. In this study, it varies from 0 to 10.

synthesizes two sub-indices that answer the following questions: Are municipal authorities elected or appointed by the central authority across the country? As for other sub-national authorities (states in the case of a federation, regions, provinces...etc.), are they elected or appointed by the central authority? The indices range from 0 to 3, where 0 indicates that sub-national authorities are appointed in total and 3 indicates that sub-national authorities are elected in total. Therefore, the higher these decentralization indices, the more participatory the decentralization. The expected sign of the coefficient associated with the variable DECENT is positive. The more autonomy and independence in decision-making in the local government, the lower the corruption will be. The mechanisms of action of decentralization on corruption are developed in section 1 of this paper.

The tertiary education level serves to proxy the human capital in an economy. It is measured by the ratio of the total number of enrollments, regardless of age, to the population of the age group that officially corresponds to the indicated level of education.

The higher the level of education in an economy, the lower the corruption. In fact, high education improves the ability of citizens to vote, behave legally, control the government, and judge the performance of politicians and consequently reduces the practices of corruption. Therefore, the expected sign of the coefficient associated with SCHOOL is positive.

The log of GDP is expected to have a negative correlation with corruption. In fact, poor countries seem to be more corrupt (Gould and Amaro-Reyes, 1983). Countries with a low level of GDP per capita are likely to have weak institutions and accounting traditions, which increases the level of corruption since citizens and civil servants tend to increase their income and gain money by twisting the law. Thus, the expected sign of the coefficient associated with Ln GDP is positive.

To control the size of the government, we use government expenditures as a share of the GDP. The increase in these expenditures presumes an improvement in the quality of public services (and vice versa). As a result, citizens can easily access public services and don't need to pay bribes to bureaucrats or administrative officials (Banerjee, 1997; Fisman et al., 2002). Therefore, the expected sign of the coefficient that associates with the variable GOVSHARE is positive.

The population is expected to have a positive impact on corruption and the expected sign of the coefficient associated with Ln POP is negative. In fact, demographic expansion generates pressure on public services and pushes citizens to bribe bureaucrats in order to acquire important public services more rapidly.

The index of civil liberty captures the extent to which a free press and free political associations curb corrupt practices in the public sector. This index varies from 0 (least freedom or no rights guaranteeing freedoms or their respect) to 4 (substantial freedom). The

higher this index, the more bureaucrats and politicians are controlled by civil society. This reduces their deviation or rent-seeking behavior. As a result, the expected sign of the coefficient associated with the CIVIL variable is positive.

Sources and description of data

The CPI is extracted from the Transparency International database (2020) and the CC is derived from World Bank Governance (2020). The variables of GDP/capita, SCHOOL, and POP are taken from the World Bank indicators (2020). The decentralization indicators and the indicator of civil liberty CIVIL are from the Institutional Profiles database, related to the 2001, 2006, 2009, 2012, and 2016 surveys. These indicators are assumed to be held constant over a four-year period, under the assumption that institutional change is long and that historical and social parameters exert resistance to their evolution. The 2001 survey is spread over the period 2001-04, the 2006 survey is spread over the period 2005-08, the 2009 survey is spread over the period 2009-11, the 2012 survey is spread over the period 2012-15, and the last survey is spread over the period 2016-19.

The descriptive statistics of the data allow us to have an idea of the dispersion and the evolution of these data over time. Table 1 shows the number of observations, the mean, the standard deviation, the minimum value, and the maximum value of our variables.

Table 1. Statistical description of variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Corruption (CPI)	76	3,604	0,639	2,6	5,3
Corruption (CC)	76	-0,404	0,263	-0,938	0,369
FISCAL	76	0,879	0,626	0	2
POLITICAL	76	1,645	0,796	0	3
Ln GDP	76	9,073	0,258	8,383	9,378
GOVSHARE	76	0,312	0,048	0,239	0,458
CIVIL	76	1,855	0,542	0,800	2,750
Ln POP	76	17,274	0,741	16,089	18,425
SCHOOL	76	0,281	0,097	0,102	0,514
TRANSP	60	2,237	0,739	0,771	4,000
Ln AREA	76	13,362	0,991	12,005	14,683

Table 1 shows that the economies that make up our sample are badly classed in terms of corruption. For the CPI indicator, on a scale that varies from 0 to 10, the average value of this indicator in our sample is equal to 2.3. For the CC indicator, on a scale that varies from -2.5 to 2.5, the average value of this indicator is equal to -0.404. This confirms the omnipresence of corruption in these economies.

Furthermore, these economies are characterized by a low level of decentralization. On a scale that varies from 0 to 4, the average value of FISCAL is 0.879 and that of POLITICAL is 1,645. Thus, local governments in these economies are characterized by low fiscal autonomy. Similarly, sub-national authorities are not wholly elected, and, in most cases, they are appointed by the central authority. These findings show that the autonomy of the subnational government and participatory governance in these economies is still limited.

Methods and results of the estimations

In this study, the estimation strategy is developed in two stages. In the first stage, we estimate the baseline model of Fisman and Gatti (2002) using a well-known static panel data method. Then, to solve the problem of endogeneity of the variable DECENT, we estimate the model by using the Instrumental Variable method. In order to check the robustness of our results, we use the system GMM method. In the second stage, we introduce an additional institutional variable (the transparency of public procurement) and an interactive variable to the baseline model, which links this latter variable with the decentralization variable. Then, we estimate the model by using the two methods (the instrumental variables method and the system GMM method).

- **The estimation of the baseline model using the static panel data method**

The estimation of a model in panel data first requires the verification of the homogeneous or heterogeneous specification of the sample studied. The Fisher statistic associated with the homogeneity test shows that the model is an individual effect model. The Hausman test allows us to identify whether these individual effects are fixed or random. The results of the estimates are given in Table 2 below.

Table 2. The estimation of model I (static panel data method)

	The effect of fiscal decentralization on corruption		The effect of political decentralization on corruption	
	Dependent Variable CC (1)	Dependent Variable IPC (2)	Dependent Variable CC (3)	Dependent Variable CPI (4)
FISCAL	0.037 (0.031)	-0.105 (0.077)	-	-
POLITICAL	-	-	-0.0767*** (0.027)	-0.102* (0.059)
Ln GDP	-0.487*** (0.102)	-3.157*** (0.525)	-0.701*** (0.112)	-3.361*** (0.522)

Table 2. The estimation of model I (static panel data method) (contd.)

Ln POP	-0.252*** (0.028)	5.942*** (1.015)	-0.279*** (0.028)	5.583*** (0.937)
GOVSHARE	-1.226*** (0.460)	-0.773 (1.294)	-0.734 (0.475)	-0.054 (1.206)
SCHOOL	0.127 (0.284)	0.961* (0.570)	0.409 (0.288)	1.157** (0.563)
CIVIL	-0.109** (0.056)	-0.397*** (0.126)	-0.089* (0.053)	-0.408*** (0.123)
Year fixed effects	Yes	No	Yes	No
Constant	8.678*** (1.153)	-69.59*** (14.83)	10.93*** (1.225)	-61.72*** (13.06)
Observations	79	79	79	79
Method	Random effect	Fixed effect	Random effect	Fixed effect
Hausman Test (P-Value) ⁽¹⁾	0.744	0.000	0.994	0.000

Notes: The asterisk represents the p-value significance levels (* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$). Standard errors in parentheses are based on robust-consistent standard errors. The results relating to year dummies are not reported. (1) This is the p-value associated with the Hausman test; if the coefficient result of the Hausman test shows that the p-value is higher than 0.05 (the significance level), then the null hypothesis of the random effects model is the preferred model. If not, the fixed effects model will be used instead.

In columns (3) and (4) of Table 2, the coefficient associated with POLITICAL is negative and significant. Thus, political decentralization increases corruption. This result is robust for the two indicators of corruption. In addition, it is shown that the coefficient associated with FISCAL isn't significant in columns (1) and (2) but has a negative sign in column (2).

Based on Fisman and Gatti (2002), Arikan (2004), and Alfada (2019), it may be argued that these estimates suffer from an endogeneity bias. In fact, the above results displayed in Table 2 assume that there is a one-way causality between decentralization and corruption. However, it is conceivable that the corrupt officials of the central government might resist decentralization policies, since this would limit their opportunities to extract rents. In this case, the coefficients estimated by using the random effect or the fixed effect estimators are biased and non-convergent. To avoid the endogeneity problem, we adopt other methods of estimation: the instrumental variable method and the system GMM method.

- **The estimation of the baseline model using the instrumental variable method**

This method allows us to obtain unbiased and convergent estimators. The principle of this method is to instrument the endogenous variables by using instruments that are correlated to the endogenous variables but not to their error term. Therefore, we have to verify the pertinence and the validity of the instruments. In this study, to instrument the endogenous variable FISCAL or POLITICAL, we use an external instrument proposed in the literature

(Arikan, 2004; Lessmann and Markwardt, 2009), which is the surface area of the country in thousand square kilometers (AREA). We also use other instruments, internal to the model, for the lag of certain exogenous variables of the model. The instruments used are the following:

- Ln (AREA)
- Ln POP₋₁: The delay of one period of the exogenous variable Ln POP,
- SCHOOL₋₁: The delay of one period of the exogenous variable SCHOOL.

To test the relevance of the instruments used, we regress the endogenous variable on all the exogenous variables of the model, namely the explanatory variables of the model and the candidate instrumental variables.

$$DECENT_{it} = a + B X_{it} + C Z_{it} + \mu_{it} \quad (1)$$

The endogenous variable *DECENT* can be *FISCAL* or *POLITICAL*, *X* is the vector of exogenous variables in the model, and *Z* is the vector of instrumental variables. The statistics of the relevance test focus on the explanatory power of the instruments in the regressions (coefficient of determination, Fisher test). Staiger and Stock (1997) show that if the value of the F statistic is greater than 10, the instruments are not weak and the model is well-identified. The estimation of equation (1) using the ordinary least squares method shows a strong explanatory power and a globally significant Fisher statistic (Table 3 in the Appendix). This allows us to conclude that the instruments seem to be relevant.

Furthermore, the application of Sargan's over-identification test (1957) shows that the null hypothesis cannot be rejected, so the instruments are not correlated with the error term. As a result, the instruments are valid.

In addition, it should be noted that the unit root test (Dickey-Fuller test) performed on our panel shows that all series are stationary.

The results of the estimation of the regression, using the instrumental variable method are presented in Table 4 below.

Table 4. The estimation of model I (instrumental variable method)

	The effect of fiscal decentralization on corruption		The effect of political decentralization on corruption	
	Dependent Variable CPI (1)	Dependent Variable CC (2)	Dependent Variable CPI (3)	Dependent Variable CC (4)
FISCAL	-0.656*** (0.239)	-0.107*** (0.034)	-	-
POLITICAL	-	-	-0.364*** (0.124)	-0.076*** (0.026)
Ln GDP	-1.586*** (0.668)	-0.555*** (0.068)	-1.832*** (0.634)	-0.640*** (0.089)
Ln POP	-0.472*** (0.048)	-0.224*** (0.008)	-0.579*** (0.070)	-0.248*** (0.016)
GOVSHARE	-5.775*** (1.635)	-1.936*** (0.292)	-1.237 (2.297)	-1.051** (0.440)
SCHOOL	3.855 (2.773)	0.469*** (0.217)	5.070*** (1.947)	0.733*** (0.155)
Constant	27.133*** (5.333)	8.806*** (0.588)	29.868*** (5.729)	9.744*** (0.912)
Year fixed effects	Yes	Yes	Yes	Yes
Observations	76	76	76	76
Sargan Test (P- Value) ⁽¹⁾	0.383	0.845	0.285	0.537
Econometric method	G2SLS Random effects	G2SLS Random effects	G2SLS Random effects	G2SLS Random effects
Instruments	Ln AREA Ln POP ₋₁	Ln AREA SCHOOL ₋₁	Ln AREA SCHOOL ₋₁	Ln AREA SCHOOL ₋₁

Notes: All regressions include year dummies (results not reported). The asterisk represents the p-value significance levels (* p < 0.1; ** p < 0.05; *** p < 0.01). Standard errors in parentheses are based on robust-consistent standard errors. (1) this is the p-value associated with the Sargan test. In the four columns, we have p-value > 0.05. This result shows that we must accept the H₀ hypothesis: the instruments are not correlated with the error term.

The estimates from the instrumental variable method in Table 4 show that the coefficients associated with the different variables of the model are statistically significant. However, the signs of certain coefficients do not conform to the expected signs. Thus, from column (1) to column (4), the coefficients associated with FISCAL and POLITICAL are negative and statistically significant. This result means that fiscal decentralization and political decentralization in the MENA region increase corruption. This result is not conformed to the theoretical model, but it is consistent with many decentralization experiences in different countries (Alfada (2019) for Indonesia; Treisman (2000) for a panel of 54 countries).

Furthermore, according to the above description of decentralization policies in the MENA region, the political and institutional environment in MENA economies is poorly suited to decentralization and is characterized by informal and personal ties. Therefore, deep institutional reforms (judicial and constitutional) are necessary for decentralization to be successful and to fight corruption.

The results of the estimates show that the logarithm of the GDP has a significant negative effect on the index of corruption in all specifications. In other words, the higher the GDP, the higher the level of corruption. Rich countries seem to be the most corrupt, which is different from most theoretical and empirical predictions in the literature. However, this result is conformed to other empirical studies like that of Alfada (2019) for the case of Indonesia

Moreover, Table 4 shows that government size has a negative effect on the index of corruption in all specifications, except for the result in column (3), which was statistically insignificant. Thus, the increase in government expenditure increases corruption. This result is defensible in our case study. In fact, in MENA countries, the increase in public expenditure is not always accompanied by the improvement and inclusiveness of public services. The increase of GOVSHARE can cause an increase in corruption since citizens bribe bureaucrats to access essential public services or get ahead of the queue.

The estimates also show that the increase in the size of the population has a positive and significant effect on corruption in all columns for a degree of risk of one percent. This result is in line with our expectations. In the presence of low public services per capita, the increase in the size of the population pushes them to engage in corruption in order to benefit from essential public services more quickly.

The estimates show that the coefficient associated with SCHOOL is positive and significant at the one percent level for all specifications, except for the result in column (1), where the coefficient is positive but statistically insignificant. This result is in line with what is expected, given the impact of education on the mitigation of corruption. In other words, high education improves the ability of citizens to fight corruption.

To show the robustness of our previous results, we consider the dynamic aspect of corruption, and we estimate the model by using the system GMM estimator of Blundell and Bond (1998).

- **Robustness checks: Estimation of the baseline model using the system GMM method**

In this section, we consider the dynamic effects of corruption. Current corruption is believed to be influenced by the corruption of the past year (Alfada, 2019). However, this dynamic effect of corruption causes a severe endogeneity problem if the lagged value of the dependent variable is placed as the independent variable. To solve this problem, we use the system GMM estimator of Blundell and Bond (1998). Moreover, this model allows us to solve the endogeneity issue resulting from the causality between corruption and decentralization. In fact, this estimation technique has the advantage of correcting the endogeneity in a panel data

model.

We introduce one-year lagged corruption as an independent variable to model I. The system GMM estimator was applied to the following model:

$$\begin{aligned} CORRUPT_{it} = & \beta_0 + \beta_1 DECENT_{it} + \beta_2 GOVSHARE_{it} + \beta_3 CIVIL_{it} + \beta_4 \ln(POP_{it}) \\ & + \beta_5 SCHOOL_{it} + \beta_6 \ln(GDP_{it}) + \beta_7 CORRUPT_{it-1} + \alpha_t + \mu_i \\ & + \varepsilon_{it} \end{aligned} \quad (II)$$

Where $CORRUPT_{it-1}$ denotes one-year lagged corruption and β_7 is a coefficient to be estimated. The other variables are the same as model I. The estimation results of the system GMM model are displayed in Table 5 below. These results allow us to note that the tests of the validity of the dynamic panel are verified. The autocorrelation tests show that we accept the presence of an AR (1) effect for the residuals, and we accept the absence of an AR (2) effect. In addition, the Sargan over-identification test confirms the validity of the instruments.⁴

Furthermore, the results given in Table 5 show that the coefficient associated with the lagged values of corruption IPC_{-1} and CC_{-1} is positive and statistically significant in all specifications. This result confirms the dynamic aspect of corruption. Current corruption is significantly correlated with past corruption. Besides, this correlation is positive. In fact, in an economy, the omnipresence of corruption in the last year – which is due to impunity, for example – increases the level of corruption in the following year. In contrast, a low level of corruption in the past year, which is due to effective anti-corruption efforts, discourages bureaucrats and politicians from getting involved in corrupt practices the next year.

The results in Table 5 also confirm those of the previous estimations in Table 4 by using the instrumental variable method. Therefore, we retain the same interpretations (developed above) concerning the results associated with the different explicative variables of the model. In effect, the coefficient associated with Ln GDP is negative and statistically significant for a degree of risk of one percent in all specifications. The coefficients associated with Ln POP and SCHOOL maintain the same sign as that in the previous estimations and are statistically significant at the one percent level. In all specifications, the coefficient of the variable GOVSHARE maintains the same sign as that in Table 4 and it is statistically significant at the one percent level in columns (1) and (2). The coefficient associated with the variable CIVIL has the expected sign and is statistically significant in columns (1) and (2). Therefore, free press and free political associations curb corruption.

⁴ To instrument the endogenous variable $CORRUPT_{it-1}$, we use its lagged values, and to instrument the endogenous variable DECENT, we use both its lagged values and the exogenous instrument Ln AREA.

Table 5. The estimation of model II (system GMM method)

	The effect of fiscal decentralization on corruption		The effect of political decentralization on corruption	
	Dependent Variable CPI (1)	Dependent Variable CC (2)	Dependent Variable CPI (3)	Dependent Variable CC (4)
IPC ₋₁	0.468*** (0.079)	-	0.446*** (0.075)	
CC ₋₁	-	0.384*** (0.106)	-	0.219** (0.094)
FISCAL	-0.496*** (0.177)	-0.178** (0.086)	-	-
POLITICAL	-	-	-0.187*** (0.054)	-0.084*** (0.027)
Ln GDP	-0.735*** (0.274)	-0.394*** (0.132)	-0.741*** (0.237)	-0.522*** (0.120)
Ln POP	-0.206*** (0.057)	-0.128*** (0.031)	-0.310*** (0.067)	-0.205*** (0.033)
GOVSHARE	-3.009*** (0.841)	-1.211*** (0.450)	-0.711 (0.807)	-0.361 (0.377)
SCHOOL	2.822*** (0.685)	0.815*** (0.298)	2.138*** (0.509)	0.759*** (0.209)
CIVIL	0.129** (0.058)	0.060* (0.033)	-0.020 (0.061)	0.012 (0.027)
Constant	12.506*** (3.333)	5.763*** (1.458)	14.065*** (3.233)	7.997*** (1.517)
Observations	76	76	76	76
<i>Arellano-Bond test</i>				
AR (1) (p-value) ⁽¹⁾	0.019	0.004	0.001	0.001
AR (2) (p-value) ⁽²⁾	0.675	0.447	0.178	0.961
Sargan Over-Identification Test ⁽³⁾ (p-value)	0.240	0.923	0.163	0.767
Econometric Method	System GMM	System GMM	System GMM	System GMM

Notes: The asterisk represents the p-value significance levels (* p < 0.1; ** p < 0.05; *** p < 0.01). Standard errors are in parentheses.

(1) In the four columns, we have p-value < 0.05. This result shows that we accept the presence of first-order correlation for the residuals.

(2) In the four columns, we have p-value > 0.05. Therefore, we accept the absence of second-order serial correlation in the first-differences error.

(3) This is the p-value associated with the Sargan test. In the four columns, we have p-value > 0.05. This result shows that we must accept the H_0 hypothesis: the instruments are not correlated with the error term.

In all specifications, decentralization is negatively and significantly associated with the index of corruption. Therefore, fiscal decentralization and political decentralization in the MENA region increase corruption. This effect is robust for the different indicators of corruption and decentralization and the different estimation methods. This result is justified by the stylized facts developed above. Indeed, the description of the decentralization policies of these economies, as well as the statistical description of data (Table 1), show that MENA countries are still characterized by a concentration of authority and resources in a central government. The situation is closer to “deconcentrating” the administrative activity than to decentralization. Furthermore, Vollmann et al. (2020) and Kherigi (2020) show that the political and institutional environment in MENA countries is not appropriate for decentralization. Thus, institutional reforms are necessary for decentralization to be successful and to fight against corruption. In the following subsection, we show that a minimum level of integrity in the management of public procurement is necessary for the success of decentralization and the fight against corruption.

The effect of transparency in public procurement on decentralization and corruption: An interactive variable model

In order to take into account the effect of public procurement transparency on corruption, we introduce a new institutional variable (TRANSP) to model I. This variable is extracted from the Institutional Profiles database and considers the degree of transparency in public procurement. This is an indicator that ranges from 0 (very low transparency) to 4 (high transparency). The more this indicator increases, the less corruption there will be. The predicted sign of the estimated coefficient associated with the variable in question is therefore positive.

Likewise, we add an interactive variable (DECENT * TRANSP) to the same equation, which links the indicator of decentralization to that of the transparency of public contracts. The new model specification is presented by equation (3) below.

$$CORRUPT_{it} = \alpha + \beta_1 DECENT_{it} + \beta_2 GOVSHARE_{it} + \beta_3 CIVIL_{it} + \beta_4 \ln(POP_{it}) + \beta_5 SCHOOL_{it} + \beta_6 \ln(GDP_{it}) + \beta_8 TRANSP_{it} + \beta_9 DECENT_{it} * TRANSP_{it} + \alpha_t + \mu_i + \varepsilon_{it} \quad (III)$$

Where, β_8 and β_9 are coefficients to be estimated.

The marginal effect of decentralization on corruption is given by:

$$\frac{\partial CORRUPT}{\partial DECENT} = \beta_1 + \beta_9 TRANSP \quad (2)$$

This effect is positive if and only if $TRANSP > \frac{-\beta_1}{\beta_9}$. So, if the transparency of public procurement is beyond a certain threshold, then decentralization can be a mechanism to fight corruption.

Of course, and statistically speaking, this threshold effect exists only if β_1 and β_9 are statistically significant

To estimate this model, we use two econometric methods. First, we use the instrumental variable method. Second, and to show the robustness of our results, we apply the system GMM method.

- **The estimation of the interactive variable model using the instrumental variable method**

In this subsection, we estimate model III by applying the instrumental variable method. We follow the same methodology as that presented above. We check the pertinence and the validity of our instruments. Table 6 in the Appendix shows that our instruments are relevant (coefficient of determination, Fisher test). Also, Sargan's test shows that these instruments are valid. Likewise, we use the two corruption indicators (CPI and CC). The results of our estimates are presented in Table 7 below.

Table 7. The estimation of model III (instrumental variable method)

	The effect of fiscal decentralization on corruption		The effect of political decentralization on corruption	
	Dependent Variable CPI (1)	Dependent Variable CC (2)	Dependent Variable CPI (3)	Dependent Variable CC (4)
TRANSP	-0.738* (0.441)	-0.282** (0.140)	-1.147** (0.545)	-0.565*** (0.277)
FISCAL	-1.782*** (0.725)	-0.502** (0.230)	-	-
FISCAL*TRANSP	0.712** (0.348)	0.244** (0.109)	-	-
POLITICAL	-	-	-2.002*** (0.709)	-1.637*** (0.243)
POLITICAL*TRANSP	-	-	0.799*** (0.306)	0.664*** (2.726)
Ln GDP	-2.351** (1.018)	-0.0627 (0.116)	-4.474* (2.311)	-0.915*** (0.347)

Table 7. The estimation of model III (instrumental variable method) (contd.)

Ln POP	5.426*** (1.161)	-0.224*** (0.0295)	8.316** (3.305)	-
GOVSHARE	-2.059 (1.370)	-1.167*** (0.343)	1.163 (0.806)	-
SCHOOL	-	-0.0476 (0.252)	0.375 (1.754)	0.786 (1.157)
CIVIL	-0.183 (0.129)	0.150*** (0.0351)	-0.392*** (0.149)	0.244*** (0.083)
Constant	-66.145*** (13.433)	4.683*** (0.981)	-96.331** (45.812)	9.375*** (2.726)
Observations	60	60	60	60
Sargan Test (P-Value) ⁽¹⁾	0.688	0.187	0.236	0.126
Econometric method	Within Fixed effects	G2SLS Random effects	Within Fixed effects	G2SLS Random effects
Instruments	SCHOOL Ln AREA	Ln POP ₋₁ SCHOOL ₋₁	Ln POP ₋₁ Ln AREA SCHOOL ₋₁	SCHOOL ₋₁ Ln AREA

Notes: The asterisk represents the p-value significance levels (* p < 0.1; ** p < 0.05; *** p < 0.01). Standard errors in parentheses are based on robust-consistent standard errors. (1) this is the p-value associated with the Sargan test. In the four columns, we have p-value > 0.05. This result shows that we must accept the H₀ hypothesis: the instruments are not correlated with the error term.

We note that: FISCAL*TRANSP is the interactive variable, which links the fiscal decentralization variable to the TRANSP.

POLITICAL*TRANSP is the interactive variable, which links the political decentralization variable to TRANSP.

The results show that the coefficient associated with the variable TRANSP is negative and statistically significant for all specifications. This effect is not conformed to what is expected. This aberration is explained by the insufficient transparency of public procurement in the economies composing our sample. This deficiency reinforces corruption and rent-seeking behavior in these economies. The descriptive statistics in Table 1 show that, on a scale that varies from 0 to 4, the average value of this indicator is equal to 2.3.

In addition, columns (1) and (2) of Table 7 show that, for the two indicators of corruption, the coefficient associated with the variable FISCAL is maintained negative and significant. Furthermore, the results show that the coefficient associated with the corresponding interactive variable FISCAL*TRANSP is positive and significant. Therefore, according to equation (2), for the marginal effect of fiscal decentralization on corruption, there is a

threshold level of transparency in public procurement above which *fiscal decentralization* leads to good local governance.

Similarly, columns (3) and (4) of Table 7 show that, for the two indicators of corruption, the coefficient associated with the variable POLITICAL is maintained negative and significant. The coefficient associated with its corresponding interactive variable POLITICAL*TRANSP is positive and significant. Therefore, there exists a minimal level of transparency in public procurement above which *political decentralization* can be a mechanism to fight corruption.

- **Robustness check: Estimation of the interactive variable model using the system GMM method**

In this subsection, we consider the dynamic effects of corruption. We add one-year lagged corruption as an independent variable to model III and we apply the system GMM method. We follow the same demarch as that presented above.

The results, presented in Table 8 below, show that the tests of the validity of the dynamic panel are verified.

The coefficient associated with TRANSP is maintained negative and statistically significant in all specifications. Furthermore, columns (1) and (2) show that the coefficients associated respectively with FISCAL and its corresponding interactive variable FISCAL*TRANSP are significant. Columns (3) and (4) show that the coefficients associated respectively with POLITICAL and with its corresponding interactive variable POLITICAL*TRANSP are significant. Thus, we can retain the same conclusion as that deduced above: there exists a threshold level of transparency in public procurement above which fiscal decentralization and political decentralization can be mechanisms to fight corruption.

Table 8. The estimation of model III (system GMM method)

	The effect of fiscal decentralization on corruption		The effect of political decentralization on corruption	
	Dependent Variable CPI (1)	Dependent Variable CC (2)	Dependent Variable CPI (3)	Dependent Variable CC (4)
CPI ₁	0.433*** (0.093)	-	0.468*** (0.098)	-
CC ₋₁	-	0.312*** (0.097)	-	0.638*** (0.056)
TRANSP	-0.370* (0.227)	-0.225*** (0.069)	-0.797*** (0.251)	-0.183*** (0.051)

Table 8. The estimation of model III (system GMM method) (contd.)

FISCAL	-1.133*** (0.372)	-0.344*** (0.108)		
FISCAL*TRANSP	0.420*** (0.175)	0.179*** (0.051)		
POLITICAL			-1.473*** (0.441)	-0.329*** (0.112)
POLITICAL*TRANSP			0.590*** (0.182)	0.130*** (0.050)
Ln GDP	-0.436* (0.240)	-0.016 (0.082)	-0.969*** (0.348)	(-0.132) *** (0.072)
Ln POP	-0.205*** (0.060)	-0.164*** (0.027)	-0.085 (0.066)	-
GOVSHARE	-1.851*** (0.736)	-0.613** (0.259)	0.465 (0.972)	-0.264* (0.150)
SCHOOL	1.223** (0.582)	-0.041 (0.164)	1.701*** (0.623)	-
CIVIL	0.186*** (0.064)	0.102*** (0.024)	0.160** (0.075)	0.087*** (0.017)
Constant	10.379*** (2.701)	3.132*** (0.911)	13.295*** (4.033)	1.443** (0.678)
Observations	60	60	60	60
Arellano-Bond test				
AR (1) (p-value) ⁽¹⁾	0.010	0.040	0.015	0.140
AR (2) (p-value) ⁽²⁾	0.909	0.446	0.092	0.409
Sargan Over-identification Test ⁽³⁾ (p-value)	0.307	0.156	0.220	0.088
Econometric Method	System GMM	System GMM	System GMM	System GMM

Notes: The asterisk represents the p-value significance levels (* p < 0.1; ** p < 0.05; *** p < 0.01). Standard errors are in parentheses.

(1) In the four columns, we have p-value < 0.05. This result shows that we accept the presence of first-order correlation for the residuals.

(2) In the four columns, we have p-value > 0.05. Therefore, we accept the absence of second-order serial correlation in the first-differences error.

(3) This is the p-value associated with the Sargan test. In the four columns, we have p-value > 0.05. This result shows that we must accept the H₀ hypothesis: the instruments are not correlated with the error term.

Conclusion

Decentralization is a complex process and its effectiveness in promoting favorable results is not linear and depends on the prevailing institutional context. Many empirical studies show that the mechanisms for transmitting the effects of decentralization on corruption can function only in the presence of really transferred powers and resources and mechanisms of accountability vis-à-vis the local population.

Our contribution in this paper is to show that fiscal decentralization and political decentralization in MENA countries increase corruption. This result is robust for different corruption and decentralization indicators and different estimation methods. Furthermore, we show that transparency in public procurement is a prerequisite for decentralization mechanisms to function and lead to good local governance. A minimum level of transparency in public procurement is necessary for decentralization to be a mechanism to fight corruption in these economies. These results are robust for different corruption and decentralization indicators and different estimation methods.

In order to succeed in decentralization policies and promote good local governance in the economies of the MENA region, many recommendations in terms of political economy are suggested. First, it should be noted that decentralization in these economies is not sufficiently participatory and that MENA countries are still characterized by a concentration of power and resources in a central state. This finding is prevalent even after the Arab Spring and the establishment of democratic institutions in some economies in the region. This reinforces uneven development and regional imbalance within the same country. Therefore, if decentralization is the foundation of local development, strengthening decentralization in MENA countries is necessary.

Furthermore, it should be noted that this participatory management of public affairs must be transparent. A minimum of transparency and integrity in public procurement is a prerequisite to activate the mechanisms for the beneficial effects of decentralization on good local governance in MENA countries.

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Data availability

<https://www.transparency.org/en>

<https://info.worldbank.org/governance/wgi/>

<https://donnees.banquemondiale.org/indicateur/NY.GDP.PCAP.PP.KD>

<http://www.cepii.fr/institutions/EN/ipd.asp>

Appendix

Table 3. Relevance test of instruments of Model I (OLS method)

VARIABLES	(1) FISCAL	(2) FISCAL	(3) POLITICAL
Ln GDP	-0.644** (0.293)	0.0103 (0.184)	0.343 (0.240)
Ln POP	-105.6*** (34.27)	0.158 (0.118)	-0.171 (0.154)
GOVSHARE	0.355 (2.327)	-3.328 (2.301)	-1.373 (3.010)
SCHOOL	2.655** (1.275)	6.811*** (2.559)	3.127 (3.347)
Ln AREA	0.0608 (0.139)	-0.0717 (0.132)	0.200 (0.172)
Ln POP ₋₁	106.0*** (34.36)	-	-
SCHOOL ₋₁	-	-6.729*** (2.338)	-5.966* (3.059)
Observations	76	76	76
R ²	0.722	0.718	0.829
Fisher	30.31	29.66	56.67

Notes: The asterisk represents the p-value significance levels (* p < 0.1; ** p < 0.05; *** p < 0.01). Standard errors are in parentheses.

Table 6. Relevance test of instruments (OLS method)

VARIABLES	(1) FISCAL	(2) FISCAL	(3) POLITICAL	(4) POLITICAL
TRANSP	-0.578*** (0.047)	-0.577*** (0.0393)	-0.557*** (0.055)	-0.549*** (0.0451)
FISCAL*TRANSP	0.468*** (0.016)	0.479*** (0.0132)	-	-
POLITICAL*TRANSP		-	0.412*** (0.025)	0.409*** (0.0207)
Ln GDP	0.193 (0.123)	-0.200 (0.136)	-0.532 (0.417)	-0.628** (0.254)
Ln POP	-0.079*** (0.031)	60.31*** (12.80)	-8.100 (28.228)	0.0298 (0.0802)
GOVSHARE	-0.137 (0.524)	-1.221*** (0.391)	1.509 (0.975)	1.359 (0.816)
CIVIL	0.072** (0.033)	0.0405 (0.0285)	0.068 (0.074)	0.0570 (0.0621)
SCHOOL	-0.483* (0.255)	-0.244 (0.773)	-1.218 (1.528)	-1.174 (1.506)
Ln POP ₋₁	-	-60.66*** (12.86)	8.176 (28.390)	-
Ln AREA	-	-	0.039 (0.073)	0.0465 (0.0684)
SCHOOL ₋₁	-	-0.312 (0.815)	1.799 (1.593)	(1.577) 0.0465
Constant	0.839 (1.110)	8.611*** (1.908)	3.721 (5.969)	5.235* (2.801)
Observations	60	60	60	60
R ²	0.973	0.982	0.971	0.971
Fisher	238.05	306.99	166.73	188.71

Notes: The asterisk represents the p-value significance levels (* p < 0.1; ** p < 0.05; *** p < 0.01). Standard errors are in parentheses.