

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

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Abstract:

The purpose of this article is to study the effect of decentralization on corruption in the MENA region during the period 2000-20019. We adopt the model of Fisman and Gatti (2002). We introduce the time dimension to the model and we use the instrumental variable method, applied to panel data. Firstly, we show that decentralization in these economies favors rent-seeking behavior and cannot be a mechanism to fight against corruption. Secondly, we introduce to the model adopted, an interactive variable, 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 reduction of corruption in MENA countries. These results are robust for different indicators of corruption and decentralization.

Keywords: corruption, decentralization, transparency in public procurement, panel data, instrumental variables method.

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Introduction:

For more than three decades, International Financial Institutions have been interested in encouraging developing countries to put in place institutions of good governance, which are capable of ensuring confidence and securing the transactions and expectations of actors. Thus, decentralization policies are inscribed in this context. They aim at democratizing the decision-making process, limiting the stakes of power and restricting the scope of political authority against corrupt and rent-seeking practices. However, the 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 work, we focus our attention on the countries of the 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, our purpose in this work is to study whether decentralization in the countries of the MENA region effectively improves the institutions of good governance and the fight against corruption in these economies.

To do this, our work is subdivided into two sections: in a 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 to fight against their opportunistic behavior. Likewise, we show that decentralization does not undoubtedly lead to reducing corruption and that there are difficulties and constraints in putting decentralization policies into practice in some economies. We show that for decentralization to be effective and successful, there are many support conditions. In this work, we show 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, seen as opaque and corrupt at the central level. Likewise, the public market constitutes a decisive instrument, which materializes the local development project. It is in the quality of management of its various procedures that the quality of management of municipal budgets manifests itself. The lack of predictability and transparency in public procurement reflects opportunistic behavior, patronage and favoritism. In this regard, the OECD (2007) in one of its reports on "Corruption in Public Procurement" recommends that "Corruption in public procurement is a structural problem that the term "public procurement" seems synonymous with "corruption" ". 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 a second section, we develop an empirical study on the effect of decentralization on corruption in MENA countries. First, we are carrying 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 and by persistent authoritarian domination of the central state and insufficient provision of local services. Then and in a second step we conduct an econometric study on the effect of decentralization on corruption in the MENA region. We adopt the model of Fisman and Gatti (2002), we consider a balanced panel of countries in the MENA region during the period 2000-2019 and we apply the instrumental variable method. First, we show that decentralization in these economies promotes rent-seeking behavior and cannot be a mechanism to reduce corruption. Next, we introduce an interactive variable, which links decentralization to transparency in public procurement. We show that a minimum of integrity and transparency in public procurement is necessary for successful decentralization and fight against corruption in MENA region. This result is robust for different indicators of corruption.

In this work, our contribution consists in introducing the temporal dimension into the model of Fisman and Gatti (2002). These authors develop a cross-sectional data study to study the impact of fiscal decentralization on corruption for a sample of 57 countries of unequal level 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 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 is a prerequisite condition 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 competences 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 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 of unequal level 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. Also, Gurgur and Shah (2005) develop an empirical study for a sample of 30 countries (developing and industrial countries), using the weighted least squares (WLS) method, and 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, Altunbaş and Thornton (2012), using an empirical study for a set of countries, 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 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 Chinese local 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 to different measures of decentralization and corruption. In addition, Anisah 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 high dependence of local governments on central government grants.

Thus, decentralization cannot inevitably lead to good local governance and cannot constitute a tool to fight against corruption unless it is accompanied by numerous conditions. So, through what mechanisms does decentralization make it possible to reduce corruption in local administrations and 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 jurisdictions¹. This leads to a reduction in fiscal resources. This situation encourages political decision-makers to improve the effectiveness of their policies and to adopt 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 government. Similarly, and in the same vein, Breton (1996) argues that in democratic regimes decentralization reduces corruption through inter-jurisdictional competition. It 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.

Then, decentralization brings about a geographical rapprochement between political decision-makers and citizens. In this regard, Fan et al (2009) as well as 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, in particular 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 to 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 improves 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. So, 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

¹ 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, spillover effects (the costs and benefits of public goods do not spill over from one community to another).

transfer of functions and powers to “antennas” of the central government" (Olsen 2007), which further reinforces corruption and rent-raising strategies. Likewise, Olsen (2007) 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 and al (2008) state that the insufficiency of really transferred powers, of accountability mechanisms vis-à-vis the local population, of financial resources associated with decision-making constitute the brakes to a decentralization policy. 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 offer and acceptance of bribes, conflicts of interest, collusion, favoritism and nepotism are situations that may compromise integrity in public management and, in particular in the award of municipal public contracts. In fact, public procurement is a major issue for local communities. Thus, 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 question 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. 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. Whereas, in the second subsection, we conduct an econometric study on a cylindrical panel of MENA countries during the period 2000-2019. The constraint of data limits our sample to 4 countries of the MENA region: Algeria, Egypt, Morocco and Tunisia. we apply the instrumental variable method in panel data and we show that, decentralization in these economies favors rent-seeking behavior and cannot be a mechanism to fight corruption. Then, we insert an interactive variable, in the 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 reduction of corruption in MENA countries. These results are robust for different indicators of corruption and decentralization

This empirical study is based on the article of Fisman and Gatti (2002a), who study 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 and 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. So, given this constraint, we use a measure of decentralization, which considers both the decentralization of decision-making and the degree of autonomy of 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 a comparative analysis at the transnational level, as an extent of an effective decentralization of decision-making. So, our decentralization indicator the best available proxy.

Moreover, our contribution in this paper is to introduce the time dimension in the Fisman and Gatti (2002) and to conduct an empirical study in panel data. Also, we introduce to the model another indicator variable, which takes into account the degree of transparency in public procurement.

2.1 Decentralization in the MENA region: a descriptive study

A commonality between MENA region's countries is that they are characterized by a concentration of power and resources in a central state. This resulted in the denial of participatory practice and citizenship rights as well as unequal development within the same country. So, Initiatives to strengthen subnational governance systems have been part of the political program in MENA countries since the 1980s. But decentralization attempts were a façade, strictly controlled by increasing the center's power through deconcentrated state agents. Though past local government reforms in the MENA have mostly taken the form of administrative decentralization (known as deconcentration), almost all countries in the region have opted for a form of, at least partly, political decentralization through elected local governments (Kherigi, 2017; Harb and Atallah, 2015).

MENA regimes promote decentralization, but tend to oppose developments that could endanger their dominance. Central-state administrations have also shown reservations regarding sharing power with elected subnational governments – or even with their own regional branches (Kherigi, 2017; Harb and Atallah, 2015). The success of local governance reforms in the MENA does not lie with subnational governments alone. It relies on major changes in the political system that must be prepared for decentralization. The newly reformed subnational councils in Morocco and Tunisia hint at the problems with inexperienced and badly trained 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 (high consumptive cost margins reduce local governments' options to act). This predicament

is further augmented by problems of understaffing (both regarding the number and skill level of functionaries), leading to an 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 still depend on central government transfers for most of their funding. Local tax collection does not yet adequately contribute to subnational funding (UCLG, 2019). 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 (parts of the) constituencies due to political reasons (Harb and Atallah; 2015, Kherigi, 2017; Kherigi, 2020).

In Morocco, local governments often decide not to collect taxes to please their political bases (Harb and Atallah, 2015; 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 5% in the MENA region, in contrast to 35% 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 2010/2011. While they show some individual progress, there are no sufficient efforts towards fiscal decentralization (data based on OECD and UCLG, 2019). Tunisia has taken massive steps towards turning from a highly centralized autocratic system towards a decentralized democracy, but only spent 7.8% of total government spending (2.1% of its GDP) and 3.4% 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% of its GDP, or 11.8% of total government expenditure, on its different subnational governments in 2016. Morocco's subnational spending increased during the new reform phase, but only moderately (8.5% of government expenditure in 2002). Subnational governments accounted for only 9.7% of public staff expenditure. This percentage is comparable to the pre-reform expenditure of 9.4% in 2002. This is surprising, considering that in 2002 about a quarter of all state employees worked locally (Bohn et al., 2018; UCLG 2009).

2.2 The effect of decentralization on corruption: an econometric study

The Specification of the Model

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

$$CORRUPT_{it} = \alpha + \beta_1 DECENT_{it} + \beta_2 GOVSHARE_{it} + \beta_3 CIVIL_{it} + \beta_4 \ln(POP_{it}) + \beta_5 SCHOOL_{it} + \beta_6 \ln(GDP_{it}) + \varepsilon_{it} \quad (1)$$

Where,

CORRUPT: corruption index

DECENT: decentralization

GOVSHARE: government share

CIVIL: civil liberty

POP: population size

SCHOOL: tertiary education rate

GDP: gross domestic production

We note that the index i designates the country i and the index t designates the date t . α is a constant of the model, $\varepsilon_{i,t}$ is a random term and $\beta_1, \beta_2, \dots, \beta_6$ are the coefficients to estimate

For the corruption index, we use two corruption indices, that are commonly used in the economic literature. These include the Corruption Perception Index (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 CPI are based on a scale ranging from 0 (very corrupt) to 100 (no corruption). Whereas, the CC index, ranges from -2.5 (low governance performance) to 2.5 (high governance performance). So, the higher each of these corruption indices, the healthier is the institutional environment and the lower is the corruption.

The decentralization is approximated by the fiscal decentralization and the political decentralization index. The fiscal decentralization index (FISCAL DECENT), which 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...). 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 levied locally. The political decentralization measure (POL DECENT) synthesizes two sub-indices that answer the following questions: Are municipal authorities elected or appointed by the central authority across the country? and 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. So, 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 local government, the lower the corruption will be. The mechanisms of action of decentralization on corruption are developed in section (1) of this article.

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, to control the government and to judge on the performance of politicians and consequently to reduce the practices of corruption. So, the expected sign of the coefficient associated with SCHOOL is therefore positive.

The index of civil liberty captures the extent to which a free press and free political associations might act as a check on a corrupt public sector. This index takes on values ranging from 1 (most freedom) to 7

(least freedom). The higher this index, the more politicians are controlled by civil society. This reduces their deviation or rent-seeking behavior. So, the expected sign of the coefficient associated with the CIVIL variable is positive

Sources of data

The Corruption Perception Index (CPI) is extracted from Transparency International data base (2020) and the Control of Corruption index (CC) is derived from World Bank Governance (2020). The variables GDP/capita, SCHOOL and POP, they are taken from World Bank indicators (2020). The indicator of civil liberty is from Freedom House (2020). The decentralization indicators are from "Institutional Profiles" data base, related to 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 2000-2004, the 2006 survey is spread over the period 2005-2008, the 2009 survey is spread over the period 2009-2011, the 2012 survey is spread over the period 2012-2015 and the last survey is spread over the period 2016-2019.

The descriptive statistics of the data allow us to have an idea of the dispersion and evolution of these data over time. the following table (table I) shows the number of observations, the mean, the standard deviation, the minimum value and the maximum value of our variables:

Table I: Descriptive statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Corruption (CPI)	80	3,604	0,639	2,6	5,3
Corruption (CC)	80	-0,404	0,263	-0,938	0,369
Fiscal Decentralization	80	0,879	0,626	0	2
Political Decentralization	80	1,645	0,796	0	3
Ln GDP	80	9,073	0,258	8,383	9,378
GOVSHARE	80	0,312	0,048	0,239	0,458
CIVIL	80	4,7	0,736	3	6
Ln POP	80	17,274	0,741	16,089	18,425
SCHOOL	80	0,281	0,097	0,102	0,514
TRANSPARENCY	60	2,301	0,609	1	3,032

Method and result of the estimates

The estimation of a model in panel data requires first 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. It remains to be seen whether this individual effect is fixed or random. The Hausman test allows us to identify whether these individual effects are fixed or random. Furthermore, it should be noted that the variable decentralization "DECENT" is an endogenous variable (Fisman and Gatti 2002). In

this case, the generalized least squares (GLS) estimator or the within estimator are biased and non-convergent. The use of the instrumental variable method is therefore necessary. This method allows us to obtain unbiased and convergent estimators. The principle of this method is to instrument the endogenous variable by using instruments that are correlated to the endogenous variables but not to their error term. As instruments of decentralization, we use the legal origin of the commercial code (French or English). So, this instrument LEGAL ORIGIN is a binary variable, which has been used quite extensively and successfully as instruments in the literature on fiscal decentralization (Dreher (2006), de Mello and Barenstein (2001)). Also, we use other instruments internal to the model, which are presented in tables below. All these instruments are strongly correlated with the endogenous explanatory variables of the model (DECENT). In fact, the correlation coefficients between these instruments and the variable to be instrumented are significant at the 5% threshold (Table 1 in Appendices). This allows us to conclude that the instruments seem to be relevant. Finally, 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) performed on our panel shows that all series are stationary.

The results of the estimation of the regression, using the instrumental method are presented in Table II and III.

Table II : The impact of decentralization on corruption (IPC) using alternative measures of decentralization

Dependent variable: Corruption (IPC)	Fiscal decentralization	Political decentralization
DECENT	-0.181* (-1.90)	-0.136** (-2.20)
CIVIL	0.364*** (4.84)	0.328*** (4.76)
Libcivil	-	-
SCHOOLING	1.073* (1.69)	1.575** (2.37)
ln_GDP	-1.088* (-1.94)	-1.592*** (-3.02)
ln_pop	2.546*** (3.27)	1.976** (2.42)
GOVSHARE	0.916 (0.75)	1.797 (1.50)
_cons	-32.665*** (-2.92)	-18.429 (-1.63)
Observation	76	76
Test de Sargan (P-Value)	0.0722	0.000

R ²	0.4240	0.3883
Econometric method	Fixed-effects (within) IV regression	Fixed-effects (within) IV regression
Instruments	LEGAL_ORIGIN L.decentpolitiqueIPD L.FISCALDECENTIPD	LEGAL_ORIGIN l.decentpolitiqueIPD

Table III. The impact of decentralization on corruption (CC) using alternative measures of decentralization

Dependent variable: Corruption (CC)	Fiscal decentralization	Political decentralization
DECENT	-0.149** (-2.16)	-0.091*** (-3.26)
CIVIL	0.098*** (2.02)	0.025 (0.79)
SCHOOLING	1.188*** (3.41)	0.483 (1.60)
ln_GDP	-0.564*** (-3.88)	-0.495** (-2.08)
ln_pop	-0.203*** (-5.92)	0.236 (1.60)
GOVSHARE	-1.609*** (-2.62)	-0.104 (-0.19)
_cons	8.348*** (5.79)	-0.048 (-0.01)
Observation	76	76
Test de Sargan (P-Value)	0.0834	0.000
R ²	0.6036	0.2317
Econometric method	G2SLS random-effects IV regression	Fixed-effects (within) IV regression
Instruments	LEGAL_ORIGIN decentpolitiqueIPD l.SCHOOLING	LEGAL_ORIGIN L.decentpolitiqueIPD

The estimates from VI method show that, higher degree of decentralization is significantly associated with lower measured corruption for the CC and the CPI indices. For economic development expressed in logarithm of GDP which has a significant negative effect on corruption. In other words, the higher the GDP, the higher the level of corruption is. So, the rich countries seem to be the most corrupt, which is different from most theoretical and empirical predictions in the literature. The index of civil liberties associated with a positive correlation with CORRUPT. Higher values in this index explain less respect for freedom of expression, assembly, association, education and religion. However, according to our results, countries that meet these criteria are more corrupt. As far as the enrolment rate is concerned, the results show a positive and significant sign, which is in line with that expected given the impact of education on the mitigation of corruption. In other words, high education improves the ability of citizens to vote, behave legally, show good citizenship, decrease the likelihood of participating in crime, to control the government and to judge on the performance of politicians and consequently to reduce the practices of corruption.

The results obtained from these previous regressions show that fiscal decentralization in the MENA region increases corruption. Indeed, the success of local governance reforms in the MENA Region does not depend on subnational governments. It relies on major changes in the political and institutional system, which must be prepared and adapted to decentralization.

Central government funding shortfalls may not deliver the promised benefits of decentralization (Bardhan and Mookherjee, 2006).

Many studies show that the political and institutional environment in MENA economies is poorly suited to decentralization and is characterized by informal and personal ties. Deep institutional reforms (judicial and constitutional) are necessary for successful decentralization. Likewise, the presence of accompanying conditions for decentralization are key elements for the success of decentralization.

In order to take into account, the effect of public procurement transparency on corruption, we introduce to equation (1) of the model, a new institutional variable (TRANSPARENCY). This variable is taken from the “Institutional Profiles” database and takes into account the degree of transparency in public procurement. This is an indicator, which 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 to the same equation an interactive variable (DECENT * TRANSP), which links the indicator of fiscal decentralization to that of the transparency of public contracts. The new model specification is presented by equation (2) below.

$$CORRUPT_{it} = \alpha + \beta_1 DECENT_{it} + \beta_2 GOVSHARE_{it} + \beta_3 CIVIL_{it} + \beta_4 \ln(POP_{it}) + \beta_5 SCHOOL_{it} + \beta_6 \ln(GDP_{it}) + \beta_7 TRANSPARENCY + \beta_8 DECENT * TRANSP + \varepsilon_{it} \quad (2)$$

The marginal effect of decentralization on corruption is given by:

$$\frac{\partial CORRUPT}{\partial DECENT} = \beta_1 + \beta_8 TRANSP \quad (3)$$

This effect is positive if and only if $TRANSP > \frac{-\beta_1}{\beta_8}$. 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 can exist only if β_1 and β_8 are statistically significant

We estimate equation (2) of the model, by applying the instrumental variable method. We follow the same approach as that presented above. We check the pertinence and the validity of our instruments. Indeed, the correlation matrix (appendix 1) shows that the instruments are correlated at the 5% threshold. Also, Sargan's test shows that these instruments are valid. Likewise, to show the robustness of our results, we use the two corruption indicators (IPC and CC). The sources of our data are already mentioned above.

The results of our estimates are presented in the tables below.

Table IV: The effect of fiscal decentralization on corruption

	<i>Dependent variable</i>	<i>Dependent Variable</i>
	IPC	CC

	(1)	(2)
FISCAL DECENT	-1.245** (-2.29)	-0.554*** (-3.07)
TR ANSPARENCY	-0.420 (-1.20)	-0.313*** (-2.73)
DECENT*TRANSP	0.433* (1.66)	0.272*** (3.17)
CIVIL	0.326*** (5.22)	0.112*** (3.33)
Ln GDP	-1.168 (-1.52)	-0.155 (-1.31)
SCHOOL	-0.110 (-0.12)	-0.037 (-0.14)
Ln POP	3.334*** (2.62)	-0.264*** (-9.60)
Constant	-43.793*** (-2.69)	5.968*** (5.91)
Number of observations	60	60
R ²	0.472	0.781
Econometric method	Instrumental variable method applied to the fixed effect model (model 2)	Instrumental variable method applied to the random effect model (model 2)

Instruments	Legal origin I. FISCAL DECENT I. POL DECENT	Legal origin I. FISCAL DECENT POL DECENT
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Notes: (***) The coefficients are significant to a level of 1% risk. (**) The coefficients are significant for a risk level of 5%. (*) The coefficients are significant to a degree of risk of 10%. The values in parentheses are the t-student of estimated coefficients

Table V: The effect of political decentralization on corruption

	Dependent variable IPC (1)	Dependent variable CC (2)
POL DECENT	-1.212*** (-2.63)	-0.496* (-1.74)
TR ANSPARENCY	-0.690** (-2.50)	-0.169 (-0.96)
DECENT*TRANSP	0.495*** (2.75)	0.198* (1.69)
Ln GDP	-3.012** (-2.44)	-0.540*** (-2.86)
GOVSHARE	0.616 (0.52)	-
CIVIL	-0.267* (-1.93)	0.179*** (3.61)
Ln POP	6.009*** (3.37)	-
SCHOOL	0.761 (1.01)	0.498 (1.30)
Constant	-71.126*** (-3.26)	4.476** (2.35)
Observations	60	60
R ²	0.4805	0.4876
Sargan test (P-value)	0.000	0.000
Econometric Method	Instrumental variable method applied to the fixed effect model (model 2)	Instrumental variable method applied to the random effect model (model 2)
Instruments	LEGAL_ORIGIN l.decentpolitiqueIP D	LEGAL_ORIGIN l.decentpolitiqueIP D

Notes: (***) The coefficients are significant to a level of 1% risk. (**) The coefficients are significant for a risk level of 5%. (*) The coefficients are significant to a degree of risk of 10%. The values in parentheses are the t-student of estimated coefficients

The results of the various estimates show that the coefficient associated with the variable TRANSPARENCY is always negative. Column (2) of table IV and column (1) of table V show that this coefficient is significant. This aberration is explained by the insufficient transparency of

public procurement in the economies constituting our sample. This deficiency reinforces corruption and rent-seeking behavior in these economies. On a scale from 0 to 4, the average value of this indicator is equal to 2.3 (see table I). In addition, columns (1) and (2) of table IV show that the coefficients associated with the variable FISCAL DECENT are kept negative and significant. Furthermore, the results show that the coefficient associated with the interactive variable is positive and significant. So, according to equation (3), the calculation of the marginal effect of fiscal decentralization on corruption, we deduce that, there exists a public procurement transparency threshold above which *fiscal decentralization* leads to good local governance.

Similarly, in table V, the coefficients associated respectively with POL DECENT and the interactive variable are significant. So, according to equation (3), there exist a minimal level of transparency in public procurement above which *political decentralization* can be a mechanism to fight against corruption

Conclusion

At the end of this work, we conclude that, decentralization is a complex process and that its effectiveness in promoting favorable results is not linear and depends on the prevailing institutional context. Thus, 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.

In this paper, our contribution is to show that transparency in public procurement is also a prerequisite for decentralization mechanisms to function and lead to good local governance. Furthermore, through a sample of countries in the MENA region, it was shown that 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 indicators of corruption and decentralization.

Thus, 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 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 the uneven development and the 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>

Appendice1

The Correlation Matrix

	POL DECENT	FISCAL DECENT	LEGAL_ ORIGIN	L.POL. DECENT	L.FISCAL DECENT	L.SCHOO
Decentpolitic	1,00					
FISCALDECENT	0,38*	1,00				
LEGAL_ORIGIN	-0,53*	-0,31*	1,00			
L.decentpolitic	0,90*	0,39*	-0,55*	1,00		
L.FISCALDECENT	0,33*	0,82*	-0,35*	0,40*	1,00	
L.SCHOOLING	-0,33*	-0,13	0,27*	-0,31*	-0,11	1,00