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GENDER AND CORRUPTION IN MENA COUNTRIES: NEW EVIDENCE FROM THE ARDL APPROACH

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Abstract

This paper aims to investigate the gender-corruption relationship in 13 MENA countries over the period 2006-20. Given the presence of cross-sectional dependence and the heterogeneity of the panel, we implement second-generation econometric panel unit root and cointegration tests. Using the ARDL-PMG approach, which is categorized as an error-corrected model, the results are broadly in line with the existing literature. We show that increased women's involvement in the economic and political sphere decreases corruption. The findings also reveal that the joint impact of women's participation and institutional variables is more effective in lowering corruption. The democracy and political stability context plays an important role in explaining the negative impact of corruption, especially when women are policymakers. Finally, we provide robust evidence that when a country performs in gender equality, the link between gender corruption becomes stronger. These results lead to several recommendations for MENA policymakers.

JEL Classifications: C23; D73; J16.

Keywords: Corruption, gender, MENA, ARDL.

ملخص

تهدف هذه الورقة إلى التحقيق في العلاقة بين الجنسين والفساد في 13 دولة من الشرق الأوسط وشمال أفريقيا خلال الفترة 2006-2020. نظرا لوجود الاعتماد المقطعي العرضي وعدم تجانس اللوحة ، فإننا ننفذ الجيل الثاني من اختبارات جذر وحدة الألواح الاقتصادية القياسية والتكامل المشترك. باستخدام نهج، الذي يصنف على أنه نموذج مصحح للأخطاء، تتماشى النتائج بشكل عام مع الأدبيات الحالية. ونبين أن الزيادة في مشاركة المرأة في المجالين الاقتصادي والسياسي تقلل من الفساد. وتكشف النتائج أيضا أن الأثر المشترك لمشاركة المرأة والمتغيرات المؤسسية أكثر فعالية في الحد من الفساد. ويؤدي سياق الديمقراطية والاستقرار السياسي دورا هاما في تفسير الأثر السلبي للفساد، لا سيما عندما تكون المرأة صانعة للسياسات. وأخيرا، نقدم أدلة قوية على أنه عندما يؤدي بلد ما أداء في مجال المساواة بين الجنسين، تصبح الصلة بين الفساد النوعي أقوى. وتؤدي هذه النتائج إلى تقديم العديد من التوصيات لصانعي السياسات في منطقة الشرق الأوسط وشمال أفريقيا.

1. Introduction

Corruption, defined as the act of using public power for private ends, is often considered a "cancer" that plagues the economic and political spheres of developed and developing countries. Research into the macroeconomic determinants of corruption has enabled economists to distinguish between the factors that can increase corruption and those that can limit the scourge. Democratic regimes, the decentralization of the government, economic growth supported by strong institutions, and strong integration into the global economy are all among the main mechanisms often considered in the fight against corruption (Brunetti and Weder, 2003; Neeman et al., 2008; Pellegrini and Gerlagh, 2004; Badinger and Nindl, 2014; Bhattacharya and Hodler, 2015; Dell'Anno and Teobaldelli, 2015). In recent years, a gender dimension has been added to these analyses. Several authors have argued that the increased participation of women in economic and political life could also reduce corruption (Dollar et al., 2001; Swamy et al., 2001; Goetz, 2007; Esarey and Chirillo, 2013; Esarey and Schwindt-Bayer, 2019). Specific arguments are often advanced to explain this negative impact. Some authors consider women more risk-averse than men, while others assume that women are interested in policy areas that are less amenable to corruption. It should be noted, however, that empirical estimates do not always confirm this relationship.

With an average score of 39 out of 100 in 2019, the MENA region is considered among the areas where corruption spreads the fastest despite the considerable efforts made to combat it. Political instability and the increase in terrorist acts have intensified the deterioration of economic conditions (Jaidane-Mazigh et al., 2019; Mazigh and Khefacha, 2022), preventing any attempt to fight corruption. Indeed, despite the progress of legislation in some countries and the economic wealth in others, MENA countries continue to record poor results in curbing corruption. Furthermore, the role of women in the fight against corruption in this region is often ignored and underestimated. There is evidence that there has been progress in eliminating gender disparities in education in this area, although gaps remain in the economic and political sphere. Indeed, four out of five working-age women are out of the labor force in the region (World Bank, 2017). Moreover, despite the establishment of legal quotas, women are underrepresented in politics. Women representatives in MENA countries' parliaments lag compared to the world average.

Thus, this rather paradoxical reality and the particularity of the MENA region explain our interest in choosing this region to investigate the relationship between the participation of women in economic and political life and the Corruption Perceptions Index.

The paper proceeds as follows. Section 2 presents a review of the relationship between corruption and gender. Section 3 describes the econometric methodology and the data. Section 4 reports and discusses the main empirical results, and section 5 offers some concluding remarks.

2. Literature review: Gender and corruption

Following the seminal article titled *Are Women Really the "Fairer" Sex?* developed by Dollar et al. (2001), the research on gender and corruption has grown considerably. Analyzing a sample of 100 countries, the authors establish that lower corruption is associated with a higher percentage of women elected to the national parliament. This result confirms previous social and economic analyses that have shown that there is a difference in behavioral characteristics between genders. According to these studies, women are often more selfless than men (Eckel and Grossman, 1998; Glover et al., 1997). In the same vein as Dollar et al. (2001), Swamy et al. (2001) conduct a study based on micro-data from world values surveys that shows that women are less involved in corruption and accept fewer bribes. Using macroeconomic data for 93 countries, the authors find strong evidence that a larger proportion of women in ministerial positions, parliament, and the labor force results in less corruption. More recently, by carrying out an analysis of 155 regions from 17 European countries, Jha and Sarangi (2018) highlight that women's presence in parliament is negatively linked to corruption, unlike the participation of women in the labor force, which does not influence the Corruption Perceptions Index. Similar results are obtained from the study of Easray (2019), which shows that women's presence in parliament decreases corruption for a sample of 76 democratic-leaning countries during the period 1990-2010.

This influence of women on corruption cannot be attributed to biological or physical differences. Women are not intrinsically more honest (Frank et al., 2011). These differences are often context-dependent and linked to social, economic, cultural, and political factors. Thus, several authors challenge the myth of the "fairer sex" and have sought to find out why gender influences corruption. The abundance of literature on this subject allows us to distinguish four main approaches that have attempted to explain the gender-corruption relationship.

First, according to Sung (2003), there is an alternative argument for the "fairer sex," which is the "fairer system." The effect of gender on corruption depends on the political system. Indeed, liberal democracy that promotes equality, fairness, and meritocracy improves women's political participation and discourages corruption through the role of the opposition candidates, independent judiciary, and free journalism. Therefore, it is evident that democratic countries with a large number of women in politics have lower levels of corruption.

Second, Goetz (2007) suggests that the gender-corruption relationship can be further explained by a difference in terms of the opportunities presented to women rather than a different behavior towards corruption. Indeed, the lack of knowledge regarding how to take part in corruption activities can explain the gender differences in attitudes. Moreover, women are generally excluded from "male-dominated patronage" and the greed corruption network. These conclusions argue the idea of "corruption convergence in gender," which invalidates the negative relationship between gender and corruption when women acquire the same status as men (Jha and Sarangi, 2018). However, using economic experiments with data collected in Australia, India, Indonesia, and Singapore, Alatas et al. (2009) find that the link between

gender and corruption differs regarding patriarchal structure. While women are less tolerant of corruption in Australia, there is no evidence of the same attitude in the case of the three Asian countries in the sample. The authors suggest that the equal gender structure that characterizes Australia may explain these results. In the same vein, Jha and Sarangi (2018) show that greater gender equality is correlated with lower corruption in 17 European countries.

Third, several studies affirm that the favored policies of women are usually different from those of men. The main issues on which women legislators focus are those linked with public services and social spending (Watson and Moreland, 2014). A similar result is supported by Rehavi (2007), who finds robust statistical associations between female political representation and health spending. In the same vein, Chattopadhyay and Duflo (2004) show that, in the local government of India, elected women increase public good spending relevant to the needs of their gender. There is evidence that women are generally considered more likely to engage in "helping behavior" (Bauhr and Charron, 2020).

Finally, an alternative line of research argues that the risk-averse attitude that characterizes women is also put forward to explain the gender-corruption relationship (Swamy et al., 2001). This argument is further reinforced by the fact that women are more severely punished when engaging in corruption (Reyes-Housholder, 2019). Schulze and Frank (2003) show that fewer women than men accept bribes when there is a high probability that the bribery will be discovered and punished. However, there is no gender difference when corruption is free of risk. Moreover, according to Eseray et al. (2013), the prevailing political regime may influence women's risk aversion. They suggest that women are less susceptible to corruption in democracies; however, the gender gap in corruption attitudes is weaker in autocratic systems. In a democracy, corruption is more stigmatized, which leads women to engage in corruption less often.

Contrary to the abundant analyses of gender-corruption relationships worldwide, scant attention has been devoted to studying this phenomenon in the MENA region. Jackson et al. (2020) argue that, in the case of Jordan, three factors explain the resistance of elected women concerning corruption: the lack of power and networks, credibility mechanisms, and risk aversion. Alexander (2020) uses public opinion data from the World Values Survey to explore gender differences in tolerance for bribery among a sample of 15,600 respondents. She then evaluates the relationship between the percentage of women in parliament and corruption across 18 MENA countries. Alexander finds weak support for the gender-corruption relationship, both for micro-data and cross-country analyses. Benstead and Lust (2018) use public opinion polls conducted in Jordan and Tunisia after the 2011 uprisings to investigate how the perception of women's incorruptibility determines their electability. The finding shows that people who admit that women are less corruptible or those who do not find any differences between men and women in their commitments to corrupt practices are more likely to vote for women candidates.

The scarce published works on the gender-corruption relationship in MENA countries explain our keen interest in prolonging the research in this area. The main contribution of this paper is to study the relationship between the participation of women in economic and political life and the Corruption Perceptions Index.

3. Empirical model specification

3.1 Data description

Due to missing data, we use annual data for only 13 MENA countries (Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Tunisia, Morocco, Oman, Qatar, the United Arab Emirates, Yemen, and Saudi Arabia) spanning 13 years from 2006 to 2020.

In Table 1, we provide a summary of the selected variables used in the analysis, along with their definitions, abbreviations, and sources. Only the GDP per capita is converted to the natural logarithm format.

Table 1. Variables' description and data sources

Variables	Definition	Abb.	Source
Corruption	Corruption Perceptions Index	COR	*TI*
DEMOCRACY	Democracy Index	DEM	*EIU*
POLITICAL_STABILITY	Political Stability Index	PS	*WGI*
LNGDP	GDP per capita ($ US courants)	LNGDP	*WGI*
KOF_INDEX	KOFFMAN Index	KOF	*KOF Swiss Economic Institute*
LABOR_FORCE_WOMAN	Labor force participation rate, female (% of female population aged 15+)	LFW	*WDI*
WOMAN_MINISTER	The proportion of women in ministerial level positions (%)	WM	*WBG*
WOMAN_PARLIAMENT	The proportion of seats held by women in national parliaments (%)	WP	*WDI*
GENDER__INDEX	The gap between men and women	GI	*TCdata360*

Note: WDI: World Bank Development Indicators; TI: Transparency International; EIU: Economist Intelligence Unit; WGI: Worldwide Governance Indicators; EF: Economic Freedom database; WBG: World Bank Group

In line with Jha and Sarangi (2018), we consider that women can reduce corruption, either because they are less corrupt and accept fewer bribes or because they can participate in the implementation of laws and strategies to fight against corruption when they are members of parliament or government. We use three measures of women's participation: the percentage of

women in the workforce, the percentage in parliament, and the percentage of women ministers in the government. These variables capture both grand and petty corruption.

According to the World Economic Forum report (2021), the Global Gender Gap Index measures the gap between men and women in four key dimensions (economic participation and opportunity, educational attainment, health and survival, and political empowerment) with four sub-indexes and 14 different indicators that compose them. The lowest score is zero (inequality) and the highest is one (equality).

From the descriptive analysis in Table 2, we state that our sample presents the following characteristics. First, there is a high level of corruption with an average of 42.743 for the period 2006-20. However, Qatar records the best performances with scores above 60, and with a maximum corruption perception index of 77 recorded in 2010. Second, there is a lack of democracy with an average Democracy Index slightly higher than three, placing the region at the bottom of the ranking in the "Authoritarian Regimes" category (The Economist Intelligence Unit, 2020). Only Tunisia stands out and is classified in the "Flawed Democracies" category with scores exceeding six since 2013. Likewise, the region is characterized by strong political instability with an average score of (-0.448). Third, statistics show high gender inequality in these countries. With an average of 60 percent, the MENA region remains the area with the largest gap (World Economic Forum, 2021). These poor performances explain the low scores of the share of women in the workforce (an average of 18.9 percent, which are substantially lower than the global average of 46 percent), the proportion of women ministers (9.1 percent), and the share of seats held by women in parliament (11.1 percent behind the world average of 23 percent). It should be noted, however, that there are some countries that show good performance. This is the case in the United Arab Emirates, where, according to the Inter-Parliamentary Union, 50 percent of elected parliamentarians in the last elections of 2019 are women.

Table 2. Descriptive statistics

	COR	DEM	GI	KOF	LFW	LNGDP	PS	WM	WP
Mean	42.743	3.293	0.602	62.052	18.909	9.105	-0.448	9.117	11.147
Median	43.000	3.160	0.607	64.700	18.113	8.616	-0.491	8.260	9.756
Maximum	77.000	6.720	0.716	78.490	28.472	11.351	1.224	29.200	50.000
Minimum	14.000	1.710	0.451	38.680	7.881	6.714	-3.010	0.000	0.000
Std. Dev.	13.898	1.026	0.042	10.020	5.509	1.234	0.945	5.541	10.394
Skewness	0.249	1.232	-1.598	-0.667	0.120	0.148	-0.266	1.149	0.908
Kurtosis	2.636	5.077	6.283	2.447	2.056	1.735	2.714	5.198	3.557
Jarque-Bera	3.100	84.328	164.395	16.926	7.191	13.293	2.956	81.730	29.309
Probability	0.212	0.000	0.000	0.000	0.027	0.001	0.228	0.000	0.000
VIF		2.82	3.66	1.61	1.9	4.9	3.01	1.46	1.95
Tolerance 1/VIF		0.354	0.273	0.622	0.525	0.204	0.333	0.684	0.514
Observations	195	195	188	195	182	189	195	194	195

Inferring to the Jarque-Bera (JB) normality test, all the variables followed the normal distribution except corruption and political stability. To examine the multicollinearity between variables, we use the tolerance values and the variance inflation factor (VIF). We can conclude that each independent variable has a unique effect on the response variable given that the values of VIF are smaller than five and the values of tolerance are more than 0.2.

This result is confirmed by the Pearson matrix correlation in Table 3 since the correlation coefficient between explanatory variables under study was less than 0.7.

Table 3. Pearson correlation analysis

	COR	DEM	GI	KOF	LFW	LNGDP	PS	WM	WP
COR	1								
DEM	-0,016 0,831	1							
GI	0,588 0,000	0,318 0,000	1						
KOF	0,079 0,296	0,095 0,213	-0,263 0,000	1					
LFW	-0,186 0,014	0,607 0,000	0,368 0,000	0,014 0,850	1				
LNGDP	0,774 0,000	-0,281 0,000	0,544 0,000	0,042 0,586	-0,141 0,063	1			
PS	0,840 0,000	0,015 0,848	0,580 0,000	-0,027 0,725	0,000 0,995	0,770 0,000	1		
WM	0,153 0,043	0,302 0,000	0,293 0,000	-0,335 0,000	0,089 0,240	-0,120 0,113	0,082 0,279	1	
WP	0,153 0,044	0,465 0,000	0,445 0,000	-0,388 0,000	0,237 0,002	-0,088 0,244	0,116 0,128	0,452 0,000	1

3.2 Model specification and econometric techniques

Two major empirical research questions are analyzed in this study: First, is women's participation in the economic and political sphere cointegrated with the Corruption Perception Index? If the long-run equilibrium relationship is identified, which women's participation measure most affects corruption? Second, does this effect depend on the political and social context?

To this end, and in line with Swamy et al. (2001) and Jha and Sarangi (2018), we try to estimate the regression expressed as follows:

$$COR_{i,t} = \beta_0 + \beta_1^{'}[WI_{i,t}] + \beta_2^{'}[X_{i,t}] + \varepsilon_{i,t}$$

where *i* corresponds to the countries. and t the time dimension.

$COR_{i.t}$ is the dependent variable representing the Corruption Perception Index.

$WI_{i.t}$ is the vector of women's involvement variables, which include $LFW_{i.t}$, $WM_{i.t}$, and $WP_{i.t}$. $X_{i.t}$ is the vector of control variables, which include $DEM_{i.t}$, $GI_{i.t}$, $KOF_{i.t}$, $PS_{i.t}$, and $\ln(GDP_{i.t})$.

Before estimating the regression model, the following process was undertaken to check the existence of a long-run relationship between the dependent and independent variables:

1. Due to the possible presence of omitted unobserved common shocks and factors across countries, we test for the presence of cross-sectional dependence and the existence of heterogeneous slopes in the panels, which have an important effect on the statistical properties of panel unit root tests. Do not consider the dependence, misspecification problems, and spurious regressions that may arise.
2. The results of the first step lead to identifying which panel unit root tests must be used. Therefore, in the context of cross-sectional dependence and the heterogeneity in slope, first-generation panel unit root tests are likely to be biased, therefore, we directly investigate the so-called second-generation panel unit root.
3. The long-term connection between the variables is carried out thanks to the Westerlund and Edgerton (2007) test.
4. Finally, we conduct the Pooled Mean Group (PMG) estimation proposed by Pesaran et al. (1999) to identify the long- and short-run effects of the exploratory variables on the response variable. This estimator is based on the Autoregressive Distributive Lag Model, known as the ARDL model, reparametrized in the form of an error correction model applicable in cases where the dependent and independent variables are a mixture of I (1) and I (0).

4. Results and discussion

4.1 Cross-sectional correlation and the heterogeneity of slope test results

Table 4 reveals a cross-sectional dependence between the countries of the panel since the null hypothesis (there is cross-sectional independence) can be rejected at the one percent significance level.

Table 4. Cross-sectional dependence and the slope homogeneity tests

Cross-sectional dependence		
Test	***Statistic***	***P-Value***
LM (Breusch and Pagan, 1980)	137,955	0.000
LM CD* (Pesaran, 2004)	4,800	0.000
LM adj* (Pesaran et al., 2008)	4,300	0.000
Homogeneity tests		
Test	***Statistic***	***P-Value***
Δ	***7.859***	0.000
Δ^{adj}	15.499	0.000

Source: Authors' calculations.

Similarly, the null hypothesis of the slope homogeneity test by Pesaran and Yamagata (2008) is rejected, confirming the need to account for heterogeneity in the relationship estimation between corruption and explanatory variables across countries.

4.2 Panel unit root test results

Since a cross-sectional dependency among the series has been detected, we cannot apply the first-generation panel unit root tests. Therefore, we examine integration levels in the cross-sectionally augmented unit root test of Pesaran (2007), which is called the CIPS test.

Table 5. CIPS panel unit root test results

Variable	CIPS (Level)	CIPS (First Difference)	Integration
COR	-1.608	-4.065***	I(1)
DEM	-1.139	-3.054***	I(1)
GI	-8.384***	-8.384***	I(0)
KOF	-1.932	-4.016***	I(1)
LFW	-2.284	-2.766***	I(1)
LNGDP	-2.611***	-2.407***	I(0)
PS	-1.723	-3.460***	I(1)
WM	-2.195***	-3.746***	I(0)
WP	-1.682	-3.141***	I(1)

Note: *** indicates rejection of null hypothesis at the one percent level.
Source: Authors' calculations.

The findings in Table 5 reveal that the null hypothesis of the unit root is rejected for the Gender Index (LNGDP and Woman Minister), whereas the same hypothesis is accepted for the six other variables of the model. The same test applied in the first differences reveals that the variables become stationary. As some variables were integrated into order zero and others into order one, we can estimate a panel ARDL model and hence study the long-term equilibrium relationship between the variables.

4.3 Cointegration test results

As suggested by Westerlund and Edgerton (2007), we test the presence of a linear combination between corruption and gender in MENA countries thanks to four-panel cointegration tests statistics (Ga, Gt, Pa, and Pt). These are later preconized for the presence of cross-sectionally dependent data and allow for a large degree of heterogeneity both in the long and short run. The two tests (Gt, Pt) are calculated with the standard errors estimated for individual states in a standard way (λ_i), while the other statistics (Ga, Pa) are computed with the standard errors of (λ) for the panel based on Newey and West's (1994) standard errors

and adjusted for autocorrelations and heteroscedasticity by considering the following equation:

$$\Delta COR_{i,t} = \alpha_i^{COR} + \lambda_i^{COR}(COR_{i,t-1} - \beta_i^{COR} WI_{i,t-1}) + \sum_{j=1}^{n} \delta_{i,j}^{COR} \Delta COR_{i,t-j} + \sum_{j=1}^{n} \phi_{i,j}^{COR} \Delta WI_{i,t-j} + e_{i,t}$$

As shown in Table 6, the significant values based on the robust p-value indicate consistent evidence of cointegration in the data at the one percent level.

Table 6. Westerlund (2007) bootstrap cointegration test analysis

Statistic	*Value*	*z-value*	*Robust p-value*
G_t	-3.033	2.957	0.000
G_a	-2.805	4.188	0.000
P_t	-7.779	0.814	0.000
P_a	-1.838	2.808	0.000

Source: Author's calculation.

4.4 Long-run estimation

The presence of different levels of integration and the presence of cointegration between the variables lead to estimating the short and long terms by modeling an ARDL equation. By choosing an appropriate lag, this technique may minimize the issue of serial correlation, and endogeneity also allows for heterogeneity in the slopes.

In the case of panel data, we employ the Pool Mean Group (PMG) estimator developed by Pesaran et al. (1999) to "highlight both the pooling implied by the homogeneity restrictions on the long-run coefficients and the averaging across groups used to obtain means of the estimated error-correction coefficients and the other short-run parameters of the model."

Before discussing the results obtained from the PMG estimator,[4] we should mention that the estimate of error correction terms of all variables (ECTs) (i.e., the speed of adjustment) is in all cases significant at the one percent level, varying between -0.234 and -0.743. This indicates that, on average, the correction of shocks and deviations from the long-run equilibrium with the variation in explanatory variables is done.

Moreover, to ensure that the PMG estimator provides more robust outcomes, we use the Hausman test to test it against the results obtained from the Mean Group (MG) estimator allowing heterogeneity in the short- and long-run estimators. At the one percent level of significance, the results show that it is difficult to decline the homogeneous restriction in the long-term equilibrium, providing evidence that the PMG is consistent as it is more efficient.

[4] We decided not to transcribe the short-run results, which can vary between countries. The estimated model was an ARDL(1,1,…,1) model. The long-run coefficients do not change much if we consider different lag lengths.

4.5. Baseline specification

In Equation 1, we investigate the effect of some economic and political variables on corruption. As shown in Table 7, we find that only economic variables (the GDP per capita and the KOF index) are significant and positive. Following several previous studies (Treisman, 2000; Dollar et al., 2001; Jha and Sarangi, 2018) a higher per capita income seems to reduce corruption. There are two main reasons for this result. On the one hand, anti-corruption policies are generally expensive. On the other hand, the argument generally advances to explain the acceptance of bribes is lower wages. Thus, the improvement of economic conditions leads to a decrease in corruption. In addition, our results show that deeper integration into the world economy given by a high Kof index reduces corruption. The finding is conformed to that of Ades and DiTella (1999), who show that economies where firms are isolated from foreign competition exhibit higher levels of corruption.

The institutional variables, namely democracy and political stability, are insignificant in this first equation. However, they often become significant when we introduce variables related to the participation of women in economic and political life (Equations 2 to 12). In most of these equations, and when it is significant, the democracy variable seems to increase the level of corruption, unlike several previous studies that show that with democratic institutions, political competition and the independence of the media reduce corruption (Treisman, 2000; Persson et al., 2003).

Table 7. Long-run coefficients

	Eq (1)	Eq (2)	Eq (3)	Eq (4)	Eq (5)	Eq (6)	Eq (7)	Eq (8)	Eq (9)	Eq (10)	Eq (11)	Eq (12)	Eq (13)
DEMOCRACY	-0,160	-0,988***	**4,407*** **	-0,493	0,100	**-6,959*** **	0,764	**-3,658*** **			**-0,731*** **	0,050	
POLITICAL_STABILITY	-0,596	-1,597	**-1,674* **	**-1,292* **	**3,539*** **	**6,060*** **	**3,895*** **	**6,530*** **	**-4,389** **	**-7,283*** **	**2,107*** **		**6,433*** **
LNGDP	**6,004*** **	**2,866** **	**6,766*** **	**5,809*** **	1,458	**6,991*** **	**3,600*** **	**4,099*** **	-0,180	**4,661*** **	1,595	**4,932*** **	**4,132*** **
KOF_INDEX	**1,859*** **	**0,454*** **	**1,849*** **	**0,919*** **	**0,696*** **			**0,254*** **	**1,149*** **	**0,661*** **	**0,357*** **	**0,631*** **	**0,421*** **
LABOR_FORCE_WOMAN		**1,534*** **				**-0,797*** **					0,177		
WOMAN_MINISTER			**0,318*** **					**-3,232*** **		**0,770*** **			**-9,751*** **
WOMAN_PARLEMENT				**0,209*** **			0,013		0,041			**-4,028*** **	
GENDER__INDEX					-21,081						-13,025	**-74,579*** **	**-31,230*** **
LABOR_FORCE_WOMAN*GENDER__INDEX											0,670		
DEMOCRACY*LABOR_FORCE_WOMAN						**0,312*** **							
GENDER__INDEX*WOMAN_PARLEMENT												**6,857*** **	
DEMOCRACY*WOMAN_PARLEMENT							**0,088*** **						
POLITICAL_STABILITY*WOMAN_PARLEMENT									**0,155** **				
WOMAN_MINISTER*GENDER__INDEX													**16,315*** **
WOMAN_MINISTER*POLITICAL_STABILITY										**0,541*** **			
DEMOCRACY*WOMAN_MINISTER								**1,048*** **					
COINTEQ	**-0,475*** **	**-0,743*** **	**-0,444*** **	**-0,547*** **	**-0,651*** **	**-0,397*** **	**-0,268*** **	**-0,355*** **	**-0,500*** **	**-0,370*** **	**-0,709*** **	**-0,234*** **	**-0,348*** **
Observation	**176**	**168**	**176**	**176**	**171**	**168**	**176**	**176**	**176**	**176**	**161**	**167**	**167**
Hausman Test	**0,27 0,9914**	**0,02 1,0000**	**0,59 0,9886**	**0,28 0,9980**	**0,28 0,9979**	**0,14 0,9997**	**0,93 0,9683**	**0,54 0,9905**	**0,67 0,9544**	**3,09 0,5429**	**0,00 1,0000**	**0,28 0,9998**	**0,18 0,9963**

Note: ***, ** and * indicate significance at the one percent, five percent and 10 percent levels, respectively.
Source: Author's calculations.

This contradictory result can be explained by the lack of democracy in most countries in the region. Indeed, several analyses (Sung, 2004; Mohtadi and Roe, 2003; Rock, 2008) show that the new democracies are characterized by fairly high levels of corruption. This is explained by the fact that the end of authoritarian regimes "democratizes" corruption. This is the case, for example, in Tunisia, where the Corruption Perceptions Index fell from 43 in 2010 to 38 in 2011. Therefore, it is not the transition to democracy that can reduce corruption, but rather the maturity of democracy and political stability.

Regarding the political stability variable, when it is significant, it generally shows a positive sign in Equations 3 to 12. This finding is consistent with the results of Campante et al. (2009). Indeed, political instability shortens the duration of politicians in power, which pushes them to increase the rate of rent extraction. Moreover, political stability allows for the establishment of policies and strategies to fight against corruption, thereby increasing the value of building a positive reputation (Treisman, 2000; Nur-Tegin and Czap, 2012).

4.6. Women's participation in the economic and political sphere and corruption

In Equation 2, the share of women in the workforce is positive and highly significant. The coefficient implies that a one percent increase is associated with an improvement of the CPI index by 1.5 points. As far as this goes for women's share of parliamentary seats, Equation 3 shows that an increase of one percent in the number of seats held by women increases the Corruption Perceptions Index by 0.2 points. Finally, in Equation 4, the influencing variable is the number of female ministers, which is also highly significant, with a coefficient equal to 0.32, which is slightly higher than that for women in parliament. Our results are broadly in line with the existing literature focusing on the gender-corruption relationship (Dollar et al., 2001; Swamy et al., 2001; Jha and Sarangi, 2018; Esarey and Schwindt-Bayer, 2019). However, unlike Swamy et al. (2001), who find nearly identical coefficients for the three variables of women's influence, we find different coefficients. Our results show that the presence of women in the labor force has a greater impact on corruption than the other two measures. We can therefore indicate – with the caution that in the case of our sample an increased number of women in the workforce will contribute to further reducing petty corruption if we consider Sway et al. (2001) and Jha and Sarangi (2018) – that women ministers and the participation of women in parliament are more linked to grand corruption.

4.7. Institutional context and the gender-corruption relationship

As noted earlier, several authors consider the gender-corruption relationship context-dependent (Sung, 2003; Goetz, 2007; Alatas et al., 2009; Esarey et al., 2013). A democratic context accompanied by political stability had to allow women to fight corruption more effectively.

To test this hypothesis, we add to the basic models the terms of the interaction of the influencing variables with the democracy variable in Equations 6, 7, and 8. We notice that the

coefficients of the crossed variables remain positive and significant, but their magnitude has changed considerably. It turns out that, when crossed with democracy, it is the female minister variable that has more influence (1.04 compared to 0.3 for LF and 0.088 for WP). Democratic institutions reinforce the effect of women as policymakers on corruption, especially grand corruption.

Similarly, in Equations 9 and 10, we find that women ministers, crossed with political stability, participate more in reducing corruption (0.54) than women in parliament (0.15). We thus show that a democratic and politically stable framework would allow woman ministers to play an important role in the fight against corruption. As the State becomes more stable and more democratic, women's involvement in political life will be associated with a cleaner government.

4.8. Gender equality and the gender-corruption relationship

We attempt to verify the "corruption convergence in gender" hypothesis, which stipulates that as and when women acquire a social status close to men, they will have easier access to the corruption network. In other words, the more the Gender Index increases, the more the Corruption Perception Index decreases. In Equation 5, we control for the Gender Index, which measures the gap between men and women. The coefficient of GI has the expected negative sign, but it is not significant. However, when the interaction between GI and women involvement variables is included (Equations 11, 12, and 13), its coefficient is positive and statistically significant. The involvement of more women in economic and political life in a more egalitarian society further strengthens the gender-corruption relationship. Our findings show that women's impact on corruption is higher through their presence in politics (6,85 for WP and 16,31 for WM). As confirmed by Rothstein (2018), greater gender egalitarianism creates a society where meritocracy and impartiality will be the foundations of good governance, which leads to corruption under control.

5. Conclusion and policy implications

This study investigates the long-term effect of women's participation on corruption in 13 MENA countries. We use the second-generation panel cointegration test, which includes cross-dependence among countries (Westerlund and Edgerton, 2007), and the ARDL-PMG approach. Our results can be summarized in three main findings.

First, we show that the increase in women's involvement in the economic and political sphere decreases corruption, which is consistent with several previous studies (Dollar et al., 2001; Swamy et al., 2001; Esarey et al., 2013; Jha and Sarangi, 2018). Second, our findings also reveal that the political context widely influences the gender-corruption relationship. Indeed, the joint impact of women's participation and institutional variables is more effective in lowering corruption, especially for women's participation in the exercise of political power. Finally, in line with Jha and Sarangi (2018), we reject the hypothesis of "corruption

convergence in gender." We provide robust evidence that gender equality strengthens the link between gender and corruption.

It must be admitted that our findings are tentative and that more micro-data analyses are needed to explain the specificity of this relationship for each country given the large diversity within the region.

Our results, as well as those of previous studies, are a strong argument to advocate for policy measures that promote female involvement in economic and political decision-making to curb corruption. However, this fight requires comprehensive and long-term strategies. A quick increase in women's participation will not be enough to eradicate this scourge, especially in the MENA region. The lack of democracy, the political instability, and the strong gender inequality (which is mainly due to the patriarchal culture rooted in the region), weaken the link between gender and corruption. The quota system, either for the candidate list (Algeria and Tunisia) or for reserved seats (Saudi Arabia and Iraq) has not improved the representativeness of women in politics in several countries of the region. Discriminatory attitudes toward women's economic and political capability prevail. Women continue to face multiple constraints to voice and agency since there is no effective inclusion in decision-making. Therefore, the gender gap must be effectively reduced to lead to a society based on merit, which is a necessary foundation for good governance and sustainable and more inclusive growth.

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