

SME Participation in Public Purchasing: Procurement Policy Matters

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Motivation

- Small and medium enterprises (SMEs) account for more than half of total employment globally.
- SMEs play a vital role in improving and sustaining social cohesion and integration (OECD, 2018)
- SMEs represent about 96 per cent of all registered companies in the MENA region (Ghassibe et al. 2019).

Motivation

- Constraints faced by SMEs diminish their ability to grow.
 - Access to finance
 - difficulties in complying with regulatory regimes
- Many countries conduct government policies to support SMEs.
- Public procurement is one instrument governments can use to this end.
- In the Arab world, the total public procurement market is large – estimated to be in the range of 15-20% of GDP (Djankov et al., 2016).
- Public procurement is therefore a potentially important mechanism to increase the demand for the output of SMEs.

Research Question

- In this paper, we use detailed panel data to examine the impact of public procurement regulation on SME participation in public contracts in 32 European countries.
- We investigate whether public procurement policies affect
 - participation in procurement processes by SMEs.
 - the probability of success in winning contracts

Main Results

- The quality of public procurement regulation has a statistically significant positive effect on SME participation in PP tenders.
- The quality of public procurement regulation improves the probability that an SME wins a public procurement contract.
- SMEs are more likely to submit bids when
 - government entities employ open procedures (first price auctions)
 - when contracts are of small size.

Conceptual Arguments

- Evenett and Hoekman (2005) argue that there are two important dimensions of procurement regulation.
 - leveling the playing field by removing explicit discrimination against foreign firms.
 - transparency and related mechanisms that reduce discretion and the potential for corruption and collusion in the allocation of contracts.
- Greater transparency and due process may be a positive or a negative for small firms.
 - There is a presumption that small firms will be less able to provide bribes or side-payments than larger firms.
 - less discretionary procurement practices may encourage greater participation by firms that otherwise would refrain from bidding for contracts

Prevailing public procurement policy regimes

- Djankov et al. (2017) characterize the quality of PP regulation for 142 countries in 2016.
 - i. bid preparation
 - ii. the content and management of the procedures used to award contracts
 - iii. payment of suppliers.
- The arithmetic mean of these scores is used to calculate an Overall Public Procurement Score.
- The source of the data used to construct these scores are surveys of more than 1,900 PP experts.

Prevailing public procurement policy regimes

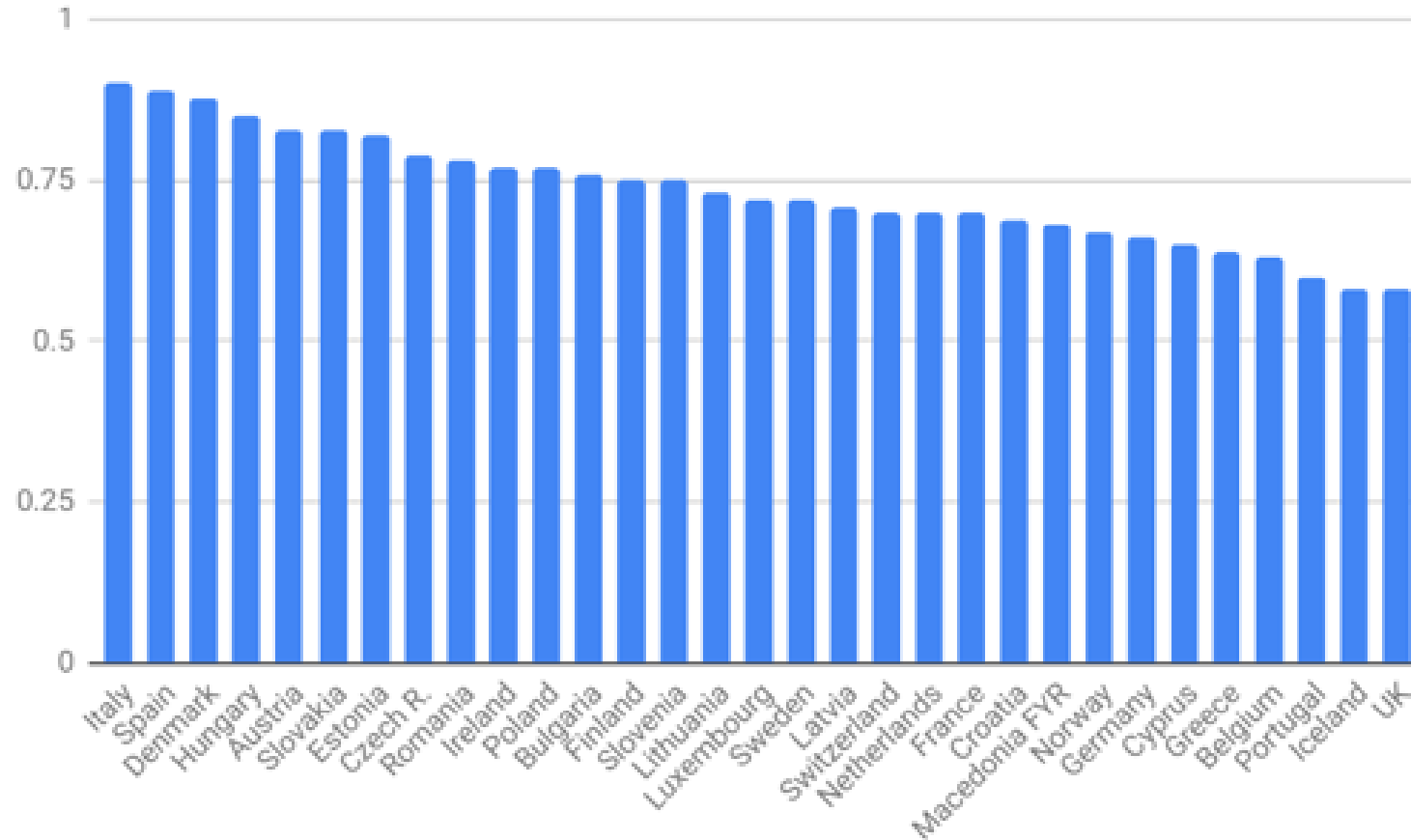
- DigiWhist initiative: EuroPAM indicators score the quality of PP processes and regulation in the European countries considered.
- DigiWhist public procurement quality scores are available from 2012 to 2017.

Table 1. World Bank and Digiwhist Public Procurement Indicators, selected European states

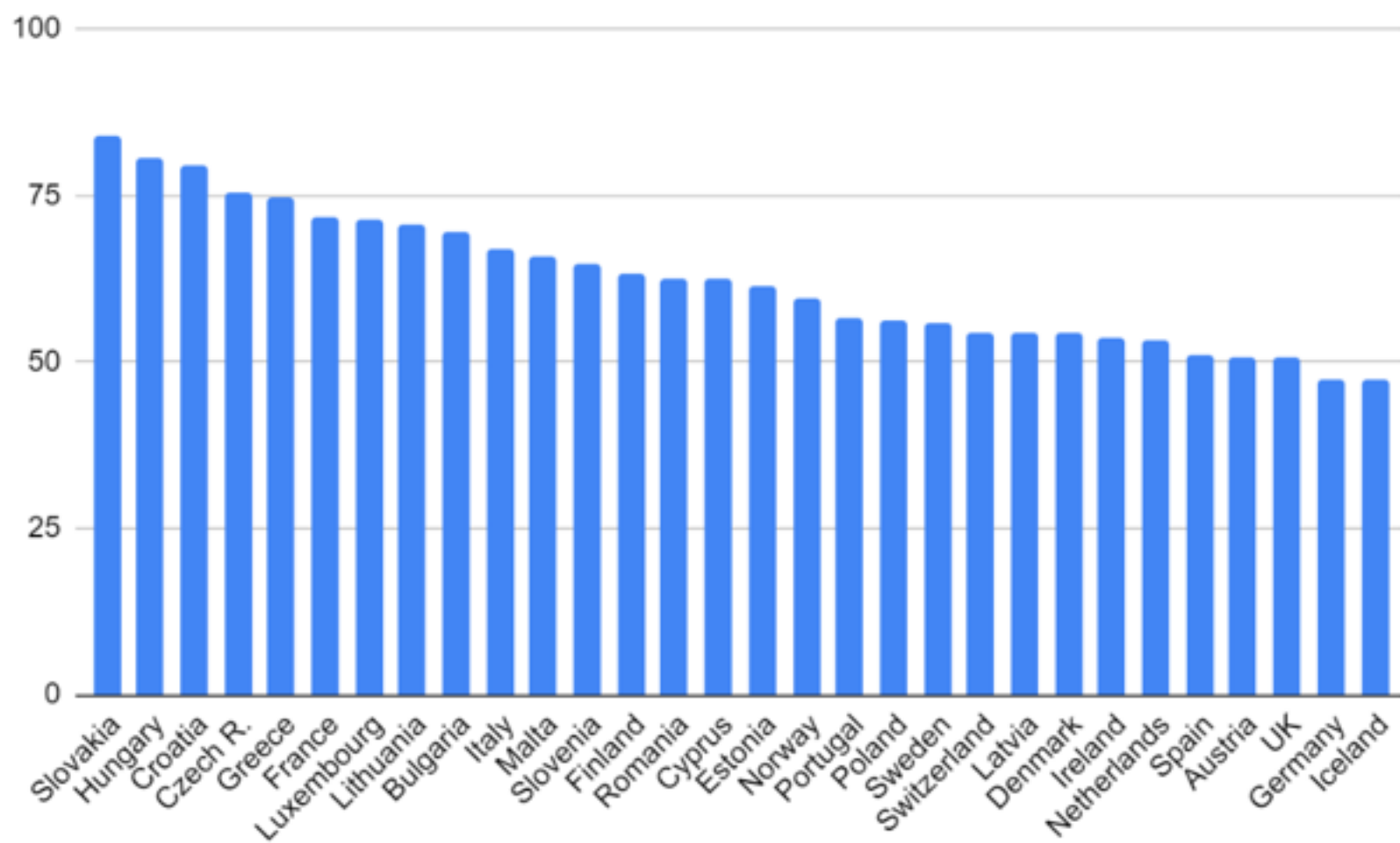
	Mean	Standard Dev.	Min.	Max
PP Overall Index	0.73	0.09	0.58	0.9
<u>EuroPAM</u> Country Score (Year 2016)	62.2	9.83	45	88
<u>EuroPAM</u> Country Score (Year 2017)	62.7	11.3	45	83

Notes: The World Bank Benchmarking Public Procurement (BPP) overall indicator ranges from 0 to 1, with higher scores denoting better quality regulation. EuroPam scores range between 0 and 100. The World Bank data span 31 European countries; DigiWhist covers one additional European country (Malta).

Figure 1. Public Procurement Regulation Scores for EU Countries

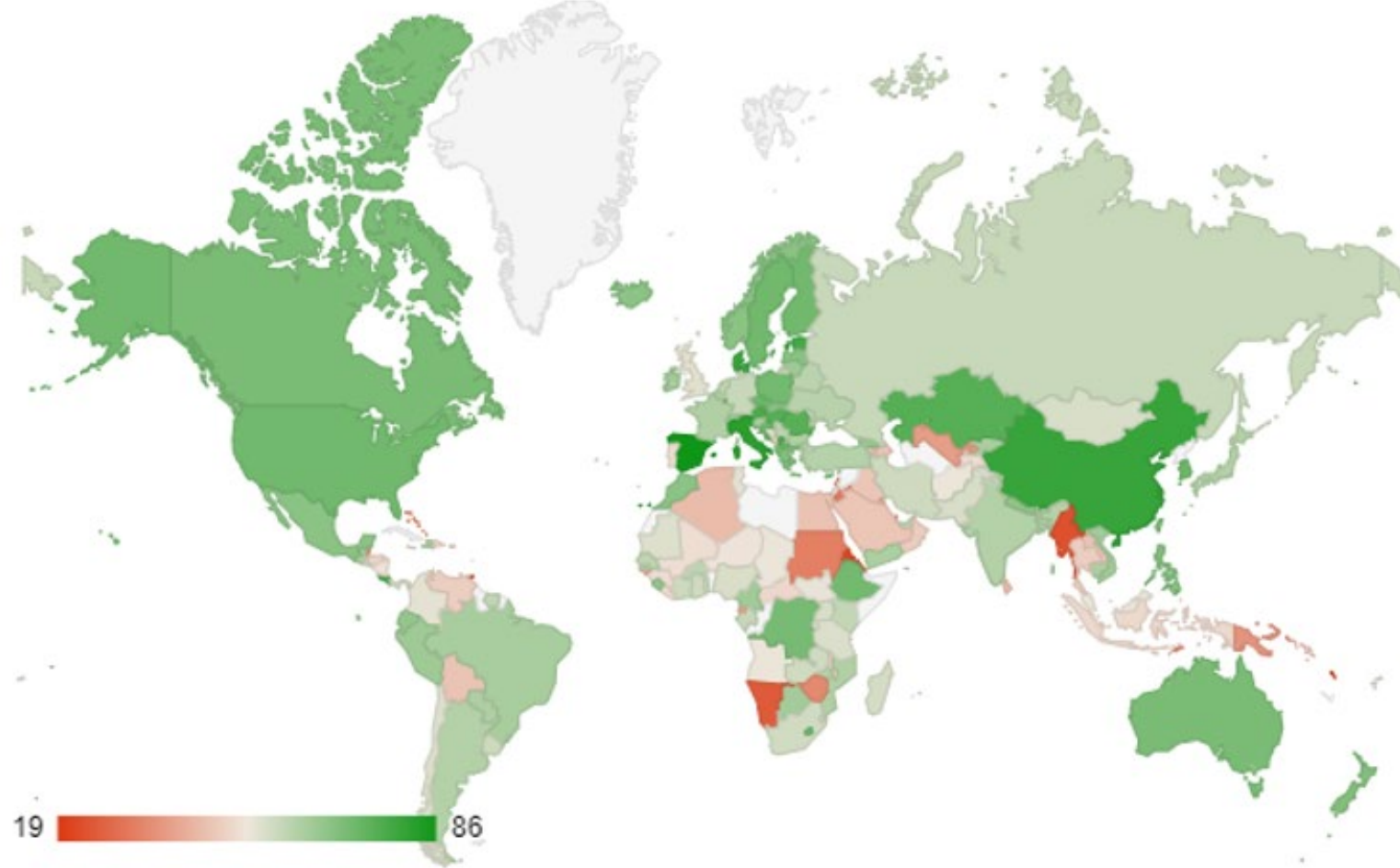


World Bank Overall Benchmarking Public Procurement Index



Average DigiWhist EuroPam country scores

Figure 2. World Bank Public Procurement Scores



Note: Higher numbers (darker green) denote higher quality PP regimes.
Source: World Bank (2017).

MENA Region

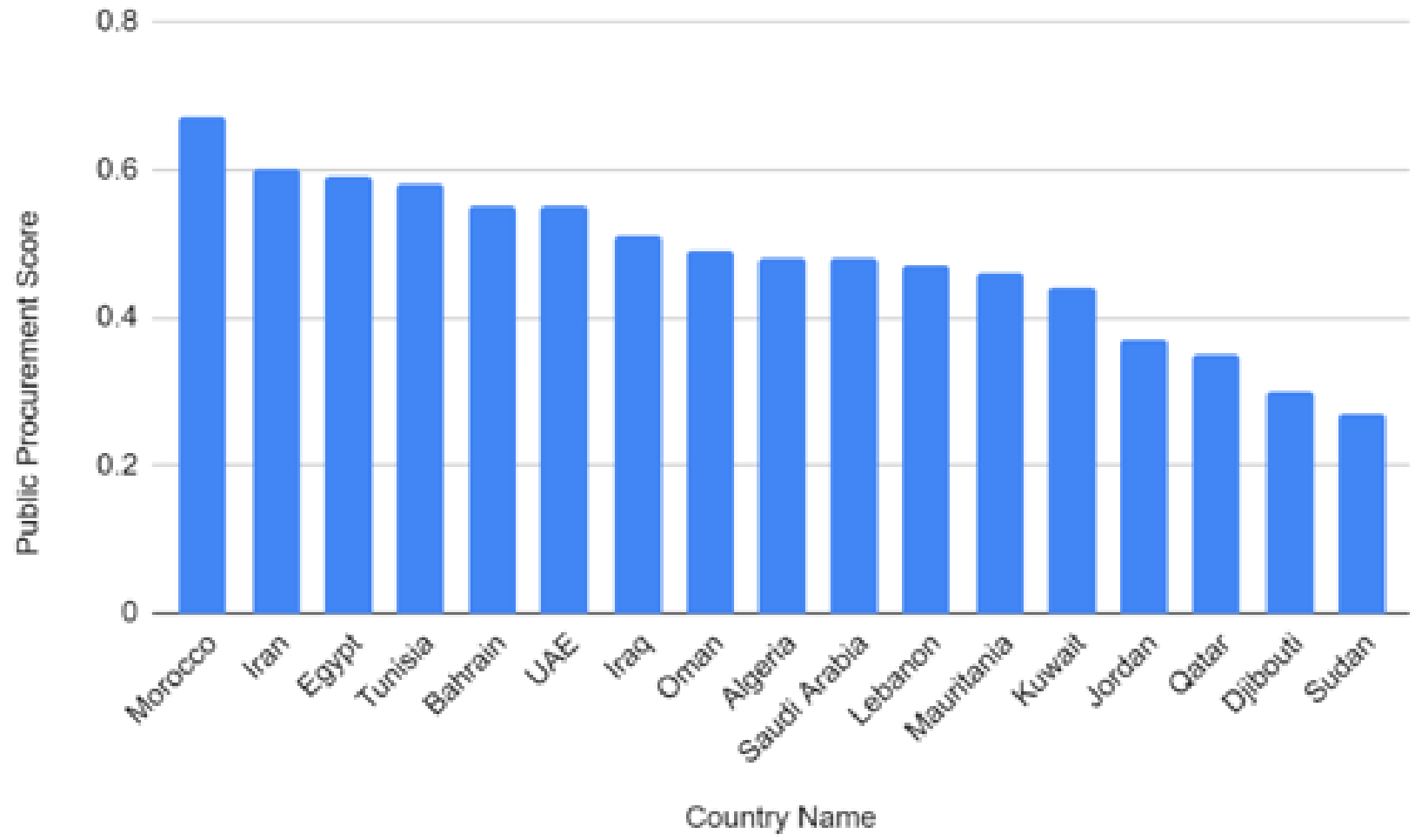
- The MENA region has significantly lower public procurement quality scores than European countries.
- Public procurement regulation quality scores for MENA countries are significantly lower, both in terms of the mean and overall distribution of scores.

Table 2. World Bank BPP Scores: Summary Statistics for European and MENA Countries

	Mean	Standard Dev.	Min.	Max
EU	0.73	0.09	0.58	0.9
MENA	0.48	0.11	0.27	0.67

Source: World Bank (2017).

Figure 3. World Bank Public Procurement Scores of MENA Countries



Data

- We use the World Bank and Digiwhist information on the quality of PP regulation and PP contract award data for 32 European countries.
- Contract award data are sourced from the TED database.
- The TED contains information on all tender opportunities as well as information on contract awards made by procuring entities in the European Economic Area (EU28, Iceland, Lichtenstein and Norway), Switzerland, and the Former Yugoslav Republic of Macedonia.
- Public authorities are obliged to publish their tender invitations on TED for all contracts exceeding EU public procurement thresholds.

Data

- For each contract, the TED database includes
 - fields for the estimated contract value (determined by the procuring entity)
 - the actual contract (award) price
 - the sectoral Common Procurement Vocabulary (CPV) code that applies to the subject of procurement
 - the procurement method used, type(s) of contracting authority
 - the names and locations of both the procuring agencies and the winning firms.

Data

- TED includes information on SME participation for 2016 and 2017. A total of 1,018,794 tenders were awarded in these two years.
- For 205,578 of these tenders, or 20 percent of the total, information is reported on the number of SMEs that participated in the tender process.
- 67 percent of tenders are won by an SME. The majority (185,682) of these contracts were awarded using open procedures (first price auctions).
- Almost 80 percent (163,265) of the contracts in our sub-sample involved division of a part of the project into smaller lots.

Empirical Analysis

- Our empirical analysis addresses three questions:
 1. the effect of PP regulation on SME participation in tenders
 2. whether higher quality PP processes affects the probability of winning a contract
 3. whether dividing larger projects (contracts) into smaller lots has an effect on SME participation and on the probability of success.

SME Participation

- We estimate the following regression equation:

$$\begin{aligned} Ratio_c = & \beta_1 PPQ_c^i + \beta_2 PM_c + \beta_3 above_c + \beta_4 divided_c + \sum_{z=1}^9 \beta_{z+4} PA_c^z + \\ & \sum_{s=1}^{44} \beta_{s+13} Sector_c^s + \varepsilon_c \end{aligned} \quad (1)$$

SME participation

- $Ratio_c$ is the ratio of bids by SMEs to the total number of bids submitted for each contract.
- PPQ_c^i is the public procurement quality score i , where i identifies whether the World Bank Overall Benchmarking Public Procurement score or the DigiWhist EuroPAM country scores are used.
- PM_c is a dummy variable for the use of open procurement methods
- PA_c^Z is a dummy variable denoting the type of public procurement authority that issued the call for tenders.
- $Sector_c^S$ denotes 44 sector fixed effects
- Dummy variables for whether estimated costs exceed the legal thresholds above which EU procurement law applies $above_c$, and whether the contract is divided into smaller lots, $divided_c$.

Table 3. Effect of Public Procurement Regulation on SME Participation

Dependent Variable: Ratio of SME bidders to total number of bidders

	OLS	IV-GMM	HB-IV GMM
	World Bank BPP Measure		
World Bank PP Score	0.16 (10.07)**	0.21 (5.74)**	0.11 (5.03)**
Open Procedure	0.07 (19.63)**	0.07 (19.46)**	0.07 (19.72)**
Above Threshold	-0.03 (16.76)**	-0.03 (15.60)**	-0.03 (17.03)**
Divided Lots	0.02 (7.07)**	0.02 (7.20)**	0.02 (6.98)**
Constant	0.57 (30.67)**	0.53 (17.45)**	0.60 (27.45)**
Observations	205,469	205,469	205,469
	Digiwhist EuroPAM Public Procurement Score		
Country Score	0.001 (8.67)**	0.001 (5.73)**	0.001 (4.83)**
Open Procedure	0.067 (19.93)**	0.067 (19.88)**	0.067 (19.98)**
Above Threshold	-0.036 (18.41)**	-0.036 (18.41)**	-0.036 (18.40)**
Divided Lots	0.017 (6.62)**	0.017 (6.55)**	0.017 (6.60)**
Constant	0.629 (39.93)**	0.61 (32.17)**	0.634 (37.18)**
Observations	205,465	205,465	205,465

Notes: * $p < 0.05$; ** $p < 0.01$. Robust z-statistics in parentheses. IV-GMM employs lagged per capita GDP as an instrumental variable. All models include authority, sector and year fixed effects.

Probability that an SME Wins a Contract

- We estimate the following regression equations:

$$Prob(SME_Winner_c = 1|x) = F(x'_{it}\beta)$$

$$SME_Winner_c = \beta_1 PPQ_c^i + \beta_2 PM_c + \beta_3 above_c + \beta_4 divided_c + \sum_{z=1}^9 \beta_{z+4} PA_c^z + \sum_{s=1}^{44} \beta_{s+13} Sector_c^s + \varepsilon_c \quad (3)$$

Table 4. Effect of Public Procurement Regulation Quality on Probability of SME Winning a Contract

	Logit	Linear Probability Model		
		OLS	IV-GMM	HB-IV GMM
World Bank BPP Measure				
World Bank PP Score	3.47 (22.31)**	0.40 (22.77)**	0.61 (24.19)**	0.20 (7.90)**
Open Procedure	-0.15 (4.91)**	-0.02 (5.09)**	-0.02 (6.15)**	-0.01 (4.63)**
Above Threshold	-0.13 (8.03)**	-0.02 (8.58)**	-0.01 (4.76)**	-0.02 (10.54)**
Divided Lots	-0.13 (6.04)**	-0.02 (6.26)**	-0.01 (5.73)**	-0.02 (6.65)**
Constant	-0.29 (1.78)	0.61 (32.62)**	0.47 (20.27)**	0.75 (32.69)**
Observations	159,035	159,035	159,035	159,035
EuroPAM Public Procurement Score				
Country Score	0.01 (13.01)**	0.001 (13.62)**	0.003 (22.23)**	0.001 (9.01)**
Open Procedure	-0.12 (4.12)**	-0.014 (4.36)**	-0.016 (5.21)**	-0.014 (4.36)**
Above Threshold	-0.20 (12.47)**	-0.023 (12.80)**	-0.019 (10.91)**	-0.023 (12.80)**
Divided Lots	-0.16 (7.15)**	-0.018 (7.29)**	-0.018 (7.58)**	-0.018 (7.30)**
Constant	1.44 (10.48)**	0.819 (54.02)**	0.712 (42.82)**	0.816 (49.23)**
Observations	159,039	159,039	159,039	159,039

Notes: * $p < 0.05$; ** $p < 0.01$. Robust z-statistics in parentheses. All models include authority, sector and year fixed effects

Multiple Lot Procurement and Lot Size: Threshold Regression Analysis

- We implement the following threshold regression specification:

$$SME_Winner_c = \beta_1 PPQ_c^i + \beta_2 PM_c + \beta_3 above_c + + \sum_{j=0}^m 1_j(lotsize_j, \gamma) dividedlots \beta_{dl} + \\ + \sum_{z=1}^9 \beta_{z+4} PA_c^z + \sum_{s=1}^{44} \beta_{s+13} Sector_c^s + \varepsilon_c \quad (4)$$

- where $1_j(lotsize_j, \gamma)$ takes the value 1 if the expression that $\gamma_j \leq lotsize_j \leq \gamma_{j+1}$ is true. Therefore, the coefficient of the *dividedlots* variable, β_{dl} , can differ across values of the threshold variable, lot size.

Table 5. Effect of PP Regulation Quality on Probability of SMEs Winning a Contract

	LOTSIZE < EURO 23,468.55 (N= 91,907)	
Divided Lots	0.009 (3.31)**	0.009 (3.09)**
	23,468.55 ≤ LOTSIZE < 250,000 (N=27,694)	
Divided Lots	-0.03 (9.39)**	-0.03 (10.22)**
	LOTSIZE ≥ 250,000 (N=21,119)	
Divided Lots	-0.13 (26.26)**	-0.14 (28.62)**
WB PP Score	0.32 (20.32)**	
Country Score		0.001 (8.19)**
Open Procedure	-0.019 (5.42)**	-0.017 (4.89)**
Above Threshold	-0.008 (3.90)**	-0.013 (6.67)**
Authority FE	Yes	Yes
Sector FE	Yes	Yes
Year Fe	Yes	Yes

Notes: Threshold regression of linear probability model. Only tenders in which an SME submitted a bid are examined, i.e., number of SME offers > 0. * $p < 0.05$; ** $p < 0.01$.

Multiple Lot Procurement and Lot Size: Threshold Regression Analysis

- The threshold regression identifies the critical lot size threshold for small contracts as €23,469.
- When lot size is smaller than this, the coefficient estimate on the *dividedlots* variable is positive and statistically significant.
- Dividing procurements into smaller lots increases the probability that an SME wins the contract.
- For lots with larger contract values, SMEs are less competitive and less likely to win public procurement contests even if contracts are subdivided.

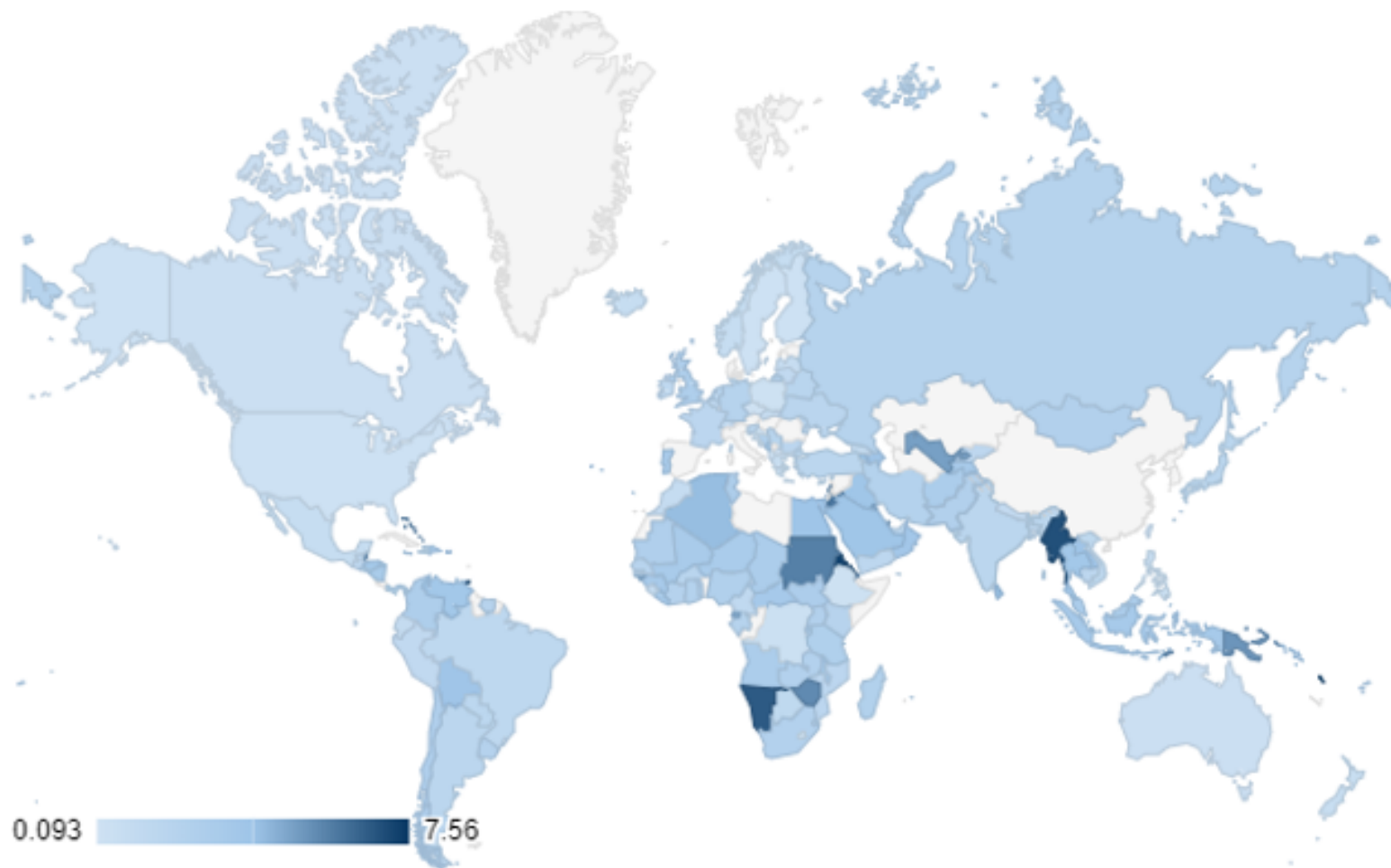
Potential Policy Implications for MENA and Other Developing Countries

Table 6. World Bank BPP Scores: Summary Statistics for Country Groups

	Mean	Standard Dev.	Min.	Max
EU	0.73	0.09	0.58	0.9
East Asia and Pacific	0.55	0.17	0.24	0.8
Latin America & Caribbean	0.55	0.12	0.25	0.77
Middle East and North Africa	0.48	0.11	0.27	0.67
South Asia	0.58	0.08	0.44	0.66
Sub-Saharan Africa	0.55	0.1	0.26	0.72

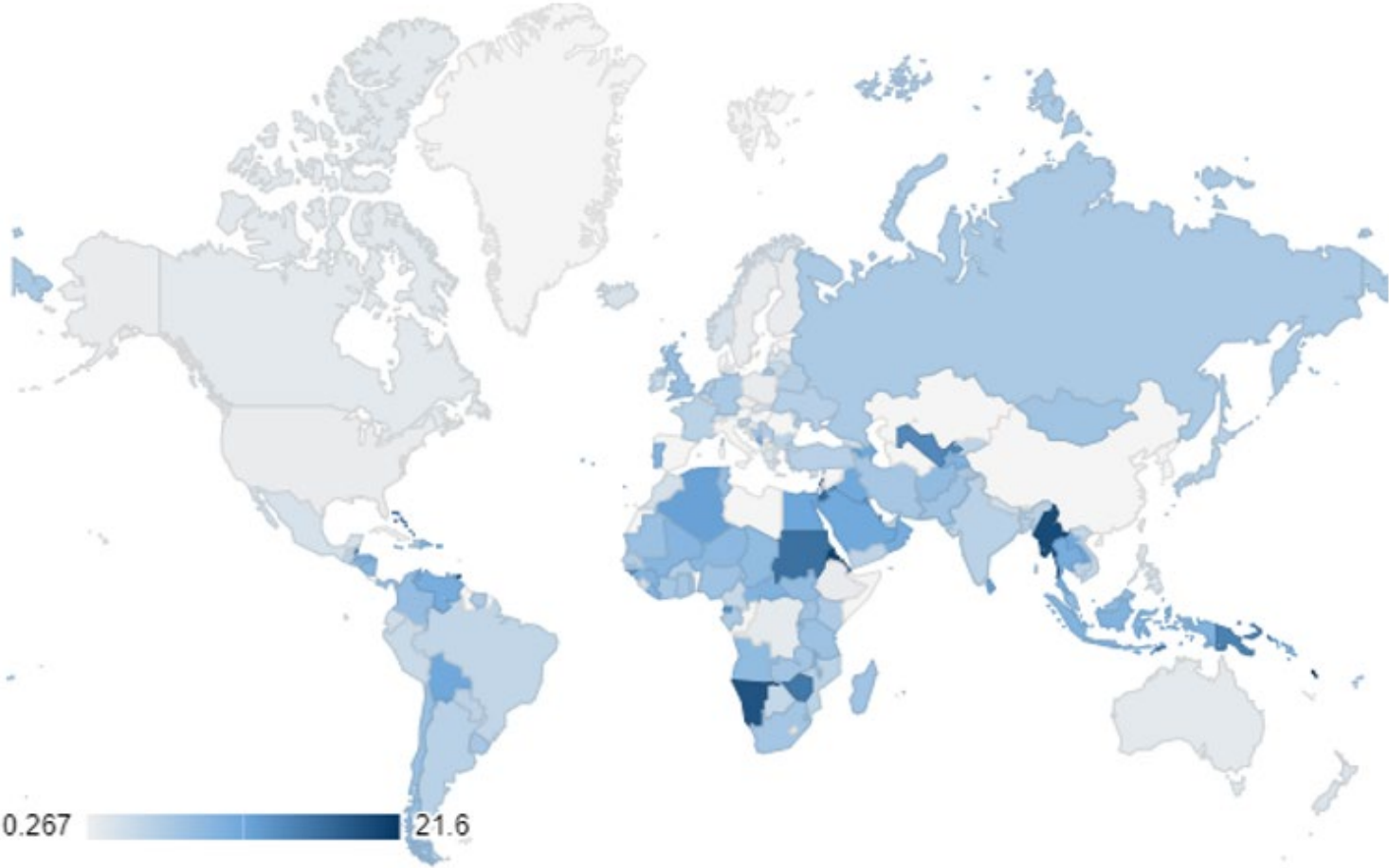
Source: World Bank (2017).

Figure 4. Potential Benefits of PP Reforms on Change in SME participation ratio (% points)



Note: Countries with BPP scores above the EU average and countries without BPP scores are white.

Figure 5. Potential Benefits of PP Reforms on Change in SME win probability (% points)



Note: Countries with BPP scores above the EU average and countries without BPP scores are white.

Table 6. Potential Benefits of PP Reforms for MENA Countries*Counterfactual Results for Attaining EU Average Procurement Score*

Country	PP quality score	Change in SME participation ratio (% points)	Change in SME win probability (% points)
Algeria	0.48	4	10
Bahrain	0.55	3	7
Djibouti	0.30	6	17
Egypt	0.59	2	6
Iran	0.60	2	5
Iraq	0.51	3	9
Jordan	0.37	5	14
Kuwait	0.44	4	11
Lebanon	0.47	4	10
Mauritania	0.46	4	11
Morocco	0.67	1	2
Oman	0.49	3	10
Qatar	0.35	5	15
Saudi Arabia	0.48	4	10
Sudan	0.27	7	18
Tunisia	0.58	2	6
UAE	0.55	3	7

Conclusion

- We find that good procurement practice is good for SMEs:
 - countries with higher PP regulation quality scores are associated with a larger ratio of SME participation
 - higher probability that SMEs win contracts.
- However, controlling for PP regulation quality, the use of open competitive tendering methods tends to benefit large firms more than SMEs, with larger contracts more likely to be awarded to large firms.

Conclusion

- The EU, Japan, South Korea and several other countries have implemented a policy that encourages subdivision of contracts into smaller lots as a way of encouraging greater participation by SMEs.
- This paper offers the first evidence on the effects of such a policy. We find that it bolsters participation by SMEs but does not increase the probability of SMEs winning contracts.
- Threshold regression analysis suggests this result is a function of the absolute value of lot sizes. If lots are small enough – below €25,000 – the likelihood that SMEs win procurement contracts improves significantly.
- Our counterfactual simulations suggest that insofar as governments are interested in enhancing participation by SMEs in public procurement auctions the focus should be on improving the quality of PP regulation.