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Determinants of the Informal Economy in MENA Economies

Orhan Erem ATEŞAĞAOĞLU, Ceyhun ELGİN, Oğuz ÖZTUNALI*

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Abstract

Using data from a panel of 23 Middle East and North African (MENA) economies over the years between 1999-2015, this paper examines the determinants of the shadow economy in this region. Specifically, we reexamine the economic and social variables used in the cross-country empirical literature on the shadow economy and compare them with those of the MENA economies to identify similarities and differences between MENA countries and the rest of the world. Moreover, we discuss key implications of the shadow economy in this setting.

Key Words: Informal Sector, Panel Data, MENA Countries

MENA Ekonomilerinde Kayıt Dışı Ekonominin Belirleyicileri

Özet

Bu makalede 23 MENA (Ortadoğu ve Kuzey Afrika) ülkesinden 1999-2015 yılları arasında bir panel veri tabanı kullanılarak kayıt dışı ekonominin belirleyicileri incelenmektedir. Spesifik olarak, iktisat yazınında ampirik analizde sıklıkla kullanılan ekonomik ve sosyal değişkenlerin kayıt dışı ekonominin büyüklüğünü belirleyicilikleri MENA ülkeleri için incelenmekte ve sonuçlar MENA ülkeleri dışındaki ülkeler ile karşılaştırılmakta ve ayrıca kayıt dışılığın sonuçları ortaya konulmaktadır. Ayrıca kayıtdışılığın ekonomi politikasına etkileri de tartışılmaktadır.

Anahtar Kelimeler : Kayıt dışı Ekonomi, Panel Veri Analizi, MENA Ülkeleri

1. Introduction

Informal sector, also called underground or hidden economy, is generally defined to include all types of economic activities that occur outside of the public and private establishments under record. In another example from the literature Ihrig & Moe (2004) define it as a sector that produces legal goods without complying with formal regulations.

While the existence of informality generates serious, social, cultural, political as well as economic problems, the source and consequences of informal sector remain largely under-explored. In the existing literature, no consensus has been established on the determinants of informality. Some of the existing open questions in the literature are as follows: (i) why the size of informal

* Orhan Erem ATEŞAĞAOĞLU, Dr.Öğr.Üyesi., Bilgi Üniversitesi, İşletme Bölümü, ORCID ID orcid.org / 0000-0003-4308-0138, erem.atesagaoglu@bilgi.edu.tr; Ceyhun ELGİN, Doç.Dr., Boğaziçi Üniversitesi, Ekonomi Bölümü, ORCID ID orcid.org / 0000-0001-8796-2429, ceyhunelgin@boun.edu.tr; Oğuz ÖZTUNALI, Dr.Öğr.Üyesi.,Bilgi Üniversiyesi, Ekonomi Bölümü, ORCID ID orcid.org / 0000-0003-3833-0956, oguz.oztunali@bilgi.edu.tr

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sector is bigger in low-income countries? (ii) whether taxes are positively correlated with the size of informality, and (iii) is there a correlation between the size of informality and corruption.

There exists an established literature on the causes and the consequences of informal economy. The existing papers mainly focus on factors such as income level, unemployment rate, formal tax burden, government expenditures, trade openness, and other institutional/cultural factors as possible determinants of informal economy. The institutional factors that are generally considered are law and order enforcement, corruption, and the quality of bureaucratic system. The main cultural/social factors that are considered are trust, religious factors, polarization and ethic unity.

In the existing literature, there are several papers that focus on the effects of the informal economy. For example, these studies argue that the existence of the informal economy affects (i) the social security system and the labor force participation behavior of individuals (Schneider & Enste, 2000), (ii) the cyclicality of tax policy (Elgin, 2012), (iii) the distribution of income (Hatipoglu & Ozbek, 2011), the monetary policy (Tanzi, 1980, 1983), the volatility - business cycles - of the economy (Elgin, 2012), and the total factor productivity.

In this study, we aim to contribute to the informal sector literature by investigating the determinants of the informal sector in the Middle East and North Africa (MENA) region, a particularly understudied geographical region despite the presence of a sizable shadow economy. Loayza and Wada (2010) provides a review of the fact that the size of informal sector in MENA countries are significantly larger compared to rest of the world developing/underdeveloped countries. Rodman (2007) argues that the decline in the employment in public sector in MENA countries is one of main factors for the existing high levels of informal employment in MENA countries. Wahba (2009a, 2009b) argues that the rise in youth population and the decline in both the fertility rates and mortality rates are key factors that contributed to the expansion of informal ecnomy among MENA countries. Moreover according to Looney (2006), in some MENA countries, the increase in recent armed conflicts led to a larger informal sector. As it can be understood from the summaries of the studies provided above, the proposed determinants for the existence of informal sector are quite different when we compare MENA region to the rest of the world. For example Wahba (2009a) also argues that the main cause of informality in the rest of the world is due to the rise in urbanization, the increase in the size of labor force, the constraints on entrepreneurship, and the decline in public sector employment. Our paper contributes to this literature by providing answers to the following questions: What drives households, entrepreneurs and businesses underground in this region? What are the key social, political and economic determinants of the shadow economy? How does this compare with the rest of the world? What are the implications?

The MENA region is home to 6-9 % of the world population; produces 3-4 % of the world GDP; has 43% of the natural gas reserves of the world. Furthermore, with 8 out of 12 OPEC members within its borders, the region has 50-60 % of the global oil reserves and has an approximately 30 % share in the total annual supply of oil in the world. It is particularly because of this last charac-

teristic that maintenance of social harmony and political and macroeconomic stability in the region is important not only for individual countries or the broader region itself, but also for the global economy as a whole. This, in turn, hinges largely upon maintenance of high rates of uninterrupted economic growth needed to create jobs for the rapidly growing population and the labor force, and a sustained pace for economic development in the region. Considering how significantly the shadow economy might affect prospects for growth in the region, MENA is an especially deserving place to be studied in search of answers to critical questions.

We employ data from a panel of 23 MENA economies over the years between 1999-2015 to examine determinants of the informal economy in this region. Specifically, we reexamine the economic/social variables used in the cross-country empirical literature on the shadow economy and compare them with those of the MENA economies to identify similarities and also the differences between MENA countries and the rest of the world. The 23 MENA countries covered in this study are Algeria, Armenia, Azerbaijan, Egypt, Cyprus, Mauritania, Malta, Turkey, Bahrain, Iran, Kuwait, Jordan, Israel, Oman, Lebanon, Libya, Qatar, Syria, Saudi Arabia, Yemen, United Arab Emirates, Tunisia, and Morocco.

In the rest of the paper, Section 2 provides a review of MENA economies with special emphasis on their relative standing with respect to the size of the informal economy. Section 3 summarizes of the empirical analysis and the data. Next, we summarize the results of the empirical analysis. Finally, we conclude.

2. MENA Countries

As the World Bank website specifically devoted to this region[1] states, MENA is an economically quite diverse region with fortunes generally determined by the oil prices as well as the heavy government intervention in the economy. These characteristics along with the structural deficiencies present in the MENA economies give rise to a significant informal sector.

To illustrate, Table 1 documents the GDP-weighted average informal sector size as % of official GDP[2] over the 1999-2015 period across different regions of the world.

[1] http://go.worldbank.org/7UEP77ZCB0

[2] See the next section for data sources.

Table 1. Informal Sector Size throughout the World (% GDP)

Countries	*Average Size (1999-2015)*	*Min.*	*Max.*
MENA	28.49	16.80	61.00
European Union	22.06	9.40	37.30
Latin American and Caribbean	40.21	18.50	67.70
Subsaharan Africa	40.91	21.90	63.70
World	33.14	8.10	68.30
Less Developed Countries [a]	37.89	11.90	68.30

[a] In this categorization, countries that has a high human development index are excluded. See UNDP (2010).
Source: Elgin and Oztunali (2012) and authors' own calculations.

We observe from Table 1 that compared to the world, the average informal sector size is somewhat smaller in MENA economies compared to the World, less-developed economies, Latin America and Subsaharan regions. However, MENA economies still have a significantly larger informal sector size than the advanced economies including OECD and EU members.

Moreover, Table 2 presents average shadow economy size as percentage of official GDP in the MENA countries in a country-by-country basis. Table 2 shows that, for MENA countries, the average size of informal sector over the period of 1999-2015 is %28.3, with averages of minimum and maximum about 17% and 60%, respectively. One should notice that the averages of Tables 1 and 2 are somewhat different as Table 1 reports GDP-weighted regional averages; whereas Table 2 reports plain averages for each specific country. Moreover, Table 2 also indicates that there is a significant variation of informal sector size across different MENA economies, ranging from about 17 % of GDP to 60%. This further motivates one's interest in understanding the determinants of informality in the region. Moreover, informal sector's profound effects on economic policy as well as macroeconomic outcomes, further spurs one's interest in the results of the current paper.

Table 2. The size of Informal Sector in MENA Economies (% GDP)

Countries	*Average Size % (1999-2015)*	*Minimum*	*Maximum*
Algeria	32.54	31.00	34.20
Bahrain	17.70	16.80	18.60
Egypt	34.88	33.10	35.70
Iran	18.32	17.30	19.10
Israel	22.02	20.70	22.70
Jordan	18.51	17.20	19.40
Kuwait	19.18	17.80	20.30
Lebanon	33.13	32.00	34.10
Libya	33.66	30.90	35.10
Morocco	34.93	33.10	36.50
Oman	18.29	17.30	18.90
Qatar	18.78	17.40	19.60
Saudi Arabia	18.07	16.80	19.20
Syria	19.06	18.50	19.30
Tunisia	37.22	35.40	38.70
United Arab Emirates	25.56	23.00	27.40
Yemen	27.09	26.80	27.70
Armenia	44.02	41.10	46.60
Azerbaijan	58.03	52.00	61.00
Cyprus	27.97	26.50	29.20
Malta	27.20	27.00	27.60
Mauritania	34.61	31.10	36.10
Turkey	31.27	29.20	32.80

3. Empirical Analysis

3.1. Methodology

Utilizing a annual cross-country highly balanced panel dataset in this paper we use a fixed-effects estimation approach in a static panel data setting.

The equation that we estimate takes the form of:

$$IS_{i,t} = f(Economy_{i,t},\ Institutions_{i,t},\ Regulation_{i,t},\ Geography_{i,t},\ Culture/History_i) \quad (1)$$

where in country-i and year-t, the term "IS" denotes the size of informal activity as % of formal economic activity, that is GDP. Moreover, we use five sets of explanatory variables in our regressions. These are economic factors ($Economy_{i,t}$), institutional quality indices ($Institutions_{i,t}$), variables related to government regulation ($Regulation_{i,t}$), geographical variables ($Geography_{i,t}$), and finally cultural-historical factors ($Culture/History_i$). Considering that the time-span of our sample is rather short (9 years), we report heteroskedasticity-consistent ordinary least squares estimates. In our

regressions, we use fixed effects estimator with country and also year fixed effects as also indicated and supported by the Hausman test for specification.

Furthermore, to address issues regarding persistence and also aiming to account for the potential existence of mean-reverting dynamics in informal sector size, we also use the GMM method developed by Arellano and Bond (1991) where one-period lagged values of the independent variables are used as instruments and one period lagged dependent variable is also used as a regressor. Generalized Method of Moments (GMM) estimation results will be reported only for one specification as a robustness check.

3.2. Data

As one might expect, it is not that straightforward to measure the scope of informal activity. However, there are a couple well-established and frequently used methods to estimate the size of informal activity. Among these, we use the one with the largest time-series dimension, panel estimates of Elgin & Oztunali (2012). Originally, their reported series end in 2010; however we have used their dynamic general equilibrium (DGE) model with two sectors to extend the dataset up to 2015. Even though, from a methodological perspective, the DGE model differs from the MIMIC (multiple-indicators multiple-causes) in its approach to estimate the extent of the informal economic activities,[3] the two methods produce remarkably similar series. (Elgin & Schneider, 2016) However, the DGE method is said to be superior compared to its alternatives (See, Elgin & Oztunali, 2012 for details). This dataset allows us to use data for all 23 countries listed in the introduction between the years 1999 and 2015.

The explanatory variables used in regressions come from five categories. These are economic, cultural-historical, institutional, regulatory and geographical factors.

3.3. Economic Factors

We use three variables representing economic factors. These are real GDP per capita, capital-output ratio and the unemployment rate. We obtained real GDP per capita through PWT 9.1; the unemployment rate from the World Development Indicators, (all in years from 1999 to 2015) published by the World Bank and we have constructed the ratio of physical capital stock to total output by using the following capital accumulation equations:

$$K_{t+1} = (1 - \delta)K_t + I_t \qquad (2)$$

[3] See Schneider (2005) for details.

$$\frac{K_{1998}}{Y_{1998}} = \frac{\sum_{i=1998}^{2015} \frac{I_t}{Y_t}}{\delta + g_Y} \quad (3)$$

Equation (2) denotes the accumulation of physical capital stock in time, where δ is the depreciation rate, K_t denotes the aggregate level of capital stock, and I_t stands for the aggregate investment in year-t.[4] Moreover, it is assumed that the economy is initially at the steady state. (1998 is taken as the initial first period) and Equation (3) is constructed based on this assumption, where g_Y denotes the GDP growth rate. As a first step, by using equation (3), we calculate the capital stock in the year 1998. Secondly, by using the equation (2), we generate series for the physical capital stock for the period of 1998-2005. At the final step, we generate the capital-income ratios (for the period of interest) by using the generated capital stock series as well as GDP series.

Once the capital series has been constructed and $IS_{i,t}$ has been regressed on the explanatory variables in Equation (1), we expect to observe a negative correlation between the size of informal activity and the Gross Domestic Product per capita. Moreover, considering that the informal sector is highly labor-intensive compared to the formal sector (see Celestin, 1989; Ihrig & Moe, 2004, and Thomas, 1992), we also expect the size of the informal sector to be negatively correlated with capital-output ratio. Capital intensity (i.e. the ratio of physical capital stock to total output) is an indicator for capital accumulation. As informal sector is generally assumed to be labor-intensive, we expect to be it negatively associated with informal sector size. A higher capital-output ratio is also a proxy for the level of capital accumulation that the economy in question has achieved. The higher this level is, the lower the share of traditional informal activities expected to be observed in that economy would be. Finally, the informal sector size is usually reported to be countercyclical to domestic business cycle of the country in question. (Elgin, 2012) Thus, the unemployment rate is expected to be positively correlated with informal sector size, as workers would be accepting low-wage informal jobs when unemployment rates run high.

3.4. Cultural and Historical Factors

To account for the possibility that different religious structures and historical legacies from the colonial past might affect informality, we also use two variables to control for cultural and historical factors. These are fraction of Muslims in the country and whether the country inherited the British law system or not. We obtained both of these variables from LaPorta et al. (1999).

3.5. Institutional Factors

We also use three different institutional quality indices in our analysis. These are bureaucratic quality, law and order as well as the corruption control indices of the International Country Risk Guide (ICRG) a subsidiary of the Political Risk Services. Since higher values for these indices imply

[4] We set the depreciation rate to 0.05 to match the observed investment rate reported in PWT 7.0.

better institutions, we would expect to observe a negative relationship between these indices and informal sector size. This expectation follows from the fact that lower institutional quality places a burden on formal firms, producers and households through the uncertainties and various costs it creates. Furthermore, low values for these indices are also likely to point to a lower capacity to enforce laws and regulations passed to prevent informality.

3.6. Regulatory Factors

As for regulatory factors, we mostly follow Goel & Nelson (2010) and use three measures: The first is the "trade openness", where it is specifically defined as the ratio of the total trade volume (exports plus imports) to GDP. The second one is the size of government, which is measured as the government expenditures-to-GDP ratio. We obtained both measures from the Penn World Tables. Finally, the third measure we use is the tax burden, defined as the ratio of total tax revenue to GDP as reported in the Government Finance Statistics published by the IMF.

Our expectation about the sign of the government size coefficient is ambiguous. The intuition behind this ambiguity is that a larger government could, on the one hand, potentially create a bottleneck (through the crowding-out effect of government spending) for (formal) households and firms, thereby creating or strengthening incentives to go informal. On the other hand, a larger amount of government expenditure resulting from increased spending on certain activities such as law enforcement, subsidies etc., might make the formal sector more attractive for firms and households.

Likewise, we don't have a clear expectation regarding the coefficient of trade openness. From a structural point of view, one should expect that the formal businesses engage in activities with the informal ones to be able to reduce their cost of production and as well as increase the flexibility of their labor input. Since "trade openness" is an indicator that serves to indicate the dependence of informal activity to formal activity, one can safely assume to end up with a positive correlation between the size of informal activity and the trade openness. On the other hand, "trade openness" can also increase sophistication level of products produced/production techniques employed and require adherence to higher quality standards, thereby feeding to formality. Trade openness can also improve a government's ability to track the informal activity. Moreover, households and firms in more open countries would have fewer financial and production constraints. Based on this, we might observe a negative correlation between the size of informal activity and the trade openness.

Finally, since higher taxes are among the key drivers of informality pushing households and firms to informal activities, we expect to observe a positive correlation.

3.7. Geographical Factors

Finally, the two geographical factors we use are urbanization (defined as the ratio of the urban regions to the total population of a country) and population density. The data for these series are from the WDI. A larger density of population would create a larger room for the labor supply as well as for informal economic activity. Therefore, it is reasonable to end up with a positive correlation between population density and the size of informal sector. On the other hand, the indicator "urbanization" is usually treated as a proxy for the level of development of an economy. Therefore, we expect a negative coefficient for urbanization.

3.8. Data Sources

The descriptive statics of all the variables are provided in Table 3. Over the period of sample, for the MENA region, (i) the average informal sector size is 28.5%, (ii) the average urbanization rate is 70.3%, (iii) the average government spending as a share of GDP is 16.1%, and (iv) the average unemployment rate is 8.9%. Table 3 also provides details about the sources of each data series.

4. Results

We report the estimation results in Table 4. We run 8 different regressions with different sets of independent variables in each using the fixed-effects estimator and one final 9^{th} regression using the GMM estimator. (In the GMM estimator we also report the results the of an AR(2) test to check for autocorrelation and J-test for exogeneity of instruments at the bottom of the table.) We do this to see the robustness of our estimates to the inclusion of different sets of control variables. We do not include the same variables in each regression as we exclude independent variables that are highly correlated (more than 0.80 in absolute value) with each other. Moreover, the GMM regression does not include institutional and cultural variables as they do not vary significantly over time.

Regarding economic factors, we observe that GDP per capita is significantly negatively correlated with informal sector size in the MENA region as expected. The empirical literature on informality also yields similar results on the relationship between GDP per-capita and informal sector size. In 6 out of 9 regressions, a lower (higher) capital-output ratio is associated with a larger (smaller) informal sector size, except in regression 5 where we control for the tax burden, which turns the coefficient of capital-output ratio insignificant. As informal sector is generally seen a highly labor intensive (rather than capital intensive) this result is also not surprising. Finally, unemployment is also significantly positively correlated with informality. This is again consistent with the literature as unemployment provides a labor resource for the informal sector.

Among the cultural and historical factors both of the variables are highly significant in all of the regressions. Both fractions of Muslims in a country and the inheritance of British law (mostly as opposed to French) seem to reduce informal sector size. British law is generally associated with a more sophisticated political and institutional infrastructure and thereby might be affecting our results.

Moreover, out of the three institutional variables used in the regressions, corruption control index is the one, which is significant in 7 out of 8 fixed effects regressions. It loses its significance when the tax burden is included among the explanatory variables.

Out of the three regulatory variables we controlled for, taxes turn out to be highly positively associated to informal sector size even though the inclusion of this variable largely reduces the sample size. When significant (in 2 out of 4 regressions), openness is negatively correlated with informality. Finally, both of the geographical factors are significant whenever they are included and seem to have the expected signs.

Table 3. MENA (The Summary Statistics for 23-Countries)

	Mean	*Std. Dev.*	*Min*	*Max*	*Source*
The Size of Informal Sector (in %)	28.49	9,96	16.00	61.00	Elgin and Oztunali (2012), author's own calculations
Urbanization	70.33	19.24	25.06	98.32	WDI
GDP per-capita	7.18	8,14	0.32	34.96	PWT 7.0
Law and Order	4.38	0.96	2.00	6.00	ICRG
Corruption Control	2.44	0.80	1.00	4.83	ICRG
Capital-Output Ratio	2.59	1.05	0.88	5.70	Constructed
Openness	93.33	36.84	38.73	194.76	PWT 7.0
Muslim	77.77	35.19	0.00	99.50	La Porta et. al (1999)
British Law Dummy	0.22	0.41	0.00	1.00	La Porta et. al (1999)
Tax Burden	18.12	7.46	5.52	33.20	GFS
Gov. spending to GDP	16.12	5.34	4.51	28.70	WDI
Population Density (log)	4.39	1.45	1.09	7.15	WDI
Unemployment Rate	8.87	6.00	2.50	36.00	WDI

Table 4. Informal Sector and Its Determinants in MENA Countries

Dep. Var. : IS	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Lagged IS									0.75*
									(0.11)
Econ. Factors									
GDP per-cap	-0.46*	-0.22**	-0.25**	-0.18**	-0.46*	-0.11***			-0.09***
	(0.07)	(0.10)	(0.10)	(0.09)	(0.12)	(0.06)			(0.05)
Capital	-1.76**	-1.94**	-2.84*	-2.37*	1.02	-2.19*			-1.90*
	(0.78)	(0.77)	(0.81)	(0.74)	(0.65)	(0.67)			(0.54)
Unemploy.							0.25*	0.43**	
							(0.09)	(0.21)	
Culture& Hist.									
Muslim Fract.		-0.07*	-0.07*	-0.06*	-0.05*	-0.09*	-0.09*	-0.06*	
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	
British Law Dummy		-6.62*	-7.52*	-7.44*	-5.54*	-6.48*	-5.01*	-5.83	
		(1.43)	(1.72)	(1.52)	(0.95)	(1.09)	(0.96)	(2.13)	
Inst. Factors									
Bureaucratic Quality		0.38	1.23						
		(1.27)	(1.32)						
Corruption Control		-2.22*	-1.57***	-1.24***	1.05	-2.25**	-2.50*	-1.58***	
		(0.81)	(0.85)	(0.68)	(1.05)	(0.90)	(0.92)	(0.87)	
Law & Order		-1.69*	-2.28*	-2.93*	-3.41*	-0.78	0.60		
		(0.63)	(0.58)	(0.62)	(1.50)	(0.87)	(0.83)		
Regulation									
Openness			-0.03**			0.001	0.03	-0.04**	0.02***
			(0.02)			(0.02)	(0.02)	(0.02)	(0.01)
Gov. Size				-0.96					
				(0.12)					
Tax Burden					0.70*			0.46*	
					(0.15)			(0.13)	
Geo. Factors									
Urbanization						-0.19*	-0.37*		-0.09**
						(0.05)	(0.06)		(0.05)
Pop. Density			1.64*	1.47*		1.28*	1.26*		0.46**
			(0.22)	(0.49)		(0.23)	(0.24)		(0.27)
R-Square	0.14	0.30	0.35	0.35	0.66	0.41	0.63	0.50	
Observations	408	386	386	378	194	386	240	144	294
F-Test	21.98*	68.48*	37.81*	43.38*	29.76*	46.32*	55.61*	8.47*	
AR (2) Test									0.01*
J-test									0.00*

Parentheses report robust (i.e. heteroskedasticity-corrected) standard errors. Moreover, 1, 5 and 10% levels of confidences are indicated by *, **, *** denote, respectively. All regressions also include an unreported constant term.

5. Discussion and Conclusion

Throughout this paper, we have studied the determinants of relative size of the shadow or informal economy in GDPs of the MENA economies. Concerning economic variables that could potentially serve as determinants, two observations emerge from our findings. First, the informal economy tends to be relatively larger in countries with higher rates of unemployment as expected. Secondly, the GDP share of informal activities is likely to be larger in countries with lower levels of per capita income where productive activities are typically carried out at relatively higher capital-output ratios, or when the production technology to produce GDP of the country is more (less) capital- (labor-) intensive. This generally intuitive finding seems to be driven largely by the leading oil producers in our sample. As can be observed from Table 2, with the exception of Jordan and Syria, all countries where informal economy's share is less than 20 per cent are major oil exporters: 5 of the 6 Arab countries in the GCC plus Iran. Relatively low size of the informal economy in these countries is in line with the capital-intensive and high value-added nature of the oil production, their major economic activity. A notable exception to this is the sixth member of the GCC, namely United Arab Emirates (where the share of informal economy is more than %25) and Libya. In the latter, the share of informal economy exceeds %30 like in other Arab countries in North Africa. It is interesting to note that Arab countries are separated along 30% line as North African countries with informal sector shares above, and others below this line, regardless of whether they are oil exporters or not. This seems like an observation making further investigation of the role of other country characteristics like geographical and cultural/historical factors worthwhile. Yet, this will require considering other variables than the ones we have already used within these categories, as estimates of coefficients for neither of these variables have enabled us to produce an answer to this empirical puzzle concerning the difference between relative sizes of the informal sectors.

Cultural/historical factors we have already incorporated into our analysis are the existence or non-existence of (indicated by a dummy variable titled British Legal Dummy) legal tradition, and the fraction of Muslims in total population. While our estimates indicate that the existence of British legal tradition seems to reduce the size of informal economy, this does not explain the similarly large sizes of informal sector of Arab countries of North Africa. Likewise, most of the countries in the sample have predominantly large Muslim populations, making it difficult to explain why some of these countries have larger informal sectors despite the significance of the (positive) coefficient associated with this variable.

While our analysis has been of limited help in resolving the differences between relative sizes of informal sectors in the Arab countries in and outside North Africa despite common languages,

more or less similar cultures and religious compositions of populations, it has been useful in identifying determinants of informal sector size in the MENA region. It must be noted that statistically significant coefficient estimates retain their sign across different regressions, and never switch signs while remaining significant (though they turn insignificant in a few instances). This increases reliability of our estimates, as identifiers of determinants of the shadow economy. Still, we need to consider other likely determinants, such as the average education level of the population in the versions of this paper to be written. Lastly, we should mention that MENA countries could potentially differ from others in terms the underlying effects of informal sector and, thus, our results may differ if it is conducted for different country groups.

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