ERF 2020
26TH Annual
Conference

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ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية

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This study is motivated by an assertion that the more unequal a society is, the higher the experienced level of corruption. If political connectedness and ability to get ahead through corruption are latent dimensions of multidimensional inequality, then corruption could be the missing piece in the Arab inequality puzzle. In fact, the positive inequality–corruption link holds in a number of developed countries, but not in the MENA or other emerging and resource-reliant countries. This result is confirmed using graphical and statistical analysis, and using analysis of inequality and corruption in levels as well as in changes.

An increase in inequality has the expected detrimental effect on corruption in developed OECD countries, particularly those following state-led non-liberal market traditions. The relationship is the weakest or negative in countries belonging to the liberal market model. Economic power appears to directly translate into political power in networked societies while the link between the two spheres is less direct in societies where most transactions are done at arm's length. Inequality affects corruption negatively in emerging and resource extracting economies, as well as notably the MENA region. Instead of following the trends among the comparative upper-middle income countries, MENA economies exhibit the trends seen among less developed countries, a possible hint of a variety of the Dutch disease.

There does not appear to be an inequality–pilferage trap across developing countries. Successful development and building of institutions initially tend to raise inequality as growth is spread unevenly throughout the society. The inequality–corruption link starts out negative and finishes positive across successive stages of development. The policy implications are that, beside improving laws and punishing corrupt policymakers directly, it is necessary to manage economic distribution, not just out of concern for social justice but also to lay down conditions for healthy political and economic contestation.

JEL Codes: P52, D73, N35

Keywords: Corruption, inequality, institutional trap, MENA, Arab variety of capitalism

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I. Motivation

Are societies with an unequal distribution of wealth and income more prone to the abuse of economic power to influence political decisions for private gains? Given the notoriously high and endemic level of corruption, and at the same time an unremarkable profile of inequality in the Middle East and North Africa (MENA), where does the region stand in relation to other countries? Does corruption contribute to development and inequality traps, and does it help resolve the Arab inequality puzzle? These are questions of an immense policy importance, with little empirical investigation done to date.

The first aim of this paper is thus to investigate the role of concentration of economic power in society on the pervasiveness of corruption in society. Existing research has identified a positive relationship between corruption and inequality, and has focused on how corruption affects economic and social development (Dobson and Ramlogan-Dobson 2012), across various dimensions of development and for various economic classes (Gupta et al. 2002), and in various parts of the developing world (Rosser et al. 2005; You 2015; Wong 2016). Our research takes a different path by investigating how economic inequality gives rise to corruption, by creating disparities across social groups in terms of their access to political power and their potential gain from capturing political decisions.[1]

The central hypothesis investigated in our study is that greater social inequality and concentration of economic power lead to higher levels of corruption. Evidence shows that social inequality is widely seen as unjust and serves as an excuse for self-serving behavior even when this is recognized as violating social norms or even laws (You and Khagram 2005; Rothstein 2011). Concentration of economic power leads to the divergence of social groups according to their access to policymakers and economic interests to protect. Those with disproportionate resources enhance their power by converting economic capital into political capital. Those who see themselves as the winners fear losing their privileges and use their economic resources for political purposes in order to insulate themselves from prospective changes in the economic order. The disadvantaged are vulnerable to extortion, and have little ability to hold the powerful accountable. Moreover, they may use the perception that the

[1] Political decisions are defined as those concerning the public sphere that should be made according to the public interest and not the interest of those with economic resources. This view is often taken to mean that only public office holders with entrusted power can engage in corruption, but the foregone conclusion that the fairness of public officials influences citizens' perceptions of corruption does not hold in more unequal countries (Ariely and Uslaner 2017). The focus on public office holders is also problematic because it excluded the "demand side" of corruption – those who use their economic power to seek political favors. Thus, corruption is not primarily a normative problem of individual wrongdoings but a problem with essentially social origins.

society is unfair to rationalize their own corrupt behavior, be it in the role of entrepreneurs or public servants.

These arguments strike a chord in much of the MENA region, where state-led and private-sector corruption are high, and have been linked to social polarization and risk of political instability. Ruling parties across the MENA have maintained a compact with their subjects to provide patronage for them and enjoy their political support in return. National authorities provide public-sector employment to large shares of population, and finance public services in the enfranchised parts of their countries with natural-resource revenues. Firms connected to ruling political parties receive protection from competition or downfall (Chekir & Diwan 2014; Hlasny 2014; Acemoglu et al. 2018), and in return advance government agenda in terms of employment, production, and prices (Adly 2009; Forstenlechner & Mellahi 2011).[2] The system of patronage and two-way favors extends to the private sector, where nepotism and favoritism (*wasta*) are prevalent (Cunningham and Sarayrah 1993). This occurs at the cost of mismanagement of resources, productive and allocative inefficiency, and harm to those without the necessary connections.

In Tunisia, the harassment and bribe demands by local authorities led a disenfranchised street vendor, Mohamed Bouazizi, to set himself on fire, which led to a public outpour of grievances and eventually triggered the Arab Spring uprisings throughout the region. The common thread of the uprisings was the complaint that "those with no connections and no money for bribes are humiliated and insulted and not allowed to live" (Leila Bouazizi, as cited by Noueihed 2011). Several corrupt regimes faced challenges or were toppled, and their corruption was exposed during the Arab Spring (Levey 2011).

The foregone conclusion that high inequality is accompanied by high corruption may not, however, play out in the MENA region. Household-survey based estimates of inequality along various dimensions show rather typical measures of inequality, which were stagnating or further falling at the height of the Arab Spring revolutions (Hlasny and Intini 2015; Hlasny and Verme 2018; Ramadan et al. 2019). The large observed or perceived degrees of corruption may thus be viewed as an under-appreciated piece of the Arab inequality puzzle. Political connectedness and ability to get ahead through corruption may be among the latent dimensions of true multidimensional inequality.

[2] Also refer to papers presented at the Workshop on the Political Economy of State Business Relations and of Growth in the Middle East and North Africa, organized by Economic Research Forum and Paris School of Economics, at Universite Paris Dauphine, 21-22 June 2018. http://en.dial.ird.fr/content/view/full/286225 (accessed on 21 November 2018).

The link between the observed inequality and corruption appears to differ across different types of economies, such as the Anglo-Saxon liberal market economies, coordinated market economies, or state-led varieties in the MENA or in East Asia (Kalinowski and Hlasny 2018). Our second central hypothesis is that the underlying economic, regulatory and political institutions governing the interplay among market actors shape the inequality–corruption relationship. Our aim is thus to examine the inequality–corruption nexus under alternative varieties of market systems and different levels of development around the world, and interpret the situation in the MENA in their perspective. This is the main contribution of our study to existing literature.

We rely on the World Bank's WDI and WGI databases and other specialized political science databases for 160+ countries, including 15 MENA region countries, and a period of 22 years (1996–2017) to estimate the relationship between economic inequality and political corruption. We go beyond reliance on indicators of the perception of corruption, and check consistency of results using multiple indicators of corruption observed, experienced or perceived by a variety of actors, including country experts, enterprises and citizens. For estimation, we rely on regressions using panel data methods including first-differencing and country fixed effects looking at changes over time within countries.

The rest of the study is organized as follows. Section II reviews relevant literature on the nexus of corruption, inequality and economic development worldwide, as well as the emerging literature on corruption in the MENA. Section III introduces the estimation methods and available data. Section IV presents the main results, and section V concludes with a discussion of main results, their policy implications, and directions for further research.

II. Existing Evidence

Existing literature examines the interaction of corruption and inequality through several branches of enquiry. The most prevalent is the research of the implications of inequality or corruption for economic development or political climate (Mauro 1995; Jain 2001; Svensson 2005; Foellmi & Oechslin 2007; Méon & Weill 2010). Savoia et al. (2010) identify the effects of inequality on economic institutions – direct effects through systematic rent-seeking, mitigated by the quality of countries' democratic institutions and the level of development.

Another large group of studies examines the effect of corruption on inequality (Gupta et al. 2002; Andres & Ramlogan-Dobson 2011; Dobson & Ramlogan-Dobson 2012b). Research of the driving forces of corruption is more limited, particularly studies accounting for social

inequality. Uslaner (2008, 2017) has established the "inequality trap" argument that claims that social inequality leads to low trust, and low trust to a higher perception of corruption and as well as higher incidence of actual corruption. Rothstein (2011), and You and Khagram (2005), on the other hand, argue that perceptions of corruption are not primarily based on levels of social inequality but rather on the perception of fairness in a society. Baryshnikova et al. (2016) found that inequality and wealth have a nonlinear and non-monotonic effect on the quality of political institutions, even though corruption appears to be best explained by its own lagged values, on account of the role of intergenerational, ingrained beliefs (p.205). Alesina and Zhuravskaya (2011), and Alesina et al. (2016) find that social segregation leads to lower interpersonal trust, envy and perceptions that the system of governance is unfair. On the other hand, Ariely and Uslaner (2017) found that the degree of inequality in society affects how citizens view their own experience of being treated fairly by public officials, in forming their perceptions of corruption. In unequal societies, citizens' perceptions of corruption do not depend on their own experience of fair or unfair treatment.

While the existing research offers very important insights about the interaction of experienced and perceived corruption, we find that the focus on trust and perceptions of fairness is somewhat circular. It is not particularly surprising that when perceptions of fairness and trust are low corruption will be perceived as high, which may lead to higher objective occurrence of corruption. Hence, their relationships reflect associations among imperfectly reported perceptions, rather than causations measured in clear units. What many of these studies lack is exogenous variation explaining an objectively measureable index of corruption. How to deal with the endogeneity of *all* variables is discussed by Baryshnikova et al. (2016).

We connect inequality and corruption to the quality of democracy in more objective terms. Donovan and Karp (2017) showed that a focus on institutions such as elections is not enough to understand the success or failure of democratization. They claim that "electoral system features largely have null effects on evaluations of democracy when corruption and income inequality are accounted for" (Donovan & Karp, 2017: 470). Recent studies provide systematic evidence that political decisions are dominated by interests of the rich while interests of the poor and the middle class play a lesser role (Gilens, 2012; Schreyer 2018). Such "post-democracy" hypotheses (Crouch 2004) have been investigated through anecdotal evidence and country case studies. Instead we undertake a large cross-country panel analysis.

Corruption–inequality nexus in the MENA

The clearest relevance of the literature discussed above for the reality in the MENA is in reference to the characteristics of political regimes, organization of the economy, and allegations of a *resource curse*. Natural resource abundance has been found to discourage investment, encourage dependency on capital inflows and rent-seeking, and affect adversely the quality of political institutions (Robinson et al. 2002; Acemoglu et al. 2002, 2004; Leite & Weidmann 2002; Busse & Groning 2011). Montinola and Jackman (2002) found that OPEC members, countries that have partially democratized and low income countries exhibit higher corruption levels than non-oil exporting countries, outright dictatorships or free democracies, or economically more developed nations. Alas, the relationship between political systems and public corruption remains poorly understood. While plurality electoral systems enable voters to punish elected politicians for their transgressions, proportional representation systems facilitate monitoring among political parties, and empirical results go either way (Persson et al. 2003; Faller et al. 2013).

In the MENA, an *Arab variety of capitalism* has been proposed, epitomized by a high degree of cronyism, patronage and interventionism by authorities, high public employment but weak social security, and weak coordination and trust in the private sector and labor market (Hertog 2016). Weak institutions and corruption have been found to affect investment in human capital and growth (Guetat 2006), fiscal position (Imam and Jacobs 2007), and firms' performance (Bishara 2011) in the MENA region. "Corporate governance failings and cultural issues in the Middle East, as well as the insular nature of small and medium-sized family enterprises, contribute to the debilitating corruption in the region" (Bishara 2011:233).

At the same time, corruption may help to 'grease the wheels' of the economy in the presence of poor governance structures in a country (Gazdar 2011; Ghoneim and Ezzat 2016), for instance in the presence of the resource curse (Kutan et al. 2009). Research of the functioning of politically connected MENA businesses, the political ramifications of propping up public sector employment, and other manifestations of state capture has exploded in recent years. The role of social institutions handed down by local and religious tradition, such as *wasta* or the prohibition of usury (*riba*), has received limited attention in economic literature. This research is now growing in recognition that the adherence to these practices has been distorted by the economic reality, and their impact on the economy and the state has grown (Rice 1999).

In relation to the puzzling co-occurrence of high corruption and medium inequality, the closest relevant explanation in existing literature involves the role of a large informal economy (Dobson & Ramlogan-Dobson 2010,2012a; Okumu & Forgues-Puccio 2014). The

informal sector provides a viable career choice for motivated individuals who cannot find well-paid formal employment, say, because they lack public-sector connections. More corrupted countries tend to have more vibrant informal economies, and may also have larger public sectors. At the same time, entrepreneurs and the self-employed are common targets of extortion by public officials.

The co-existence of large groups of informal workers with precarious employment, and at the same time of securely-employed public servants, may lead to social conflict and to calls for economic reforms, both from citizens and from international donors. When governments do embark on reforms, the informal economy tends to become restricted, public-sector employment reduced, and a variety of redistributive measures abolished, which may all exacerbate inequality. Conversely, Farzanegan (2013) reasoned that external constraints that disturb the formal economy, such as international sanctions in Iran, may give rise to a moderately sized informal economy which may mitigate inequality. Weakening of the public sector and strengthening of the formal private sector has the effect of limiting the prospects of corruption. In sum, inequality of opportunities arising under certain forms of market organization is thought to have implications for observable corruption.

We next turn to studying this hypothesis formally.

Methods

In view of the associations identified in the previous section, we review the available quantitative indicators of corruption and inequality in the MENA and worldwide. We then delve deeper to distinguish the stand-alone direct effect of inequality on corruption, and the indirect effects through the level of development, market system, industry structure, and reliance on natural-resource revenues.

To facilitate identification of partial effects, the inequality–corruption is investigated in first differences, inequality changes are lagged, fixed effects in countries' trends in corruption are controlled out, and institutional factors are included in regressions. To allow for non-linear inequality–corruption relationship, inequality changes are interacted with factors that are thought to intervene in the inequality–corruption relationship.

This method is deemed more robust than the methods typically used, such as the dynamic distributed lag model by Baryshnikova et al. (2016), because it controls away any spurious relationships due to non-stationarity and fixed effects in the levels of variables. Our method allows us to control for unobserved country-level heterogeneity as well as for arbitrary time effects.

One problem is that inequality and corruption are highly persistent and path-dependent, subject to self-reinforcing mechanisms (Alesina and Angeletos 2005; Rose-Ackerman and Palifka 2016; Mungiu-Pippidi and Johnston 2017). At the same time, the available data may exhibit spurious year-to-year variation simply due to sampling errors or due to the salience of events occurring in the economy in any given year (e.g., bribery scandal, arrest for prior bribery). For these reasons, changes in corruption and in inequality 3–10 years apart are used for them instead of year-to-year differences. Regressions are of the form:

$$(corr_{it} - corr_{it-v}) = \beta_0 + \beta_1(ineq_{it} - ineq_{it-w}) + \beta_2 X_{it} + \beta_3(ineq_{it} - ineq_{it-w})X_{it} + a_i + \varepsilon_{it}$$

where v is the appropriate time spell for the change in corruption, and w is the time spell for the corresponding change in corruption. Selecting $w > v$ is equivalent to allowing for a distributed lag in the relationship between changes in inequality and changes in corruption.

To evaluate the robustness of this specification, different choices for v and w are considered, as are alternative measures of inequality, in agreement with the assertion that inequality in different parts of the income or wealth distribution may affect corruption differently, subject to different delay.[3]

Data

Data for our analysis come from international organizations, most notably the World Bank's Worldwide Governance Indicators (WGI) and World Development Indicators (WDI), and various specialized public sources of political science indicators (table A1 in the Appendix reports detailed sources and descriptive statistics).

Corruption, the dependent variable here, is notoriously difficult to measure (Kalinowski 2016:1). Unlike previous studies we do not rely on a single subjective indicator for perception of corruption, but we review several objective and subjective indicators by a variety of actors. These include scores given by country experts in the World Bank's Control of Corruption Index (CCI), anecdotal evidence on bribe paying in Transparency International's Global Corruption

[3] As a future extension, instrumental-variable approach will be taken to link the exogenous components of changes in inequality to the observed changes in corruption. Valid instrumental variables are those highly correlated with changes in inequality, and uncorrelated directly with measures of actual corruption. The alternative variables considered for instrumenting include changes in migration; fluctuations in realty/equity/precious-metal markets; price levels of basic commodities; and signing of trade pacts. Easterly (2007) uses agricultural endowment as an instrument for inequality. Erickson and Vollrath (2004) use crop and mineral indicators to instrument for land inequality. Whether these instruments are exogenous to domestic corruption is unclear.

Barometer (TI GCB), firms' experience in the World Bank's Enterprise Surveys (WBES), and citizen perceptions in the Arab Barometer and World Values Surveys (WVS). The CCI ($\times [-1]$), thought to gauge well the various manifestations of corruption in society, and available for the largest set of countries and years, is used as the main dependent variable in regressions.

CCI is a composite indicator summarizing the common component of various "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests" (Kaufmann et al. 2010:4). The scores are obtained from up to 31 different surveys of firms and households, as well as expert assessments from various commercial business information providers, non-governmental organizations, and multilateral and other public-sector organizations. CCI comes with an estimate of uncertainty about it. (In follow-up research, we will use this to compute more accurate confidence intervals.)

For the main explanatory variable of interest, we use two alternative measures of economic inequality – Gini coefficient from the World Development Indicators, and aggregate income share of top 10% of households from the World Wealth and Income Database. For variables mediating the effect of inequality on corruption, we control for the level of national income (WDI data), size of the informal sector (Andrews et al. 2011; ILO 2013; Charmes 2016, 2019), and the *resource curse* for countries' economic planning from relying on natural-resource extraction for fiscal revenues. Following Baryshnikova et al. (2016), the reliance on natural resource extraction is estimated as: $ract = (FE + OR) \times ME/GDP$, where FE and OR are the shares of merchandise exports from fuel, and from ores and metals, and ME/GDP is the share of real GDP from merchandise exports. This is particularly relevant given the rentier nature of MENA-region economies.

For other control variables we use the index of government size from the Fraser Institute's (2018) Economic Freedom of the World (EFW) database. Binary indicators for countries under the alternative varieties of market economy (see table A2 in the Appendix).[4] Finally, year indicators are used to control away time-specific secular trends.

The main dataset used in regression analysis is an unbalanced panel of up to 3,272 country–year observations covering 186 countries over 22 years, 1996-2017. The Arab region

[4] For the degree of coordination of wage-setting mechanisms in the economy we consider Kenworthy's wage-bargaining index (Visser, 2009), but this unavailable for MENA countries except for Turkey. As alternative measures of labor market coordination, we consider an Economic Freedom of the World index of lenience of labor market regulations and labor union density in a country (Visser, 2009).

is represented by twenty countries: Algeria, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, Turkey, UAE and Yemen. Among these countries, we have substantial heterogeneity in terms of corruption (lowest in Qatar, highest in Iraq and Yemen), income level (low-income Syria and Yemen to the high-income Gulf countries), income inequality (Gini of 31 in Iraq, and 46 in Saudi Arabia), the role of resource extraction in the economy (less than 1% in Jordan, over 97% in Algeria), and labor market informality (less than a third of all employment in Turkey, more than 75% in Morocco). This heterogeneity helps to ensure robustness and efficiency of our inference.

Review of the main dataset indicates that corruption in MENA countries is distributed just slightly worse than in upper-middle income countries, but better than in lower-middle income countries (figure A1 *i* in the Appendix), or in the group of all resource exporting countries (panel *ii*). Most MENA countries have poorer corruption scores than high income economies, particularly those with liberal (Anglo-American countries) and coordinated non-liberal (Continental Europe) market traditions (panels *iii*,*iv*). In terms of the Gini index of inequality, MENA region does worse than the group of high income countries, but better than that of upper-middle income countries (figure A2 *i*). MENA-region Gini is distributed similarly as in other resource exporting countries and, interestingly, similarly as in the block of lower-middle income countries (panels *i*,*ii*). MENA Gini is higher than in liberal market and coordinated non-liberal market advanced economies, but not too differently from that in the East Asian state-led non-liberal economies (panel *iii*,*iv*). Finally, regarding the degree of informality of labor markets, once we control for countries' income level, we find that MENA countries do not have an excessive degree of informality, and in fact lie at the low end of the comparable income groups (figure A3 *i*). Changes in informality and changes in corruption do not have a clear monotonic relationship, in the MENA or in other developing economies, and if anything the relationship is U-shaped (*ii*). These observations dampen any assertions of the MENA region's exceptionalism. To investigate the associations between inequality, level of development, governance institutions, market structure, and corruption – and to assess the position of the MENA region in relation to other country blocks – we must investigate the variables in tandem.

Results

Corruption–inequality association in the MENA

Before embarking on formal statistical analysis of the effect of inequality on corruption, it is useful to survey the observable association between the two using alternative measures and data sources. Tables 1–4 and figures 1–3 show assorted evidence of the degree of corruption and inequality, and their association, in the MENA. Figures 4–5 show this association accounting for the countries' income level or variety of capitalism.

Table 1 shows the perceptions of the extent of corruption and of government efforts to crack down on it by residents of six MENA countries, according to the Arab Barometer surveys. In Jordan and Palestine, 5–6 percent of residents feel that almost all public officials are corrupted, and another 26–30 percent feel that most are. In Algeria, Lebanon, Morocco and Yemen, the perceptions are direr still, with 61-78 respondents feeling that most or all officials are corrupted. At the same time, national governments are thought to do little to tackle corruption, with only 56–66 percent of respondents in Jordan and Palestine – and only 17–28 in other countries – feeling that their government exerts a medium or large extent of effort tackling corruption.

While table 1 indicates that Jordan and Palestine are less plagued by corruption than their MENA neighbors, table 2 (using WVS) shows the opposite pattern regarding the bribery of voters in elections. Over two-thirds of Jordanians and Palestinians (as well as the Lebanese and Yemenese) feel that voters are fairly/very often bribed, compared to 50 percent in Egypt, Iraq, Kuwait, Libya and Tunisia. The attitude toward accepting bribes also varies substantially across MENA countries, with 7–15 percent of residents in Algeria, Bahrain, Kuwait and Lebanon viewing it as often/always acceptable (responding 6-10 on a 1-10 scale), compared to only 1 percent in Turkey and 1–3 percent in Iraq, Jordan, Morocco and Tunisia. Compared to middle and high income countries worldwide, the MENA region fares poorly in terms of the perceived extent of bribery in elections, but is not atypical in terms of residents' rationalization of accepting bribes. Figure 1 shows that MENA countries are in the right half of the worldwide distribution of the perceptions of bribery, but are no higher in terms of rationalizing the acceptance of bribes. Figure 2 illustrates the puzzling co-occurrence of high corruption and modest income inequality in the MENA region compared to those observed in middle and high income countries worldwide.[5] There is no clear upward or downward

[5] In this figure and in all of the following analysis, Solt's (2016) estimates of inequality in developing countries must be viewed with caution. In particular, Egypt's disposable-income Gini of 46 is far above other available estimates (e.g., Hlasny and Verme 2018). Alternative measures of inequality – including the Gini using a different income concept, or the aggregate income share of the highest-earning 10% of households – yielded analogous qualitative results, but using smaller sample sizes. To preserve sample size and ensure comparability across countries, the disposable income Gini is used as our main inequality indicator.

relationship between perceived corruption and inequality, overall or across any of the groups of countries.

Table 3 reports on four indicators of public-sector corruption as per TI's GCB surveys. Compared to respondents worldwide, MENA residents rate the corruption problem in their country as non-existent (2-7 17% in Libya and Sudan, compared to 1.1% outside MENA), or existent but not very serious (23-82% MENA respondents call it 'little' to 'serious' vs. 13% worldwide), and are less likely to call it very serious (10-76% in MENA vs. 86% outside MENA). MENA residents also downplay the importance of personal contacts in dealing with the public sector compared to respondents worldwide. Across MENA, only 60 percent view personal contacts to be important or very important (17-38% in Libya, Sudan and Yemen), compared to 73 percent worldwide.

At the same time, MENA residents are more likely to be asked to pay a bribe than individuals worldwide (for instance 56-75% in Libya, Morocco and Yemen vs. 41% worldwide). MENA residents are also much more likely to acknowledge that their government is run by a few big entities ('entirely,' say 19% of MENA respondents vs. 2% worldwide; 'to a large extent,' say 30% in MENA vs. 11% worldwide), particularly in Egypt, Lebanon, Morocco and Tunisia.

Tables 2 and 3 thus indicate that the degree of acceptance of corruption is rather high in the MENA relative to the objective evidence of corruption. They also suggest that the type of corruption prevalent in the MENA, such as high-level influence over national government that is publicly well known, may differ from that in developing countries worldwide, such as the petty corruption of trading favors with public officials through mutual relationships. Figure 3 illustrates the prevalence of being asked to pay a bribe in a country against the national level of income inequality. The MENA region ranks in the top half of the distribution of experienced bribery. Interestingly, this figure reveals a positive relationship between inequality and corruption. OECD countries (shown as paragons of industrialized economies with high-quality institutions) are concentrated tightly in the lower left corner, MENA countries are in the center and somewhat above the trend line, and other developing countries are distributed widely around the center and toward the right. The difference between figures 2 and 3 is due to the selection of countries included, but importantly also due to the distinction of perceived versus experienced corruption.

Table 4 shows more evidence of the type of corruption, as perceived and felt by representatives of business enterprises. Business representatives in the MENA are more likely to view national courts as unfair or corrupted than their counterparts worldwide, particularly

in Lebanon, Mauritania and Yemen (but in Sudan and Tunisia responses appear surprisingly positive regarding courts' fairness). Nearly one-half of MENA-region enterprises report that corruption represents a major or very severe obstacle to their operation, compared to less than 30 percent worldwide. Figure 4 illustrates. OECD countries uniformly score well according to how much of an operating obstacle corruption represents for enterprises. Developing countries are distributed widely from a very high to a very low (on par with OECD) degree of obstructiveness of corruption. MENA countries are among the top end of this distribution, with Yemen a clear single outlier. There appears to be a weak positive association between inequality and the degree of obstructiveness of corruption.[6]

Effect of inequality on corruption

Previous sections have discussed the associations between countries' level of development, inequality, and the experienced or perceived corruption. Most measures of corruption are related positively with inequality, particularly those based on objective experience or observation of corruption rather than on subjective tolerance or rationalization of corruption. Whether this positive association is direct or operates through other mediating factors, and how much of the association can be attributed to each source, is the question tackled next.

World Bank's CCI will be used as the dependent variable for its inclusiveness of various forms of corruption, and good availability. First, to eye-ball the role of various third factors to explaining corruption, we plot CCI ($\times [-1]$; -2.5 being the best, +2.5 the worst) as a function of lagged inequality, and we estimate their bivariate relationship for various groups of countries: according to which variety of capitalism they can best be described by, by their income level, and by their status as resource-exporting countries. Inequality–corruption relationships in levels ($corruption_t$ vs. $inequality_{t-1}$) as well as in first-differenced form ($3\text{-}yr\ \Delta\ corruption_t$ vs. $10\text{-}yr\ \Delta\ inequality_{t-1}$) are shown. Figures 5 and 6 show that the positive inequality–corruption relationship is strongest among state-led non-liberal economies (East Asia) and high-income countries, followed by that in coordinated non-liberal market economies (Continental Europe), while it is weak positive in liberal market economies (Anglophone countries), and

[6] Table A5 in the Appendix shows enterprises' estimates how their costs would be affected if the obstacle were removed. In Djibouti and Jordan, interestingly, more enterprises predict their costs to rise than to fall, suggesting a 'grease the wheels' effect of corruption.

Other available data on corruption include the World Bank's CCI – analyzed in the following section – and an EFW index of extra payments/bribes/favoritism extracted from businessmen by regulators (Fraser Institute 2018) – shown in the Appendix table A4 and figure A4.

floppy or decidedly negative in the MENA region (Figures 5–6 panels *i*,*ii*). These findings are consistent with a view that, in the presence of poor institutional structures and efforts to enforce political stability, keeping inequality down using public-sector employment or government dictate over industry may be associated with elevated corruption. Corruption may also offer otherwise non-connected agents access to economic opportunities, while economic reforms and anti-corruption drives may increase inequality.

When changes in inequality and corruption, rather than their levels, are juxtaposed, these results appear broadly valid in recent years (panel *iv* in figure 5 and figure A5 in the Appendix), although they are not supported during 2003-2012 (panel *iii*). When countries with heavy reliance on resource exports, including low-income countries, are set apart instead of MENA countries (figure A5), the results also remain valid but are subject to more noise. For clarity of presentation, low income non-MENA (or non-resource exporting) countries were excluded from this analysis because of the great heterogeneity of their development and institutional experience.

As another test of the corruption–inequality relationship at different stages of country development, we estimate simple regressions of corruption on lagged inequality by decile of the world income distribution, and then separately for MENA. We find that the coefficient on the lagged inequality index is nearly monotonically increasing (figure 7). Using either the Gini or the top income share, the coefficient is negative among lower-income countries and becomes positive for countries with median or higher income level. This supports the conjecture that factors holding down inequality may be conducive to corruption among the poorest and mismanaged economies, while the opposite is the case among middle-income and high-income countries, where factors promoting equality also promote transparency. MENA countries are shown to systematically exhibit negative relationship between inequality and corruption, and their regression coefficients are significantly lower than those among other middle and high income countries.[7] In fact, the coefficients estimated among MENA countries are consistent with those for the poorest quarter of countries.

Direct effect of inequality on corruption

[7] These results are broadly supported by regressions with random or fixed effects (figure A2 in the Appendix). The one notable exception is that the effect turns negative among the top decile of countries. This could be on account of a handful leverage observations – such as highly corrupt ergatocracies ramping up resource extraction (e.g., Venezuela), or rich countries with high post-fiscal income inequality (e.g., Singapore, UK, US) – and should be explored further. In these regressions, using income share of the richest households instead of the Gini, for a smaller sample size, gives rise to wider confidence intervals and some fluctuation across country-income deciles (panel *ii*,*iv*).

We next turn to formal methods to isolating the one-directional direct effect of inequality on corruption, as well as the contributions of other mediating factors. Table 5 reports the results of regressions of inequality on corruption in first differences. Ordinary least squares (OLS) regressions are used as baseline, while regressions with random effects (generalized least squares GLS), or with fixed effects are used as more appropriate, given the substantial heterogeneity and heteroskedasticity in the sample of worldwide countries.

The dependent variable is the one-year change in CCI ($\times [-100]$; –111 being the best, +90 the worst in the sample). The main explanatory variable is the ten-year change in the Gini coefficient ($\times 100$; –16 being the best, +11 the worst in the sample). This variable is interacted with the variety of capitalism binary indicators, with national income per capita in logarithmic form, its square, stock market capitalization in logarithmic form, and the degree of market informality. In regressions without country fixed effects, variety-of-capitalism and MENA-region indicators are evaluated as controls. Coefficients on '10yr Δgini' (and its interaction terms) can be interpreted as increases in the corruption score (times the value of the interacted variable, respectively) predicted as a result of a one percentage-point increase in the Gini. For instance, -0.169 means that as Gini increases by ten percentage points, say from 35 to 45, the corruption score is predicted to fall by 1.69, say from 0 to -1.69 (and the original CCI score is predicted to rise from 0 to +0.017).

The first row in table 5 shows that reductions in inequality are predicted to raise corruption, significantly so in OLS and GLS regressions, but the effect becomes insignificant once country-level heterogeneity is accounted for. For the MENA region alone, rows one and two jointly indicate that inequality still has a negative effect on corruption, but this is effect is weaker than outside the MENA. This is because the coefficients on '10yr Δgini ×MENA' are positive but smaller in magnitude than the coefficients on '10yr Δgini'. In the first four columns in table 5, the inequality–corruption relationship in the MENA is significantly different from that outside the MENA, and significantly different from zero, at least at the 10% level of significance. When additional variables or fixed effects are included, however, the MENA-region effect becomes insignificant.

Comparing these findings to those for other country blocks, we find that the (continental European) coordinated market economies exhibit an even stronger negative effect of inequality on corruption than among outside-MENA countries on average, and this is significant even in regressions with fixed effects. State-led (East Asian) non-liberal market economies – like MENA countries – display less of a negative inequality–corruption

relationship than other countries. This finding is significant in regressions with random effects, but not significant at all with fixed effects.

An illustration of the findings described above is in order. Let us take column 5 in table 5 as our model of choice. Using variable means for the MENA and non-MENA countries in 2015–2017, suppose that the starting corruption scores are 46.52 and -5.47; real national income per capita is $21,850 and $14,910; stock market capitalization per GDP is 7.5% and 2.2%; and the degree of informality is 58.6% and 50.7%, in the MENA and outside the MENA, respectively. Suppose the Gini remains steady at some level for five years, and then permanently rises by one percentage point due to some demographic shock. Five years later, suppose the Gini starts increasing by one percentage point annually, say due to the ushering in of economic reforms. (Say, Gini=35 between years -5 and -1, then Gini=36 between years 0 and 4, and then it may rise to 41 between years 5 and 9.) Figure 8 shows the predicted paths of the corruption index in MENA versus non-MENA countries, separately for the coordinated versus state-led non-liberal market economies. Liberal market economies and developing economies are subsumed in the non-MENA other group. Clearly, corruption started on different initial paths across the groups of countries, and the paths are sensitive to rises in inequality to a different extent. This is not restricted to the regression in column 5 – all regressions yield this. In the model from column 5, as inequality increases, corruption is predicted to fall the fastest in the coordinated non-liberal market economies, and more gradually in the MENA and in the liberal/other market economies, but is predicted to rise in the state-led non-liberal market economies. In regard to the trend in corruption following a change in inequality, this analysis suggests that the MENA region does not necessarily stand out, particularly in perspective of the liberal market economies and other/developing countries. (Predictions from other regression models are available on request.)

As a last note, regressions presented in table 5 use parsimonious sets of regressors that keep sample sizes high, and are likely to produce robust predictions. Most variables are used in interaction terms but not in levels, because they were insignificant in levels – this has to do with the first-difference nature of the dependent variable and the estimation methods accounting for country heterogeneity. Beside these explanatory variables, several other variables were evaluated, but were ultimately dropped from the main regressions. This includes countries' government size, and reliance on exports of fuels, ores and metals (insignificant in all regressions), market wage coordination systems, parliamentary systems, and election years (unavailable for most developing countries), and measures of dispersion of top incomes (smaller sample size). Several alternative lags for the changes in corruption and

inequality were also evaluated – 2-year, 3-year and 5-year changes – but the one-year change in corruption and 10-year change in inequality offered good properties in terms of large sample, conceptually large regression coefficients, and good empirical fit. Alas, regressions with fixed effects lead to weak results that do not support the findings from OLS and GLS models, suggesting that the modeling choices discussed here should be re-examined. That will be the task for our follow-up work.

Discussion

This study was motivated by an assertion that the more unequal a society is, the higher the experienced or perceived level of corruption should be. This is found to be the case in a number of developed countries, but not necessarily for emerging or resource-reliant countries. This is confirmed using both graphical and statistical analysis, and using analysis of inequality and corruption in levels as well as in first-differences.

An increase in inequality does have the expected detrimental effect on corruption in some developed OECD countries, particularly those following state-led non-liberal market traditions. The relationship is the weakest or negative in countries belonging to the liberal market model. This makes sense as economic power more directly translates into political power in networked societies while the link between the two spheres is more indirect (although not necessarily weaker) in societies where most transactions are done at arm's length. The negative relationship between inequality affects corruption negatively in developing countries, and in the MENA and resource extracting economies. One explanation could be that successful development initially tends to increase inequality as growth is not spread evenly throughout the society. An increasing shape – starting negative and finishing positive – obtains for the relationship between inequality and corruption across stages of economic development. Relatedly, we find that resource exporting countries underperform relative to their level of development, perhaps an indication of a variety of a Dutch disease.

Our research has important policy implications. In addition to improving laws and punishing corrupt policymakers directly it is necessary to understand and manage economic distribution, not just out of concerns for social justice but also for the goal of enhancing economic contestation, political participation, and stability. Redistributive fiscal policies should be seen not only as instruments of social justice but, for better or worse, also tools abetting the institutionalization and entrenchment of certain vested interests. Proposals for policy reforms involving liberalization or formalization of markets must be evaluated in regard to the prospect of cronyism.

Fruitful directions for future research include studying the channels between inequality and corruption for more narrowly defined forms of inequality and corruption. While our study could only use the general Gini coefficient because of data limitations, top income shares, wealth shares, and/or poverty rates are expected to yield stronger results, not least because they vary more across countries and years. In regard to corruption, corporate and social corruption are obvious starting points. Another prospect is to decompose the observed degree of state corruption into several categories or by source, such as that prompted by corruptibility (or *supply* of corruption) by state authorities, and that prompted by the need for special treatment or patronage (*demand* for corruption) by private-sector parties. This is relevant, because each source is linked to different forms of inequality, through different channels. Distinguishing Transparency International's 'according to rule' corruption (facilitating preferential treatment for legally provided services) and 'against the rule' corruption (providing unsanctioned services), would also be useful. In relation to the suspected Dutch disease in resource extracting countries and parts of the MENA region, accounting better for developing countries' resource utilization and recent growth experiences is warranted.

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Table 1. Perception of corruption by MENA residents, Arab Barometer 2006–2007 (% of responders; [% of valid responders])

	Algeria	Jordan	Lebanon	Morocco	Palestine	Yemen
How widespread is corruption and bribe taking?						
Hardly anyone is involved	3.6 [4.1]	20.4 [22.9]	1.8 [1.8]	3.1 [3.1]	9.2 [9.6]	4.7 [5.3]
Not a lot of officials	23.3 [26.6]	37.4 [42.0]	18.3 [18.7]	22.0 [22.3]	51.2 [53.9]	23.6 [26.5]
Most officials are corrupted	40.9 [46.6]	25.5 [28.6]	60.3 [61.6]	40.5 [41.0]	29.5 [31.0]	50.8 [57.1]
Almost everyone is corrupted	19.9 [22.7]	5.8 [6.5]	17.5 [17.9]	33.2 [33.6]	5.2 [5.5]	9.8 [11.0]
Can't choose/don't know	6.00	10.94	1.67	1.10	4.66	8.51
Decline to answer	6.31	0.09	0.42	0.16	0.24	2.65
In your opinion, to what extent is the government working to crackdown on corruption & bribe taking?						
To a large extent	8.9 [10.1]	23.5 [25.6]	5.0 [5.2]	9.0 [9.4]	31.5 [33.1]	8.8 [9.8]
To a medium extent	17.9 [20.3]	32.8 [35.6]	12.4 [12.8]	18.8 [19.5]	34.5 [36.3]	14.8 [16.5]
To a small extent	32.6 [37.1]	25.0 [27.2]	19.6 [20.3]	27.6 [28.7]	15.5 [16.3]	25.1 [28.0]
Not at all	28.5 [32.5]	10.8 [11.7]	59.7 [61.7]	40.8 [42.4]	13.6 [14.3]	40.9 [45.6]
Not clear	0.00	0.26	0.00	0.00	0.00	0.00
Can't choose/don't know	7.54	7.52	3.10	3.45	4.89	9.21
Decline to answer	4.62	0.09	0.25	0.31	0.08	1.26
All responders	1,300	1,143	1,195	1,277	1,267	717

Source: Association of Religion Data Archives, Arab Barometer, 2006-2007.

Table 2. Perception of corruption by MENA residents, World Values Survey 2001–2014 (% of valid responders)

How often are voters bribed in your country's elections?

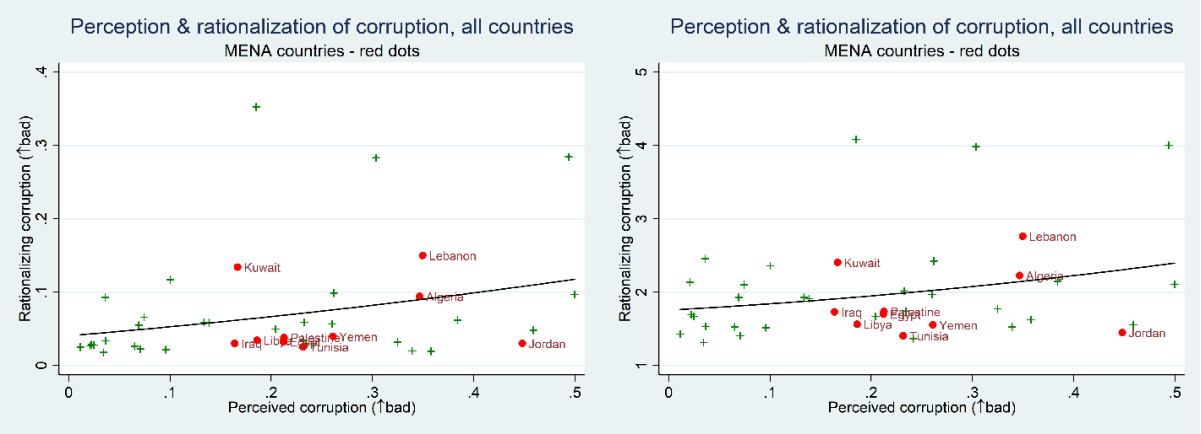
	Very often	Fairly often	Not often	Not at all often	Valid responders
Algeria 2013	34.66	28.08	20.14	17.12	730
Egypt 2013	21.19	30.59	33.17	15.05	1,400
Iraq 2012	16.39	33.52	36.74	13.35	1,086
Jordan 2014	44.8	35.57	12.31	7.33	1,105
Kuwait 2014	16.68	29.57	30.62	23.13	947
Lebanon 2013	34.97	36.33	20.89	7.81	1,101
Libya 2014	18.61	23.96	26.79	30.64	1,447
Palestine 2013	21.26	45.56	19.39	13.79	856
Tunisia 2013	23.15	37.24	28.87	10.74	717
Yemen 2014	26.09	41.24	18.71	13.97	759

How justifiable is someone's accepting a bribe?

	Never	2	3	4	5	6	7	8	9	Always	Valid responders
Algeria 2002	88.59	3.30	1.02	1.10	1.49	0.79	0.71	1.34	0.79	0.87	1,271
Algeria 2013	63.50	10.30	8.53	3.64	4.62	2.75	1.60	1.07	0.80	3.20	1,126
Bahrain 2014	41.58	39.08	6.58	3.17	2.67	3.75	2.33	0.50	0.33	0.00	1,200
Egypt 2001	93.96	2.69	1.35	0.62	0.66	0.38	0.10	0.07	0.10	0.07	2,896
Egypt 2008	88.49	4.19	1.92	1.44	1.09	0.77	0.61	0.73	0.37	0.39	3,050
Egypt 2013	67.09	17.15	9.20	1.17	2.16	1.05	0.49	0.42	0.36	0.92	1,523
Iraq 2004	84.65	11.66	1.16	0.30	0.30	0.09	0.04	0.43	0.90	0.47	2,325
Iraq 2006	94.37	3.98	0.34	0.15	0.19	0.04	0.08	0.15	0.15	0.56	2,662
Iraq 2012	65.52	17.41	7.36	4.94	1.76	1.00	0.92	0.33	0.59	0.17	1,195
Jordan 2001	96.41	0.97	0.85	0.47	0.25	0.04	0.20	0.19	0.25	0.37	1,209
Jordan 2007	95.34	2.12	0.47	0.64	0.48	0.43	0.00	0.26	0.08	0.19	1,195
Jordan 2014	82.00	7.67	4.17	1.92	1.25	1.50	0.75	0.25	0.17	0.33	1,200
Kuwait 2014	64.30	7.09	7.68	3.12	4.39	3.71	3.12	1.86	1.77	2.95	1,185
Lebanon 2013	50.08	9.00	9.08	8.67	8.17	6.75	3.75	2.33	1.58	0.58	1,200
Libya 2014	83.00	4.39	3.64	2.93	2.61	0.67	0.74	0.18	0.25	1.59	2,064
Morocco 2001	97.90	0.11	0.28	0.36	0.91	0.00	0.00	0.05	0.00	0.38	1,231
Morocco 2007	82.48	5.22	2.61	1.68	3.79	1.01	0.93	1.10	0.59	0.59	1,187
Morocco 2011	81.37	6.94	4.29	2.28	3.29	0.91	0.37	0.27	0.00	0.27	1,095
Palestine 2013	71.70	9.77	7.45	3.32	3.93	1.41	1.41	0.60	0.10	0.30	993
Qatar 2010	87.83	5.20	1.08	0.57	1.37	1.43	1.30	0.58	0.36	0.28	1,052
Tunisia 2013	88.08	2.62	3.13	1.01	2.62	0.76	0.34	0.17	0.34	0.93	1,183
Turkey 2007	83.00	10.90	3.47	1.35	0.66	0.00	0.27	0.08	0.00	0.25	1,341
Turkey 2011	86.83	8.20	2.11	1.45	0.43	0.05	0.29	0.19	0.42	0.05	1,602
Yemen 2014	81.98	6.46	3.33	1.98	2.29	0.63	0.94	1.35	0.52	0.52	960

Source: WVS waves 4–6, individuals 18+ years old. National samples are adjusted using sampling weights.

Figure 1. Perception & rationalization of bribery in 2011-2014, by country

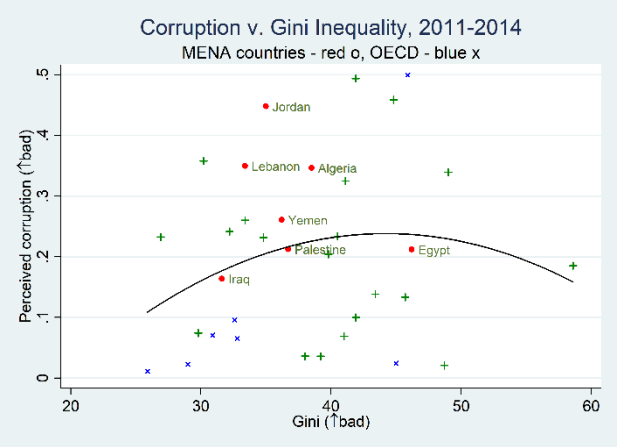


i. Share of respondents perceiving fair/high bribery, vs. share viewing bribery as sometimes/always justifiable

ii. Share of respondents perceiving fair/high bribery, vs. mean response to how justifiable bribery is

Source: WVS wave 6, 2011–2014.
Notes: Dots are country means among valid responders 18+ years old. Perception of corruption is the share of valid responders 18+ years old in a country who answer that voters are bribed very or fairly often. Rationalization of corruption, in panel (i), is the share of valid responders 18+ years old in a country who answer 6-10 whether accepting a bribe is justifiable. In panel (ii), it is the mean national response (1-10) to how justifiable is accepting a bribe. National samples are adjusted using sampling weights. Quadratic line fitted among all countries is shown for illustration.
MENA countries are: Algeria, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Palestine, Tunisia, Yemen.
Non-MENA countries are: Argentina, Australia, Azerbaijan, Brazil, Chile, Colombia, Ecuador, Estonia, Germany, Ghana, Hong Kong, India, Kazakhstan, Kyrgyzstan, Malaysia, Mexico, Netherlands, Nigeria, Pakistan, Peru, Philippines, Poland, Romania, Rwanda, Singapore, South Africa, Taiwan, Thailand, Ukraine, Uruguay, Zimbabwe.

Figure 2. Perception of bribery vs. inequality in 2011-2014, by country



Source: WVS wave 6, 2011–2014.
Notes: Quadratic line fitted among all countries is shown for illustration. OECD countries include Australia, Chile, Estonia, Germany, Mexico, Netherlands, Poland. Non-OECD countries include: Argentina, Brazil, Colombia, Ecuador, Ghana, Hong Kong, Kazakhstan, Kyrgyzstan, Malaysia, Pakistan, Peru, Philippines, Romania, Rwanda, Singapore, South Africa, Taiwan, Thailand, Ukraine, Uruguay

Table 3. Perception of corruption by MENA residents, 2013 (% of valid responders)

	Q1: To what extent do you believe corruption is a problem in the public sector in your country?					Q2: Have you ever been asked to pay a bribe?		Valid responders
	Not at all	A little problem	A problem	A serious problem	Very serious	Yes	No	Q1 | Q2
Algeria	1.32	1.32	7.51	17.66	72.18	50.66	49.34	985 | 987
Egypt	3.66	4.27	12.91	34.86	44.31	48.27	51.73	984 | 955
Iraq	0.75	2.15	23.62	29.32	44.16	45.82	54.18	1,071 | 1,041
Jordan	3.85	10.40	24.74	31.19	29.83	20.90	79.10	962 | 914
Lebanon	1.28	1.18	4.60	21.71	71.23	29.47	70.53	935 | 655
Libya	16.76	7.78	22.45	11.61	41.4	75.00	25.00	913 | 976
Morocco	1.43	0.82	4.71	17.40	75.64	55.60	44.40	977 | 964
Sudan	17.73	33.71	31.97	6.15	10.45	33.33	66.67	976 | 921
Tunisia	2.63	3.68	12.00	15.16	66.53	41.20	58.80	950 | 966
Turkey	5.12	6.35	20.98	17.50	50.05	22.39	77.61	977 | 1,005
Palestine	2.10	10.09	17.78	34.77	35.26	10.92	89.08	1,001 | 952
Yemen	6.67	26.06	28.81	27.33	11.12	66.56	33.44	944 | 963
Non-MENA	1.11	1.07	5.14	6.77	85.91	40.93	59.07	97,216 | 98,418 95 countries

In your dealings with the public sector, how important are personal contacts/relationships to get things done?

	Not important	Of little importance	Moderately important	Important	Very important	Valid responders
Algeria	10.4	12.74	19.88	27.73	29.26	981
Egypt	6.60	4.06	11.07	33.20	45.08	985
Iraq	0.56	7.91	25.12	40.84	25.58	1,075
Jordan	3.17	7.06	21.68	38.14	29.96	978
Lebanon	0.81	2.31	7.29	23.96	65.63	864
Libya	25.50	12.43	26.25	10.41	25.40	941
Morocco	2.48	5.07	6.52	38.72	47.20	966
Sudan	24.84	32.40	26.19	9.52	7.04	966
Tunisia	14.48	9.94	16.07	32.35	27.17	946
Turkey	14.45	8.16	16.32	27.53	33.53	1,017
Palestine	4.08	10.98	19.67	30.65	34.62	956
Yemen	5.62	27.37	29.11	24.51	13.38	979
Non-MENA	5.87	9.31	12.19	37.48	35.15	97,036

To what extent is this country's government run by a few big entities acting in their own best interests?

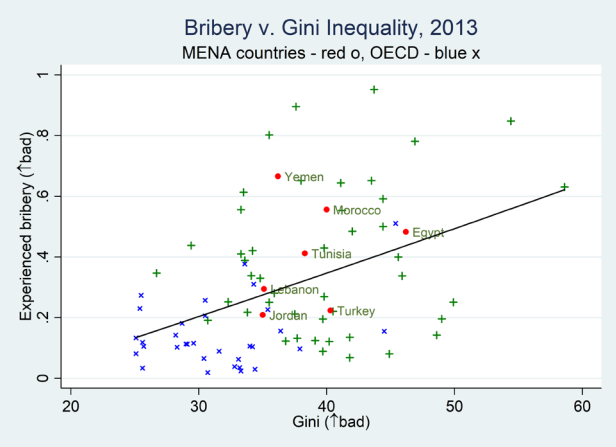
	Not at all	Limited extent	Somewhat	Large extent	Entirely	Valid responders
Algeria	8.80	18.64	27.64	28.27	16.65	955
Egypt	7.36	11.66	18.61	34.36	28.02	978
Iraq	1.17	11.82	36.72	41.02	9.28	1,024
Jordan	6.14	24.20	37.19	27.74	4.72	847
Lebanon	1.00	3.01	6.90	38.64	50.45	898
Libya	20.73	17.98	24.86	14.55	21.88	873
Morocco	2.66	6.41	32.04	41.96	16.93	827
Sudan	21.44	28.45	26.60	10.82	12.68	970
Tunisia	10.69	12.81	19.38	37.19	19.93	898
Turkey	7.68	8.40	34.65	25.31	23.96	964
Palestine	3.07	17.16	31.67	33.47	14.62	944
Yemen	6.56	25.79	29.64	23.53	14.48	884
Non-MENA	17.54	30.91	39.29	10.59	1.67	92,214

Source: GCB 2013.

Notes: National samples are adjusted using sampling weights. Non-MENA includes Afghanistan, Albania, Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Belgium, Bolivia, Bosnia & Herz., Brazil, Bulgaria, Burundi, Cambodia, Cameroon, Canada, Chile, Colombia, Congo DR, Croatia, Cyprus, Czech Republic, Denmark, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Georgia, Germany, Ghana, Greece, Hungary, India, Indonesia, Israel, Italy, Jamaica, Japan, Kazakhstan, Kenya, Korea, Kosovo, Kyrgyzstan, Latvia, Liberia,

Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mexico, Moldova, Mongolia, Mozambique, Nepal, New Zealand, Nigeria, Norway, Pakistan, P.N Guinea, Paraguay, Peru, Philippines, Portugal, Romania, Russia, Rwanda, Senegal, Serbia, Sierra Leone, Slovakia, Slovenia, Solomons, South Africa, South Sudan, Spain, Sri Lanka, Switzerland, Taiwan, Tanzania, Thailand, Uganda, Ukraine, UK, US, Uruguay, Vanuatu, Venezuela, Vietnam, Zambia, Zimbabwe.

Figure 3. Experience of bribery vs. inequality in 2013, by country



Source: GCB 2013.

Notes: National samples are adjusted using sampling weights. Linear line fitted among all countries is shown for illustration. OECD countries include Australia, Belgium, Canada, Chile, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, New Zealand, Norway, Portugal, Slovakia, Slovenia, Spain, Switzerland, Taiwan, UK, US. Non-OECD countries include: Argentina, Armenia, Bangladesh, Bolivia, Bosnia &Herz., Brazil, Bulgaria, Burundi, Cameroon, Colombia, El Salvador, Ethiopia, Fiji, Georgia, Ghana, Indonesia, Kazakhstan, Kosovo, Kyrgyzstan, Liberia, Macedonia, Malawi, Malaysia, Moldova, Mongolia, Mozambique, Pakistan, Paraguay, Peru, Philippines, Romania, Russia, Rwanda, Serbia, Solomons, South Africa, Sri Lanka, Tanzania, Thailand, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, Zambia.

Table 4. Perception and experience of corruption by MENA enterprises (% of valid responders)

The court system is fair, impartial and uncorrupted:

	Strongly disagree	Tend to disagree	Tend to agree	Strongly agree	Valid responders
Djibouti 2013	22.54	30.74	38.93	7.79	244
Egypt 2013	11.81	20.88	39.44	27.87	2,490
Iraq 2011	26.14	42.52	23.62	7.72	635
Jordan 2006	14.39	28.29	45.16	12.16	403
Jordan 2013	11.62	21.05	41.01	26.32	456
Lebanon 2013	41.12	32.36	23.15	3.37	445
Mauritania 2006	21.61	27.97	27.54	22.88	236
Mauritania 2014	51.97	26.77	12.6	8.66	127
Morocco 2013	14.79	34.32	41.42	9.47	338
Palestine 2006	36.06	30.14	29.3	4.51	355
Palestine 2013	19.65	30.35	42.49	7.51	346
Sudan 2014	4.26	15.22	54.19	26.33	657
Tunisia 2013	8.84	25.82	51.13	14.21	577
Turkey 2008	19.92	18.21	25.07	36.8	1,049
Turkey 2013	28.51	24.42	22.49	24.58	1,245
Yemen 2010	57.79	20.32	16.25	5.64	443
Yemen 2013	60.53	20.77	15.13	3.56	337
Non-MENA ‘11-‘16	20.94	28.01	37.27	13.78	47,798

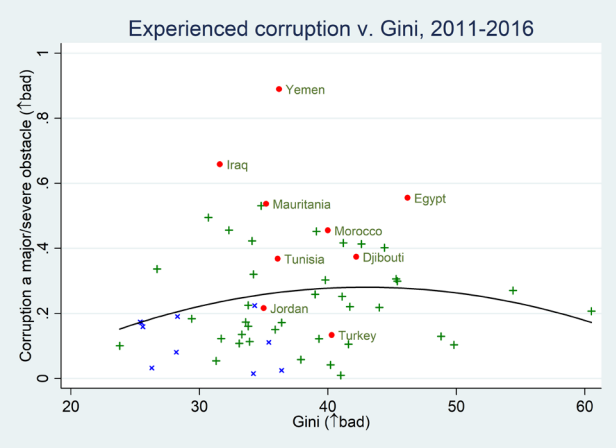
How much of an obstacle to current operation is corruption?

	No obstacle	Minor	Moderate	Major	Very severe	Valid responders
Algeria 2002	24.52	17.05	23.18	15.71	19.54	522
Djibouti 2013	38.61	10.81	12.74	13.9	23.94	259
Egypt 2004	31.83	4.14	14.50	15.45	34.08	956
Egypt 2007	21.99	7.05	11.68	16.38	42.91	1,319
Egypt 2013	17.82	9.62	16.22	24.67	31.66	2,817
Iraq 2011	11.08	9.58	11.76	24.21	43.37	731
Jordan 2006	26.31	9.64	21.29	24.1	18.67	498
Jordan 2013	36.02	22.54	17.51	14.29	9.66	497
Lebanon 2006	8.43	8.14	16.86	21.8	44.77	344
Lebanon 2009	8.51	5.85	19.15	18.35	48.14	376
Lebanon 2013	14.1	5.06	12.48	26.58	41.77	553
Mauritania 2006	40.68	30.51	10.59	11.44	6.78	236
Mauritania 2014	16.89	13.51	15.54	30.41	23.65	148
Morocco 2004	54.50	17.92	10.92	9.53	7.13	850
Morocco 2007	51.15	11.29	10.23	14.81	12.52	567
Morocco 2013	27.46	12.85	13.6	23.68	22.42	397
Oman 2003	68.45	12.50	7.14	3.87	8.04	336
Palestine 2006	10.66	8.38	14.47	23.1	43.4	394
Palestine 2013	22.89	9.64	23.13	23.61	20.72	415
Sudan 2014	1.36	7.85	26.59	53.32	10.88	662
Syria 2003	22.66	8.27	11.51	18.35	39.21	556
Syria 2009	7.43	9.24	16.27	14.06	53.01	498
Tunisia 2013	25.51	17.23	20.44	23.99	12.84	592
Turkey 2002	39.45	16.77	20.12	23.67	0.00	507
Turkey 2004	46.52	14.84	21.61	17.03	0.00	546
Turkey 2005	19.77	9.68	16.80	16.96	36.79	1,290
Turkey 2008	29.16	16.98	15.73	14.76	23.38	1,125
Turkey 2013	58.95	14.47	12.95	7.31	6.32	1,313
Yemen 2010	9.03	4.73	12.26	29.46	44.52	465
Yemen 2013	0.85	3.41	6.53	18.18	71.02	352
Non-MENA ‘11-‘16	36.14	17.66	17.33	16.58	12.30	51,873

Source: WBES 2002–2014. National samples in Egypt ‘04, Morocco ‘04, Turkey ‘05 are adjusted using sampling weights, unavailable elsewhere. Non-MENA countries are Afghanistan2014, Albania2013,

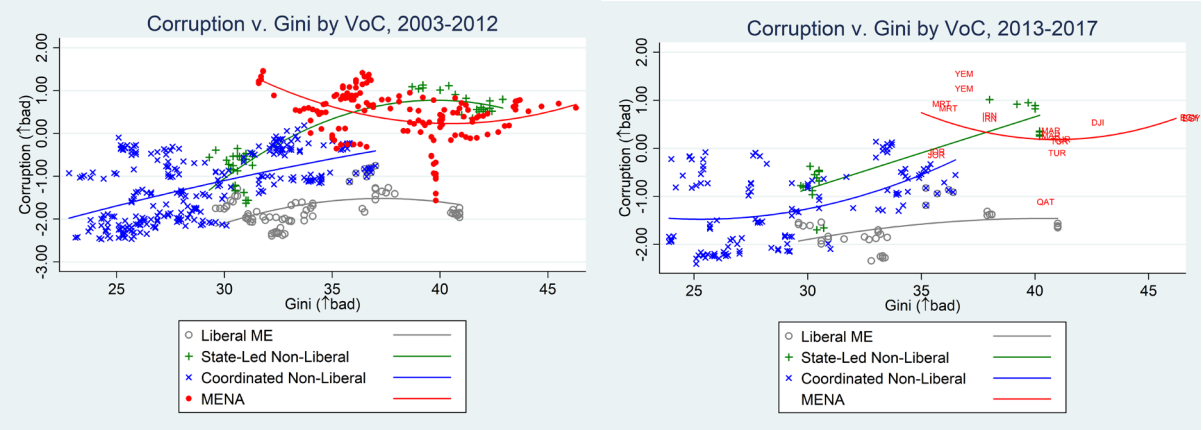
Armenia2013, Azerbaijan2013, Bangladesh2013, Belarus2013, Benin2016, Bhutan2015, Bosnia & Herz.2013, Bulgaria2013, Burundi2014, Cambodia2016, Cameroon2016, CAR2011, China2012, Croatia2013, Czechia2013, Coate d'Ivoire2016, DRC2013, El Salvador2016, Estonia2013, Ethiopia2015, Macedonia2013, Georgia2013, Ghana2013, Guinea2016, Hungary2013, India2014, Indonesia2015, Israel2013, Kazakhstan2013, Kenya2013, Kosovo2013, Kyrgyzstan2013, Laos2016, Latvia2013, Lesotho2016, Lithuania2013, Madagascar2013, Malawi2014, Malaysia2015, Mali2016, Moldova2013, Mongolia2013, Montenegro2013, Myanmar2014, Namibia2014, Nepal2013, Nigeria2014, Pakistan2013, P.N Guinea2015, Philippines2015, Poland2013, Romania2013, Russia2012, Rwanda2011, Senegal2014, Serbia2013, Slovakia2013, Slovenia2013, Solomons2015, South Sudan2014, Sri Lanka2011, Swaziland2016, Sweden2014, Tajikistan2013, Tanzania2013, Thailand2016, Timor Leste2015, Togo2016, Uganda2013, Ukraine2013, Uzbekistan2013, Vietnam2015, Palestine, Zambia2013, Zimbabwe2016.

Figure 4. Corruption as an obstacle to current operation vs. inequality in 2011-2016, by country

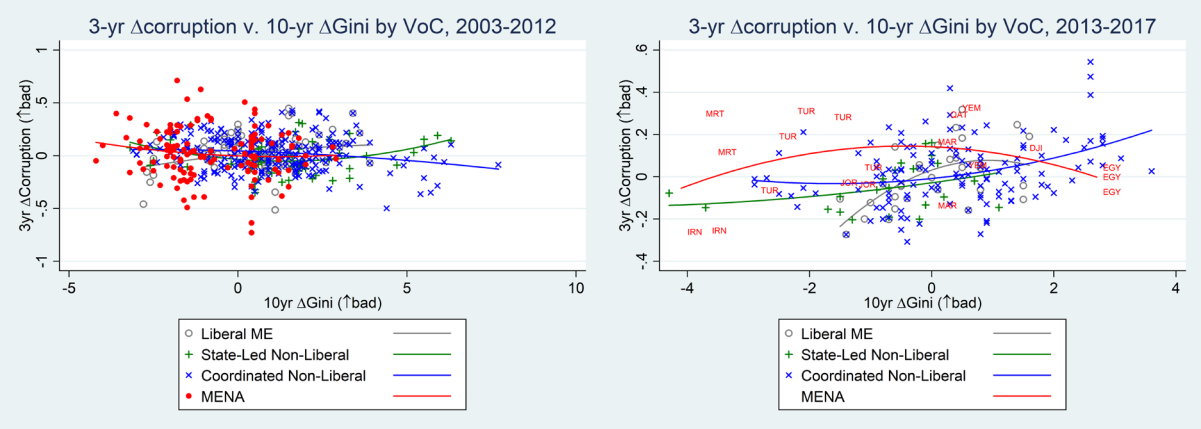


Source: WBES 2011-2016.
Notes: OECD countries are Croatia, Czechia, Estonia, Hungary, Israel, Latvia, Lithuania, Slovakia, Slovenia, Sweden. Non-OECD countries are Armenia, Bangladesh, Belarus, Benin, Bosnia & Herz., Bulgaria, China, El Salvador, Ethiopia, Georgia, Ghana, Indonesia, Kazakhstan, Kosovo, Laos, Malaysia, Moldova, Mongolia, Montenegro, Myanmar, Namibia, Pakistan, Philippines, Poland, Romania, Russia, Rwanda, Serbia, Sri Lanka, Tajikistan, Tanzania, Togo, Uganda, Ukraine, Vietnam, Zambia, Zimbabwe.

Figure 5. Corruption index – Gini relationship by variety of capitalism, 2003-2017



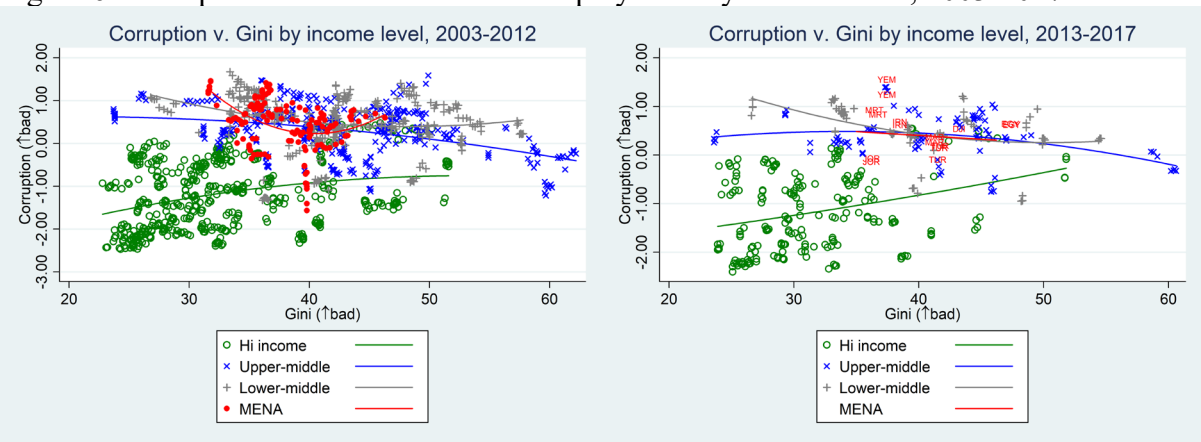
i. Corruption vs. Gini, 2003-2012 ii. Corruption vs. Gini, 2013-2017



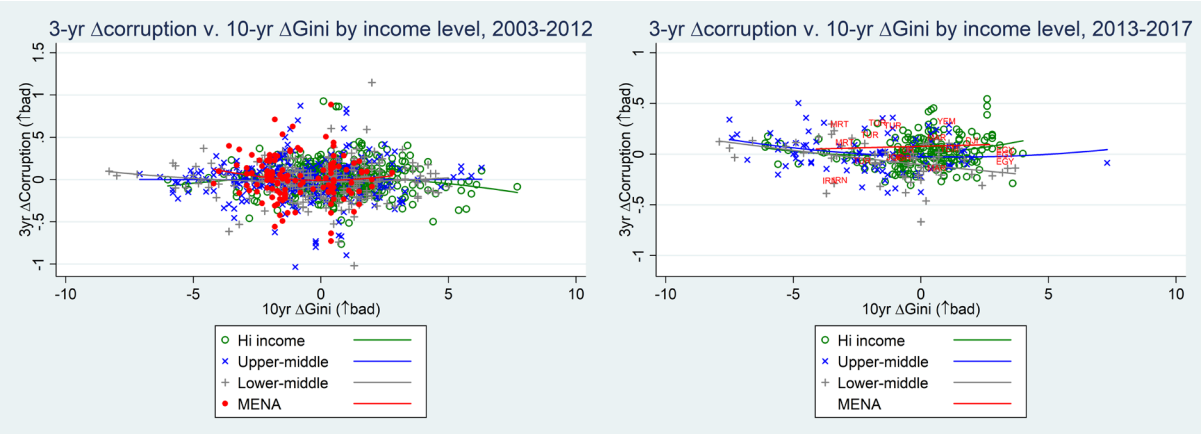
iii. 3-year Δ in corruption vs. 10-year Δ in Gini, 2003-2012 iv. 3-yr Δ in corruption vs.10-yr Δ in Gini 2013-2017

Notes: Quadratic lines fitted among the individual groups of countries are shown for illustration.
Source: World Bank WGI.

Figure 6. Corruption index – Gini relationship by country income level, 2003-2017



i. Corruption vs. Gini, 2003-2012 ii. Corruption vs. Gini, 2013-2017



iii. 3-year Δ in corruption vs. 10-year Δ in Gini, 2003-2012 iv. 3-yr Δ in corruption vs.10-yr Δ in Gini 2013-2017

Table 5. Results of regressions of change in corruption on 10-year change in Gini (preliminary)

OLS	Random Effects GLS	Fixed Effects

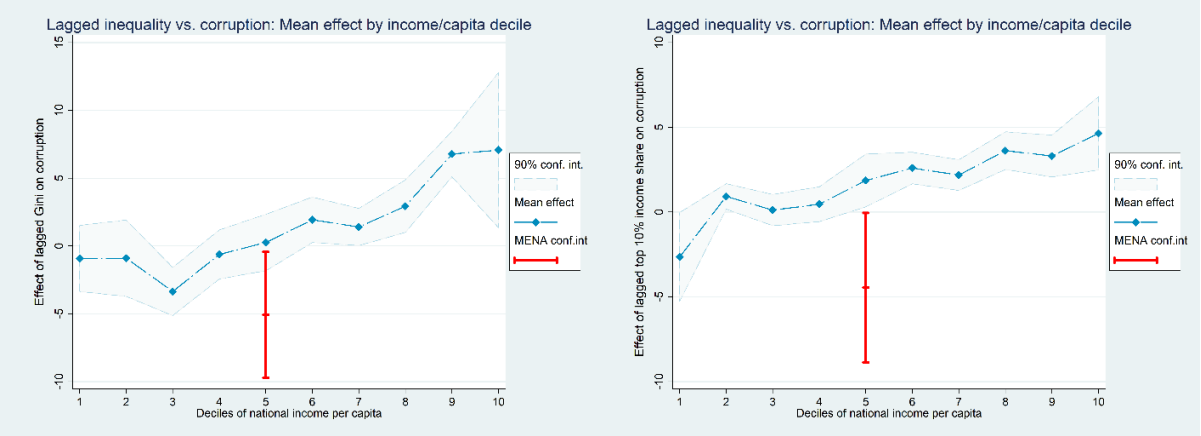
10yr Δgini	-.169**	-5.340*	-.165**	-5.108*	-20.12***	-18.48**	-.013	.026	-25.56*	-19.222
	(.078)	(3.081)	(.077)	(3.050)	(6.878)	(7.903)	(.096)	(5.558)	(15.51)	(16.017)
10yr Δgini	.271*	.245*	.270*	.249*	.743	.002	.395	.333	-.363	-1.451
×MENA	(.155)	(.148)	(.155)	(.149)	(.669)	(.852)	(.468)	(.452)	(1.597)	(1.411)
10yr Δgini					-2.53***	-2.34***			-3.10***	-3.16***
×Coord ME					(.391)	(.499)			(.485)	(.707)
10yr Δgini					.726***	.504*			-.026	-.658
×State-led ME					(.283)	(.302)			(.399)	(.586)
10yr Δgini		.945*		.923*	3.498***	3.283**		.116	4.528*	3.603
×log inc per cap		(.550)		(.548)	(1.186)	(1.407)		(1.064)	(2.704)	(2.867)
10yr Δgini		-.042*		-.042*	-.158***	-.149**		-.012	-.200*	-.164
×log inc per cap^2		(.024)		(.024)	(.053)	(.065)		(.051)	(.114)	(.127)
10yr Δgini					-.107**	-.153**			-.102	-.049
×log stockmkt cap					(.052)	(.061)			(.096)	(.110)
10yr Δgini					.018**	.016*			.003	-.001
×informality					(.008)	(.009)			(.011)	(.013)
Coordinated ME					3.796***	3.404***				
					(.423)	(1.099)				
State-led ME					1.696**	2.608***				
					(.723)	(.750)				
MENA					-1.460	-1.141				
					(2.423)	(2.662)				
Year dummies						Y***				Y***
Constant	.133	.092	.132	.098	-.323	.831	.118***	.161***	-.594***	6.232
	(.179)	(.189)	(.180)	(.191)	(.419)	(3.099)	(.034)	(.051)	(.205)	(4.427)
Within R-squared	.001	.002	.001	.001	.036	.108	.001	.001	.027	.111
F statistic	2.70*	2.32*	2.62*	2.25*	1.99*	1.63**	.36	.84	1.34	1.64**
Observations	2,526	2,518	2,526	2,518	467	467	2,526	2,518	467	467
MENA countries	15	15	15	15	8	8	15	15	8	8
Non-MENA	146	144	146	144	60	60	146	144	60	60

Notes: Significant at 10% *, 5% **, 1% ***. Standard errors are robust to heteroskedasticity and clustering at country level.

MENA countries: Algeria, Djibouti, Egypt, Iran, Jordan, Lebanon, Mauritania, Morocco, Palestine, Qatar, Sudan, Syria, Tunisia, Turkey, Yemen.

Non-MENA countries: Albania, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia, Bosnia & Herz., Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, CAR, Chile, China, Colombia, Comoros, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czechia, Denmark, Dominican Rep., Ecuador, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Kazakhstan, Kenya, Korea, Kosovo, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Micronesia, Moldova, Mongolia, Montenegro, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, P.N. Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russia, Rwanda, Sao Tome & Princ., Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, St.Kitts & Nevis, St.Lucia, Swaziland, Sweden, Switz., Taiwan, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Trin & Tobago, Turkmenistan, Tuvalu, Uganda, Ukraine, UK, US, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia, Zimbabwe.

Figure 7. Coefficient in regression of corruption on lagged inequality, by country income level

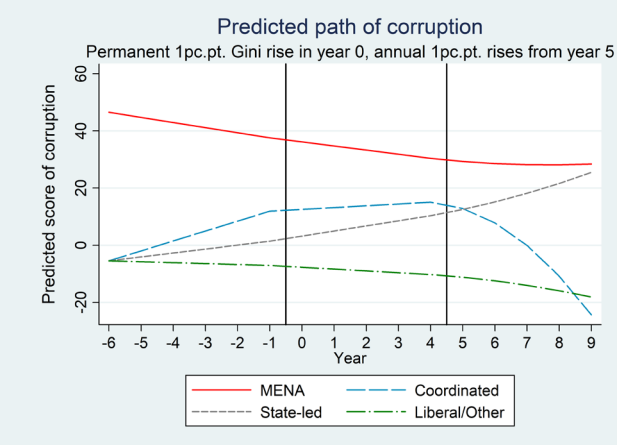


i. OLS coefficients on lagged Gini share

ii. OLS coefficients on lagged top 10% income share

Notes: Coefficient from a simple regression of *Corruption* on lag *Gini* (panel *i*) or lagged top 10% income share (panel *ii*). 90% confidence interval using robust standard errors clustered at the country level. Sample: 2,965 non-MENA, 304 MENA observations (161, 20 countries) in panel *i*; 1,478 non-MENA, 68 MENA observations (148, 15 countries) in panel *ii*. MENA countries include Algeria, Djibouti, Egypt, Iran, Iraq, Jordan, Lebanon, Mauritania, Morocco, Sudan, Syria, Tunisia, Turkey, Palestine, Yemen. Panel *i* additionally includes Kuwait, Libya, Qatar, Saudi Arabia, UAE.

Figure 8. Predicted path of corruption score in hypothetical scenario, by block of countries



Source: Own calculation.

Appendix

The ILO defines informal employment as comprising persons who in their main job were: (a) own-account workers, employers or members of producers' cooperatives employed in their own informal sector enterprises; (b) own-account workers engaged in the production of goods exclusively for own final use by their household; (c) contributing family workers, irrespective of whether they work in formal or informal sector enterprises; or (d) employees holding informal jobs, whether employed by formal sector enterprises, informal sector enterprises, or as paid domestic workers by households.

Table A1. Description and Sources of Variables in Estimation

	Description (Source)	Mean (s.d.)	Range	Availability (Countries, Years)
Corruption				
corruption control	Control of corruption estimate (WB Worldwide Governance Indicators v.13)	0.137 (99.593)	-250 to 250	C: 212; Y: 1996-2017
bribery1	0-10 scale (EFW, Fraser Institute 2018)	5.306 (1.991)	0 to 10	C: 156; Y: 1995-2017
bribery2	How widespread? % of valid responses saying 'widespread' (Arab Barometer 2006–2007)	2.699 (0.839)	2.187 to 3.052	C: 6; 2006-2007
crackdown	Government cracking down? 1-4 scale; % of valid responders (Arab Barometer 2006–2007)	2.784 (1.082)	2.117 to 3.385	C: 6; 2006-2007
election bribery	How frequent? 1-4 scale; % of valid responders (World Values Survey rounds 6, 2012–2014)	20.789 (13.948)	1.142 to 49.948	C: 41; Y: 2011-2014
bribe justification	How justifiable is bribe taking? 1-10 scale; % of valid responders (World Values Survey rounds 4-6, 2001–2014)	5.720 (6.125)	0.135 to 38.206	C: 92; Y: 1999-2014
obstacle	How much of an obstacle? 1-5 scale; % of valid responders (World Bank Enterprise Surveys 2002–2014)	31.032 (18.622)	0.965 to 88.952	C: 151; Y: 2002-2016
unfair courts	How unfair is court system? 1-4 scale; % of valid responders (World Bank Enterprise Surveys 2006–2014)	28.359 (16.836)	3.415 to 76.861	C: 139; Y: 2006-2016
cost effect	Change in corruption without bribery? 1-3 scale; % of valid responders (World Bank Enterprise Surveys 2013)	--	1 to 3	C: 9; Y: 2013
asked to pay bribe	% of responders answering yes ; Global Corruption Barometer (TI)	33.549 (23.671)	1.896 to 95.200	C: 107; Y: 2013
importance of contacts	Mean response in 1-5 scale; Global Corruption Barometer (TI)	3.700 (0.450)	1.546 to 4.513	C: 107; Y: 2013
gov run by private entities	Mean response in 1-5 scale; Global Corruption Barometer (TI)	3.493 (0.443)	1.486 to 4.345	C: 106; Y: 2013
Corruption is a public probl.	Mean response in 1-5 scale; Global Corruption Barometer (TI)	4.105 (0.556)	2.007 to 4.810	C: 107; Y: 2013
Inequality				
Gini	0-100 index (Solt 2016; World Bank Poverty & Equity Data; UNDP 2018)	38.344 (8.577)	18.1 to 63.3	C: 191; Y: 1986-2017
Top 10% income share	Aggregate income share of the richest 10%, % (WIID)	22.315 (14.861)	14.0 to 61.5	C: 166; Y: 1986-2017
LME	Binary for liberal market economies (Australia, Canada, New Zealand, UK, US)	.172 (.378)	0 to 1	C: 31, Y: 1982–2013
CME-NL	Binary for coordinated nonliberal market economies (EU, Iceland, Norway, Switzerland).	.726 (.446)	0 to 1	C: 31, Y: 1982–2013
SME-NL	Binary for state-led nonliberal market economies (China, Japan, Korea)	.081 (.272)	0 to 1	C: 31, Y: 1982–2013
high_inc	Income classification of countries (WB)	0.345 (0.475)	0 to 1	C: 224; 1986-2017
uppermid_inc	Income classification of countries (WB)	0.274 (0.446)	0 to 1	C: 224; 1986-2017
lowermid_inc	Income classification of countries (WB)	0.229 (0.421)	0 to 1	C: 224; 1986-2017
low_inc	Income classification of countries (WB)	0.151 (0.358)	0 to 1	C: 224; 1986-2017

informal	Share of aggregate employment in informal sector (Charmes '00,'09,'12,'16,'19; Andrews et al. 2011; ILO '13,'18)	57.367 (21.406)	4.70 to 99.01	C: 83; Y: 1989-2017
endowed	Share of fuel, ore and metal exports to GDP, % (World Bank estimates using WTO Statistics on merchandise trade; United Nations Statistics Division-Comtrade)	7.036 (4.967)	0 to 24.965	C: 266; Y: 1986-2017
Var democ	(Coppedge et al. 2018; Pemstein et al. 2018)			
forex-flexible	0=no separate legal tender; 1=preannounced peg or currency board arrang.; 2=preann. horiz. band within 2%; 3=de facto peg; 4=preann. crawl. peg; 5=preann. crawl. band within 2%; 6=de facto crawl. peg; 7=de facto crawl. band within 2%; 8=preann. crawl. band 2%+; 9=de facto crawl. band within 5%; 10=moving band within 2%; 11=managed float, or dual market with parallel market data missing; 12=Free floating/falling (Ilzetzki et al. 2011)	6.036 (4.520)	0 to 12	C: 31, Y: 1982–2012
financial-openness	Lack of controls of the movement of capital & people, index 0 to 10 (EFW); interpolated by fitting using capital accounts openness index (Chinn & Ito 2006; Brady et al. 2014)	7.038 (2.195)	.024 to 12.70	C: 31, Y: 1982–2013
stockmarket-cap	Stock market capitalization as % of GDP(/100) (Beck et al. 1999)	65.962 (48.982)	5.55 to 281.39	C: 31, Y: 1988–2011
trade-openness	Exports plus imports as % of current-price GDP (Brady et al. 2014)	76.791 (49.237)	15.92 to 319.55	C: 31, Y: 1982–2011
wagecoord	Kenworthy's wage-bargaining index, 1 to 5 (Visser 2016; Brady et al. 2014)	2.945 (1.281)	1 to 5	C: 30, Y: 1982–2011
labor-flexible	Lenience of labor market regulations, index 1 to 10 (Economic Freedom of the World)	5.683 (1.633)	2.60 to 9.30	C: 31, Y: 1982–2013
unionization	Union members as % of all salary workers (Visser 2016; Brady et al. 2014)	36.523 (22.726)	6.00 to 99.07	C: 31, Y: 1982–2011
welfare	Unemployment, sickness & pension social protection generosity, mean of index 0 to 1 (Esping-Andersen 1990)	.837 (.184)	.00 to 1.10	C: 27, Y: 1982–2011
LR-govseats	Left-right ideological gravity of political party in power, weighted by seats in the lower house, index -100 to 100 (Cusack & Engelhardt 2002)	2.493 (12.510)	-42.70 to 39.44	C: 28, Y: 1982–2012
fractional	Political party system fractionalization, index 0 to 100 (Armingeon et al. 2011)	74.972 (8.013)	50.24 to 90.28	C: 23 , Y: 1982–2010
electionyear	Binary for election years (Cusack & Engelhardt 2002)	.211 (.408)	0 to 1	C: 31, Y: 1982–2013

Notes: Summary statistics computed over all (CY) observations for which the dependent variable and main independent variable (Δcorrupt, Δgini) are non-missing, regardless of their ultimate appearance in each regression.

Table A2. Country availability and classification by variety of capitalism (years & observations)

European (coordinated) nonliberal market economies				East Asian (state-led) nonliberal economies		Liberal market economies	
Austria	(1986-2017)	Italy	(1986-2017)	China	(1986-2017)	Australia	(1986-2017)
Belgium	(1986-2017)	Luxembourg	(1986-2017)	Japan	(1986-2017)	Canada	(1986-2017)
Czech Rep.	(1986-2017)	Netherlands	(1986-2017)	Korea	(1986-2017)	Ireland	(1986-2017)
Denmark	(1986-2017)	Norway	(1986-2017)		(1986-2017)	Israel	(1986-2017)
Estonia	(1986-2017)	Poland	(1986-2017)			New Zealand	(1986-2017)
Finland	(1986-2017)	Portugal	(1986-2017)			UK	(1986-2017)
France	(1986-2017)	Slovenia	(1986-2017)			USA	(1986-2017)
Germany	(1986-2017)	Spain	(1986-2017)				(1986-2017)
Greece	(1986-2017)	Sweden	(1986-2017)				
Hungary	(1986-2017)	Switzerland	(1986-2017)				
Iceland	(1986-2017)		(1986-2017)				

Source: Own classification based on Hall and Soskice (2001), Hall and Gingerich (2009), and including MENA and East Asian countries.

Table A3. Corruption indicator for MENA countries: the lower the score the better

	1996	1998	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ALG	56.67	88.18	93.79	87.57	69.23	67.95	48.22	52.13	55.99	59.46	57.79	52.48	54.46	50.32	47.35	60.00	66.29	69.30	61.01
BHR	-32.87	-27.31	-38.1	-82.06	-39.99	-45.15	-39.01	-19.4	-18.08	-18.89	-18.52	-18.32	-21.73	-37.38	-43.31	-27.88	-13.89	1.59	14.06
DJI	72.00	77.97	94.64	73.93	82.48	58.35	71.04	66.23	54.38	32.80	36.81	40.45	41.00	46.24	54.21	59.94	65.76	65.35	64.03
EGY	47.23	45.63	55.36	40.93	55.28	64.71	62.44	74.75	76.2	77.91	51.55	63.14	69.55	59.81	63.13	62.48	64.26	64.86	54.06
IRN	48.06	45.18	40.12	19.06	26.72	38.93	48.28	48.36	54.83	77.54	83.94	94.72	87.29	79.07	68.72	61.92	60.46	71.14	81.13
IRQ	160.22	143.21	150.06	140.82	121.36	148.48	137.40	144.84	146.05	146.23	132.70	125.88	117.07	121.73	127.77	133.38	136.89	138.7	137.2
JOR	3.54	-9.81	-8.38	5.21	-31.46	-25.56	-25.68	-25.93	-26.41	-35.61	-15.89	-4.12	-10.10	-7.21	-6.79	-13.57	-26.01	-26.53	-26.00
KWT	-47.87	-59.08	-59.06	-101.4	-79.91	-78.65	-50.75	-43.3	-37.06	-42.02	-30.94	-30.22	-8.63	19.05	18.83	24.03	22.51	26.82	33.12
LBN	65.97	44.54	54.27	47.61	66.53	66.29	53.07	94.23	88.85	81.83	83.39	87.51	90.26	86.94	92.41	103.72	88.38	96.52	99.97
LBY	87.19	90.71	86.73	95.03	88.47	90.83	96.25	108.41	104.58	95.32	120.8	128.83	130.2	136.38	148.18	156.5	161.69	162.67	159.1
MAR	10.69	-11.08	10.97	18.76	26.00	14.33	30.79	40.85	34.49	38.24	32.56	20.49	40.08	43.68	37.11	26.57	22.03	12.97	13.24
MRT	55.57	46.82	45.37	2.53	3.11	52.65	56.02	74.24	57.87	78.78	61.34	71.54	62.81	78.26	83.36	92.75	92.33	73.92	75.09
OMN	-41.46	-75.61	-79.75	-93.46	-59.01	-67.34	-39.47	-35.22	-35.08	-51.54	-33.23	-32.37	-13.96	-18.23	-15.95	-31	-26.89	-33.94	-24.79
PAL	-4.15	-4.35	7.96	32.33	36.68	0.89	49.16	29.83	11.24	43.59	10.47	11.02	44.58	25.06	25.21	27.78	45.33	14.95	2.77
QAT	4.56	-50.12	-53.06	-68.49	-53.57	-51.93	-71.26	-93.06	-67.72	-94.27	-156.7	-140.7	-100.8	-106.1	-111.1	-98.85	-89.15	-90.07	-73.40
SAU	16.33	25.10	18.97	-19.87	15.22	28.7	9.75	19.04	16.52	0.84	1.66	-4.05	30.5	3.86	2.05	-8.73	-5.21	-23.09	-36.40
SDN	124.00	106.85	86.68	102.22	124.24	127.96	137.23	118.08	132.44	141.69	114.62	118.73	118.07	148.56	146.9	144.54	148.72	154.35	154.5
SYR	88.12	91.46	102.61	39.50	79.85	82.14	84.80	106.11	110.47	115.11	112.94	113.43	109.3	121.3	125.9	155.32	154.57	157.21	156.2
TUN	53.37	23.80	23.12	-36.99	-15.97	-8.29	25.79	18.93	24.96	30.39	22.10	25.88	5.68	5.97	6.70	3.69	7.22	13.70	10.66
TUR	14.81	29.64	19.72	52.18	18.39	17.51	3.13	-2.73	-10.53	-11.24	-8.78	-2.93	-4.42	-15.77	-9.22	14.79	15.44	19.16	19.29
YEM	74.37	97.89	105.14	97.95	93.79	108.13	88.53	78.83	79.04	79.05	106.92	118.95	122.76	124.85	124.51	155.51	147.4	166.37	159.2

Source: Control of corruption (with an opposite sign), Worldwide Governance Indicators.

Table A4. Index of extra payments/bribes/favoritism extracted by regulators, the higher the score the better (0-10)

	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
ALG				4.69	5.29	4.57	5.66	5.13	4.25	3.75	3.92	3.20	2.62	2.71	3.21	3.32	3.60	3.77
BHR					7.62	6.91	7.51	7.17	6.98	7.62	7.76	7.72	7.64	7.09	7.08	6.40	6.60	6.60
EGY	3.72	5.80	5.80	5.57	6.00	6.24	6.39	5.47	4.58	4.87	5.28	4.36	3.88	3.83	4.94	5.08	5.16	4.76
IRN											4.81	4.71	5.06	4.62	3.98	3.97	4.14	4.29
JOR	4.50	6.37	5.94	7.55	7.48	7.28	7.08	6.75	6.84	6.92	6.22	5.44	6.00	6.28	5.77	5.31	5.50	5.33
KWT						6.78	7.13	6.35	5.64	5.49	5.68	5.37	5.25	5.34	4.99	4.21	4.14	4.00
LBN												2.9	2.69	2.31	1.93	2.19	2.62	2.39
LBY															3.00	3.13	3.13	3.13
MAR			4.56	4.40	6.33	4.06	5.08	5.06	4.82	4.43	4.60	4.70	5.17	5.31	5.29	4.84	4.46	4.26
MRT							3.77	3.54	3.03	3.30	2.70	2.66	3.18	2.49	2.11	2.26	2.84	2.74
OMN								6.07	7.16	7.80	7.96	7.85	7.73	7.71	7.02	5.90	5.95	5.95
QAT												8.08	8.48	8.86	8.74	8.34	7.93	8.17
SAU												7.87	7.47	7.23	7.28	6.66	6.60	6.57
SYR								3.20	3.77	3.79	3.51	3.61	5.72	5.98		4.58	4.13	4.13
TUN			6.98	6.83	7.02	6.57	6.84	7.06	6.94	6.92	7.34	5.88	8.44	4.76	4.54	4.25	4.11	3.98
TUR	3.23	5.52	3.70	4.71	5.33	5.58	6.33	6.39	5.71	5.03	4.68	4.51	5.19	5.53	5.22	4.32	4.35	4.35
UAE					8.67	8.23	8.07	7.99	7.88	8.27	8.1	7.97	8.62	8.63	8.77	8.08	8.24	8.47
YEM												1.94	2.40	2.24	1.84	1.85	1.79	2.11
Non-MENA	5.71	6.57	6.39	6.09	6.34	6.12	6.22	5.86	5.48	5.40	5.35	5.01	5.02	4.95	4.91	4.42	4.42	4.40

Source: EFW Database, Fraser Institute (2018). Non-MENA countries are Albania, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Barbados, Belgium, Belize, Benin, Bhutan, Bolivia, Bosnia & Herz., Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, CAR, Chad, Chile, China, Colombia, Congo, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czechia, Denmark, Dominican Rep, Ecuador, El Salvador, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Jamaica, Japan, Kazakhstan, Kenya, Korea, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Panama, P.N Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Rwanda, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Trinidad & Tobago, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

Table A5. Perceived effects of corruption on costs by MENA enterprises (% of valid responders)

Change in total costs if corruption is no longer an obstacle:

	Increase	Remain the same	Decrease	Valid responders

Djibouti 2013	71.34	12.10	16.56	157
Egypt 2013	14.70	46.65	38.65	2,150
Jordan 2013	40.23	22.56	37.22	266
Lebanon 2013	4.51	13.09	82.40	466
Morocco 2013	28.17	23.59	48.24	284
Palestine 2013	23.90	47.48	28.62	318
Tunisia 2013	24.72	8.39	66.89	441
Turkey 2013	23.70	38.54	37.76	519
Yemen 2013	19.58	11.28	69.14	337

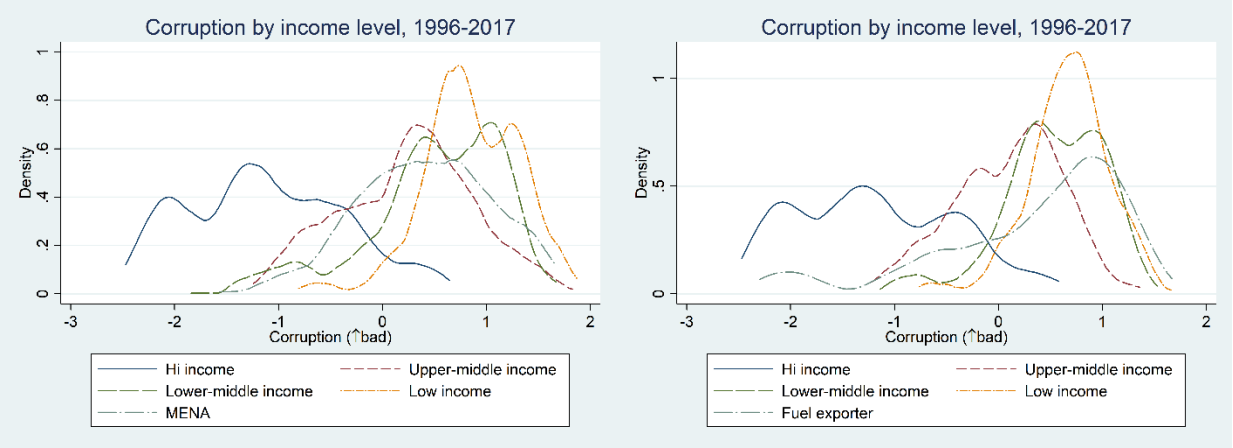
Source: World Bank Enterprise Surveys 2013.

Table A6. Gini coefficient of inequality for disposable income for MENA countries: the lower the score the better

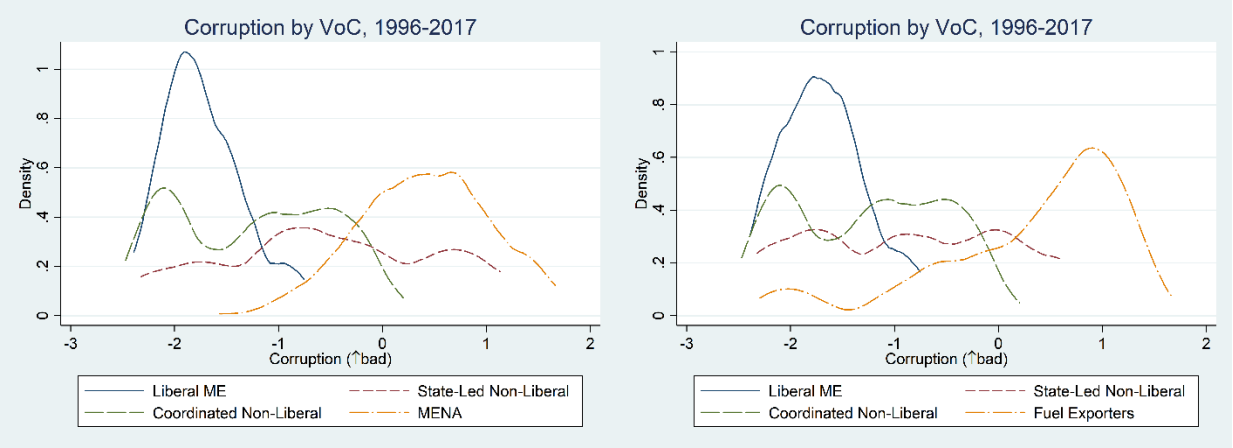
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ALG	35.7	35.5	35.4	35.3	35.2	35.0	34.9	34.7	34.6	34.5	34.3	34.1	33.9	33.7	33.5	33.3						
DJI	40.0	40.1	40.2	40.2	40.3	40.4	40.6	40.7	40.9	41.0	41.2	41.3	41.5	41.7	41.8	42.0	42.2	42.2				
EGY	42.2	42.6	43.0	43.2	43.6	43.5	43.5	43.5	43.5	43.4	43.5	43.6	43.7	44.1	44.7	45.5	46.3	46.2	46.2	46.1	46.1	46.1
IRN	42.6	42.5	42.4	42.4	42.2	42.1	41.8	41.5	41.1	40.8	40.6	40.2	39.7	39.2	38.6	38.1	37.6	37.4	37.4			
IRQ										31.8	31.8	31.8	31.8	31.7	31.7	31.6	31.6	30.9				
JOR	37.6	37.5	37.3	37.2	37.1	37.0	36.9	36.6	36.3	36.0	35.7	35.4	35.2	35.1	35.0	35.0	35.0	35.0	35.0			
KWT			33.0																			
LBN	38.0	37.9	37.7	37.6	37.4	37.2	37.1	36.9	36.7	36.5	36.3	36.1	35.9	35.7	35.5	35.2	35.1					
LBY								32.3														
MAR	39.6	39.6	39.7	39.7	39.8	39.9	39.9	40.0	40.0	40.0	40.1	40.1	40.1	40.1	40.1	40.1	40.0	40.0	40.0			
MRT	39.9	39.8	39.7	39.7	39.5	39.4	39.2	39.1	39.0	38.6	38.1	37.7	37.3	36.9	36.6	36.2	35.9	35.5	35.2	32.4	32.4	32.4
PAL								34.0	34.0	34.7	34.0	35.6	35.1	34.5	35.3	34.4	35.0	35.5				
QAT	39.3	39.3	39.3	39.4	39.4	39.5	39.6	39.6	39.6	39.7	39.7	39.8	39.8	39.8	39.8	39.8	39.8	39.8				
SAU																	45.9	45.9				
SDN	37.4	37.3	37.2	37.1	37.0	37.0	36.9	36.8	36.7	36.7	36.6	36.5	36.4	36.4								
SYR		34.6	34.8	34.9	35.0	35.1	35.3	35.4	35.6	35.5	35.5	35.5					35.8	35.8				
TUN	40.5	40.4	40.3	40.2	40.1	40.0	39.9	39.7	39.6	39.5	39.3	39.2	39.0	38.8	38.6	38.5	38.3	36.1				
TUR	44.1	44.0	43.9	43.7	43.7	43.6	43.4	43.2	43.0	42.7	42.2	41.7	41.4	41.2	41.0	40.7	40.5	40.3	40.4	40.4	40.5	40.5
YEM	35.7	35.6	35.5	35.6	35.6	35.6	35.7	35.7	35.8	35.9	36.0	36.0	36.0	36.1	36.1	36.1	36.1	36.2	36.2			

Source: SWIID (Solt 2016); World Bank Poverty & Equity Data; UNDP (2018).

Figure A1. Distribution of corruption by group of countries, all years 1996-2017



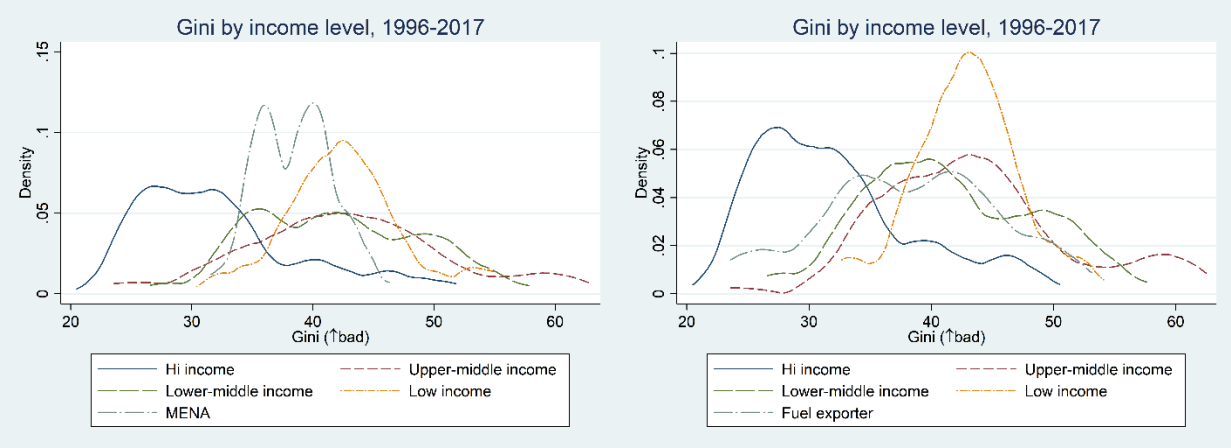
i. MENA countries vs. other income groups ii. Fuel exporting countries vs. other income groups



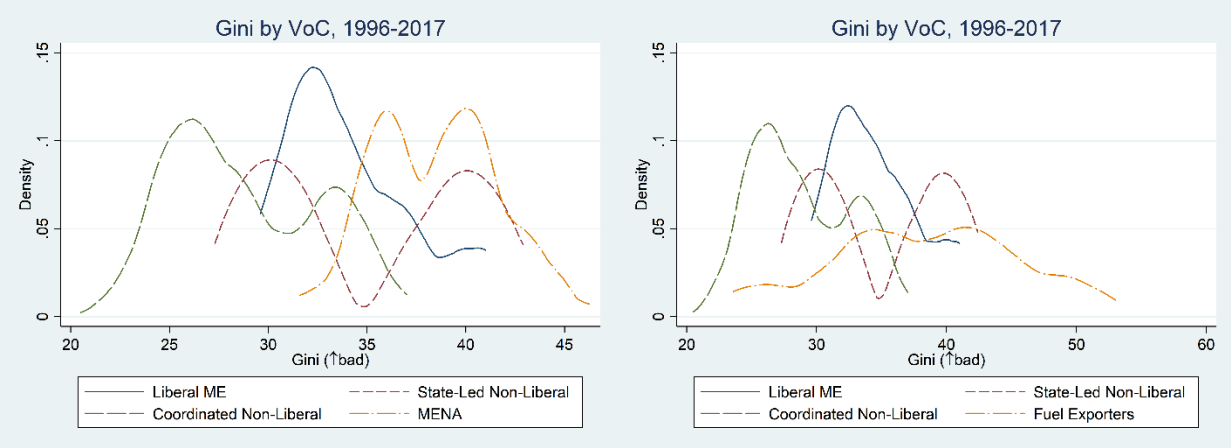
iii. MENA countries vs. other VoC groups iv. Fuel exporting countries vs. other VoC groups

Notes: Kernel density plots of control of corruption estimate×-1, from the World Bank Worldwide Governance Indicators. Fuel exporters are the top 20% of countries in terms of share of fuel in merchandise exports (21.4%+ of merch. exports), estimated by World Bank/UN Statistics Division. Income level is from the World Bank Financial Structure and Development Database. Fuel exporters are excluded from other income groups in *i* (MENA countries in *ii*).

Figure A2. Distribution of the Gini inequality index by group of countries, all years 1996-2017



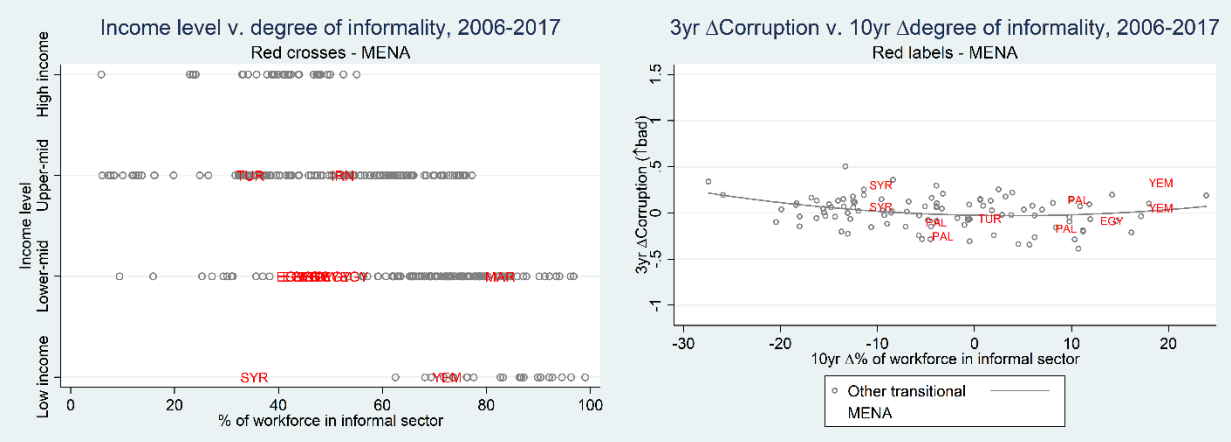
i. MENA countries vs. other income groups ii. Fuel exporting countries vs. other income groups



iii. MENA countries vs. other VoC groups iv. Fuel exporting countries vs. other VoC groups

Notes: Kernel density plots of Gini for disposable, post-tax, post-transfer income per adult equivalent (Solt 2016). Fuel exporters are the top 20% of countries in terms of share of fuel in merchandise exports (21.4%+ of merch. exports), estimated by World Bank/UN Statistics Division. Income level is from the World Bank Financial Structure and Development Database. Fuel exporters are excluded from other income groups in *i* (MENA countries in *ii*).

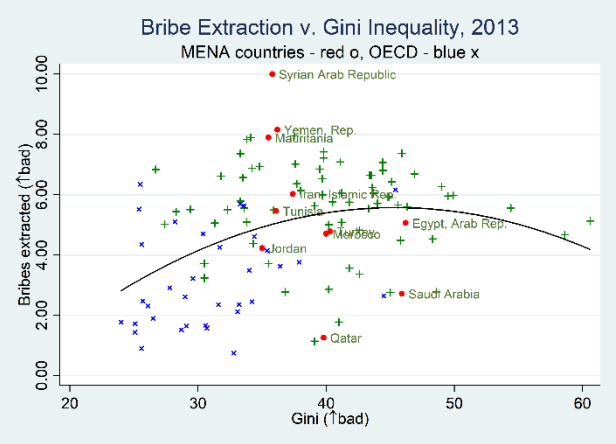
Figure A3. Degree of informality of employment vs. income level or corruption of developing economies



i. Informality of employment vs. income level ii. Δ informality of employment vs. Δ corruption

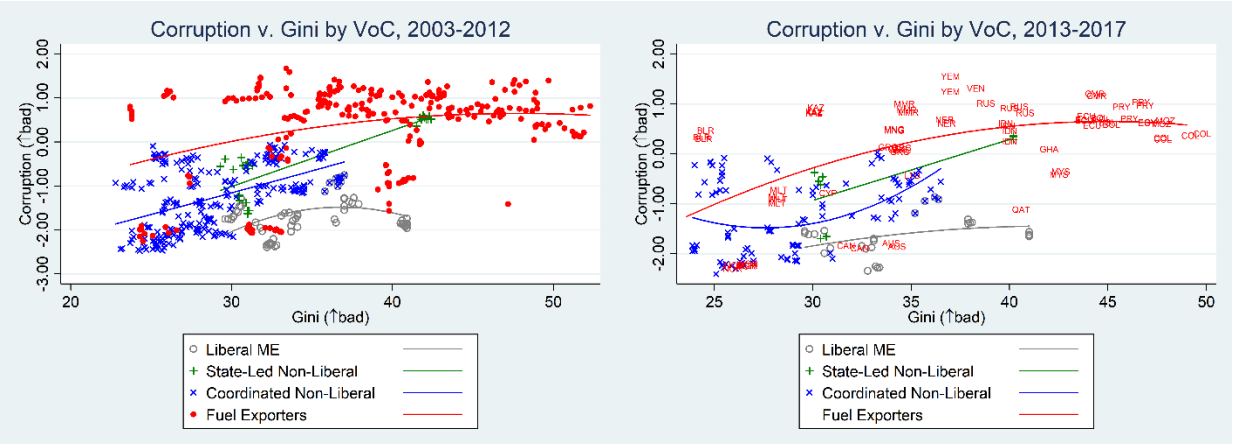
Notes: In panel i, MENA countries include Egypt, Iran, Lebanon, Morocco, Syria, Turkey and Yemen, and non-MENA countries include 67 developing countries. In panel ii, MENA countries include Egypt, Palestine, Syria, Turkey and Yemen, and non-MENA countries include 32 developing countries.

Figure A4. Index of extra payments/bribes/favoritism extracted by regulators (inverted; 0 best, 10 worst) vs. inequality in 2013, by country

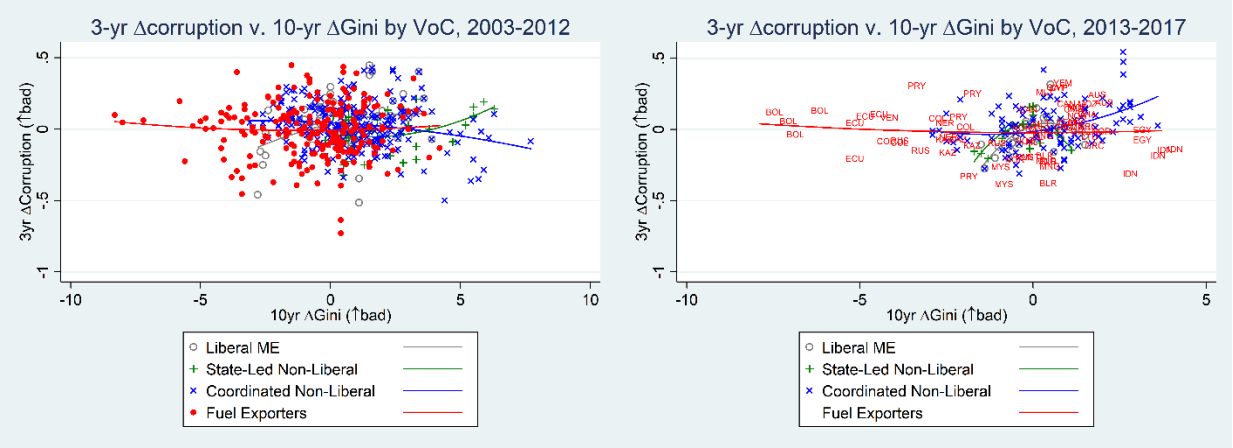


Source: EFW Database (Fraser Institute 2018), SWIID (Solt 2016).
Notes: OECD countries are Australia, Austria, Belgium, Canada, Chile, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK, US. Non-OECD countries are Argentina, Armenia, Bangladesh, Benin, Bolivia, Bosnia & Herz., Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, China, Colombia, Costa Rica, Croatia, Cyprus, Dominican Rep, Ecuador, El Salvador, Ethiopia, Fiji, Gambia, Georgia, Ghana, Guatemala, Honduras, Hong Kong, Indonesia, Kazakhstan, Kyrgyzstan, Lithuania, Macedonia, Malawi, Malaysia, Malta, Moldova, Mongolia, Montenegro, Mozambique, Myanmar, Namibia, Nicaragua, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Russia, Rwanda, Serbia, Seychelles, Singapore, South Africa, Sri Lanka, Taiwan, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, Zambia.

Figure A5. Corruption index – Gini relationship by variety of capitalism & resource-wealth, 2003-2017

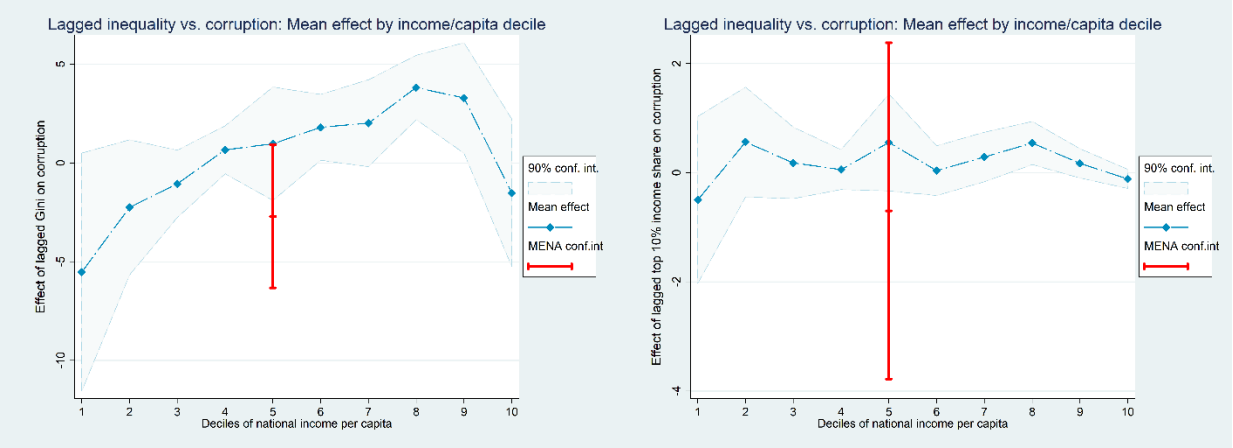


i. Corruption vs. Gini, 2003-2012 ii. Corruption vs. Gini, 2013-2017

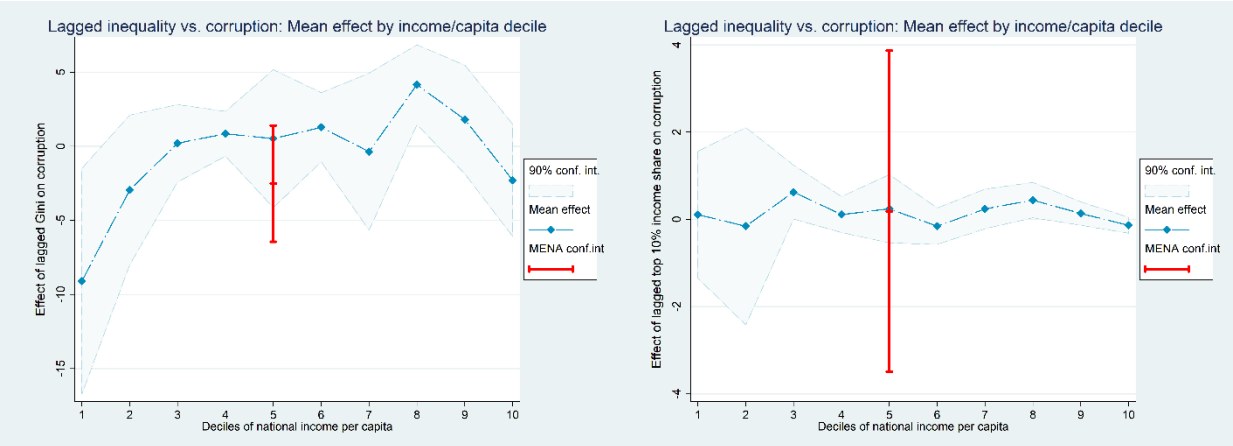


iii. 3-year Δ in corruption vs. 10-year Δ in Gini, 2003-2012 iv. 3-yr Δ in corruption vs.10-yr Δ in Gini 2013-2017

Figure A6. Coefficient on inequality by country income level, random/fixed effects regressions



i. RE coefficients on lagged Gini ii. RE coefficients on lagged top 10% income share



iii. FE coefficients on lagged Gini iv. FE coefficients on lagged top 10% income share

Notes: Coefficient from a simple regression of *Corruption* on lag *Gini* (panel *i*,*iii*) or lagged top 10% income share (panel *ii*,*iv*), using random effects (panel *i*,*ii*) or fixed effects (panel *iii*,*iv*). 90% confidence interval using robust standard errors clustered at the country level. Sample: 2,965 non-MENA, 304 MENA observations (161, 20 countries) in panel *i*,*iii*; 1,478 non-MENA, 68 MENA observations (148, 15 countries) in panel *ii*,*iv*. MENA

countries include Algeria, Djibouti, Egypt, Iran, Iraq, Jordan, Lebanon, Mauritania, Morocco, Sudan, Syria, Tunisia, Turkey, Palestine, Yemen. Panels *i*,*iii* additionally include Kuwait, Libya, Qatar, Saudi Arabia, UAE.

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