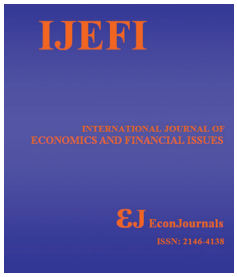

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Institutions and Growth in the Arab and Middle Eastern Countries

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ABSTRACT

We assess the impact of the quality of public institutions on economic growth during the period 1995-2013 in the Arab and Middle Eastern (AME) countries. We use a sample of 99 countries, of which 17 AME countries, and employ a dynamic panel approach that controls for unobserved heterogeneity, common shocks affecting the sample countries, and accounts for the endogeneity of the regressors. From a global standpoint, the impact of institutions on growth seems to be depending on the development level. From a regional perspective, the effect of institutions on economic outcome in the AME countries is found positive but insignificant. The prevalence of extractive industries could explain the insignificant effect of institutions on economic performance in some AME countries. In others, the insignificant result is likely to reflect shortages in technological readiness and inefficient resource-allocation policies.

Key words: Arab and Middle Eastern Countries, Growth, Institutions, Corruption, Dynamic Panel Estimation
JEL Classifications: O43, O47

1. INTRODUCTION

The relatively high gross domestic product (GDP) growth rates experienced by the Arab and Middle-Eastern (AME) countries in the course of 2000-2010 did not translate into substantially higher standards of living. There is, in fact, an extensive gap between GDP growth in the region (averaging around 4.8% during the 2000s) and GDP per capita growth (averaging around 2.5% over the same period). Excluding sub-Saharan Africa, this gap is the highest in the world (O'Sullivan et al., 2011).

The mediocre weight of the private sector in these economies, as well as its incapacity to create more and better jobs, has been identified as one of the main culprits behind relatively low GDP per capita growth in the region. While this can be explained by many labor market-specific factors, features related to poor governance conditions in the AME region were recently brought to the fore as key explanatory factors of the meager performance of the private sector. To a large extent, the region has been characterized by widespread corruption, miss-governance and cronyism. This has added to the transactional costs borne by businesses and negatively affected their investment and production decisions in the past two decades. On the social front, this has nurtured the high unemployment rates in the region, notably among educated youth. Studying the impact the institutional environment has recently had on growth in the AME region is timely, especially after the recent popular calls for greater political and economic freedom in many countries of the region.

Looking at the previous studies on growth in the AME region, no clear consensus emerges as regards the effect of the governance conditions on economic performance. Most of these studies were casted into a cross-section regression analysis, with only few papers applying panel data estimation[1]. While some of the cross-sectional studies neglected the endogeneity of several regressors, notably the institutional variables, others have used more or

1 In a cross section econometric analysis, each country is "observed" at one point in time (typically during a year; alternately, the observations per country could be averaged across the time period covered yielding one observation). In a panel setting, a country is examined throughout several points in time.

less appropriate instruments[2]. A common shortcoming of the cross-sectional studies is their failure to control for unobserved country-specific characteristics, leading to biased and inconsistent estimates. Growth regressions applied in a panel data setting focused on a relatively small number of countries, which affects the validity of some standard tests of the instruments used in panel data. Further, these papers fail to control for cross-country correlation due to common time-induced shocks.

The present research builds on the previous literature and estimates the impact of institutions on the economic performance of AME countries during the period 1995-2013, while tackling most of the shortcomings previously mentioned. Indeed, we use a relatively large sample of countries, allowing for a differentiated impact of the institutional variable on growth across regions. We also control for shocks simultaneously affecting the countries of the sample. Further, the panel setting allows us to control for unobserved country-specific effects, yielding consistent estimates, and uses the generalized method of moments (GMM) estimation with a set of valid instruments.

Our results show that the impact of the institutional quality on growth seems to depend on the development level, suggesting the existence of "thresholds effects." In the AME countries, there is evidence of a positive but statistically insignificant effect of institutions on growth.

The remainder of this paper is organized as follows. Section two briefly sketches the institutional environment in the AME region, both from international and intra-regional perspectives. Section three reviews some of the most recent papers tackling growth determinants in the region. Our empirical strategy is set in section four, along with a description of the variables used. Section five couches the results and discusses our key findings. A final section concludes.

2. INSTITUTIONS IN THE AME COUNTRIES: FACTS AND FIGURES

In the 1990s, good governance became a paramount theme on the agenda of international organizations. On the policy front, developing countries were prompted to actively engage in institutional reforms, with the aim of enhancing the market efficiency and achieving higher growth rates. AME countries were no exception as many countries in the region implemented reforms aiming at reducing the transactional costs and ameliorating the business environment starting from the early 1990s. However, the implemented measures were particularly lengthy and spotty as documented by several authors (Dasgupta et al., 2004). For instance, the trade liberalization process launched in the midst of the 1990s by many countries in the region was slow compared to the one undergone in East Asia and Latin America (Page, 2003). Moreover, the privatization scheme put in place in many Arab countries was patchy and hesitant. This has reduced the attractiveness of these countries to foreign investors: The share of the region in the total value of privatized projects in developing countries in the 1990s was less than 3 percent on average (Page, 2003). What is more, in many countries, the privatization scheme and public procurement processes were managed to ensure that only the close circles of those in power would control these assets (Kaufmann, 2011). This heightened the rent-seeking system that characterizes many countries in the region.

In sum, the implemented reforms did not succeed in increasing the private sector's share in the economy: Throughout the 1990s, up to one third of the GDP in Arab countries was produced by the public sector (Yousef, 2005).

The relative failure of reforms to induce a marked participation of the private sector in the economy has been largely attributed to bureaucratic hurdles and institutional loopholes. Page (2003) underscores the complexity of the investment procedures in Egypt and Jordan. In the same vein, Yousef (2005) outlines the slowness of judicial procedures in many Arab countries. Corruption is a critical scourge affecting many countries in the region. A 2008 survey conducted among 300 firms operating in 9 Arab countries revealed that corruption is still perceived as one important obstacle to intra-regional trade and investment (Hoekman and Zarrouk, 2009).

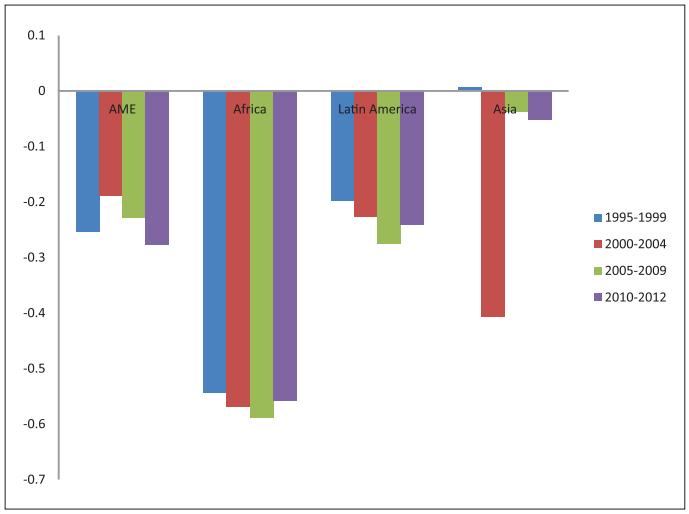
The poor governance conditions in the AME countries suggested by anecdotal evidence can be put into perspective when compared to the quality of institutions in other regions in the world. Figure 1 sheds light on the average of three indicators, namely the "control of corruption," the "rule of law" and the "government effectiveness," across four regions during 1995-2012.

Two stark conclusions can be drawn as regards the quality of the institutions in AME countries. First, the region has been lagging in terms of its institutional quality, as only Africa has been doing worse in terms of miss-governance during the period covered. Second, the quality of institutions in the AME countries seems to be on a downward trend since 2005. The worsening of the quality of governance in the region chiefly reflects the "capture" of the political and economic spheres by the political rulers in several countries (Kaufmann, 2011). Kaufmann argues that this specific form of miss-governance (i.e. "capture") has distorted the privatization and liberalization processes undergone in a number of AME countries, dissipating their expected benefits and leading to a skewed accumulation of assets and wealth. Unsurprisingly, those who were particularly affected by such miss-governance were the poor and youth (Kaufmann, 2011).

Many have identified the subpar performance of the region in terms of governance, coupled with the disparate distribution of the fruits of the liberalization process as well as high unemployment rates, as a chief factor driving the initial waves of unrest that hit the region in 2010. To some extent, this is corroborated by the fact that a significant "governance-gap" exists between AME countries as shown in Figure 2.

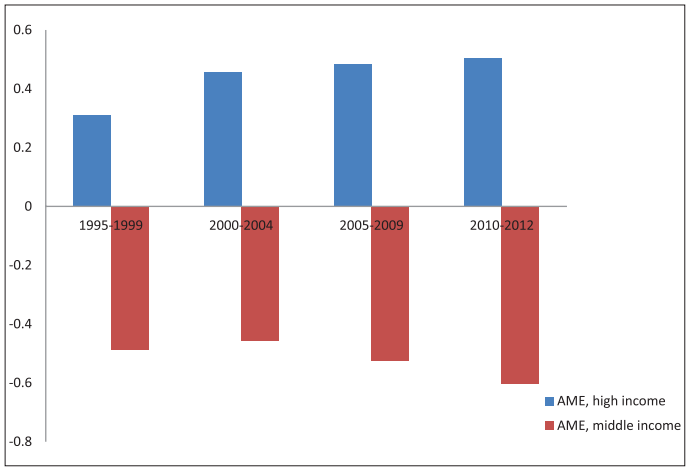
2 The endogeneity of the institutional variables stems from the fact that the economic outcome is likely to affect the quality of institutions; a two-way causality might thus prevail between the variable reflecting economic performance and the ones capturing the quality of institutions.

Figure 1: Institutions, by region and period



Source: Author's computations based on the World Bank, World Development Indicators. Note: (i) For every period, "institutions" is the simple average of the following indices: "Rule of law," "control of corruption" and "government effectiveness" (each of the indicators ranges from approximately −2.5 [weak governance performance] to 2.5 [good governance performance]); (ii) the regional grouping is the one presented in Table A3 of the appendix with the following modifications: "Asia" also includes Japan and South Korea, and "Latin America" also includes Mexico, AME: Arab and Middle Eastern

Figure 2: Institutions, by Arab and Middle Eastern sub-region and period



Source: Author's computations based on the World Bank, World Development Indicators. Note: (i) Institutions are computed as in Figure 1; (ii) countries included in "Arab and Middle Eastern (AME), high income" and "AME, middle income" are as explained in Table A3 of the appendix

Indeed, a clear gap exists between high-income countries and middle-income ones, as the former have continuously had better institutions throughout the period. What is more, the gap seems to have widened over time. Interestingly, all countries that recently experienced social turmoil have been part of those whose institutions suffered from a continuous deterioration during the 1990s and early 2000s.

3. REVIEW OF RECENT LITERATURE ON GROWTH IN THE AME REGION

Recent papers that examined economic growth in the AME countries have generally used an empirical equivalent of the augmented Solow model. Precisely, most of the authors made use of a setting similar to the one introduced by Mankiw et al. (1992) with a "convergence regression" where the annual growth rate of GDP per capita over a given period is regressed on the start of period GDP per capita and a number of variables affecting the steady state level of GDP per capita[3]. To this common "baseline" specification, additional regressors were added to account for the degree of openness to trade, macroeconomic policies, the quality of institutions and some variables potentially more relevant to the Middle-East such as conflicts, oil dependence and resource endowments. Except for the variables measured at the start of the period, a common practice was to consider the averages of the regressors across the time period. Most of the empirical studies undertaken on the AME countries involve a cross-sectional setting with a sample encompassing developing and developed countries to assess the main determinants of growth in the AME countries as compared with the rest of the world. Recently, a number of researchers have considered a panel data setting when studying the growth-determinants in the AME region. The samples used are limited to Middle-Eastern countries examined over a large number of years.

In what follows, we present some of the most recent studies that tackled growth in the AME countries, starting with the ones undertaken using a cross-sectional approach.

Makdisi et al. (2007) use a sample of 86 countries, comprising 8 from the Middle-East, to examine the main constraints on economic growth in the latter during 1960-1998. Using the above-mentioned "convergence regression" framework, the authors add to the standard regressors several variables of particular interest to the Middle-East, notably a proxy for external shocks, a measurement of openness, a variable capturing the natural resource abundance and a measure reflecting output volatility. In addition to the ordinary least squares estimation, the authors apply a two-stage-least squares instrumental variable (2sls IV) estimation to account for the potential endogeneity of some regressors. Their results suggest that the inefficiency of investments in the region, the lack of its integration with the rest of the world and its pronounced vulnerability *vis-à-vis* external shocks have negatively impacted growth in the AME countries.

Using a sample of 90 countries, including 9 from the AME region, Guetat (2006) studies the determinants of growth over the 1960-2000 period, while allowing for unobservable heterogeneity across regions using regional dummies. In addition to the standard augmented Solow model regressors, as well as variables accounting for government consumption, trade openness, political stability, and resource endowment, the author also investigates

3 The main determinants of the steady state level of GDP per capita are the investment ratio, the growth rate of the population and the level of educational attainment of the latter.

the impact of corruption and bureaucratic quality on growth. Comparing the impact the institutional variables have had on economic performance across different regions, Guetat finds that their impact was significantly higher in AME countries. However, since the author does not account for the likely endogeneity of the institutional variables, her results only point to the existence of a positive correlation between institutional quality and economic growth with no causality inference.

Hakura (2006) estimates the impact of a set of variables on the growth rate during 1980-2000 using a sample of 74 countries, with 10 countries from the Middle-East. The author controls for the augmented Solow model variables, while adding measures capturing macroeconomic policies, trade openness, terms of trade volatility and the quality of institutions. Relatively to the previous study, Hakura (2006) treats the endogeneity of the institutional variable using 2sls IV estimation with a set of appropriate instruments. The author finds a positive and significant impact of the institutional quality on growth. Regarding the implications of her results on the Arab countries, the author finds that institutions are particularly important for non-oil exporters relatively to oil exporting countries.

Using data for a single year (2005) and a sample of 103 countries including 7 from the Arab region, Brach (2008) estimates the impact of a large set of regressors on the 2005 GDP per capita, including a measurement of the institutional quality. The author implements 2sls IV estimation using a large vector of instruments for the institutional variable. Her results suggest that the lack of technological readiness significantly hinders economic development in the Middle-East region whereas the impact of institutions is found insignificant.

A further investigation of the major constraints on growth in the Middle-East was conducted by Bhattacharya and Wolde (2010). In the framework of an augmented Solow model, the authors use the World Bank Business Enterprise surveys to highlight the factors that were most binding to economic growth in the AME countries during the last two decades. Using 2sls IV estimation to account for the endogeneity of some of the macroeconomic variables, the authors find that labor skills shortage is the most important constraint on growth in the Middle-East. Of more relevance to the present research, the authors find that corruption and regulations did not affect growth in the AME countries.

Before presenting two studies that examined growth determinants in the AME countries using a panel approach, we briefly highlight two main shortcomings affecting the previous papers. The first refers to the endogeneity of some of the regressors, particularly the macroeconomic variables, typically included in the regressions. A valid instrumentation strategy should take this fact into account and use instruments for all potentially endogenous variables. This was not a systematic practice in the previously mentioned studies. The endogeneity problem also affects the institutional variables: While a clear effort has been made to use proper instruments for the institutions, the choice of some of the instrumental variables that were used is questionable given their dubious exogeneity.

The second deficiency of the above-mentioned studies is their incapacity to properly account for unobserved time-invariant country-specific characteristics. From the standpoint of the neoclassical growth model, these country-effects mostly account for the technology of production and factors that affect it (Islam, 1995). Given that these elements are likely to be correlated with a subset of the included regressors, failing to account for these effects yields biased and inconsistent estimates. This problem can be properly solved in the context of data having a time series dimension (Caselli et al., 1996); hence the appropriateness of studies based on a panel data setting.

Using two different samples, Kutan et al. (2011) investigate whether corruption has a different impact on economic outcome in two regions: Latin America and AME countries. Specifically, the authors examine the impact of gross capital formation, labor force, political risks and corruption on the level of GDP per capita using panel data for the period 1993-2003. The authors use one-period lagged values of all regressors to account for their endogeneity. Both fixed effects and random effects estimation techniques are used and results suggest that higher levels of corruption are associated with higher levels of GDP per capita in the 16 AME countries covered. Given the stringent regulatory framework in the AME region, the authors argue that corruption appears to "grease the wheels" of the economy via bypassing burdensome administrative procedures.

Covering the period 1990-2008 and a sample of 13 AME countries, Rachdi and Mensi (2012) use a dynamic panel data model and GMM estimation to focus on the impact of financial development and institutions on economic growth in the region. The institutional variables capture the corruption level and the rule of law, as well as aspects related to the political institutions and to the overall stability. Results suggest that neither the financial development nor the institutional environment has significantly affected the recent economic performance of the AME region. The authors conclude that AME countries' endeavors for better financial sector and institutions have not been consistent enough to positively contribute to their growth. Despite the considerable improvement in the estimation that a dynamic panel data setting allows, the previous study suffers from two key drawbacks. First, the authors do not account for shocks that simultaneously affect the countries of the sample. This is likely to yield biased estimates. Second, the validity of one of the post-estimation tests, designed to examine the soundness of the instrumentation strategy of the GMM procedure, hinges on using a large sample of countries relatively to the number of instruments employed (Roodman, 2009). Given that the sample in Rachdi and Mensi (2012) is limited to 13 countries, their results should be treated with caution.

4. EMPIRICAL STRATEGY AND VARIABLES USED

We employ the augmented Solow model, casted into a dynamic panel data setting, to assess the impact of public institutions on economic growth in the AME countries. The empirical analysis covers the (1995-2013) period with a sample of 99 countries, of

which 17 from the AME region. We divide this period into four sub-periods: 1995-1999; 2000-2004; 2005-2009; and 2010-2012[4]. For a given sub-period, the estimated equation is:

$$lny_{it} - lny_{it-\tau} = \alpha_1 lny_{it-\tau} + X_{it-\tau,t-1}\beta + \delta_1 I_{it-\tau,t-1} + \sum_a \psi_a \left(I_{it-\tau,t-1} \times Region_i^a\right) + \eta_i + \mu_t + \varepsilon_{it} \quad (1)$$

With[5]:

lny_{it} and $lny_{it-\tau}$ the (logarithm of) real GDP per capita at time t and $(t-\tau)$, respectively; with $t = 2000$, 2005, 2010 and 2013. For instance, when $t = 2000$, $t-\tau = 1995$ and $t-1 = 1999$ and so on for $t = 2005$, 2010 and 2013;

$X_{it-\tau,t-1}$ a row vector where three measures of the determinants of the steady state in the augmented Solow model are included. The first variable is the average annual growth rate of the population during each sub-period (i.e. between $t-\tau$ and $t-1$). The second variable is a proxy for human capital: The average number of years of primary schooling in the population aged 15 and above at the start of each sub-period (i.e. at $t-\tau$)[6]. The average of gross capital formation in GDP during each sub-period is the final element included in $X_{it-\tau,t-1}$;

$I_{it-\tau,t-1}$ an institutional quality index captured by the simple average of three of the World Bank's good governance indicators: The control of corruption, the rule of law, and the government effectiveness[7]. The institutional index is averaged over each sub-period;

$I_{it-\tau,t-1} \times Region_i^a$ an interaction term between the index of institutional quality of a given country and the region where it is located. The regional dummy is equal to one when country i is located in region α. It allows for region-based heterogeneity. Our sample of countries is divided across six regions: Africa, AME, Asia, Europe, Latin America and the Organization for Economic Cooperation and Development (OECD) countries[8];

η_i an unobservable country-specific effect accounting for time-invariant country characteristics;

μ_t a time dummy that controls for universal shocks affecting sample countries; and

ε_{it} the error term with mean zero.

Equation (1) represents our "baseline" specification. As a robustness check exercise, we add to the baseline specification various variables typically included in empirical growth models, with a special emphasis on those that are *a priori* more relevant to the AME region. Consequently, the "augmented" specifications are represented by Equation (2):

$$lny_{it} - lny_{it-\tau} = \alpha_1 lny_{it-\tau} + X_{it-\tau,t-1}\beta + \delta_1 I_{it-\tau,t-1} + \sum_a \psi_a \left(I_{it-\tau,t-1} \times Region_i^a\right) + M_{it-\tau,t-1}\omega + \eta_i + \mu_t + \varepsilon_{it} \quad (2)$$

Where, $M_{it-\tau,t-1}$ is a row vector including: The share of government consumption expenditures in GDP, an index of political stability, and the share of merchandise trade in GDP, all averaged over each-sub-period. The vector also includes the average annual growth rate of the terms of trade during each sub-period, and two different measures of conflicts: A primary measure which is a dummy variable equal to unity if the considered country has experienced a conflict on its soil during the correspondent sub-period, and an alternative variable equal to the number of years where a country experienced a conflict on its soil during each sub-period.

A concluding remark pertaining to the sources of our data as well as our estimation strategy is in order. Pertaining to the data sources, figures on macroeconomic and demographic variables are retrieved from the World Bank's World Development Indicators database; data on the constituents of the institutional quality index as well as on the political stability index comes from the World Bank's World Governance Indicators dataset. The variable reflecting education is that developed by Barro and Lee (2013), whereas the conflicts measurements are based on the Uppsala Conflict Data Program/International Peace Research Institute Oslo armed conflict dataset.

The likely endogeneity of the institutional variable renders an appropriate instrumentation strategy indispensible to avoid biased and inconsistent estimates. Given the dynamic panel data nature of our specifications, the first difference GMM (FDGMM) estimator yields consistent estimates provided suitable lags of the endogenous variables are used as instruments. Employing a GMM estimation using a sample containing only AME countries would not however induce reliable results as the validity of one of the post-estimation tests depends on having a large sample of countries, as previously mentioned. We therefore made use of a broad sample of countries and employed regional dummies to single out the growth impact of institutions in AME countries.

5. MAIN RESULTS AND DISCUSSION

5.1. Results

Table 1 summarizes the findings of estimating Equations 1 and 2: Column 2 reports the findings of the baseline specification, whereas each of the remaining columns lays out the results of specifications that add to the baseline model regressors from the vector $M_{it-\tau,t-1}$.

4 Due to limited data availability, the last sub-period covered is shorter than the previous ones.

5 Summary statistics across regions and by AME sub-regions are provided in Tables A1 and A2 of the appendix.

6 Given that most of our sample countries are developing countries, primary education is expected to be more relevant to their economic performance than higher levels of education. When we substitute the average years of primary education in the population with that of (i) secondary education and (ii) overall education (which also includes tertiary education), we find an insignificant impact of education on growth.

7 Relatively to other indicators, these indices arguably capture more accurately the quality of economic institutions. The latter usually designate the rules and policies that directly affect economic activity by shaping economic agents' incentives (Acemoglu et al., 2005).

8 For more details, see Table A3 of the appendix. Even though OECD is not a region, it is included as the base group.

Table 1: Estimating equations 1 and 2 using the FDGMM estimator

Regressor	S_1	S_2	S_3	S_4	S_5	S_6
lnyi, t-τ	−0.67***	−0.59***	−0.65***	−0.54***	−0.57***	−0.66***
	(0.15)	(0.19)	(0.16)	(0.1)	(0.13)	(0.15)
Education	0.01	0.05	0.004	0.03	0.06	0.02
	(0.06)	(0.08)	(0.06)	(0.05)	(0.05)	(0.06)
Investment	0.009***	0.007***	0.007**	0.008***	0.01***	0.009***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Population	−0.01*	−0.01	−0.01*	−0.01	−0.02**	−0.01*
	(0.01)	(0.01)	(0.008)	(0.01)	(0.01)	(0.01)
Institutions	0.79***	0.83***	0.85***	0.8***	0.45	0.77***
	(0.31)	(0.34)	(0.33)	(0.27)	(0.41)	(0.32)
Institutions*AME	−0.59	−0.54	−0.54	−0.51	−0.58	−0.51
	(0.55)	(0.7)	(0.6)	(0.56)	(0.65)	(0.56)
Institutions*Africa	−0.98***	−1.05***	−1.07***	−0.94***	−0.64*	−0.98***
	(0.29)	(0.35)	(0.35)	(0.3)	(0.36)	(0.33)
Institutions*L. America	−1.41***	−1.35***	−1.5***	−0.82*	−1.17***	−1.34***
	(0.42)	(0.41)	(0.49)	(0.43)	(0.38)	(0.4)
Institutions*Asia	−1.46	−1.05	−1.87*	−0.37	−0.46	−1.37
	(1.29)	(1.17)	(1.08)	(0.56)	(1.12)	(1.3)
Institutions*Europe	0.09	−0.19	0.08	−0.96	0.59	0.27
	(1.93)	(1.34)	(2.09)	(0.62)	(1.73)	(2.03)
Gov. expenditures	-	0.006	-	-	-	-
		(0.008)				
Openness	-	-	0.001	-	-	-
			(0.001)			
Terms of trade	-	-	-	0.001	-	-
				(0.001)		
Political stability	-	-	-	-	0.1	-
					(0.06)	
Conflicts	-	-	-	-	-	−0.001
						(0.02)
Number of countries	99	99	98	96	99	99
Observations	270	269	269	231	270	270
AB (P value)	0.14	0.14	0.17	0.19	0.03	0.14
Hansen (P value)	0.72	0.73	0.75	0.82	0.56	0.63

Note: (i) Numbers between parentheses are standard errors of the estimated coefficients; ii) standard errors are robust to cross-sectional heteroskedasticity and to within-panel serial correlation, they are also finite-sample corrected; (iii) asterisks (***), (**), and (*) denote P values equal to or inferior to 1%, 5% and 10%, respectively; (iv) "S1" stands for specification 1, and so forth; (v) "Institutions*AME" refers to the interaction term between the institutional variable and the AME region, and so on for the rest of the regions; (vi) time-specific effects are not reported; (vii) we consider the time effects as well as the conflicts variables as exogenous, the rest of the variables are treated as endogenous, except for the lagged value of GDP per capita, education and the terms of trade considered as predetermined; (viii) lags of one period and earlier are used as instruments for the predetermined variables, while lags of two periods and earlier are used as instruments for the endogenous variables; (ix) the AB test has the following null hypothesis: "Absence of serial correlation of order 2 and higher orders" in the errors of the first-differenced equation, the overidentification test is based on Hansen J statistic, and has the following null hypothesis: "All instruments are valid" (i.e., exogenous); (x) The OECD countries constitute the base-group; (xi) we also used the alternative measure of conflicts, it yielded similar results. FDGMM: First difference generalized method of moments, AME: Arab and Middle Eastern, GDP: Gross domestic product, OECD: Organization for Economic Cooperation and Development, AB: Arellano-Bond

At the end of every estimated specification we report the P value of two tests: The Arellano-Bond (AB) test of (absence of) serial correlation in the errors, and the overidentification test. The AB test examines whether the errors are serially uncorrelated; in which case, lagged values of the endogenous variables can be used as instruments. The overidentification test investigates the validity of the instruments used in the first-differencing procedure[9]. Throughout this sub-section we only outline the key results, leaving the interpretation of the central findings to the next one.

Results, both of the baseline and alternative specifications, seem to support the "conditional convergence" hypothesis, with a negative and significant coefficient on the initial level of GDP per capita[10]. Changes in the measurement used for the educational variable over time do not necessarily mean better educational quality: The insignificant impact of education on growth can therefore be interpreted as evidence of a lack of important changes in the quality of education over the period covered. The investment ratio affects positively and significantly growth across all the estimated specifications. While population has the expected sign and is significant in the baseline specification, its significance depends on the estimated specification when variables contained in $M_{it-\tau,t-1}$ are added.

None of the variables included in $M_{it-\tau,t-1}$ seems to significantly impact growth. For some of these variables, like the conflicts

9 For details about the FDGMM estimator and the corresponding instrumentation strategy, as well as on the assumptions underlying the battery of tests done, Blundell et al., 2000; Bond et al., 2001; Roodman, 2009.

10 According to this hypothesis, countries with low starting levels of GDP per capita should "converge" to their steady state equilibrium faster than countries with higher initial GDP per capita levels.

dummy, the insignificant effect most likely reflects the incapacity of a simple dummy to capture the duration and the intensity of conflicts. In the case of other variables, like political stability, this could be explained by an indirect impact on growth via other regressors. For instance, it can be argued that in countries characterized by a stable political environment, the latter affects growth through higher investment ratios.

Results show that institutions are positively and significantly associated with growth. The only specification where their impact is insignificant is the one where the political stability index is introduced, probably reflecting the high correlation between the two variables. Given the specifications that we estimate, this positive and significant impact refers primarily to the base group: The OECD countries. Regarding the impact institutions have had on recent economic performance in the AME countries, results suggest that their impact has been less than in OECD countries: The estimated coefficient of institutions in the AME hovers around 0.2 and 0.3, depending on the considered specification[11]. Despite this positive relationship between institutions and growth in the AME region, it was not found to be significant. This finding echoes the ones of Brach (2008), Bhattacharya and Wolde (2010) and Rachdi and Mensi (2012) who found an insignificant impact of the institutional environment on economic performance in the AME countries. Among the other regional groups, our findings show that better institutions have been significantly associated with weaker economic performance in Africa and Latin America.

The validity of the findings of the various estimated specifications largely depends on the two aforementioned tests. Except in the case of specification five, the AB test suggests the absence of autocorrelation among the errors, which implies that appropriate lagged values of the endogenous variables can be used as instruments. Moreover, in all specifications, the overidentification test does not reject the null hypothesis of suitable instruments. Concomitantly, the tests suggest that the instrumentation procedure of the FDGMM estimator is valid and that our estimates should not suffer from serious bias and inconsistency[12].

5.2. Discussion

5.2.1. Understanding our key findings

Our key findings can be summarized as follows: (i) There is evidence of a positive and significant impact of the institutional environment on the economic performance of OECD countries; (ii) the relationship between institutions and growth seems to be insignificant in a number of regions (positive in Europe and the AME countries, while being negative in Asia); and (iii) there are indications that the significant impact of institutions on growth has been negative in Africa and Latin America. While a thorough analysis of these findings on a regional basis is clearly out of the scope of this study, we put forward some plausible explanations and their main implications.

The following Table 2 distinguishes, among each of the regions studied, between low-income, middle-income and high-income countries:

Table 2 allows an understanding of our key results in the light of the differences in development levels between countries and across regions. It seems that, to a considerable extent, the influence of the institutional infrastructure on growth depends on the development level of the considered country. This is rather clear for the two "ends" of the spectrum: In low income (African) countries, the institutions' impact on growth is negative, whereas in high income (OECD) countries, their impact is quite the opposite. In the case of middle-income countries, the relationship between institutional quality and economic outcome seems to be more complex, depending on the considered countries. From a statistical point of view, the nuanced relation between institutions and growth in middle-income countries, as compared to high-income countries, can be explained by a relatively small disparity in terms of the quality of their institutions, associated to large differences in terms of their economic growth. This is depicted in Table 3:

Table 3 shows that the growth performance of middle-income countries is roughly comparable to that of high-income countries in terms of the average growth rate, the standard deviation and, to some extent, the minimum-maximum range. It is clear however, that they performed more poorly in terms of the institutional quality, with a significantly lower average and a more compact distribution.

As a rudimentary investigation of the existence of a development level-differentiated impact of institutions on growth, we created three dummy variables mirroring the development level of each country and thus grouped sample countries into three income categories: Low-income, middle-income and high-income countries. We then estimated three equations where the growth rate is regressed on the standard variables and an interaction term between the institutional quality index and the income category dummy. Results reported in the Table 4 do not contrast with our

Table 2: Regions and countries' income levels

Region	Low-income	Middle-income	High-income	Total
Asia	2	10	1	13
AME	0	12	5	17
Africa	11	8	0	19
Europe	0	2	2	4
Latin America	0	16	4	20
OECD	0	2	24	26
Total	13	50	36	99

Note: (i) The distinction in terms of income levels is based on the World Bank classification; (ii) for details about the countries included in each region see Table A3 of the appendix. AME: Arab and Middle Eastern, OECD: Organization for Economic Cooperation and Development

11 The estimated parameter of institutions in the AME region is computed by adding up the estimated coefficient on institutions and the one on the interaction term between institutions and the AME countries.

12 Under some circumstances, the FDGMM might suffer from a possible finite sample bias (Blundell et al., 2000; Bond et al., 2001). To account for such a possibility and to improve the efficiency of the FDGMM estimates, we estimated equations 1 and 2 using an alternative estimator: The so-called system GMM (SGMM) estimator that adds to the instruments employed by the FDGMM estimator a set of extra instrumental variables (Blundell et al., 2000; Bond et al., 2001). However, the post-estimation tests pointed to the invalidity of the instrumentation strategy of the SGMM estimator. We thus only report the findings of the FDGMM estimation.

Table 3: Growth and institutions: Cross-country income level-based descriptive statistics

Variable	Low-income			Middle-income			High-income		
	Mean±SD	Min.	Max.	Mean±SD	Min.	Max.	Mean±SD	Min.	Max.
Growth	1.77±1.98	−1.54	5.82	2.41±1.67	−1.35	8.71	2.06±1.59	−0.41	7.73
Institutions	−0.79±0.31	−1.47	−0.44	−0.39±0.48	−1.54	0.74	1.3±0.64	−0.11	2.16

Note: (i) "Growth" is the annual growth of real GDP per capita over the 1995-2010 period; (ii) The institutional quality is the simple average of the three World Bank indicators over the period 1995-2010; (iii) "SD" stands for standard deviation; "Min." and "Max." for minimum and maximum, respectively. GDP: Gross domestic product

Table 4: Income level-based impact of institutions on growth

Regressor	Regression 1	Regression 2	Regression 3
lnyi, t-τ	−0.47***	−0.4**	−0.6***
	(0.17)	(0.18)	(0.12)
Education	0.04	0.11	0.02
	(0.11)	(0.08)	(0.06)
Investment	0.01*	0.01	0.008*
	(0.006)	(0.008)	(0.004)
Population	−0.04	−0.04	−0.03**
	(0.03)	(0.02)	(0.01)
Institutions	0.47**	0.06	−0.03
	(0.27)	(0.49)	(0.1)
Low-income*Institutions	−1.14	-	-
	(1.1)		
Middle-income	-	0.42	-
*Institutions		(0.73)	
High-income*institutions	-	-	0.92***
			(0.38)
Number of countries	99	99	99
Observations	270	270	270
AB (P value)	0.18	0.4	0.42
Hansen (P value)	0.36	0.01	0.23

(i) The estimated equation (via the FDGMM estimator) is similar to equation (1) with the same dependent variable, and the initial (log of) GDP per capita, the augmented Solow model variables, the institutional index and an interaction term between the institutional index and an income level-based dummy variable as regressors; (ii) the income based classification follows that of the World Bank; (iii) numbers between parentheses are standard errors of the estimated coefficients; (iv) standard errors are robust to cross-sectional heteroskedasticity and to within-panel serial correlation, they are also finite-sample corrected; (v) asterisks (***), (**), and (*) denote P values equal to or inferior to 1%, 5% and 10%, respectively; (vi) time-specific effects are not reported; (vii) notes of Table 1 regarding the distinction between endogenous/predetermined variables, the instrumentation procedure, and the null hypothesis of the AB and Hansen tests apply. FDGMM: First difference generalized method of moments, GDP: Gross domestic product, AB: Arellano-Bond

analysis: Institutions have positively and significantly impacted growth in high-income countries, whereas their impact has been negative (albeit insignificant) in low-income countries[13].

The possible existence of income-based "thresholds" affecting the way institutions impact economic performance has been documented in several papers[14]. Guetat's (2006) empirical investigation reveals that the control of corruption and the quality of bureaucracy negatively affected growth in African countries while their impact was positive in richer regions. Islam (1996) shows the significant contribution of an overall economic freedom index to growth in high income countries, unlike in middle and low-income countries where the impact was insignificant.

It appears that the interaction between some time-invariant or nearly time-invariant country-specific characteristics (captured by the country-specific effects in the equations) and the institutional environment could be a decisive factor in terms of the final impact of the latter on growth, notably in middle-income countries. In some cases it can lead to a (significant) negative impact (as in the case of Latin America), whilst in others it induces a positive (but insignificant) effect (as in the case of the AME countries). Among the country-specific variables whose interplay with the institutional environment could be influential in the way the latter impacts the economic performance of a given country, the literature has highlighted two factors: The technology level and long-run growth impacting policies.

Recent empirical research has shown that the growth-impact of some of the standard determinants of economic performance differs across countries according to their technology level. For instance, Acemoglu et al. (2006) show that trade openness matters more for growth in countries that are close to the technology frontier. Results of Vandenbussche et al. (2006) indicate that higher education is more important for economic performance in technology-advanced countries. It is also likely that the impact of institutions on growth depends, to some extent, on the technology level of the considered countries. This is in line with the view of Gerschenkron (1962) who argues that some institutions can be growth-inducing, depending on the development level of the considered countries, before becoming inefficient as a new development level is reached.

A number of authors have recently pinpointed the importance for developing countries to implement policies addressing market failures and encouraging resource allocation in growth-enhancing sectors to benefit from higher and sustainable growth (Hausmann and Rodrik; 2003, Khan, 2007, and Stiglitz, 1995). Such policies are typically put in place over a relatively long period of time with long lasting effects; they are thus likely to be captured by the country-specific effects. Their interaction with the institutional variable might also help explaining the final outcome in terms of growth.

All in all, our results underscore possible "thresholds effects" when it comes to the impact of institutions on growth. This could be explicated by the interaction between some country-specific factors and institutions. Key candidates among those factors are technology levels and long-term growth-enhancing policies:

13 In the case of middle-income countries, the overidentification test does not support the validity of the instruments.

14 Alternately, one can posit the existence of institutional quality level-based "thresholds" affecting the impact of institutions on growth. Instead of addressing the thorny issue of classifying countries relatively to their institutional quality, we prefer to revert to a more established way of classification. In all cases, institutional quality is highly correlated with income levels.

Table 5: Share of extractive and manufacturing industries in GDP in high-income AME countries (in various years)

Country	Share of extractive industries in GDP (%) (2003, 2006, 2010, respectively)	Share of manufacturing industries in GDP (%) (2003, 2006, 2010, respectively)
Bahrain	25.2; 26.5; 24.4	10.9; 12.3; 17.1
Kuwait	46.6; 55; 51.5	7.2; 6.7; 5.3
Qatar	57.6; 61.9; 55.7	6.9; 6.7; 7.3
Saudi Arabia	38.1; 50.1; 47.8	10.1; 9.4; 10
United Arab Emirates	32; 37.1; 31.6	13.6; 12.1; 9.7

Source: Arab Monetary Fund, Joint Economic Report (2004, 2007, 2011). AME: Arab and Middle Eastern, GDP: Gross domestic product

Through their interaction with the institutional environment, cross-country differences in terms of those elements could explain large differences in terms of growth, notably among middle-income countries.

5.2.2. Implications for the AME countries

As we saw earlier, there is a clear "governance" gap between AME countries, with high-income countries exhibiting better institutional performance during 1995-2012. High-income countries include Bahrain, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates. A common feature to these countries is the importance of oil in their economies: The average share of fuel exports in total merchandise exports during 1995-2010 in these countries ranged from a "low" of 71.7 percent (in Bahrain) to a staggering peak of 91.6% in Kuwait[15]. The magnitude of oil and gas in these countries is also reflected by the substantial share of extractive industries in GDP: As is clear from Table 5, extractive industries are a major contributor to economic activity in high-income AME countries. This contrasts with the relatively feeble share of manufacturing in GDP[16]. The predominance of oil in these economies made their growth, notably over a relatively short period of time, largely oil-driven (Sala-i-Martin and Artadi, 2003).

It could be argued that, despite having relatively good quality institutions, the impact of the latter in high-income AME countries is subdued by their large dependence on oil and gas exports. The impact of good institutions on growth is largely due to their role as a transactional costs damper. In diversified economies, transactional costs are mostly related to sectors as varied as finance, manufacturing, and agriculture. It is therefore reasonable to assert that the more diversified the economy, the greater the magnitude of the role of institutions as a costs-reducing factor and the more significant is their impact on growth. Part of the insignificant effect of institutions on growth in the AME region can thus be explained by their limited relevance in the rich oil-exporting AME countries.

The rest of the AME countries of our sample falls in the category of middle-income countries. The previous sub-section pinpointed that the ultimate impact of institutions on growth, notably in middle-income countries, could be contingent on their technology level and long-term policies affecting resource allocation. Thus, another part of the insignificant effect of institutions on growth in the AME region could reflect the inability of middle-income AME countries of acquiring technologies and implementing resource allocation-affecting measures that would stimulate significantly the economic outcome. This interpretation is in line with the findings of Hakura (2006) and Bhattacharya and Wolde (2010) who noted that shortages in technologies and skills were among the major impediments to growth in the AME region.

In the light of our findings and discussion, a number of implications can be outlined in the case of AME countries. Investing in education remains of primary importance to the region. Although a considerable improvement has taken place over the last 15 years, the AME region still lags relatively to Asia and Latin America in terms of the average years of total schooling, as shown in Figure 3. Investing in human capital will enable the AME countries to acquire more rapidly the technologies applied in more advanced countries. Better adopted technologies will induce productivity gains, enhancing the competitiveness of the AME economies.

Over the long run, the acquisition of more advanced technologies might positively interact with the institutional environment to significantly affect growth. Investing in education requires measures to increase the enrollment rates in primary and secondary education as well as reforms to enhance the quality of education. This should equip students with analytical and technical skills that are of primary importance in nowadays economy, and help in reducing high unemployment rates among youth. This is particularly true for middle-income AME countries where the average years of total schooling is considerably less than what prevails in high-income AME countries as reflected by the following Figure 4.

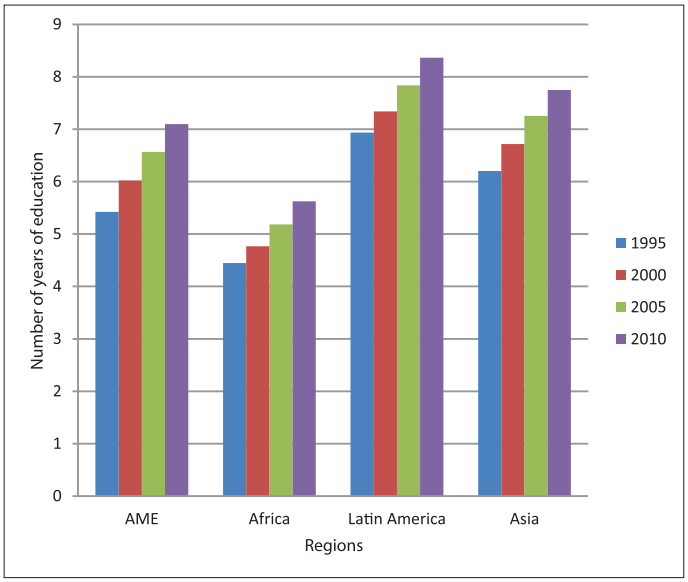
AME countries should also strengthen their efforts aiming at implementing growth-inducing measures, among which the enhancement of the quality and efficiency of public institutions. Despite the insignificant impact that we found, better economic institutions would translate into lower transaction costs and more efficient markets, notably in diversified AME economies. This entails consolidating the rule of law, actively combating corruption, and delivering efficient public services. Measures aiming at lowering the transactional costs and enhancing market-efficiency might however be insufficient to attract advanced and new technologies[17]. A more active and well-targeted state

15 The World Development Indicators database.

16 For comparison, the share of extractive industries was equal to 13.7% in Egypt and 8.6% in Tunisia in 2010. The same year, the share of manufacturing in GDP in these two countries was 16.1% and 14.9%, respectively (Arab Monetary Fund, 2011).

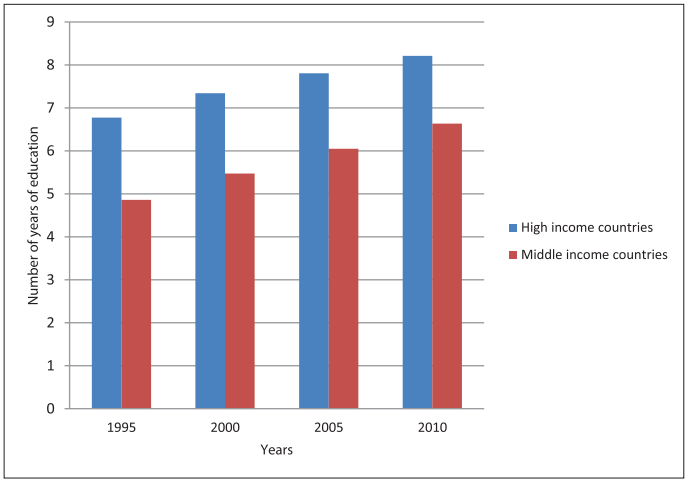
17 One can argue that, given the structural characteristics of a developing country (notably, the levels of technology and human capital), the market efficiency in the latter will remain relatively low and only attract low value-added activities until a certain level of development is achieved (Khan, 2007).

Figure 3: Average years of total schooling by region



Source: Barro and Lee database. Note: (i) Precisely, it is the average years of primary, secondary and tertiary schooling among population aged 15 and above; (ii) the regional grouping is the one presented in Table A3 of the appendix with the following modifications: "Asia" also includes Japan and South Korea, and "Latin America" also includes Mexico, AME: Arab and Middle Eastern

Figure 4: Average years of total schooling by Arab and Middle Eastern sub-region



Source: Barro and Lee database. Note: (i) precisely, it is the average years of primary, secondary and tertiary schooling among population aged 15 and above; (ii) countries included in " Arab and Middle Eastern (AME), high income" and "AME, middle income" are as explained in Table A3 of the appendix

intervention to speed up technology acquisition and investments might thus be required. This involves the implementation of incentives that would lead to an allocation of resources and assets that favors technology adoption (Khan, 2007)[18].

18 For instance: Targeted and conditional subsidies to catch up with best practices; as well as infrastructure and tax facilities to multinational firms conditional on knowledge transfer.

Such policies will undoubtedly differ across countries according to a set of political-economy parameters. It is likely, however, that a key element for the success of these endeavors in any country is a more proactive engagement from all the stakeholders: The political elite, the private sector and the civil society.

6. CONCLUSION

The poor quality of the institutions in the majority of the AME countries has been identified as one of the main impediments to a more dynamic private sector. Many have suggested that miss-governance in the region has also deprived youth from better living standards and brighter prospects, which ignited the popular uprising many countries have witnessed 2010 onwards. Our descriptive analysis, that revealed a substantial gap between AME countries and other-mainly developing - countries in terms of a number of institutional measures, corroborated this gloomy picture.

All these factors called for an empirical investigation of the impact institutions have had on the recent economic performance of AME countries in an international perspective. From a global standpoint, we found that the impact of institutions on growth could be depending on the development level, with possible "thresholds effects." From a regional perspective, the effect of institutions on economic outcome in the AME countries was found positive but insignificant.

We conclude with two remarks that could be insightful for future research on the impact of institutions on economic outcome in the AME countries. First, our results outlined the importance of a careful examination of some of the country-specific effects and their interaction with the institutional quality. Investigating growth determinants in the AME region would thus gain from a country-level analysis of the technological capacities, the resource allocation-affecting policies, and the political-economy factors and how they interact with the institutional environment and affect growth.

Second, our empirical framework appeals to a number of assumptions, some of which are vulnerable. In particular, we have assumed that the coefficients of the estimated equations are common across all countries. Moreover, we made the assumption that shocks affecting countries uniformly are the only source of cross-country correlation. A cross-country regression analysis of this kind would gain by employing a more flexible estimation technique that allows for heterogeneous coefficients and controls for shocks of different forms with potentially a differentiated impact across countries[19].

19 One such estimation technique, that needs a longer time dimension than the one in our dataset, is the common correlated effects mean-group estimation; for details see Eberhardt and Teal (2011), and Pesaran and Smith (1996). Our analysis could not start earlier than 1995 given the absence of reliable data on the three governance variables that we study.

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APPENDIX

Appendix Tables

Table A1: Summary statistics across regions

Variables	Mean±Standard deviation			
	AME	Asia	Latin America	Africa
Corruption	−0.23±0.63	−0.12±0.89	−0.27±0.75	−0.55±0.5
Law	−0.23±0.68	0.01±0.79	−0.41±0.73	−0.59±0.52
Gov. effectiveness	−0.24±0.65	0.19±0.83	−0.18±0.68	−0.55±0.5
Annual population growth	2.5±1.1	1.4±0.7	1.3±0.7	2.5±0.9
Average years of total education	5.4±1.6	6.4±2.7	6.8±1.5	4.4±2.1
Domestic investment % GDP	25.5±7.5	26.5±6.6	21.5±4.6	18.2±8.7
Government expenditures % GDP	9.3±4.7	9.2±4.2	9.6±4.9	11.4±6.1
Political stability	−0.4±0.8	−0.4±0.9	−0.3±0.7	−0.4±0.6

(i) All variables, except the average years of education, are averages over the 1995-2010 period; the education variable is measured at the beginning of the period (1995); (ii) the higher the governance indicator the better the institutions; (iii) "Gov. effectiveness" stands for government effectiveness; (iv) the regional grouping is the one presented in Table A3 with the following modifications: "Asia" also includes Japan and South Korea, and "Latin America" also includes Mexico. AME: Arab and Middle Eastern, GDP: Gross domestic product

Table A2: Summary statistics by AME sub-region

Variables	Mean±Standard deviation		
	High income countries	Lower middle income countries	Upper middle income countries
Corruption	0.46±0.44	−0.51±0.33	−0.52±0.54
Law	0.48±0.19	−0.49±0.49	−0.54±0.67
Gov. effectiveness	0.35±0.42	−0.52±0.34	−0.45±0.73
Annual population growth	3.6±1.2	2.3±0.7	1.8±0.7
Average years of total education	6.7±0.8	3.5±1.3	5.7±0.8
Domestic investment % GDP	28.1±5.1	23.7±8.3	24.8±8.8
Government expenditures % GDP	6.6±3.5	9.8±5.1	10.8±5
Political stability	0.3±0.5	−0.5±0.6	−0.8±0.8

(i) All variables, except the average years of education, are averages over the 1995-2010 period; the education variable is measured at the beginning of the period (1995); (ii) "Gov. effectiveness" stands for government effectiveness; (iii) "high income countries" include: Bahrain, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates; (iv) "lower-middle-income countries" include: Egypt, Mauritania, Morocco, Syria and Yemen; (v) "upper-middle-income countries" include: Algeria, Iran, Iraq, Jordan, Libya, Tunisia and Turkey; (vi) the income-based sorting is according to the World Bank classification. AME: Arab and Middle Eastern, GDP: Gross domestic product

Table A3: Regional grouping

Region	Countries
Africa	Botswana, Cameroon, Gabon, Gambia, Ghana, Ivory Coast, Kenya, Malawi, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe
Asia	Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Singapore, Sri Lanka, Thailand, Vietnam
AME	Algeria, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Libya, Mauritania, Morocco, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, the United Arab Emirates, Yemen
Europe	Bulgaria, Cyprus, Malta, Romania
Latin America	Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, Venezuela
OECD	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States
High-income AME	Bahrain, Kuwait, Qatar, Saudi Arabia, United Arab Emirates
Middle-income AME	Algeria, Egypt, Iran, Iraq, Jordan, Libya, Mauritania, Morocco, Syria, Tunisia, Turkey, Yemen

(i) Since Chile became a member of OECD in 2010, it was kept in "Latin America;" (ii) although Turkey is an OECD member, it was included in the "AME" region; (iii) the distinction between high-income and middle-income AME countries is based on the World Bank classification. AME: Arab and Middle Eastern, OECD: Organization for Economic Cooperation and Development