THE EFFECTS OF CORRUPTION ON GROWTH PERFORMANCE OF THE MENA COUNTRIES

*By Imène Guetat**

Abstract

This article aims at testing the effects of institutional characteristics on growth in countries of the Middle East and North Africa (MENA) region. For this purpose, we consider conditional convergence in terms of initial conditions, macroeconomic performance, trade openness, government size, natural resource abundance and institutional and political structures for a sample of 90 countries over the period 1960-2000. We use regional indicators and MENA-specific variables in order to test for the effects of each variable on the growth performance of the MENA economies. We highlight the direct and indirect impacts of both corruption and bureaucratic quality on the MENA growth compared to the other regions of the world. (JEL K4, O1, O4)

Introduction

The recent empirical growth literature has suggested a wide range of variables as determinants of growth[1]. The list includes, among others, initial conditions, macroeconomic performance, trade openness, government size, income distribution, financial market development, natural resource abundance, political stability and institutional quality[2]. The effects of corruption as an institutional variable on economic growth performance have been a topic of debate over the last 40 years. On the one side, there is a view, exemplified by Myrdal (1989) and Shleifer and Vishny (1993), that corruption is detrimental for investment and economic growth. On the other hand, Lui (1985), and others have found it plausible for corruption to be beneficial for economic growth at some levels. However, the empirical evidence has supported the existence of a linear and negative correlation between the level of corruption and the average growth rate of per capita income (see Mauro, 1995; Hall and Jones, 1999). In particular, empirical studies by Tanzi and Davoodi (1997), Mauro (1998) and Gupta et al. (2001) have shown that corruption alters the composition of government expenditure[3] towards less productive activities and, therefore, the greater the government expenses are, the greater the negative effects of corruption.

The main purpose of this paper is to investigate whether certain institutional characteristics have any effects on MENA countries' growth. More specifically, the paper aims to find out if corruption and bureaucratic quality variables have any effects on the long run growth performance of MENA countries. Our analysis considers possible direct and indirect effects of corruption on growth. To capture the effects of institutional characteristics unique to MENA countries and to

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[1] The economic determinants of growth considered in cross-national regressions include: fiscal policy (Easterly and Rebelo, 1993), government consumption (Barro, 1991), inflation (Fischer, 1993), black market premium on foreign exchange (Sachs and Warner, 1995), overvaluation of the exchange rate (Dollar, 1992), financial liberalization (Eichengreen, 2002), and trade policy (Lee, 1993).

[2] Several cross-country studies of growth have found that the conventional factors of growth (labor, physical and human capital accumulation, and so on) do not fully explain the growth experience especially for developing countries and introduced an institutional explanation (see Easterly and Levine, 1997).

[3] On corruption and public expenditure, see also Abed and Gupta (2002) and the review by Hillman (2004).

distinguish between the effects of corruption and bureaucratic quality in MENA countries and the other regions of the world, region-specific variables are introduced.

The paper is organized as follows. Section 2 discusses the determinants of growth in the MENA region. Using an empirical model based on a large cross-country data set, Section 3 analyzes the effects of specific institutional variables on growth in the MENA countries and compares the effects of different variables on growth across MENA and other regions. Section 4 explains how corruption affects growth indirectly by again using region-specific regressors. Section 5 concludes the paper.

Determinants of Growth in the MENA Region

We begin our study of the determinants of growth by considering the issue of global conditional convergence. A global convergence equation is estimated with various determinants of growth to study their respective impacts on growth. Determinants of growth specific to the MENA region are then identified by introducing MENA-specific variables to the global convergence regression. This approach makes it possible to compare each variable's contribution to growth in different regions of the world, including the effects of corruption.

The Relation of Global Convergence: Tests of the Conditional Convergence Hypothesis

Equation (1) shows the β-conditional convergence as suggested by Barro and Sala-i-Martin (1991) as well as Mankiw et al. (1992):

$$\frac{\ln(q_{iT})-\ln(q_{i0})}{T}=\beta\ln(A(0))+\beta\ln(q_{i,0})+\vartheta_i X_{i,t}+u_{i,t},\ i=1,\ldots,N \tag{1}$$

where $\hat{\beta}=-(1-e^{\beta T})/T$ is an estimator of the speed of β adjustment toward the steady state and q_i represents the real *per capita* income in country *i*.

$X_{i,t}=[\ln(n+g+\delta)\ln(s_K)\ln(s_H)]$ proxies the steady state equilibrium of the economy for the period [0,T], whereas A(0) measures the initial level of efficiency of the factors of production. $u_{i,t}$ is the standard error term, independently and identically distributed (i.i.d) both across *i* and *t* with a zero mean and a finite variance, σ^2. Following Mankiw et al. (1992), conditional β-convergence is hypothesized to take place if $\hat{\beta}>0$.

The cross section approach to convergence tests is based on the unrealistic assumption that the initial level of technology is identical[4] across all countries, and A(0) is unobservable (Mankiw et al. 1992). Naturally, this assumption becomes even less realistic when working with a sample including developed and developing countries together. The applicability of this approach is further limited by biased OLS estimates produced due to the omission of a relevant variable that is correlated with other explanatory variables.

To solve this lack of robustness in growth regressions, Islam (1995), Caselli et al. (1996) and Berthelemy et al. (1996) estimated the relation on panel data by introducing individual heterogeneity in the form of fixed effects. This process, too, has its drawbacks as highlighted by Temple (1999)[5]. Temple (1998) suggested a second method which consists of introducing regional

[4] The assumption of identical technological level was tested and rejected for 19 industrialized countries by Helliwell (1994).

[5] Taking into account the temporal dimension introduces non-desired effects because of the cyclic variations series. Moreover, the method employed to eliminate the influence of the fixed effects reduced the precision of the estimations and

indicators into the regressions in order to approximate unobservable technological levels and defended this approach based on results in Koop et al. (1995) showing that technological differences are more notable between groups of countries than within them. Thus, the bias in regression coefficients is avoided by adopting Temple's approach and using regional dummies in the estimations here.

Basic Specification

In this section, cross-country regression models are used to place economic growth in the MENA region into an international perspective. A small set of regressors that would account for most of the variation in cross-country *per capita* GDP growth is identified. The absence of guidance from growth theory as to which variables to include makes the choice among a large number of possible correlates of growth a difficult one. Our selection is guided by variables that proved to be more "robust" than others in the recent growth literature and variables that are believed to have shaped recent growth performance of the MENA region are included. Appendix A provides the variable definitions and data sources.

A pooled sample of 90 countries is used in the regressions covering the period from 1960 to 2000. (Appendix B provides the complete list of the countries in the sample). Four control variables are included: the logarithm of the average value of the rate of investment during the period 1960-2000 (INVEST), the growth rate of the population (N), one of the various indicators of the level of country openness (SOPEN) and finally, the growth in the average number of years of education of the population age 15 years and higher between 1960 and 2000 (KH6020)[6]. For the calculation of this growth, a proxy for human capital similar to that of Barro and Lee (2002) is adopted. Specifically, we use the average number of years of schooling (in primary, secondary and higher education) for individuals older than 15. This proxy for human capital is introduced into the regressions in level and not in logarithms, taking into account criticism by Benhabib and Spiegel (1994).

The results of various OLS regressions are reported in Tables 1 and 2. The standard deviations of the estimators are corrected for heteroskedasticity using White's (1980) procedure. The signs of the coefficients are as expected. In accordance with the theoretical model, we note that growth is influenced negatively by the initial GDP per capita and the population growth rate. On the other hand, the level of initial human capital and the average rate of investment have positive impacts on growth. The absence of conditional convergence hypothesis is rejected in all cases at 1% level of statistical significance. The significance of certain variables (in particular the logarithm of the rate of investment) depends on the control variables included in the regression, which is akin to the criticism formulated by Levine and Renelt (1992).

Regional Effects

In order to introduce regional dummy variables in the regressions to correct for the estimation bias due to the restrictive assumption of identical initial technologies for all sample countries, the complete sample of 90 countries is divided into five areas. Asia (Asia: 16 countries) 17.77% of the sample, Central and South America (Latin: 22 countries) 24.45% of the sample, Sub-Saharan Africa (SSA: 21 countries) 23.33% of the sample, Middle East and North Africa (MENA: 9 countries) 10% of the sample, and the rest of the world, mainly the OECD countries (22 countries) that account for 24.45% of the total sample. Table 1 presents regression results using regional dummy variables based on this classification. (See Appendix B for their descriptions).

The majority of the coefficients for control variables did not change when taking into account the regional difference in technological levels. Thus, variables KH6020, LGDP60 and N are

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can, in certain cases, exacerbate biases due to errors of measurement. For more information and studies of the advantages and disadvantages of the cross section approach of convergence compared to that of panel data, refer to Temple (1999).

[6] The use of this variable was enthused from the work of Sachs and Warner (1997).

significant and have the expected signs in all cases. INVEST diminishes in significance in the regressions containing political stability variable and even nonsignificant in regressions containing the institutional variables. However, in both cases, they possess the expected sign.

The coefficient of regional dummies for Asia (ASIA), Latin America (Latin) and Middle East and North Africa (MENA) are positive and significant, suggesting differences in growth performance between these regions. The regional dummy for MENA is significant at the 1% level in all models but Model 1-5 (Table 1-Model 5) where it is significant at the 5% level. The coefficient of the MENA dummy is the highest compared to other regional dummies suggesting that these growth specifications are more significant for the MENA region, relative to the other regions in comparison to the OECD. Thus, the difference in the regional dummy coefficients specifically for MENA and Asia is the weakest in Model 1-1 and the highest in Model 1-4 in which the bureaucratic quality variable (BQ) is introduced. A more powerful effect on the growth of the MENA countries relative to the OECD is detected for the institutional variables (BQ and CORR), the political stability variable (REVCOUP), the government spending variable (CONSGOVT) and the natural resource variables (OIL and SNR). The regional dummy for ASIA is also always significant but has a lower coefficient than that of MENA[7]. The coefficient of the regional dummy for Latin America has a smaller magnitude and diminishes the significance in all models compared to other regional dummies. On the other hand, the regional variable for Sub-Saharan Africa is insignificant.

Oil and natural resources appear to have a negative impact on economic growth in the MENA region. All of the arguments, discussed in the recent literature, explaining the negative link between natural resource abundance and growth performance apply in the context of the MENA region. Sachs and Warner (1997), for instance, have found compelling evidence that countries with high initial ratio of natural resource exports tend to grow slowly in subsequent periods[8]. Earlier findings in the development literature about the disappointing performance of resource-abundant countries have motivated their study on the link between natural resources and economic growth. Natural resource abundance negatively affects growth through several channels. Natural-resource abundant countries tend to experience Dutch-disease as a result of overvalued exchange rates, leading to difficulties in developing a profitable export-oriented or import-competing manufacturing sector. Resource-rich countries are also associated with wasteful consumption and public investment behavior, and provide incentives for rent-seeking and other unproductive activities. In addition, it is widely observed that natural resource availability forestalls reform. Finally, the secular decline of world prices of natural resources and their high volatility create a highly uncertain environment generating, in turn, negative growth.

To see whether the regional groups of countries differ among themselves in terms of the growth impacts of the considered explanatory variables in different models, two Fisher tests are constructed: (F-test-1) inclusion of the OECD in the considered geographical regions, and (F-test-2) exclusion of the OECD. The difference in the impacts of various determinants of growth among regions is very clear if the OECD is one of the considered regions. In fact, F-test-1 is significant for all models. However, if the OECD region is excluded (F-test-2), then the difference is found to be significant only for model 1-2 and 1-4 where corruption and bureaucratic quality variables are introduced. The institutional variables seem to explain the difference on growth performance between non-OECD regions' countries.

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[7] If MENA is considered as the reference region by omitting the MENA regional dummy from the regression, then the regional dummies for Latin America, Sub-Saharan Africa and OECD turn out to be significant in all models except for the Latin America dummy in model 1-5. In this model, the variable REVCOUP introduced for political stability seems to have a similar effect on the growth of the MENA and Latin America regions. Asia's regional dummy became significant in model 1-4 which includes the bureaucratic quality variable. This result reveals a different effect of BQ on MENA and Asia growth. The detailed results of these exercises are available from the author upon request.

[8] Natural resources are defined as primary agriculture, fuels and minerals.

Interaction Between Openness and Growth

We consider the effects of the degree of openness of a country by taking the average number of years between 1970 and 1990 (variable SOPEN) when the country was regarded as open according to the criteria of Sachs and Warner (1995) as the relevant measure. The coefficient for SOPEN points to a positive impact of openness on growth (Model 1-1). It is significant at the 1% level in all regressions (Table 1). As argued by Rodriguez and Rodrik (2001), the less open a country, the more it suffers from the consequences of certain macroeconomic imbalances which, in turn, explain the positive impact of openness on growth.

Public Expenditures

In Model 1-3 the public expenditures (CGOVT) variable is included based on the mean of the government consumption in GDP over the period 1960-2000. Within a neoclassical framework, the amount and the structure of public expenditures act on the level of GDP *per capita* and not on GDP growth rate. In contrast, public expenditures possess a permanent effect on the long-term growth rate in endogenous growth models. In line with theoretical considerations, the coefficient on the public expenditures variable turns out to be negative and significant at the 5% level. This negative effect of public consumption (other than expenditures on education and defence) on growth is explained by the fact that public consumption does not improve productivity in addition to its indirect effect on saving and private consumption through taxation.

Institutions and Growth

Two institutional variables are introduced: a corruption index (CORR) measuring the diffusion of "illegal means of payments" and a bureaucratic quality index (BQ). Both indexes range from 0 to 6, where lower scores indicate more corruption and less bureaucratic quality. Model 1-2 reveals a positive linkage between less corruption and growth. The coefficient is positive and significant at the 1% level. However, the share of the investment in GDP (in logarithmic form) becomes insignificant. Private investment also becomes insignificant. The regional dummies ASIA and MENA are positive and significant at the 1% level, while LATIN is significant only at the 5% level. Less corruption seems to have the same effect on the growth as a better bureaucratic quality. Thus, a favorable institutional climate with less corruption seems to support growth.

BQ is introduced in Model 1-4 as an institutional variable. The addition of this variable in the regression produces a notable change since the private investment represented by the logarithm of the share of the investment in the GDP becomes insignificant. The regression shows that better bureaucratic quality supports growth. Indeed, this variable is significant at the 1% level. The regional dummies: ASIA and MENA are positive and significant at the 1% level, while LATIN is significant at the 5% level. These regions thus have a tendency to grow more than these structural variables enable us to foresee, in particular the bureaucratic quality.

The results of Models 1-2 and 1-4 illustrate the positive effects of growth on institutional indicators, as well as the positive effect of these indicators on growth. It is difficult with these estimations to specify the direction of causality between economic growth and institutional variables. Bad institutional indicators are associated with less growth and with weak growth performance; the probability that institutional indicators will get worse increases.

Political Stability

A proxy for political stability (REVCOUP) is introduced: the average number of revolutions and the number of government interventions per annum over the period of 1970-1985. The coefficient of the variable REVCOUP is negative and significant at the 5% level (Model 1-5). This variable represents the probability of a threat against property rights because of instability and political turmoil. Such a situation discourages foreign and domestic investment and consequently

reduce growth. The regional variables ASIA and MENA are positive and significant at the 5% level, while LATIN is significant at the 10% level.

Natural Resources

To determine the effect of natural resources on growth, two variables are introduced successively: the share of mining output in GNP in 1971 (NR) and a dummy variable (OIL) that takes 1 for the countries whose fuel exports account for 50% or more of their total exports over the period 1984-1986, and 0 for others. The coefficient of NR is negative and significant at the 1% level (Model 1-6). In this case, all regional variables are positive and significant. The dummy variables ASIA, LATIN and MENA are significant at the 1% level and SSA variable is significant at the 5% level, whereas the OIL dummy is insignificant (Model 1-7).

The Effects of Institutional Variables on MENA Growth

In this section, region-specific institutional variables are introduced into the regressions to capture their effects on the growth performance of MENA countries in order to distinguish regional characteristics of growth from global characteristics. This is done by including in the regressions the institutional variables BQ and CORR specific to MENA region countries. In other words, each country from the MENA region is allowed to have different slope coefficients from any non-MENA country in the sample. This is achieved by including interaction terms between the variables under study and the MENA dummy.

Letting the variables specific to MENA be denoted by *m* (Models 2-1 and 2-3), we have, for a variable X:

$$Xm = X \times (regional\ dummy\ MENA)$$

The same exercise is then repeated for all regions (Models 2-2 and 2-4). As in the regressions for total convergence (Table 1), the variable INVEST is insignificant in the presence of CORR and BQ. BQm and CORRm, like most variables of the regressions, are significant and have the expected signs. Therefore, a bigger difference of the mean number of years of study (in primary, secondary and higher education) of the population over 15 years old between 1960 and 2000 (KH6020), a higher mean number of years between 1970 and 1990 when the country is regarded as open according to the criteria of Sachs and Warner (1997) (SOPEN, Model 2-1), weaker growth rate of the population, less corruption (CORR, Models 2-3 and 2-4) and better bureaucratic quality (BQ, Model 2-1 and 2-2) do favor growth. All these variables are significant at the 1% level.

The newly introduced variables specific to the MENA region, BQm in Model 2-1 and CORRm in Model 2-3 are significant at 1% level, indicating a stronger effect that bureaucratic quality and corruption have on MENA countries' growth. The coefficient of BQ for the MENA countries turns out to be 0.757, more than double the value of the coefficient estimated for the whole sample. Similarly, the effect of corruption on MENA countries' growth (0.546) is twice as strong as the one observed over the whole sample.

Table 1: Regressions of Global Convergence with Regional Dummies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	5.100***	8.201***	5.892***	8.199***	5.852***	3.876**	4.969***
	(2.81)	(4.76)	(3.11)	(4.78)	(3.22)	(2.24)	(2.73)
LGDP60	-0.793***	-1.033***	-0.820***	-1.112***	-0.836***	-0.679***	-0.785***
	(-4.04)	(-5.21)	(-4.10)	(-5.52)	(-4.20)	(-3.65)	(-4.01)
INVEST	0.798***	0.123	0.738**	0.125	0.677**	0.945***	0.812***
	(2.62)	(0.45)	(2.44)	(0.45)	(2.23)	(3.55)	(2.63)
KH6020	0.319***	0.278***	0.310***	0.223***	0.326***	0.329***	0.329***
	(3.60)	(3.75)	(3.32)	(2.76)	(3.72)	(4.09)	(3.62)
n	-0.697***	-0.821***	-0.648***	-0.594***	-0.632***	-0.771***	-0.650***
	(-3.71)	(-4.85)	(-4.05)	(-3.95)	(-3.22)	(-3.86)	(-3.58)
SOPEN	1.847***	1.091***	1.842***	1.195***	1.831***	1.667***	1.829***
	(4.95)	(3.20)	(5.65)	(3.76)	(4.74)	(4.73)	(4.92)
CORR		0.379***					
		(5.53)					
CGOVT			-0.027**				
			(-2.18)				
BQ				0.472***			
				(6.69)			
REVCOUP					-0.771**		
					(-2.41)		
SNR						-4.613***	
						(4.11)	
OIL							-0.204
							(-0.654)
ASIA	1.256**	1.527***	1.265***	1.440***	1.134**	1.633***	1.264***
	(2.52)	(2.96)	(2.67)	(3.02)	(2.14)	(3.45)	(2.55)
LATIN	0.828**	0.914**	0.845**	1.091**	0.785*	1.247***	0.859**
	(1.97)	(2.11)	(2.11)	(2.53)	(1.72)	(2.72)	(2.04)
SSA	0.591	0.019	0.622	0.029	0.342	1.240**	0.619
	(0.98)	(0.03)	(1.11)	(0.05)	(0.5)	(2.15)	(1.02)
MENA	1.486***	1.838***	1.601***	2.041***	1.358**	2.000***	1.507***
	(2.81)	(3.56)	(3.01)	(3.73)	(2.40)	(4.02)	(2.86)
F-test-1	2.93**	8.81***	2.95**	9.46***	3.29**	3.61**	2.89**
F-test-2	1.15	6.23***	1.32	5.61***	1.39	0.81	1.02
$\bar{R}^2$	0.68	0.73	0.69	0.75	0.68	0.71	0.67
N	86	72	86	72	85	85	86

Notes: The Student-t statistics are given in parentheses, where the standard errors have been computed through White (1980) correction procedure. (*), (**), and (***) denote significance at the 10%, 5% and 1% levels, respectively. F-test-1 is the F test, testing region effects (including OECD). F-test-2 is the F test, testing region effects (excluding OECD).

A comparison of the coefficients of the variables specific to each area (introduced into Models 2-2 and 2-4) reveals a more significant effect of bureaucratic quality and corruption on the growth of the MENA countries than Asia, Latin America and Sub-Saharan Africa. More specifically, the coefficients for bureaucratic quality and corruption specific to Latin America are insignificant, implying that corruption does not affect growth in this region differently than in the OECD area. The variables specific to MENA and Asia, on the other hand, are significant at the 1% level, pointing to a significant impact of bureaucratic quality on the growth of the countries in MENA and Asia relative to OECD countries. The specific effect of bureaucratic quality on the growth of Sub-Saharan Africa countries is different than in other regions. Better bureaucratic quality reduces growth in this region slightly (-0.072). This seems like a threshold effect: below a certain minimal level of bureaucratic quality, trying to improve the bureaucratic system reduces growth. A possible explanation for this is that bad bureaucratic quality and corruption may allow for flexibility in obtaining investment permits, export and import licenses, etc., thereby helping growth. Validity of this reasoning is supported by the results of Model 2-4, which shows a negative and significant effect of less corruption on growth in Sub-Saharan Africa. As in the case of bureaucratic quality, the most significant impact of corruption on growth is observed for MENA countries, followed by ASIA. For these two areas, the corruption effects on growth are stronger than in the OECD. The specific effect of corruption in Latin America is again insignificant.

Overall, the regression results require that the absence of conditional convergence hypothesis be rejected for all the countries of the sample at 1% level of statistical significance across all specifications, along with an $\bar{R}^2$, suggesting that all the considered control variables explain a little less than two thirds of the differences in the growth rates between the countries of the sample.

How Does Corruption Affect Growth?

In order to investigate how corruption affects growth, two synthetic variables[9] CORRINVEST and CORRKH6020 (measuring the impact of corruption on long term growth rates through investment and human capital formation channels, respectively) are included in Model 2-5, along with the variable CORR (Table 2). In this exercise, the coefficient for CORR turned out to be insignificant; while those for CORRINVEST and CORRKH6020 are significant at 1% level, pointing to the existence of indirect effects corruption has on growth through its impact on investment and human capital.

The coefficient for CORRINVEST is positive, indicating that less corruption is better for investment, which is beneficial for growth. On the other hand, the coefficient of CORRKH6020 is negative, implying that corruption reduces the large positive effect of human capital KH6020 on growth as shown in Model 2-5. It could therefore be concluded that less corruption increases the profitability of human capital thereby helping growth.

Adding MENA-specific CORRINVEST variable to Model 2-6 allows us to observe a stronger effect of less corruption on investment and hence growth in MENA countries. The CORRINVESTm variable is statistically significant at the 1% level. The MENA-specific variable CORRKH6020m is also significant but only at the 10% level (Model 2-8). The inclusion of this variable reduces the negative coefficient of CORRKH6020, highlighting the significant effect of corruption on the region's human capital.

[9] To get more insight into factors affecting growth, synthetic variables relating CORR and REVCOUP, CORR and SNR and CORR and OIL were included but the results were not significant.

Table 2: Regressions of Global Convergence with MENA and Regional Specifics

	(1)	(2)	(3)	(4)	(5)
Constant	8.669***	8.622***	9.203***	9.137***	10.208***
	(6.623)	(6.573)	(6.388)	(6.349)	(7.893)
LGDP60	-1.185***	-0.992***	-1.206***	-1.019***	-1.263***
	(-6.890)	(-5.562)	(-6.947)	(-5.551)	(-8.204)
INVEST	0.421	0.072	0.469	0.162*	-0.161
	(1.468)	(0.288)	(1.599)	(0.667)	(-0.572)
KH6020	0.312***	0.211***	0.364***	0.274***	0.700***
	(3.678)	(2.846)	(4.395)	(3.969)	(6.878)
N	-0.458***	-0.544***	-0.682***	-0.798***	-0.558***
	(-3.141)	(4.351)	(-4.131)	(-5.244)	(-4.414)
SOPEN	1.210***	0.993***	1.095***	0.741**	0.787***
	(4.358)	(3.355)	(3.382)	(2.432)	(2.705)
BQ	0.322***	0.273***			
	(3.803)	(3.205)			
BQm	0.435***	0.550***			
	(3.040)	(3.542)			
BQasie		0.340***			
		(4.447)			
BQlatin		0.105			
		(1.348)			
BQssa		-0.346***			
		(-2.161)			
CORR			0.261***	0.223***	-0.387
			(3.209)	(2.611)	(-1.228)
CORRm			0.285***	0.388***	
			(2.936)	4.121	
CORRasie				0.337***	
				3.759	
CORRlatin				0.080	
				(0.885)	
CORRssa				-0.236*	
				(-1.829)	
CORRINVEST					0.329***
					(3.015)
CORRKH6020					-0.090***
					(-2.695)
$\bar{R}^2$	0.64	0.76	0.62	0.66	0.65
N	72	72	72	72	72

Table 2: Regressions of Global Convergence with MENA and Regional Specifics (continued)

	(6)	(7)	(8)	(9)
Constant	10.885***	10.023***	10.843***	10.657***
	(8.243)	(8.037)	(8.314)	(8.090)
LGDP60	-1.311***	-1.095***	-1.304***	-1.146***
	(-8.506)	(-7.073)	(-8.503)	(-7.261)
INVEST	-0.189	-0.333	-0.190	-0.342*
	(-0.684)	(-1.609)	(-0.691)	(-1.689)
KH6020	0.657***	0.661***	0.645***	0.549***
	(6.699)	(8.460)	(6.187)	(6.771)
n	-0.650***	-0.842	-0.639***	-0.765***
	(-4.635)	(-6.830))	(-4.545)	(-5.742)
SOPEN	0.894***	0.746***	0.809***	0.514*
	(2.926)	(2.911)	(2.595)	(1.833)
CORR	-0.338	-0.087	-0.385	-0.408*
	(-1.038)	(-0.373)	(-1.211)	(-1.952)
CORRINVEST	0.303***	0.207***	0.322***	0.325***
	(2.643)	(2.681)	(2.906)	(4.566)
CORRKH6020	-0.083**	-0.107***	-0.082**	-0.101***
	(-2.551)	(-5.857)	(-2.467)	(-5.525)
CORRINVESTm	0.078***	0.127***		
	(3.113)	(5.347)		
CORRINVESTasie		0.120***		
		(6.705)		
CORRINVESTlatin		0.502		
		(1.589)		
CORRINVESTssa		-0.068		
		(-1.191)		
CORRKH6020m			0.054*	0.096***
			(1.897)	(3.218)
CORRKH6020asie				0.093***
				(6.416)
CORRKH6020latin				0.041
				(1.103)
CORRKH6020ssa				-0.088
				(-1.393)
$\bar{R}^2$	0.66	0.78	0.65	0.78
N	72	72	72	72

Notes: The Student-t statistics are given in parentheses, where the standard errors have been computed through White (1980) correction procedure. (*), (**), and (***) denote significance at 10%, 5% and 1% levels, respectively.

A reduction in corruption would have a stronger impact on growth in MENA than it would have on the growth of the other sample countries. To compare indirect effects of the same institutional variables on regional growth, region specific variables CORRINVESTm, CORRINVESTasia, CORRINVESTlatin and CORRINVESTssa are introduced into Model 2-7. Symmetrically, region specific effects of CORRKH6020 variable in Model 2-9 are investigated by adding relevant regional variables to regressors. In both cases, specific MENA and Asia variables are the only ones significant at the 1% level. Thus, Model 2-7 reveals that the indirect investment effect of corruption is more significant for MENA countries than for Asian countries. For both regions, the effect is stronger than in the OECD. Model 2-9 shows that lowering corruption has a stronger indirect effect through human capital in MENA relative to Asia. For these two regions, the indirect effect is higher than in the rest of the regions. In general, the institutional variables play a more important role for growth in the MENA region than others. This is probably due to the fact that in the MENA region, corruption is the highest and bureaucratic quality is the worst: the means of corruption and bureaucratic quality indices in MENA are 2 and 1.78, respectively, and lower than the respective averages of 3.40 and 3.26 for the overall sample.

Conclusion

Consideration of the growth performance of the MENA region within an international perspective yielded interesting results concerning the importance of institutional variables (corruption and bureaucratic quality) for the MENA countries. The direct and indirect effects of these variables on growth were estimated by introducing institutional variables specific to MENA and other regions of the world first, and then by adding two synthetic variables (CORRINVEST and CORRKH6020) that measure the impact of corruption on long term growth performance via investment and human capital variables. The results highlighted an indirect effect of corruption on growth through both channels. The magnitudes of these indirect effects were also compared to those on other regions using the same synthetic variables with values specific to other regions.

This econometric analysis revealed that the direct impact of institutional variables is strongest in the MENA region relative to the regions considered. The same is true about indirect effects of corruption on growth through investment and human capital. Thus, better-performing institutions are likely to improve growth by increasing the volume and the efficiency of investment and by improving and promoting human capital. Institutions matter for growth and productivity because they affect incentives of growth performance factors

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Appendix A: Definitions and Sources of the Variables

The data are compiled from three main sources: Penn-World Tables (PWT) of Summers and Heston (1991, version 6.1) and the data of Barro and Lee (1994) brought up to date in 2002 for the human capital variable, and the Sachs and Warner (1997) data.

National Aggregates

INVEST Natural logarithm of the average share of investment in the GDP between 1960 and 2000, Source SH v.6.1.

G602000 Growth rate of GDP between 1960 and 2000.

Population

n Population growth rate between 1960 and 2000, Source SH v.6.1.

Government Expenditure

CGOVT Average share of government consumption in the GDP between 1960 and 2000, Source: SH v.6.1.

Opening and Marketing Policy

SOPEN The fraction of years during the period 1970-1990 in which the country is rated as open according to Sachs and Warner's criteria.

Education

KH6020 Difference of the average number of years of education of the population over 15 years old between 1960 and 2000. From data on education in Barro and Lee, Updated 2002.

Institutional Variables

CORR Measure the diffusion of illegal means "of payments" to the government or senior officials, in the form of "bribes" for operations involving the use of export and import licenses, exchange controls, tax assessments, police protection, or loans, etc. This index is measured on a scale going from 0 to 6; with higher values whenever corruption is low. Source: Sachs and Warner (1997).

BQ 0 to 6 index of bureaucratic quality built by "the Center for Institutional Reform and the Informal Sector (IRIS)". Higher index values show better quality and independence of the bureaucracy. Source: Sachs and Warner (1997).

Political Stability

REVCOUP Average number of revolutions and coups per year, over the period 1970-1985. Source: Barro and Lee, 1994.

Natural Resources

OIL Dummy variable for oil exporters based on the IMF classification of the countries taking 1 for countries whose fuel exports represent 50% or more of the total of exports during the period between 1984 and 1986, and 0 others.

SNR The share of mineral production in GNP in 1971.

Appendix B: List of Countries in the Sample and Regional Dummies

Asia: Bangladesh, China, Hong Kong, Indonesia, India, South Korea, Sri Lanka, Malaysia, Nepal, Pakistan, the Philippines, Papua New Guinea, Singapore, Thailand, Taiwan, Tanzania
Sub-Saharan Africa: Benin, Botswana, Rep. of Central Africa, Cameroon, Rep. of Congo, Ghana, Gambia, Kenya, Lesotho, Mali, Mozambique, Mauritius, Malawi, Niger, Rwanda, Senegal, Togo, Uganda, South Africa, Zambia, Zimbabwe
Latin America: Argentina, Bolivia, Brazil, Barbados, Chile, Colombia, Costa Rica, Dominican Rep., Ecuador, Guatemala, Guyana, Honduras, Haiti, Jamaica, Mexico, Nicaragua, Peru, Paraguay, El Salvador, Trinity and Tobago, Uruguay, Venezuela
MENA: Algeria, Egypt, Iran, Israel, Jordan, Morocco, Syria, Tunisia, Turkey
OECD: Australia, Austria, Belgium, Canada, Switzerland, Cyprus, Denmark, Spain, Finland, France, United Kingdom, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, New Zealand, Portugal, Sweden, United States