Corruption Effects on MENA Countries Growth

Imène Guetat, Faculté de Droit et des Sciences Economiques et Politiques, Tunisia

INTRODUCTION

The recent empirical growth literature has suggested a wide range of growth determinants[i]. The list includes among others, initial conditions, macroeconomic performance, trade openness, government size, income distribution, financial market development, natural resource abundance, political stability and institution quality. These ultimate sources of growth have been shown to be very important. This article examines the significance of corruption and bureaucratic quality on long run growth and to show if there is a specific effect of these variables for the Middle East and North Africa (MENA) countries. In order to perform the analyses the paper tries to find out if there are indirect effects of corruption on growth. In addition to regional specific variables, MENA specific variables are introduced in the regressions for better seizing Specific effects on MENA countries.

The remainder of the paper is organized as follows. Section 2 is an account of the determinants of growth in the MENA region. Using an empirical model based on large cross-country data sets, section 3 analyzes the specific effects of institutional variables on MENA countries. To compare specific MENA effects with that of the other areas, we introduce regional specific variables. Section 4 explains how corruption acts indirectly on growth. Again we introduce MENA specific regressors and regional specific regressors to better seize the indirect impacts of corruption on MENA countries. Section 5 concludes.

THE GROWTH DETERMINANTS IN THE MENA REGION

The objective of this section is to explain if the world economy is characterized by a global conditional convergence, which makes the study of growth determinants possible. The results of convergence obtained with cross section regressions could be explained partly by the existence of a low number of converging countries. An equation of global convergence is estimated with various determinants of growth to study their impacts on the growth. Then, the determinants of growth of the MENA region are identified. This was possible by introducing specific variables to the MENA countries in the global convergence regression. Using the same technique the variable's effects on growth for different regions of the world are compared, especially for corruption.

The relation of global convergence: Tests of the conditional convergence hypothesis

The average growth rate; is expressed using the equation (1), this is the □-conditional convergence as suggested by Barro & Sala-i-Martin (1992) and Mankiw, Romer and Weil, (1992):

$$\frac{\ln(q_{iT}) - \ln(q_{i0})}{T} = \hat{\beta}\ln(A(0)) + \hat{\beta}\ln(q_{i,0}) + \vartheta_i X_i + u_i,\ i = 1,\ldots,N \qquad (1)$$

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

$X_{i,t} = [\ln(n+g+\delta)\ln(s_K)\ln(s_H)]$ which proxies the stationary balance of the economy for the period [0,T]. A (0) measures the initial level of efficiency of the factors of production.

Similar to Mankiw, Romer and Weil (1992) conditional β-convergence is hypothesized to take place if $\hat{\beta}$>0. In addition, to test such hypothesis, it is necessary to maintain constant the stationary balance of each economy. This method is applied to heterogeneous samples of countries with various economic structures. It is used to check the convergence of each country towards its own stationary state. It consists in introducing into the estimated models the determinants of the stationary states.

The cross section approach of convergence tests supposes that the initial level of technology is similar to all the countries, and A (0) is unobservable (Mankiw, Romer and Weil, 1992). This assumption limits the range of this approach. Indeed, if this assumption is not checked, there is an omission of a relevant variable correlated with the other explanatory variables, which bias the coefficients of the convergence regression. The assumption of an identical technological level was tested and rejected for 19 industrialized countries by Helliwell (1994). This assumption has even less chance to be checked for a sample incorporating at the same time developed and developing countries.

To solve this problem, Islam (1995), Caselli and Al. (1996) and Berthélemy, Dessus and Varoudakis (1997) estimated the relation on panel data by introducing individual heterogeneity in the form of fixed effects. This process has its drawbacks as highlighted by Temple (1999a)[ii]. Temple (1998) suggested a second method which consists in introducing regional indicating variables into the regressions, in order to approximate these nonobservable technological levels. Temple referred to the results of Koop, Osiewalski & Steel (1995) which show that the technological differences are more notable between groups of country, than within them. We adopt these suggestions in our estimations to avoid some of the econometric problems of the cross section method.

Basic specification

In this section we will use a cross-country regression models to put the MENA region's economic growth in 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 the great number of possible correlates of growth a difficult one. However, our selection will be guided by variables that proved to be more "robust" than others in the recent growth literature. In addition, variables that are believed to have shaped the MENA region's recent growth performance are included. The aim of this paper is not to focus on the problems of causality, endogeneity or the possible correlation between the different growth correlates.

A sample of 90 countries is used in the regressions (see appendix 4.2 for the complete list of the countries and appendix 4.1 for the definitions and the sources of the variables). Four control variables are included: the logarithm of the average value of the rate of investment on the period 1960-2000 (INVEST), the growth rate of population (N), one of the various indicators of the level of openness of country (SOPEN) and finally the difference of the average number of years of study of the population of age higher than 15 years between 1960 and 2000 (KH6020)[iii]. For the calculation of this difference, a proxy for human capital similar to Barro & Lee (2002) using the average number of years of schooling (in primary education, secondary and higher education) for individuals above 15 years old, is adopted. This proxy for human capital is introduced into the regressions in the level and not in logarithm, taking into account Benhabib & Spiegel's (1994) criticism as mentioned before.

The results of the various OLS regressions are reported in tables 1 and 2. The standard deviations of the estimators are corrected for heteroscedasticity using White's (1980) method. The signs of the coefficients are as expected. In accordance with the theoretical model, we note that the growth is influenced negatively by the initial GDP per capita and the growth rate of the population. On the other hand, the level of initial human capital and the average rate of investment have a positive impact on the growth. The assumption of conditional convergence is accepted in all the cases at 1% level. The significance of certain variables (in particular the logarithm of the rate of investment) depends on the control variables introduced in the regression, which joins the criticism formulated by Levine & Renelt (1992).

Table 1 Regressions of global convergence with regional dummies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	5.100*** (2.815)	8.201*** (4.764)	5.892*** (3.114)	8.199*** (4.778)	5.852*** (3.217)	3.876** (2.241)	4.969*** (2.726)
LGDP60	-0.793*** (-4.037)	-1.033*** (-5.214)	-0.820*** (-4.105)	-1.112*** (-5.522)	-0.836*** (-4.196)	-0.679*** (-3.651)	-0.785*** (-4.011)
INVEST	0.798*** (2.620)	0.123 (0.454)	0.738** (2.442)	0.125 (0.454)	0.677** (2.236)	0.945*** (3.552)	0.812*** (2.631)
KH6020	0.319*** (3.600)	0.278*** (3.753)	0.310*** (3.322)	0.223*** (2.765)	0.326*** (3.716)	0.329*** (4.092)	0.329*** (3.623)
n	-0.697*** (-3.714)	-0.821*** (-4.855)	-0.648*** (-4.054)	-0.594*** (-3.954)	-0.632*** (-3.223)	-0.771*** (-3.857)	-0.650*** (-3.581)
SOPEN	1.847*** (4.950)	1.091*** (3.202)	1.842*** (5.647)	1.195*** (3.761)	1.831*** (4.738)	1.667*** (4.734)	1.829*** (4.917)
CORR		0.379*** (5.535)					
CGOVT			-0.027** (-2.184)				
BQ				0.472*** (6.692)			
REVCOUP					-0.771** (-2.414)		
SNR						-4.613*** (4.111)	
OIL							-0.204 (-0.654)
ASIA	1.256** *(2.523)*	1.527*** *(2.959)*	1.265*** *(2.670)*	1.440*** *(3.025)*	1.134** *(2.141)*	1.633*** *(3.453)*	1.264*** *(2.549)*
LATIN	0.828** (1.975)	0.914** (2.107)	0.845** (2.113)	1.091** (2.532)	0.785* (1.724)	1.247*** (2.721)	0.859** (2.036)
SSA	0.591 (0.978)	0.019 (0.030)	0.622 (1.110)	0.029 (0.046)	0.342 (0.499)	1.240** (2.149)	0.619 (1.019)
MENA	1.486*** (2.808)	1.838*** (3.562)	1.601*** (3.009)	2.041*** (3.726)	1.358** (2.401)	2.000*** (4.017)	1.507*** (2.865)
$\bar{R}^2$	0.68	0.73	0.69	0.75	0.68	0.71	0.67
N	86	72	86	72	85	85	86

t-Student are between brackets, the standard deviations of the coefficients were calculated by the method of White (1980) to correct the heteroscedasticity.
* The coefficient is significant at 10%.
** The coefficient is significant at 5%.
*** The coefficient is significant at 1%.

Table 2 Regressions of global convergence with MENA and regional specifics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constant	8.669*** (6.623)	8.622*** (6.573)	9.203*** (6.388)	9.137*** (6.349)	10.208*** (7.893)	10.885*** (8.243)	10.023*** (8.037)	10.843*** (8.314)	10.657*** (8.090)
LGDP60	-1.185*** (-6.890)	-0.992*** (-5.562)	-1.206*** (-6.947)	-1.019*** (-5.551)	-1.263*** (-8.204)	-1.311*** (-8.506)	-1.095*** (-7.073)	-1.304*** (-8.503)	-1.146*** (-7.261)
INVEST	0.421 (1.468)	0.072 (0.288)	0.469 (1.599)	0.162* (0.667)	-0.161 (-0.572)	-0.189 (-0.684)	-0.333 (-1.609)	-0.190 (-0.691)	-0.342* (-1.689)
KH6020	0.312*** (3.678)	0.211*** (2.846)	0.364*** (4.395)	0.274*** (3.969)	0.700*** (6.878)	0.657*** (6.699)	0.661*** (8.460)	0.645*** (6.187)	0.549*** (6.771)
N	-0.458*** (-3.141)	-0.544*** (4.351)	-0.682*** (-4.131)	-0.798*** (-5.244)	-0.558*** (-4.414)	-0.650*** (-4.635)	-0.842 (-6.830))	-0.639*** (-4.545)	-0.765*** (-5.742)
SOPEN	1.210*** (4.358)	0.993*** (3.355)	1.095*** (3.382)	0.741** (2.432)	0.787*** (2.705)	0.894*** (2.926)	0.746*** (2.911)	0.809*** (2.595)	0.514* (1.833)
BQ	0.322*** (3.803)	0.273*** (3.205)							
BQm	0.435*** (3.040)	0.550*** (3.542)							
BQasie		0.340*** (4.447)							
BQlatin		0.105 (1.348)							
BQssa		-0.346*** (-2.161)							
CORR			0.261*** (3.209)	0.223*** (2.611)	-0.387 (-1.228)	-0.338 (-1.038)	-0.087 (-0.373)	-0.385 (-1.211)	-0.408* (-1.952)
CORRm			0.285*** (2.936)	0.388*** 4.121					
CORRasie				0.337*** 3.759					
CORRlatin				0.080 (0.885)					
CORRssa				-0.236* (-1.829)					
CORRINVEST					0.329*** (3.015)	0.303*** (2.643)	0.207*** (2.681)	0.322*** (2.906)	0.325*** (4.566)
CORRKH6020					-0.090*** (-2.695)	-0.083** (-2.551)	-0.107*** (-5.857)	-0.082** (-2.467)	-0.101*** (-5.525)
CORRINVESTm						0.078*** (3.113)	0.127*** (5.347)		
CORRINVESTasie							0.120*** (6.705)		
CORRINVESTlatin							0.502 (1.589)		
CORRINVESTssa							-0.068 (-1.191)		
CORRKH6020m								0.054* (1.897)	0.096*** (3.218)
CORRKH6020asie									0.093*** (6.416)
CORRKH6020latin									0.041 (1.103)
CORRKH6020ssa									-0.088 (-1.393)
$\overline{R}^2$	0.64	0.76	0.62	0.66	0.65	0.66	0.78	0.65	0.78
N	72	72	72	72	72	72	72	72	72

Between brackets t- Student are reported, the standard deviations of the coefficients were calculated by the method of White (1980) to correct the heteroscedasticity.
* The coefficient is significant at 10%.
** The coefficient is significant at 5%. *** the coefficient is significant at 1%.

Regional effects
Regressions based on the restrictive assumption of an initial level of identical technology for all the countries of the sample can bias the estimations. According to Temple (1998), the introduction of regional dummy variables makes it possible to correct for this type of bias. In order to apply this recommendation, we broke up our complete sample of 90 countries into five distinct areas. Asia (16 countries) 17,77% of the sample, the Central America and the South (22 countries) 24,45% of the sample, sub-Saharan Africa (ASS: 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) accounts for 24,45% of the total sample. Table 1 presents the regressions using regional dummy variables thus made up.

The majority of control variables the coefficients did not change when taking into account the regional difference in technological levels. Thus, variables KH6020, LGDP60 and n are significant and have the expected signs, in all considered cases. INVEST is less significant in the regressions containing political stability variable and even nonsignificant in regressions containing the institutional variables. However in both cases, they hold 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 among these regions. The regional variable MENA is significant at 1% level in all specifications but specification 4, 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 specification are more significant for 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 and the highest in model 4 in which the bureaucratic quality variable (BQ) is introduced. A more powerful effect on the growth of the MENA countries in comparison to OECD of the institutional variables (BQ and CORR), the political stability variable (REVCOUP) of the government spending variable (CONSGOVT) and of natural resource variables (OIL and SNR) is detected. The regional variable ASIA is also always significant but with a lower coefficient than MENA. The coefficient of the regional dummy of Latin America has smaller magnitude and is less significant an all the models compared to other regional dummies. On the other hand the regional variable of Sub Saharan Africa is insignificant.
Oil and natural resources appear to have 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[iv]. Earlier findings of 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 exhibit the Dutch-disease syndrome in terms of overvalued exchange rates, and hence the difficulty to develop a profitable export-oriented or import-competing manufacturing sector. Resource-rich countries are also associated with wasteful consumption and public investment behaviour, 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 translate into high uncertainty, which, in turn, generates negative growth.

Interaction between openness and growth
We considered as indicators of the degree of openness of a country: the average number of years between 1970 and 1990 when the country was regarded as open according to the criteria of Sachs & Warner (1995) (variable SOPEN).

This variable (SOPEN) shows a positive impact of openness on growth (model 1). It is significant at 1% level in all regressions (table 1). For Rodriguez & Rodrick (1999), the more a country is closed the more it suffers from the consequences of certain macroeconomic imbalances, which in turn explains the positive impact of openness on growth.

Public expenditure

In model (3) the public expenditure (CGOVT): the mean of the government consumption in the GDP over the period 1960-2000 is included. In the neoclassic analysis, the amount and the structure of public expenditure act on the level of GDP per capita and not on GDP growth rate. In contrast in endogenous growth models, public expenditure has a permanent effect on the long-term growth rate.

In consistency to the theory conclusions, the coefficient of public expenditure variable is negative and significant at the 5%. This negative effect of the public consumption on the growth, other than expenditures on education and defence, is explained by the fact that it 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 with low score indicating more corruption and less bureaucracy quality.

Model (2) shows a positive relation between less corruption and growth. The coefficient is positive and significant at the 1% level. However, the share of the investment in GDP (in log form) becomes insignificant. Private investment becomes insignificant. The regional dummies ASIA and MENA are positive and significant, at the 1%, while LATIN is significant only at the 5%. 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 4 as 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 a better bureaucratic quality supports growth. Indeed, this variable is significant at the 1%.

The regional dummies: ASIA and MENA are positive and significant at the 1% level, while LATIN is significant at the 5%. These regions thus have tendency to grow more than these structural variables enable us to foresee, in particular the bureaucratic quality.

The results of models 2 and 4 illustrate the positive effect of growth on institutional indicators, as well as the positive effect of these indicators on the growth. It is difficult to specify to the causality direction connecting the economic growth and institutional variable with these estimations. Bad institutional indicators show less growth and a weak growth perforce the probability of worse institutional indicators.

Political stability

A proxy for political stability (REVCOUP) is introduced: the average number of revolutions and the number of government inversion per annum over the period of 1970-1985.

The coefficient of the variable REVCOUP is negative and significant at the 5% level (model 5). This variable translates the probability of a threat weighing on the rights of ownership because of instability and political agitation. This discourages the foreign and domestic investment and consequently would reduce growth. The regional variables ASIA and MENA are positive and significant at the 5%, while LATIN is significant at the 10%.

Natural resources

To determine the effect of natural resources on growth, two variables are introduced successively: the share of the mineral production in the GNP in 1971 (NR) and a dummy variable (OIL), indicating by 1 the countries with fuel exports accounting for 50% and more of the total exports over the period 1984-1986 and by 0 others.

The coefficient of NR is negative and significant at the 1% level (model 6). In this case, all the regional variables are positive and significant. The dummy variables ASIA, LATIN and MENA are significant at the 1% level whereas SSA variable is significant at the 5%. The countries with fuel exports accounting for 50% and more of the total of exports between 1984 and 1986 are called oil countries. The dummy variable (OIL) indicating these countries are insignificant (model 7).

TRYING TO KNOW THE TRUTH ABOUT THE INSTITUTIONAL VARIABLE EFFECTS ON MENA COUNTRIES GROWTH

In this section the specific effect of the institutional variables on MENA countries growth is better seized. Regional specific variables are introduced in the regressions. This took place by including in the regressions the same variables BQ and CORR, but this time specific to MENA region countries. Thus, the variables to which we add (m) are specific to this area (model 1 and 3). We thus have, for a variable X:

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

Also, are introduced with specific effects for all the regions (model 2 and 4).

As in the regressions of 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. Thus, 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 & Warner (SOPEN, model 1), a weaker growth rate of the population, a less corruption (CORR, model 4) and a better bureaucratic quality (BQ, model 4) are favorable to growth. All these variables are significant at the 1%.

The new introduced variables specific to the MENA region, BQm and CORRm respectively into regressions 1 and 3, are significant at the 1% level which proves a more important effect of the variables of bureaucratic quality and corruption on MENA countries growth. Thus, the coefficient of BQ for the MENA countries is revealed to be equal to 0.757 which is more than the double of the coefficient valid for the whole sample. In the same way, corruption effect on the MENA countries growth is the double of that on the whole sample of countries. The coefficient becomes equal to 0.546.

The comparison of the coefficients of the variables specific to each area introduced into regressions 2 and 4 shows a more significant effect of bureaucratic quality and corruption on the growth of the MENA countries than on the other areas; Asia, Latin America, Sub Saharan Africa and OECD.

In more details, the variable of bureaucratic quality and corruption specific to Latin America are insignificant which shows that corruption do not have a different effect on growth in this area from that on the OECD countries growth.

On the other hand, the variables specific to MENA and Asia are significant to the 1% which shows a more significant impacts of bureaucratic quality on the growth of the countries of these areas than on that of the OECD countries. The specific effect of bureaucratic quality on the growth of Sub Saharan Africa countries is different from that on the other regions. Indeed, better bureaucratic qualities reduce slightly the growth of the countries of this area (-0.072). This seems a threshold effect; below a certain minimal level of bureaucratic quality, trying to improve the bureaucratic system reduces growth. In this case, bad bureaucratic quality allows certain flexibility through possibilities of corruption, of illegal payment of bribes and intervention to facilitate certain actions (investment, export), which contribute to growth. This fact is confirmed by the results of regression 4, which shows a negative and significant effect of less corruption on growth in Sub Saharan Africa. In the same way as for bureaucracy, the most significant impact of corruption is on the growth of the MENA countries followed by ASIA. For these two areas the corruption effect on the growth is higher than on OECD countries growth. Again, specific effect of corruption on Latin America is insignificant.

Conditional convergence is accepted for all the countries of the sample. The assumption of conditional convergence is always accepted at the 1% and the $\overline{R}^2$, suggests that all the considered control variables explains a little less than two thirds of the differences in the growth rate mean between the countries of sample.

HOW CORRUPTION AFFECTS GROWTH?

In order to determine how corruption affects growth two synthetic variables CORRINVEST and CORRKH6020 measuring the impact of corruption on investment and the human capital profitability's on long term growth rate are introduced into regression 5 in addition to the variable CORR. Variable CORR becomes insignificant; while CORRINVEST and CORRKH6020 variables are significant at the 1%. Thus, we can deduce that corruption have an indirect effect on growth through an impact on investment and human capital.

However, CORRINVEST seems to be another proxy of investment, which becomes insignificant. The variable CORRINVEST coefficient is positive showing that less corruption is better for investment, which is beneficial for growth. On the other hand, the coefficient of CORRKH6020 is negative; reducing the high positive effect of human capital KH6020 as shown in this regression. The overall impact of the human capital becomes lower. Therefore, it could be concluded that a positive effect of less corruption on the profitability of human capital and thus on growth.

Adding in regression 6 MENA specific CORRINVEST variable allows us to note a stronger effect of less corruption on the investment and thus on growth in MENA countries. Indeed, the CORRINVESTm variable is significant at the 1%. The variable CORRKH6020, MENA specific is also significant but only at the 10% (model 8), it reduces the negative coefficient of CORRKH6020 and highlights the significant effect of corruption on the human capital in the countries of this area.

A reduction of corruption would have a stronger stimulation of the beneficial impact of the human capital on growth in MENA than it would have on the growth of the other countries of the sample. To compare specificities of these variables proper to each area, regional specific variables: MENA, Asia, Latin America and Sub Saharan Africa specifics respectively, (CORRINVESTm), (CORRINVESTasia), (CORRINVESTlatin) and (CORRINVESTssa) are introduced into regression 7. Symmetrically regional specific effects of CORRKH6020 variable in regression 9 are set up by adding to the regressors (CORRKH6020m), (CORRKH6020asia), (CORRKH6020latin) and (CORRKH6020ssa). In both cases the specific MENA and Asia variables are the only significant at the 1%. Thus model 7 proves that the indirect effect of corruption on the investment is more significant for MENA countries than for Asian countries. For both regions the effect is stronger than on OECD countries growth. Model 9 shows a more important effect of less corruption on the beneficial role of the human capital on growth for the MENA countries than for the Asian countries. For these two areas, the indirect impact of corruption on the human capital is higher than for the OECD countries.

CONCLUSION

This study enabled us to chow the very important effects of the institutional variables on the MENA countries growth. Thus we could note that their impact is highest on the economies of this region than on those of the other world regions. This is probably due to the fact that in MENA region, corruption is the highest and bureaucratic quality is the worst: the mean of corruption and bureaucratic indexes in MENA are respectively 2 and 1.78, which is largely below the averages of overall sample 3.40 and 3.26. Indirect effects of corruption on growth through a favorable effect of less corruption on the investment and human capital benefits are highlighted. These indirect effects are the strongest for MENA countries in comparison with other regions of the world.

REFERENCES

Barro, R. (1991): "Economic Growth in a Cross-Section of Countries," Quarterly Journal of Economics, 104: 407-433.

Barro, R. and J.W. Lee (2000): "International Data on Educational Attainment: Updates and Implications," Working Paper no. 42, Center for International Development at Harvard University, April.

Benhabib, J. and M. Spiegel (1994): "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data," Journal of Monetary Economics 34: 143-173.

Barro R.J. & Sala-I-Martin X. (1991): « Convergence across states and regions », Brookings Papers on Economic Activity, 1, pp 107-158.

Bisat, A. EL-Erian M.A. and T. Helbling (1997): "Growth Investment, and Saving in the Arab Economies," IMF working paper WP/97/85.

Chowdhury S. K. (2004): "The Effect of Democracy and Press Freedom on Corruption: an Empirical Test", Economic Letters, 85: 93-101.

Cohen D. & Hammour M.L. (1994): « Economic Growth in the Middle East and North Africa: An International Comparison », Cairo Economic Research Forum for the Arab Countries, The Islamic Republic of Iran and Turkey, Working paper 9403.

EL Badawi, I. (1999): "Can Reforming Countries Perform an Asian Miracle?: Role of Institutions and Governance on Private Investment," in Limam I. (ed) "Institutional Reform and Development in the MENA Region," published by Arab Planning Institute and Economic Research Forum for the Arab Countries, Iran and Turkey.

EL-Erian M.A., Eken S., Fennell S. & Chauffour J.P. (1996): « Growth and Stability in the Middle East and North Africa», IMF working paper, International Monetary Fund, March 1996.

Fischer, S. (1993): "The Role of Macroeconomic Factors in Growth," Journal of Monetary Economics 32 (3): 485-512.

Jain A. K. (2001): "Corruption: A review", Journal of Economic Surveys, 15: 71-121.

Knack, S. and P. Keefer (1995): "Institutions and Economic Performance: Cross-Country Test Using Alternative Institutional Measures" Economies and Politics 7(3): 207-227.

Mankiw, N. G., Romer D., and D. N. Weil (1992): "A Contribution to the Empirics of Economic Growth," Quarterly Journal of Economics 107 (2): 407-437.

Sachs, J. D. and A. M. Warner (1997): "Natural Resource Abundance and Economic Growth," Center for International Development and Harvard Institute for International Development.

Sachs, J. D. and A. M. Warner (1996): "Sources of Slow Growth in African Economies," Development Discussion paper no. 545 Harvard Institute for International Development.

Sachs, J. D. and A. M. Warner (1995): "Economic Reform and the Process of Global Integration," Brookings papers on Economic Activity, 10-1-118.

Senhadji, A. (1999): "Sources of Economic Growth: An Extensive Growth Accounting Exercise," IMF Working Paper WP/99/77.

ENDNOTES

[i] The economic determinants of growth included in cross-national regressions includes: 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), trade policy (Lee 1993).

[ii] 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 can, in certain cases, to exacerbate skews 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 (1999a).

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

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