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**What is so specific with Middle-East and North-African pattern
of growth and structural change? A quantitative comparative
analysis**

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Le modèle de croissance et de changement structurel des pays du Moyen-Orient et Afrique du Nord (MENA) est-il spécifique ? Une analyse comparative quantitative

Résumé

Dans cet article, nous comparons quantitativement les modèles de croissance des pays du Moyen-Orient et Afrique du Nord (MENA) avec celles d'un échantillon de pays à revenu intermédiaire. Trois ensembles complémentaires de déterminants de la croissance sont testés: l'accumulation, les institutions et le changement structurel. Après avoir estimé le modèle sur un échantillon de pays à revenu intermédiaire, notre analyse comparative montre que les économies de la région MENA contrastent fortement avec d'autres économies émergentes à revenu intermédiaire à l'égard de deux dimensions principales: (1) la structure sectorielle de la production et (2) l'environnement institutionnel. L'hypothèse selon laquelle l'accumulation, les déterminants institutionnels et structurels ont des effets complémentaires sur la croissance est également testée. Nous montrons enfin que le modèle de croissance MENA présente des faiblesses structurelles, comme la combinaison d'un faible rythme de changement structurel et des niveaux élevés de corruption, qui pourraient avoir entravé l'expansion très productive du travail, et nourri un mécontentement massif dans la région.

Mots-clés : Changement structurel ; Institutions ; Corruption ; Moyen-Orient et Afrique du nord, Economies à revenu intermédiaire ; Analyse comparative quantitative ; données de panel ; GMM

What is so specific with Middle-East and North-African pattern of growth and structural change? A quantitative comparative analysis

Abstract

This paper quantitatively compares Middle East and North African (MENA) countries' growth patterns with those of a sample of middle-income countries. Three complementary sets of growth determinants are tested: accumulation, institutions and structural change. After having estimated the model on a sample of middle income countries, our comparative analysis shows that MENA economies sharply contrast with other middle income emerging economies with respect to two main dimensions: (1) the sectoral structure of production and (2) the institutional environment. The assumption of complementary effect of the accumulation, institutional and structural growth determinants is also tested. We show that the MENA pattern of growth exhibits structural weaknesses, like the combination of a low pace of structural change and high corruption levels, which may have hindered the expansion of highly productive job, and possibly bred massive discontent in the region.

Keywords: Economic growth; Structural change; Institutions; Corruption; Middle-East and North-Africa; Middle-income economies; Quantitative comparative analysis; Panel data; GMM estimation

JEL: O4; J2

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<http://ideas.repec.org/p/grt/wpegrt/2014-23.html>.

1. Introduction

Recent Arab revolutionary episodes have abruptly shed light on the failure of some Middle East and North African (MENA) economies to bring pervasive and momentous well-being improvement to their population. Although the massive demonstrations were primarily pushed by the rejection of authoritarian corrupted political elites, they were also triggered by the lingering disappointment raised by the persistent dearth of economic opportunities faced by Arab countries populations (Yousef, 2004; Agenor et al, 2007; Campante and Chor, 2012). More than an issue of growth level, the lack of economic opportunities may, in fact, be an issue of GDP growth sectoral composition (Mac Millan and Rodrik, 2011; Kucera and Roncollato, 2012). East-Asian economies have shown that, once capital and labour accumulation have reached a sufficient level, efficient allocation of inputs to the most productive industries becomes a crucial condition both for sustained growth and skilled job creation (Nelson and Pack, 1999). Japan, South Korea and Taiwan have caught up with developed economies because they have succeeded in transforming their production structure towards high productive activities (Young, 1995; Kim and Lau, 1994). Cross-country empirical studies have also shown that episodes of sustained GDP growth tend to be longer if structural change shifts labor and capital from the less productive firms and industries to the most productive ones (Berg et al., 2012; McMillan and Rodrik, 2011).

Accordingly, we argue in this paper that MENA economies' limited capacity to generate economic opportunities for their rapidly-growing educated population may be related to the limited expansion of new and more productive activities¹. Our implicit assumption is that MENA economies may have reached a development threshold at which the current sectoral structure of production and trade is no longer able to support efficient allocation of production factors, thereby providing young and educated workers with too few economic opportunities in the long run. This paper proposes a test of this "structural" explanation of the so-called Arab spring by comparing the MENA region GDP growth pattern with that of other Asian and Latin American middle-income countries. We show that MENA economies sharply contrast with other middle income emerging economies with respect to (1) the direct growth effect of structural change (2) the combined growth effect of structural change with physical and human capital accumulation, and (3) the way in which institutions contribute to growth. Two varieties of structural change are considered: inter-sectoral change, which is measured by the GDP share of agriculture, and intra-sectoral change towards highly exporting productive firms, which is measured by export diversification.

Our paper is connected to the growing interest for the effect of an economy's sectoral structure on various outcomes such as growth (Rodrik, 2013; Lin, 2012), productivity and labour (Kucera and Roncolatto, 2012), aid efficiency (Rajan and Subramanian, 2011), poverty (Loayza and Raddatz, 2007) or inequality (Ray, 2010). Our work also relates to the recent literature about middle-income traps (Agénor et al., 2012; Felipe et al, 2012; Eichengreen, Park, and Shin 2011; World Bank 2012) which insists on the crucial role played by the changing structure of the economy, the types of products exported and the diversification of the economy in the middle-income country's ability to switch to a more technological and skill-intensive pattern of growth.

¹ Malik and Awadallah (2011) have proposed a very complementary descriptive explanation of the economic underpinnings of the Arab Spring which focuses on various sources (weak trade integration, high dependence to natural resource rents, opportunity costs of reforms) of hindrance to the expansion of a dynamic private sector.

The remainder of the paper is organized as follows. The next section presents the econometric approach and the data used. Results and comments are presented in Section 3, while Section 4 concludes.

2. Structural change, institutions and growth: An overview

Like in other regions of the developing world, MENA economies may have reached a development threshold at which the current structure of production and trade is no longer able to support sustained GDP and income per capita increases in the long run. Recent papers have pointed out the difficulty of some Asian and Latin American middle-income countries to overcome the various institutional, economic or political obstacles that slowed down productivity increase and may prevent their economy to embark on a sustained growth path that could drive them to rapidly converge towards developed economies (Agénor et al., 2012; Felipe et al, 2012; Eichengreen, Park, and Shin 2011; World Bank 2012). Symptoms of the middle-income trap seem to be low productivity increase, rising wages and declining cost competitiveness, slow structural change compared to rising skills and expectations, high inequality, lack of dynamic specialization, difficulties in shifting from an accumulation-based to an innovation based growth pattern and various institutional inadequacies.

As for MENA economies, Table 1 shows their growth pattern from the 1980s onwards can be described as having been mostly extensive, much akin to Latin America and Sub-Saharan Africa, but in sharp contrast with developing Asia and Central and East European economies. Over that period, the region's GDP growth in volume was essentially fed by high rates of capital accumulation and government expenditures. Table 1 shows that, between 1984 and 2001, MENA levels of productivity decreased while it simultaneously increased in the other developing regions, even peaking at 2.5% annual growth in China.

Table 1: Annual averages for selected macroeconomic indicators (1984-2011)

	GDP growth (in %)	TFP growth (in %)	Investment (% of GDP)	Government expenditures (% of GDP)	Terms of Trade variation (5-year MA)	Export growth (Const. price)
World	3.57	0.70	22.77	n.a.	n.a.	6.25
Advanced economies	2.64	0.40	21.56	40.54	0.19	5.82
Developing economies	4.25	1.10	23.78	28.06	0.29	7.45
Developing Asia	7.69	1.60	33.29	21.85	-0.92	11.39
Latin America	3.17	0.00	20.47	29.88	0.33	6.19
Sub-Saharan Africa	3.70	0.20	18.57	27.28	1.03	3.75
Central and Eastern Europe	2.93	0.70	22.71	39.77	-0.69	7.16
Middle East and North Africa	3.81	-0.10	24.03	31.74	1.84	3.96

Sources: IMF World economic Outlook database, except for TFP growth (The Conference Board Total Economy Database, January 2012, <http://www.conference-board.org/data/economydatabase/>)

Micro-level evidence points to the same lack of structural change since average TFP level of MENA firms is reported to only accounts for 45% of the average TFP level of Brazilian or

South African ones (World Bank, 2009)². Likewise, manufactured goods exports in volume have grown more slowly in MENA than in other middle-income regions, even though MENA economies have experienced a steep increase of their terms of trade from the mid-1990s onwards. All in all, those figures point to the deficit of structural change that seems to have characterized MENA accumulation-led growth regime over the last thirty years.

Structural change requires that entrepreneurs invest in new activities, and such risky investments draw heavily on economic incentives that are delivered by market prices, but also by institutions and public policies. When markets perform correctly their price setting role, market incentives may be sufficient to trigger investment in new activities (Hausman and Rodrik, 2003). When various institutional features hinder innovation and risky investment, however, structural change, and the ensuing output growth and productive job creation, evolve only slowly. Costs of compliance with regulations are higher in MENA than in Eastern Europe, Latin America or East Asia (World Bank, 2009). Equally, since corruption has tended to be more pervasive than in other developing regions, MENA small- and medium-size businesses incur additional transaction costs limiting their propensity to invest in risky projects³. Furthermore, by imposing high levels of protection and job-related benefits, the high degrees of labour market regulation have limited the incentives to hire workers for the private sector. Meanwhile, significant cuts in public employment and real wages could not fully discourage young educated workers to look for jobs in governmental bureaucracies where returns to education are still higher than in the private sector (World Bank, 2004)⁴. Consequently, because of a dearth of job creation in modern activities, educated workers have been diverted from occupations in growth-enhancing activities, with a lot of them choosing to stay idle or to occupy underproductive jobs in informal services, rural activities, or public service (Pissarides and Veganzones-Varoudakis, 2007; Yousef, 2004)⁵. Throughout the whole MENA region, such a mismatch of the supply of and demand for educated workers, to be coupled with an enduring weakness of investment in new activities, may have eventually affected Total Factor Productivity (TFP) and GDP increase (Malik and Awadallah, 2011).

Despite recent trends of reforms, high corruption, low accountability, political instability and conflicts still characterize developing economies institutional systems, and this is especially true of MENA economies. (World Bank, 2003; Aysan et al., 2007, World Bank, 2009). Among the possible institutional sources of growth-increasing structural change hindrance, corruption is particularly interesting. Over recent years, corruption has alternatively been analyzed as an efficiency driver, greasing the wheel of excessively regulated systems, and as a fetter for entrepreneurship because it increases uncertainty and related transaction costs (Aidt, 2003). On the one hand, it is traditionally assumed that high levels of bribes and corruption may ceil returns to entrepreneurial investments because they act as a tax levied on factor accumulation by firms, on innovations by entrepreneurs and on investments in human capital by individuals. But on the other hand, the view that has become dominant is that corruption may mitigate, at least in the medium-run, the adverse effect of inappropriate regulation or excessive red tape on entrepreneurship (Méon and Sekkat 2005,

² It should be noticed, however, that Turkey accounts for 80% of Brazilian TFP levels, and Morocco and some rare resource-rich and labor-importing countries such as Oman or Saudi Arabia have TFP levels akin to those of the dynamic East-Asian economies (Thailand, Malaysia and China) (World Bank, 2009).

³ Financial constraint remains also high, since State-owned banks averaging 60 per cent of the total assets of banking systems, tend to favour large private or public enterprises, leaving small businesses exposed to capital shortage (Enders, 2007; Battacharya and Wolde, 2010).

⁴ However, estimations show that these returns are higher for all education levels, with the exception of the university level. Actually, what young educated people look for is also the stability associated with these public jobs (Yousef, 2004: 18).

⁵ Most of them are also involved in activities not properly recorded in national income statistics, such as the running of social services (Pissarides and Veganzones-Varoudakis, 2007).

Dreher and Gassebner, 2007). Low political accountability is another source of low growth that has been related to MENA economies deceiving performance (World Bank, 2003; Platteau, 2011) insofar as it generally entails a limited quality and quantity of public goods and services (World Bank, 2003; Besley and Persson, 2012). Institutional constraints are also tied to insufficient reforms of the business environment and the persistence of a weak property right enforcement, high costs of compliance to red-tape, and high levels of bribes and corruption⁶.

Although education has increased steadily in the MENA region during the last thirty years (World Bank, 2003), its contribution to growth has remained lower than in the rest of the world (Pissarides and Vegganzones-Varoudakis, 2007). Skilled labour absorption has been limited by such strong hindrances to labor market efficiency as hiring, wage-setting and collective bargaining rigid regulation, and a strongly protected public employment sector (Agénor *et al.*, 2007). In over-regulated and educated worker-rich countries, prospects for industrial diversification and growth may additionally be dampened by the excess educated labor endowments relatively to entrepreneurial skills (Iyigun and Owen, 1999). Accordingly, economies with a high share of educated labor force over entrepreneurs, like MENA countries today or CEECs just after having their transition to market, may be unable to efficiently use their human capital endowment insofar as investment in new activities is limited by low entrepreneurship (Rodrik and Iyigun, 2005). As a result, the poor performance of labour market in efficiently allocating talents may have ultimately triggered the discontent expression for the broad groups of educated underemployed people whose opportunity costs of revolting had become sufficiently low (Campante and Chor, 2012).

3. Method, model and data

In this paper, we contrast Middle East and North African (MENA) countries growth patterns with those of a sample of middle-income countries. Three complementary sets of growth determinants will be tested: *accumulation*, *institutions* and *structural change*. After having estimated the model on a sample of middle income countries, our comparative analysis shows that MENA economies sharply contrast with other middle income emerging economies with respect to two main dimensions: (1) the sectoral structure of production and (2) the institutional environment. The assumption of complementary effect of the accumulation, institutional and structural growth determinants is also tested. Equation (1) adapts a Solow-augmented model of growth to the aim of testing the role of the various determinants of the growth regime that were overviewed in the previous section, namely those that are related to accumulation and to the sectoral structure of the economy:

$$\Delta \text{Log} Y_{it} = \theta \Delta \text{Log} Y_{it-1} + \Psi X_{it} + \beta W_{it} + \Pi Z_{it} + \varepsilon_{it} \quad (1)$$

Vector X_{it} includes the standard determinants of growth in the Solow-augmented model, the three *accumulation* variables, i.e. population growth (*Population*), capital goods (*Investment*) and human capital (*Schooling*) accumulation⁷. Given the importance of foreign direct investment (FDI) inflows for middle-income emerging economies, the variable *FDI* is also

⁶ Some of these dimensions clearly reflect labour market red-tape instrumentation by either the organized workers of the formal sector looking for protections and higher wage guaranties or/and of the economic elites (administration and first generation of entrepreneurs linked to the administration and the rulers) claiming both for higher barriers to entry and for restrictions of credit to private small business to serve their vested interests (for a general model, see Aidt and Gassebner, 2010).

⁷ *Population* growth, *Investment*, *GDP* growth and levels are taken from the World Bank Development Indicators, except initial levels of *Schooling* that come from Barro and Lee (2000). Data definitions, sources and mean values are reported in Table A1 in Annex.

included to account for the growth-effect of non-domestic sources of investment. W_{it} is a vector of structural growth determinants. Two structural dimensions are considered: inter-sectoral structural change and the aggregate degree of economic diversification. In line with Imbs and Warziag (2003) or Temple and Woeßmann (2006), we use the agricultural share of the value added (*Agricultural share*) as our main indicator for inter-sectoral structural change. As for the second economic diversification dimension, we use an indicator of export diversification⁸ (*Diversification*) since it informs about the extent of structural change towards the more efficient and competitive exporting firms (Hausman and Rodrik, 2003; Klinger and Lederman, 2004). Z_{it} is a vector of institutional determinants. Given the high degree of correlation of governance indicators, institutions are first measured by ICRG indicator of corruption (*Corruption*)⁹ which is a comprehensive indicator of the quality of both the economic and political governance. In pure market economies, corruption is expected to hinder growth by imposing higher transaction costs and administrative costs to potential entrepreneurs and innovators. In more statist and regulated economic systems, corruption may either have a positive growth-effect, because paying bribes enables alleviating excessive regulation, or have no growth-effect at all, because investment is made by large State-owned companies in a limited number of sectors. Alternative measures of the institutional environment are, however, tested as robustness checks. The term $\Delta \text{Log} Y_{it-1}$ of Equation (1) signals that our model is dynamic, with lagged growth as an additional variable. In order to control for fixed effects and to correct for endogeneity bias, Equation (1) is estimated by GMM-system on a panel of 21 middle income and emerging countries from Asia, Latin America and Middle East and North Africa¹⁰ and annual data covering 1984-2008. The baseline growth model specification is drawn from the growth literature and is supposed, without much discussion, to correctly model the three main long-term growth determinants: *accumulation, institutions and governance quality and structural change*. The comparison of MENA and non-MENA growth patterns is justified under this assumption.

4. Baseline regressions

Results for the system-GMM estimation of equation (1) are reported in Table 1¹¹. Column 1 shows the results for the overall sample of middle-income countries. The coefficients for the core variables of the Solow-augmented model all have the expected sign and are highly significant (*Initial GDP, Investment, Labour*), except *Schooling*¹². As for structural change variables, higher non-manufactured share of the value added (*Agricultural share*) and higher export concentration (*Diversification*) both have an individual adverse effect on growth. This result suggests that the entrepreneurs' capacity to introduce new tradable goods through investments in modern non-agricultural activities may be a key factor to explaining higher growth, for a given level of all other growth determinants. The positive *FDI* effect suggests that, for the average middle-income country of our sample, GDP growth is increased by access to foreign technologies, in the case of extractive or horizontal investments, and/or to world value chains, in the case of vertical or platform investments. As for the institutional

⁸ We use the UNCTAD's indicator of *Diversification*, which is measured by a Herfindhal index of concentration. It means that a higher value of the index corresponds to a higher concentration, and therefore, a lower diversification of the export structure.

⁹ We use the ICRG indicator of corruption, which takes a higher value when perceived corruption is lower.

¹⁰ Algeria, Argentine, Brazil, China, Chile, Egypt, India, Indonesia, Malaysia, Mexico, Morocco, Pakistan, Paraguay, Peru, Philippines, Thailand, Tunisia, Turkey, Uruguay, Venezuela.

¹¹ Sargan/Hansen instruments' validity tests and Arellano and Bond (1991) first and second order autocorrelation tests are reported in the bottom panel of the tables.

¹² As is usual in the Solow augmented model, the coefficient for the speed of global convergence is computed as $(\theta-1)$. A positive sign means that convergence occurs.

determinant, lower corruption increases GDP growth for our sample of countries. Our sample of middle-income countries thus supports the “sanding the wheel” hypothesis (Aidt, 2003) according to which corruption acts as critical hindrance to investment and innovation.

Estimations of the model (1) have been rerun on MENA and non-MENA sub-samples (Table 1). Chow test results reported at the bottom of the Table 1 confirm that the estimated coefficients are significantly different for the two sub-groups¹³. As regards non-MENA countries, results are akin to the baseline regression results of Column (1) in so far as all the variables included in the baseline specification (GDP_{t-1} , *Schooling*, *Investment*, *Population*, *Diversification*, the *Agricultural share*, *FDI* and *Corruption*) have significant coefficients with the expected sign. The two varieties of structural change that are considered, *i.e.* an extension of the non-agricultural activities and a de-concentration of the traded goods and services structure, have a significant positive effect on GDP growth. In addition, less corruption has also positively contributed to output growth during the period.

Table 2. GMM-System estimation of GDP growth for MENA and non-MENA countries

	Overall sample (1)	MENA countries (2)	Non-MENA countries (3)
GDP_{t-1}	.8549*** (9.64)	.9359 *** (7.88)	.8504*** (8.57)
Investment	.0096*** (9.61)	.0056*** (3.51)	.0108*** (9.34)
Schooling	.0014 (1.33)	.0045** (2.43)	.0009 (0.84)
Population	.7067*** (3.99)	.1254** (2.23)	.7646*** (4.12)
Diversification	-.3156*** (-3.41)	-.1075 (-0.63)	-.5468*** (-3.84)
Agricultural share	-.0064*** (-2.81)	.0033 (1.18)	-.0139*** (-4.61)
FDI	.0068*** (4.22)	.0036** (1.92)	.0099*** (4.83)
Corruption	.0057*** (2.37)	.0015 (0.34)	.0066*** (2.84)
Constant	-1.5534** (-2.52)	.1210 (0.58)	-2.1667 (-3.24)
Wald Chi2 test	$\chi^2 = 2559.46$ P = .000	$\chi^2 = 3530.09$ P = .000	$\chi^2 = 2345.56$ P = .000
Overidentification Sargan J test	P = .034	P = .590	P = .216
AR(1) Arellano-Bond test	P = .010	P > z = .030	Pr > z = .027
AR(2) Arellano-Bond test	P = .884	P > z = .183	Pr > z = .589
Observations	504	120	384
Chow test	F(8,488) ; Pr > F=.004		

Notes: *** Significance at 1% level; ** Significance at 5% level; * Significance at 10% level

¹³ Mean- and variance-difference tests on *GDP*, *Schooling*, *Population*, *Investment*, *FDI*, *Agricultural share*, and *Corruption* show that the MENA sub-group exhibits systematically lower level and higher heterogeneity for all variables, except for *Corruption* whose level is significantly higher. The results are not reported in the paper, but they are available on request.

As for the MENA countries, estimations are fairly close in what concerns the Solow-augmented set of variables since GDP_{t-1} , *Schooling*, *Investment*, *Population* are all significant with the expected sign, including *Schooling*¹⁴. The picture is clearly different in the case of structural and institutional determinants. In what concerns structural determinants, neither a decrease in *Agriculture share* nor an increase of *Diversification* have significantly impacted GDP growth during the period. This result supports our assumption that MENA economies' main driver of growth has remained capital accumulation, including human capital accumulation, from the mid-1980s onward and not structural change. Whereas corruption was detrimental to growth on the overall sample and for the non-MENA economies of this sample, it had no significant positive or adverse effect on growth for MENA economies during the period.

This result could be somewhat surprising to anyone having directly experienced the high levels of central and decentralized corruption plaguing MENA economies. A first explanation is statistical. Since all MENA countries exhibit uniformly high corruption levels, the low variability of this variable may explain the non significance of the estimated coefficient. However, a more strictly economic explanation may be advanced. Corruption may possibly be less detrimental to growth for resource-based economies than for industrial economies. But another interpretation may be that these economies specific pattern of extensive growth has succeeded in accommodating itself with the corruption's detrimental impact on the productive sector. As found by Aidt *et al.* (2008) and Aidt (2009), although corruption has little effect on growth for economies which converge towards a bad equilibrium, its adverse impact becomes larger for countries converging to the good institutional equilibrium. Our results may therefore support the idea that MENA economies have converged towards a low-level institutional equilibrium, whereas the non-MENA economies of our sample have rather converged to a high-level equilibrium. MENA countries may well have been trapped in a stable equilibrium combining low diversification and high levels of state regulation of the economy, with the former being having favored high levels of corruption. Cuberes and Jerzmanowski (2009) have described similar patterns and provided supporting evidence that more highly regulated, and therefore, corrupt, economies also tend to be less diversified and sophisticated. By extension, the "greasing the wheel" hypothesis cannot be rejected for MENA whereas our results show that it tends to be rejected for non-MENA middle-income economies.

5. Complementary effects

Introducing interactive terms in Equation (1) enables to examine how the growth effect of the structural change variables is affected by the other growth determinants. It shows if structural, accumulation and institutional growth determinants have non linear (either cumulative or contradictory) growth effects. As argued by Agénor *et al.* (2007: 278), insofar as structural change requires a high degree of private actors' reaction to a significant change of economic incentives, the odds are that MENA region's heavy institutional rigidities will constrain TFP and GDP growth, via the channel of their adverse impact on structural change. Our three groups of *accumulation*, *structural* and *institutional* growth determinants may possibly exhibit complementarities that can be assessed by estimating the growth equation with various interactive terms. Results for those non-linear specifications for MENA and non-MENA countries have been reported in Table 2.

¹⁴ Foreign investment has also increased GDP growth during the period.

Table 3. Regressions with interactive terms (1984-2011): non-MENA and MENA sub-groups

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Non-MENA countries				MENA countries			
GDP _{t-1}	.9148*** (8.55)	.8461*** (8.33)	.8297*** (8.14)	.8524*** (8.58)	.7879*** (9.40)	.8065*** (9.15)	.8083*** (8.08)	.9384*** (8.63)
Investment	.0103*** (8.02)	.0108*** (9.35)	.0104*** (9.01)	.0108*** (9.34)	.0015 (0.69)	.0032* (1.77)	.0037*** (2.13)	.0055*** (3.42)
Schooling	.0003 (0.29)	.0007 (0.67)	.0017*** (2.56)	.0045* (2.43)	.0001 (0.13)	.0044* (2.07)	.0037* (1.79)	.0045* (2.43)
Population	.5039*** (2.77)	.8114*** (4.39)	.7039*** (3.13)	.7580*** (4.08)	1.0064*** (2.71)	.8046*** (2.49)	1.1028*** (3.28)	.1218** (2.16)
Corruption	.0052** (1.90)	.0082*** (2.96)	.0021 (0.33)	.0116 (0.62)	.0001 (0.02)	-.0026 (-0.51)	.0080 (0.43)	.0354 (0.67)
FDI	.0044*** (2.90)	.0106*** (5.19)	.0021*** (5.43)	-.0139*** (4.60)	.0025 (1.17)	.0025 (1.20)	.0023 (1.12)	.0032 (1.56)
Agricultural Share		-.0084*** (-2.56)	-.0076*** (3.05)			.0019 (0.57)	0.024 (0.59)	.0035 (1.24)
Diversification				-.5340*** (-3.71)				-.0795 (-0.45)
Investment*Schooling	.0009** (1.97)				.0013* (1.84)			
Agricultural*Schooling		-.0001*** (-3.64)				.0001 (1.45)		
Agricultural*Corruption			-.0004 (1.09)				-.0008 (-0.51)	
Diversification*Corruption				-.0204 (-0.76)				-.0631 (-0.71)
Constant	-1.4330*** (-2.22)	-2.1208*** (3.19)	-1.2432 (-1.29)	-2.1543*** (-3.22)	-2.2553 (-1.57)	-1.6385*** (-1.56)	-2.9468*** (2.41)	-1.9381 (-1.89)
Wald Chi2 test	$\chi^2=2288$ P=.000	$\chi^2=2370$ P=.000	$\chi^2=2451$ P=.000	$\chi^2=2331$ P=.000	$\chi^2=650$ P=.000	$\chi^2=650$ P=.000	$\chi^2=664$ P=0.000	$\chi^2=600$ P=0.000
Overidentification J test	P(> χ^2)=.038	P(> χ^2)=.165	P(> χ^2)=.089	P(> χ^2)=.242	P(> χ^2)=.563	P(> χ^2)=.561	P(χ^2)=.573	P(χ^2)=.614
AR(1) A-B test	P(> z)=.002	P(> z)=.066	P(> z)=.011	P(> z)=.039	P(> z)=.083	P(> z)=.087	P(> z)=.032	P(> z)=.030
AR(2) A-B test	P(> z)=.047	P(> z)=.636	P(> z)=.089	P(> z)=.436	P(> z)=.387	P(> z)=.869	P(> z)=.946	P(> z)=.166
Individuals	384	384	384	384	120	120	120	120

To begin with, it should be noticed that the addition of the interactive terms to the model does not modify neither the results for the Sargan and Arellano-Bond tests, nor the signs and significance of the core variables. Columns (3), (4), (7) and (8) show that the interaction of *Corruption* with *Agricultural share* or *Diversification* is never significant, even for the non-MENA subsample.

Table 4. Dependent variable: GDP growth rate (1984-2011): MENA sub-group

	(1)	(2)	(3)	(4)	(5)
GDP _{t-1}	.9359*** (7.88)	.9224*** (9.79)	.9350*** (9.31)	.9274*** (9.95)	.9316*** (9.47)
Investment	.0056*** (3.51)	.0066*** (4.23)	.0059*** (3.72)	.0062*** (3.83)	.0061*** (3.82)
Schooling	.0045** (2.43)	.0035** (1.89)	.0033** (1.84)	.0035** (1.89)	.0034** (1.88)
Population	.1255** (2.23)	.1428** (2.35)	.1274*** (2.16)	.1380** (2.31)	.1252** (2.15)
Diversification	-.1075 (0.63)	-.0782 (-0.69)	-.0172 (-0.15)	-.0744 (-0.66)	-.0766 (-0.68)
Agri. share	.0033 (1.18)	.0029 (1.03)	.0034 (1.18)	.0030 (1.04)	.0029 (1.04)
FDI	.0036** (1.92)	.0038 (1.54)	.0034** (1.81)	.0038 (1.54)	.0041** (1.99)
Corruption	.0015 (0.34)				
Investment climate		.0038 (0.89)			
Bureaucracy quality			.0180** (2.01)		
Internal conflict				.0039 (0.92)	
Social conditions					.0029 (0.72)
Constant	.1210 (0.58)	.2173 (0.89)	.1769*** (0.61)	.2248 (0.87)	.2343 (0.99)
Wald Chi2	$\chi^2(8)=3530.09$ P = 0.000	$\chi^2(8)=3852.2$ P = 0.000	$\chi^2(8)= 3520.95$ P = 0.000	$\chi^2(8)=3970.4$ P = 0.000	$\chi^2(8)= 3654.62$ P = 0.000
Overid. J test	P(> χ^2) = 0.59	P(> χ^2) = 0.58	P(> χ^2) = 0.69	P(> χ^2) = 0.58	P(> χ^2) = 0.59
AR(1) A-B test	P(>z) = 0.030	P(>z) = 0.03	P(>z) = 0.034	P(>z) = 0.054	P(>z) = 0.072
AR(2) A-B test	P(>z) = 0.183	P(>z) = 0.184	P(>z) = 0.187	P(>z) = 0.166	P(>z) = 0.179
Individuals	140	140	140	140	140
Instruments	124	124	126	124	126

Note: ***(1%) ;**(5%) ; *(10%).

Although corruption has an adverse effect on GDP growth, *per se*, in both the non-MENA and overall sample of countries, it does not modify significantly the growth effect of the accumulation (*Investment*) or structural change (*Agricultural share*) determinants. Accordingly, structural change may have been too slow in MENA economies, thereby limiting the growth impact of schooling improvements throughout the whole region. Hence, the assumption that an improved institutional environment increases the growth effect of investment and structural change is not supported by our sample, at conventional risks levels.

As for the non-linear effects of accumulation and structural determinants of growth, our results are more conclusive. The coefficient for the interactive term between *Investment* and *Schooling* in Columns (1) and (4) is always positive and significant, whatever the sample. The growth effect of capital accumulation is, therefore, reinforced by human capital accumulation in both sub-samples. In addition, the positive effect of schooling, in Columns (2) and (6), is

magnified by a lower share of non-agricultural industries, but only for non-MENA economies. It should be noticed, moreover, that in the case of MENA countries, the singular growth effect of schooling is left unchanged and significant when the *Schooling*Aggricultural share* interactive term is introduced (Column 6). It suggests that although the growth-effect of schooling was magnified by structural change in non-MENA middle-income economies, it was not the case in MENA economies.

Table 5. Dependent variable: GDP growth rate (1984-2011): Non-MENA sub-group

	(1)	(2)	(3)	(4)	(5)
GDP _{t-1}	.8504*** (8.57)	.8590*** (9.09)	.8825*** (9.50)	.8406*** (9.01)	.8325*** (9.16)
Investment	.0108 *** (9.34)	.0102 *** (8.87)	.0106*** (9.22)	.0102*** (9.02)	.0107 *** (9.46)
Schooling	.0009 (0.84)	.0009 (1.40)	.0009 (1.43)	.0002 (0.21)	.0002 (0.20)
Population	.7645*** (4.12)	.8436*** (4.04)	.8328*** (4.05)	.6154** (2.76)	.4054** (2.04)
Diversification	-.5467*** (-3.84)	-.3610*** (-3.43)	-.3363*** (-3.21)	-.3268*** (-3.12)	-.3250*** (-3.10)
Agri. share	-.0009 *** (-2.86)	-.0073*** (-2.97)	-.0068*** (2.81)	-.0071*** (-2.88)	-.0067*** (-2.76)
FDI	.0099*** (4.83)	.0108*** (5.39)	.0105*** (5.20)	.01054*** (5.26)	.0107*** (5.34)
Corruption	.0065*** (2.84)				
Investment climate		.0078*** (2.90)			
Bureaucracy quality			.0123*** (2.57)		
Internal conflict				.0075*** (2.80)	
Social conditions					.0069*** (2.58)
Constant	-1.2013 (1.25)	-.7459 (0.77)	.0123 (1.20)	.2716 (0.33)	.1515 (0.19)
Wald Chi2	$\chi^2(8)=2345.56$ P = 0.000	$\chi^2(8)= 2372.80$ P = 0.000	$\chi^2(8)= 2545.65$ P = 0.000	$\chi^2(8)=2464.63$ P = 0.000	$\chi^2(8)= 2471.59$ P = 0.000
Overid. J test	P(> χ^2) =0.216	P(> χ^2) = 0.062	P(> χ^2) = 0.085	P(> χ^2) =0.030	P(> χ^2) =0.087
AR(1) A-B test	Pr>z=0.027	Pr>z=0.023	Pr > z =0.034	Pr > z = 0.0380	Pr > z = 0.086
AR(2) A-B test	Pr > z = 0.589	Pr > z = 0.813	Pr > z = 0.187	Pr > z = 0.4464	Pr > z = 0.1937
Individuals	448	448	448	448	448
Instruments	252	251	252	252	253

Note: ***(1%) ;**(5%) ; *(10%).

MENA middle-income economies therefore exhibit a somewhat specific pattern of long-term growth, with structural change and governance having very limited impact on the limited pace of economic expansion. These results confirm that MENA economies need urgent reforms to accelerate structural change and make their educated labour force contribute more broadly to both productivity and output increase.

6. Robustness

What about our results if we substitute alternative measures of the institutional context to the *Corruption* variable? The significant association of the low levels of corruption with higher growth performance over the whole sample can be attributed to such correlated outcomes as the higher quality of the general institutional environment, the economic administration or the social climate more hospitable to entrepreneurs and investment. In these cases, our story about corruption and entrepreneurship should be discussed. Tables 4 and 5 present estimations of the model (1) of Table 2 for both the MENA and non-MENA subgroups with alternative institutional indicators included. Our estimations show that although for the MENA subgroup, only the administration quality has a significant and positive impact on economic growth, it is the case of all the dimensions of institutional quality of the non-MENA subset. Hence, it is the nature of the relationship between those having political or economic power and those needing their service that matters for explaining differences in economic performance between MENA countries. Internal conflicts, social conditions and the investment climate have not the impact they have for explaining the variation of economic growth performance in non-MENA middle-income countries. This confirms the singular nature of the institution-growth relationship in the MENA countries.

7. Conclusion

MENA countries are currently undergoing socio-political instability that may be rooted into their specific pattern of structural change. In this paper, we show that long-term structural change – between- and within-sectors – had no direct influence on their growth rate from the mid-1980s onwards, whereas it significantly increased growth for other middle-income countries. Our paper shows that MENA economies sharply contrast with other middle income emerging economies with respect to two structural features: (1) the sectoral structure of production and (2) the institutional environment. Two main dimensions of explanation are addressed by our analysis. First, in a context of increasing competition for access to global markets and attraction of foreign investment, most MENA economies have failed to diversify their production and export out of the commodity sector. Second, the climate of corruption and rent-seeking and the lack of political freedom may have increased uncertainty as regards the rules of the game, eventually hindering private investment and preventing the related emergence of entrepreneurs (Noland and Pack, 2007, World Bank, 2009; Battacharya and Wolde, 2010). By the same token, Rougier (2014) has recently argued by that the authoritarian-redistributive social may have played a crucial role to explain these features. More research is needed to address this question at a more disaggregated level, as well as to relate structural change to the provide a more fine-grained analysis of the different factors, as well as of their specific modes of complementarity, that were conducive to such growth and structural change disappointing performances.

Appendix

Table A1. Definition and average value of variables

Variables	Definition	Sources
GDP; GDP growth	GDP level and GDP annual growth rate	World Bank WDI
Investment	Gross capital accumulation (in GDP %)	World Bank WDI
Schooling	Secondary schooling attainment rate	Barro and Lee (2000) updated by the authors
Population	Annual population growth rate	World Bank WDI
Corruption, Investment profile, Bureaucracy quality, Internal conflicts, Social conditions	Institutional ratings	ICRG
FDI	Annual FDI inflows	UNCTAD
Diversification	Herfindhal index of concentration	UNCTAD
Agricultural share	Agricultural share of the GDP (in %)	World Bank WDI

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