Foreign Direct Investment, Institutions and Economic Growth: Evidence from the MENA Region

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Abstract: Few scientific papers treat the role of institutions on the relationship between foreign direct investment (hereafter FDI) and economic growth. In the existing literature, the FDI effects on growth are not easy to understand. Mixed findings, both theoretical and empirical, have been provided on this issue by the academic research. The first contribution of this study is an analysis of how institutions quality affects FDI-growth nexus. The second contribution is the use of the Panel Smooth Transition Regression (PSTR) modeling because the nexus between FDI and economic growth is nonlinear and depends on specific national factors especially institutions quality. This method helps to account for a change of regime in the effects of FDI on economic growth. The major finding of this study is that the effect of FDI on economic growth is conditional to the development of institutions in MENA countries. Empirically, on a sample of 19 MENA countries over the period 1984-2011, we found that only countries with good institutions can exploit the advantages of FDI on growth.

Keywords: Economic growth, FDI, institutions quality, PSTR, MENA countries.

1. INTRODUCTION

The liberalization of the economy is necessary for better mobilization of savings, diversification of risks to lead to growth. Most developing countries eased restrictions on FDI and offered many tax incentives to attract foreign capital. Not surprisingly, thus, an important number of academic researchers have examined the relationship between FDI and economic growth because FDI is considered one of the most stable components of capital flows and is identified as a vehicle of technology transfer that improves factors productivity. FDI is often regarded as an important way and plays an ambiguous role in contributing to economic growth. Literature suggests that FDI can stimulate economic growth only under certain particular policy hypotheses, especially, the quality of institutions. Institutions quality is regarded as key factor of economic growth. Fatih Ahmed (2010) highlights that institutional framework supports markets, facilitates economic exchange, defines and protects rights, registers and enforces contracts. Proficient and established institutions provide an appropriate environment for growth-enhancing activities like investment, innovation, and entrepreneurship, and permit society to function smoothly as individuals are able to invest their time in fruitful activities.

The quality of institutions in host countries affects growth directly through influencing total factor productivity, and indirectly through influencing investment. When institutions are weak, the legal system doesn't work effectively and seems to be an impediment to attract FDI. The share of FDI is lower in countries with weak institutions. In contrast, high quality institutions secure foreigners against the risk of expropriation and increase the amount of FDI. We can point out that FDI and institutions go hand in hand and that FDI is fostered by the effectiveness of institutions. The role of institutions quality has not received considerable and growing attention in literature. This paper fills this gap in examining this impact on economic growth (Bénassy-Quéré *et al*. 2007; Kohler 2010, Jude and Levieuge 2013).

The main purpose of our paper is to explore what is beyond the role of institutions as a determinant of FDI inflows and consider institutional quality as a feature of absorptive capacity. Though a limited theoretical contribution regarding the interpretation and analysis of the relationship between the growth of FDI and the quality of institutions, we tried to rise up significant arguments that can support and maintain the hypothesis of the heterogeneous effect on FDI growth based on the quality of institutions. We will analyse in concomitant manner FDI and institutions. To our knowledge, no attempts have so far been made to investigate the relationship between FDI, institutions and economic growth in the MENA region. This first study contributes to the existing literature in several ways. Firstly, motivated by the benefits generated by FDI that can intensify when institutions quality improves, we revisit the nexus between FDI and institutions in generating outcome by applying a PSTR

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in all MENA countries as the potential for institutional heterogeneity to expect the existence of a threshold level influencing the FDI-economic growth nexus. Secondly, the advantage of PSTR over other alternative models (fixed effect, random effect and GMM in system) is that the estimation of the thresholds is endogenous.

The rest of this paper is structured as follows: Section 2 provides a brief review of the literature and discusses the relationship between FDI, institutions and economic growth. Section 3 describes the empirical methodology and reports estimations results. Section 4 concludes.

2. RELATED LITERATURE

The main channel of the FDI influence on economic growth is the productivity enhancement that the foreign affiliates spread and share with the domestic organizations. Stakeholders' relationships and convergences play a crucial role in occurring spillovers, increasing firm's competitive advantages, and labor turnover. Foreign investment intensifies competition in the industry it enters, both by increasing the number of competitors, and by introducing new ways to compete (Blomström and Kokko, 2003; Driffield and Love, 2007). Local firms may adapt their strategies to counter the challenge, and thus to raise their competitive edge (Bowen and Wiersema, 2005).

Several researches have investigated the relationship between the Institutions' quality and their impact on the FDI. This impact was analyzed on the basis of different methodologies, time spans, and geographical. The first line of action of FDI on economic growth takes place through Institutional quality and productivity spillovers, the core influence of FDI on economic growth consists of productivity improvements from foreign affiliates to domestic firms. According to North (1990), the analysis of the institutions helps to clarify their economic performance based on their organizational behavior and change management. The majority of researches asserted that the "Well-functioning institutions" represent a crucial factor of attracting FDI. Even if the concept of institutions' quality was not as important as it is today, the current situation allowed to report the necessity of better promoting and organizing the field to reach the objectives assigned by institutions to enhance their capacity and capability. In this project we are trying to diagnoses the present, and build the future to explain and understand the realities of what really works and what is the correlation between the FDI growth and the quality of institutions. North (1990) contends that any theory on institutions must be based on human behaviors since all institutions are created and changed by humans.

Daude and Stein (2007) demonstrate that inward FDI is deeply influenced by the quality of institutions. Busse and Hefeker (2007) find that governmental stability; internal and external conflict; ethnic tensions; law and order; democratic accountability of government; and the quality of bureaucracy are highly significant in determining FDI inflows in the sample of 83 developing countries. On the other side, Meon and Sekkat (2004) investigated the impact of the quality of institutions on manufactured exports and FDI in MENA countries. Their results show that a low level of corruption and high level of bureaucracy contribute significantly to the firms' decision related to invest abroad. Daniele and Marani (2007) analyzed the factors of FDI towards the MENA countries where the growth of FDI flows proved to be notably inferior to the one recorded in the European and Asian economies, especially China and India. They suggest that MENA require deep institutional reforms in order to improve the attractiveness in terms of FDI.

Accordingly, Guerin and Manzocchi (2009) put forward that, in 1992-2004, democracy positively affected the amount of FDI flows; while most empirical studies show that corruption affects negatively the amount of FDI flows. Wei (1997, 2000) stipulates that when multinationals are not sure about the host country's corruption, this will negatively affect their choices for FDI locations. This idea is supported by the empirical tests of Voyer and Beamish (2004), Habib and Zurawicki (2002). In addition, Onyeiwn (2003) has also tried to study the effect of corruption on FDI in the MENA region. As a matter of fact, local firms hinder any foreign entry if they have sound reasons for their refusal (Chen *et al.* 2007). When countries receive foreign investment, competition in industry will intensify as not only the number of competitors will increase but also new ways of competitiveness will develop (Dunning, 1988). This competition will urge local firms to enhance their strategies to face the challenge and therefore to raise their competitive edge (Bowen and Wiersema, 2005). It is worth noting that the local firms' reaction to competition depends on their motivation and thus the incentives they face. The latter depend on the institutional framework and in particular the effectiveness of both domestic and institutional markets

(North, 1990; Peng *et al*. 2008) and the national innovation system (Nelson, 1993; Lundvall *et al*. 2002). Copy rights and research and development protection processes highly affect the quality of institutions and deeply influence the technology transfer from the main office to affiliates overseas. Following the same logic than Busse and Hefeker (2007) and Ali *et al*. (2010), we argue that institutions can increase and optimize not only the FDI quantity, but also their quality. Instability and change inside institutional environment threaten the organization progress and increase risks. Low institutional quality will be followed by a low-technology, resource exploiting and limited potential growth of FDI.

According to Mody and Murshid (2005), financial integration allows agents to optimize their investment portfolios, and this may not involve increasing domestic investment. Their results show that the surge in capital flows during the 1990s was driven largely by this diversification motive. Countries with better policies did have greater success in absorbing foreign inflows. At least in part, this could be because improved policies raised the marginal product of new investments, while at the same time they created an environment conducive for the diffusion of new technologies and ideas intrinsic to foreign capital. Improved policies probably also reduced the risk of holding domestic assets, which in turn, by discouraging capital outflows, would have further enhanced the relationship between capital flows and investment.

Based on an annual aggregate data presenting 46 developing countries, Morrissey and Udomker-dmongkol (2012) tried to analyze the FDI and their impact on the domestic private investment. They investigated on alternative elements of governance and their different impacts on FDI and private investment relationship. According to them, good governance is the key factor that attracts greater total investment. The extent of crowding out is highly dependent on the degree of governance transparency and trust. Political stability and absence of corruption are the most stimulated elements of FDI and the core dimension of building trust and confidence in the business environment. They demonstrated how an increase in FDI has the greatest effect on reducing private investment while it leads to a significant increase of total investment) inside political stable regimes.

We argue that institutions may reduce the crowding-out effect by encouraging foreign investment in new fields, where domestic competition has lesser density. Supply chain designing is also crucial and can affect the performance of the organization when taking advantage of the entrance of new suppliers into the market. The interaction between foreign and domestic investment can also occur through the financial market, especially in the case of mergers and acquisitions. For Méon and Sekkat (2008), the control of corruption led to a positive and significant growth of the manufactured goods export within political stability.

3. ECONOMETRIC FRAMEWORKS AND MAJOR FINDINGS

3.1. Data and Model

This section describes the econometric approach to evaluate the link between FDI, institutions and economic growth. The empirical evidence on the effect of FDI, institutions on economic growth is less conclusive. Our empirical study is based on a sample of 19 countries (*Algeria, Bahrain, Egypt Arab Rep, Irak, Iran, Islamic Rep, Israël, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, Tunisia, Turkey and United Arab Emirates*) over the period 1984-2011.

PSTR models have better fitting performance and predictability than linear models and also estimates the smoothness of the transition through regimes. The basic PSTR model with two extreme regimes is defined as:

$$y_{it} = \mu_i + \alpha_0' x_{it} + \alpha_1' x_{it} G\left(z_{it-d};\gamma,c\right) + \varepsilon_{it} \quad \text{(Eq. 1)}$$

Where i=1…, N, and t=1,…, T. N and T denote the cross-section and time dimensions of the panel, respectively. y_{it} is a dependent variable and x_{it} is a K-dimensional vector of time-varying exogenous variables. μ_i represents the fixed individual effect. $G\left(z_{it-d};\gamma,c\right)$ is the transition function bounded between 0 and 1 and dependent on the transition variable z_{it}, which can be an exogenous variable or a combination of the lagged endogenous one. d is the delay of transition (the optimal lag length for the transition variable). γ is the slope parameter, describing the slope of the transition function. c is the threshold or location parameter. γ and c are endogenously estimated. ε_{it} is a residual term ($\varepsilon_{it} i.i.d\left(0,\sigma_\varepsilon^2\right)$). In a panel framework, the logistic or exponential specification can be used for the transition function:

Logistic function:

$$G\left(z_{it-d};\gamma,c\right)=\left[1+\exp\left(-\gamma\prod_{j=1}^{m}\left(z_{it-d}-c_j\right)\right)\right]^{-1} \quad \text{(Eq. 2)}$$

Exponential function:

$$G\left(z_{it-d};\gamma,c\right)=1-\exp\left(-\gamma\prod_{j=1}^{m}\left(z_{it-d}-c_j\right)^2\right) \quad \text{(Eq. 3)}$$

Where$\gamma>0$ and $c_1 \le c_2 ..... \le c_m$. m is the number of location or threshold parameters. When $\gamma\to\infty$, the PSTR converges towards a panel transition regression (PTR) model. On the contrary, when $\gamma\to 0$, the transition function is constant and the PSTR estimation becomes a panel with fixed effects. Gonzales *et al*. (2005) argued that from an empirical point of view, it is sufficient to consider only the cases of m=1 or m=2 to capture the non linearities due to regime switching.

In this study, we will use the institutional variable as a transition variable z_{it-d}, the PSTR model is defined as follow:

$$GDP_{it} = \mu_i + \alpha_0^{'}\mathrm{FDI}_{it} + \alpha_1^{'}\mathrm{FDI}_{it}G\left(z_{it-d};\gamma,c\right)+\delta^{'}x_{it}+\varepsilon_{it} \quad \text{(Eq. 4)}$$

Where x_{it} is k-dimensional vector of growth (inflation, trade, commodity price, government consumption, domestic investment population and bilateral exchange rate), d is the delay of transition. To resolve the endogeneity bias of FDI, we use Ng and Perron (1995) test to determine the optimal lag length of the FDI ($\varepsilon_{it} i.i.d\left(0,\sigma_\varepsilon^2\right)$).

$$GDP_{it} = \mu_i + \sum_{j=1}^{p}\alpha_j\mathrm{FDI}_{it-j} + \left\{\left(\sum_{j=1}^{p}\alpha_j^{'}\mathrm{FDI}_{it-j}\right)*G\left(z_{it-d};\gamma,c\right)\right\}+\delta^{'}x_{it}+\varepsilon_{it} \quad \text{(Eq. 5)}$$

The final model to estimate in this study is:

$$GDP_{it} = \mu_i + (\alpha_0+\alpha_1\mathrm{FDI}_{it-1}) + (\alpha_0^{'}+\alpha_1^{'}\mathrm{FDI}_{it-1})*G\left(z_{it-d};\gamma,c\right)+\delta^{'}x_{it}+\varepsilon_{it} \quad \text{(Eq. 6)}$$

Where: GDP is the real GDP per capita growth. FDI is the foreign direct investment. X: is the vector of explanatory variables (inflation, trade, government consumption, domestic investment, population, commodity price index and bilateral exchange rate). INS: We use 12 measures of institutions including government stability, socioeconomic conditions, investment profile, law and order, corruption, internal conflicts, external conflicts, democratic accountability military in politics, religion in politics bureaucracy quality and ethnic tension. ε is the error term. Real GDP per capita growth, FDI, inflation, trade, government consumption, domestic investment and population are taken from the World Bank (World Development Indicators), Exchange rate is taken from Datastream, oil price material from UNCTAD and the institutional variables are taken from the International Country Risk Guide Database (ICRG). A definition and abbreviations of all the variables and their sources is provided in Appendix 1.

Table **2** contains the descriptive statistics for the variables that investigate the effect of FDI and institutions on growth. It presents means, standard deviation, minimums and maximums of all the variables.

Table **3** presents the correlation coefficients of the institutional variables used in our models. This symmetric matrix measures correlation on a scale with 1 indicating a perfect positive correlation, zero no correlation and -1 perfect negative correlation. Results indicate that all correlation coefficients are lower than

Table 1: Optimal Lag Length of the FDI[1]

Lag length of the FDI	Coefficient	T-stat	p-value
Constant	1.527***	5.165	0.000
FDI (1)	0.702***	10.015	0.000
Ljung-Box Q-Statistics	**Lags**	**χ^2 -Stat**	**p-value**
	Lag (6)	14.385**	0.025
	Lag (12)	24.727**	0.016
	Lag (18)	28.699**	0.052
	Lag (24)	34.804*	0.071

[1]The coefficient of the second lag of FDI is insignificant at the level of 10%.
, * and * indicate statistical significance at the 5%, 10% and 1% level.

Table 2: Summary Statistics

VARIABLES	Observation	Mean	Std.Dev.	Min	Max
Real GDP per capita growth	469	1.391	6.345	-42.930	42.579
Real GDP per capita (US dollars)	509	$1.4\ 10^{14}$	$2.49\ 10^{15}$	$2.72\ 10^{9}$	$5.20\ 10^{16}$
FDI over GDP	527	2.209	3.468	-4.260	33.365
FDI (US dollars)	508	1640.88	4059.67	1174.9	39455.9
SIZE	456	18.389	7.434	4.835	76.222
DI	438	21.891	5.936	5.539	44.058
INF	473	1.819	1.372	-2.862	6.608
EXCH	532	4.158	0.543	2.092	6.206
POP	529	2.175	1.448	-1.083	4.415
TRD	532	-0.003	2.261	-5.643	3.924
CP	532	-0.235	2.806	-3.616	8.108
LAW	532	3.684	1.332	1	6
CORP	524	2.505	0.896	1	5
SOCIO	517	5.699	2.084	5	11
INVP	532	7.098	2.422	1	11.5
EXTC	532	8.568	2.294	2	12
DEMO	524	2.704	1.439	0.416	6
GOVS	531	8.065	2.334	1	11.5
INTC	528	7.951	2.756	1.666	12
MILP	487	3.546	1.530	0.083	10.5
BUR	512	1.945	0.733	0.083	4
RELP	514	3.274	1.465	0.083	10.5
ECTH	516	3.830	1.475	0.083	6

Table 3: Correlation Matrix of Institutional Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LAW (1)	1.000											
CORP (2)	-0.021	1.000										
SOCIO (3)	0.421	0.017	1.000									
INVP (4)	0.548	-0.176	0.536	1.000								
EXTC (5)	0.534	0.033	0.291	0.415	1.000							
DEMO (6)	0.006	0.233	-0.114	0.014	-0.071	1.000						
GOVS (7)	0.600	-0.250	0.362	0.625	0.557	-0.202	1.000					
INTC (8)	0.703	-0.090	0.418	0.407	0.686	-0.170	0.671	1.000				
MILP (9)	0.407	0.058	0.486	0.408	0.373	-0.080	0.348	0.409	1.000			
BUR (10)	0.313	0.370	0.259	0.232	0.118	0.456	-0.008	0.028	0.369	1.000		
RELP (11)	0.335	-0.132	0.311	0.345	0.430	-0.210	0.481	0.495	0.420	-0.056	1.000	
ECTH (12)	0.449	-0.193	0.282	0.345	0.479	-0.217	0.553	0.686	0.284	-0.168	0.270	1.000

0.7. We conclude the absence of bi-variable multi-colinearity.

3.2. Methodology and Major Results

The estimation procedure for the PSTR model consists of eliminating the individual effects μ_i by removing country-specific means and applying nonlinear least squares (NLS)[1] to the transformed model. Gonzales *et al*. (2005) propose a testing procedure in order to test linearity against the PSTR model and determine the number r of transition functions. For the linearity test, the null hypothesis can be written as: $\{H_0 : \gamma = 0.$

In both cases the test is non-standard, since the PSTR model contains unidentified nuisance parameters under the null hypothesis. The solution is to replace the transition function $G(z_{it-d};\gamma,c)$ by its first-order Taylor expansion around $\gamma = 0.$ To Test

[1]For more details, see Hansen (1999) and Gonzalez *et al*. (2005).

Table 4: LM Fisher Linearity Test[1]

Delay[2]	d1	d2	d3	d4	d5	d6
LAW	26.936 (0.000)	11.348 (0.00)	0.881 (0.450)	2.953 (0.032)	0.383 (0.765)	2.018 (0.111)
CORP	3.996 (0.000)	15.484 (0.000)	14.188 (0.000)	8.605 (0.000)	4.971 (0.002)	2.274 (0.079)
SOCIO	2.198 (0.087)	2.529 (0.056)	1.642 (0.179)	3.851 (0.009)	3.223 (0.022)	1.723 (0.162)
INVP	4.233 (0.005)	5.608 (0.000)	0.927 (0.427)	0.491 (0.688)	4.752 (0.002)	1.042 (0.374)
EXTC	6.263 (0.000)	8.700 (0.000)	0.951 (0.415)	0.088 (0.966)	0.109 (0.954)	0.679 (0.564)
DEMO	4.888 (0.002)	3.348 (0.019)	0.876 (0.453)	0.347 (0.791)	1.547 (0.201)	1.687 (0.169)
GOVS	50.732 (0.000	19.375 (0.000)	13.703 (0.000)	1.847 (0.138)	0.424 (0.735)	0.396 (0.755)
INTC	2.377 (0.069)	2.476 (0.061)	1.291 (0.276)	2.124 (0.096)	4.242 (0.005)	5.732 (0.000)
MILP	50.020 (0.000)	30.879 (0.000)	12.283 (0.000)	5.894 (0.000)	4.368 (0.004)	3.110 (0.026)
BUR	449.049 (0.000)	361.400 (0.000)	10.007 (0.000)	5.320 (0.001)	2.191 (0.088)	4.276 (0.005)
RELP	14.375 (0.000)	12.384 (0.000)	8.523 (0.000)	9.476 (0.000)	7.917 (0.000)	3.361 (0.019)
ECTH	11.766 (0.000)	2.588 (0.052)	3.330 (0.019)	0.103 (0.958)	0.029 (0.993)	0.232 (0.873)

[1]The Wald LM and the Likelihood ratio tests confirm the results of Fisher LM test.
[2]The optimal lag length for the transition variable.
H_0: linear model Vs H_1: PSTR model with at least one threshold.
The numbers in parentheses are p- values of F-statistics.

$H_0 : \gamma = 0,$ we will use in this study the Fisher LM test[2]: $LM_F = \left[\left(SSR_0 - SSR_1\right) / K\right] / \left[SSR_0 / \left(NT - N - K\right)\right]$; where SSR_0 is the panel sum of squared residuals under H_0 (i.e., linear panel model with individual effects) and SSR_1 is the panel sum of squared residuals under H_1 (i.e., PSTR model with two regimes). K is the number of explanatory variables, and it has an approximate $F\left(K, NT - N - K\right)$ distribution.

Referring to the LM test in Table **4**, the null hypothesis that the model is linear is rejected at the 1% level for transition variables. We conclude that the relationship between institutions and growth is non-linear. Therefore, a PSTR model is used to estimate that relationship. After fixing the delay, Teräsvirta (1994) proposes a short sequence of ordinary Fisher test to decide between PESTR and PLSTR family of models (Table **5**).

Once the linearity test and the test of the choice between PESTR and PLSTR are used, the problem is to identify the number of transition functions. The methodology of sequential tests is generally used. In general, a PSTR with r* transition functions, we test the null hypothesis (H_0: r =r* against H_1: r =r*+1). If H_0 is not rejected, the procedure ends. Otherwise, H_0: r =r*+1 is tested against H_1: r =r*+2. The testing procedure continues until the first acceptance of the null hypothesis. The issue is to test whether there is one transition function (H_0: r =1), or whether there are at least two transition functions (H_1: r = 2).

According to the test of no remaining nonlinearity the F-statistic LM_F, we find that the model with one threshold (two regimes) adequately captures the non-linear relationship. A weak number of transition functions are sufficient to assess the non-linearity. Thus, a PSTR model with one transition function seems to be appropriate in this study (Table **6**).

Table **7** presents PSTR estimates of Eq (6) using the NLS method for the 12 models. We conclude that all control variables have the expected sign. We find an instable direct impact of FDI on growth, measured by α_0, insignificant in all regressions, with one exception when the threshold variable is Military in politics (MILP). Also, we find for all transition variables, FDI-economic growth coefficient α_1 is positive and only statistically significant for Socioeconomic conditions (SOCIO) variable with values ranging between 0.006 and 3.794. This implies that an increase of the transition variables entails an increase of FDI-growth coefficient. In Countries with high level of institutions, there is positive effect of FDI on economic growth.

We found that the shift between the two extreme regimes occurs around the location parameter c (the 12 location parameters seem far from their respective mean values reported in Table **1**). We conclude that only countries with good institutions can exploit the advantages of FDI on growth. The slope appears to be sharp for Investment profile (INVP), Democratic

[2]To test linearity, there are also the Wald LM test: $LM_W = NT\left(SSR_0 - SSR_1\right) / SSR_0$ and the pseudo- Likelihood ratio test: pseudo-$LR = -2\left(\log SSR_1 - \log SSR_0\right)$ distributed as $\chi^2(k)$ under the null hypothesis.

Table 5: Sequence test of Fisher: Choice between PESTR and PLSTR

Non-linear Variables	PLSTR			PESTR		
LAW		**F stat**	**P-value**			
	H01	0.376820	0.0396			
	H02	34.608669	0.1153			
	H03	42.517542	0.0000			
CORP		**F stat**	**P-value**			
	H01	3.6399885	0.0571			
	H02	1.2798311	0.2586			
	H03	7.0129974	0.0084			
SOCIO		**F stat**	**P-value**			
	H01	0.0552708	0.0142			
	H02	5.7899751	0.2166			
	H03	0.7577185	0.3845			
INVP		**F stat**	**P-value**			
	H01	1.559703	0.0124			
	H02	10.996635	0.5243			
	H03	0.126235	0.7225			
EXTC		**F stat**	**P-value**			
	H01	9.3869561	0.0023			
	H02	8.7080392	0.2033			
	H03	0.5011193	0.4794			
DEMO		**F stat**	**P-value**			
	H01	2.345029	0.0264			
	H02	1.589555	0.2081			
	H03	10.674720	0.0012			
GOVS					**F stat**	**P-value**
				H01	30.403259	0.3421
				H02	21.591254	0.0000
				H03	87.826694	0.1253
INTC		**F stat**	**P-value**			
	H01	3.6723351	0.0560			
	H02	0.0139941	0.9059			
	H03	3.4308177	0.0647			
RELP		**F stat**	**P-value**			
	H01	2.983913	0.0848			
	H02	10.688918	0.1112			
	H03	28.597406	0.0000			
BUR					**F stat**	**P-value**
				H01	488.30254	0.1243
				H02	391.98241	0.0000
				H03	1.82933	0.1769
ECTH		**F stat**	**P-value**			
	H01	0.088471	0.0663			
	H02	35.173159	0.3142			
	H03	0.106278	0.7446			
MILP		**F stat**	**P-value**			
	H01	8.404544	0.0039			
	H02	66.078902	0.1236			
	H03	63.232969	0.0000			

The numbers in parentheses are P-values of F-statistics. Statistics are reported until the non-rejection of H_0

Table 6: No Remaining Nonlinearity Test

Transition Variables	H_0: 1 regime (no transition function) vs H_0 : 2 regimes (1 transition function)	H_0 : 2 regimes (1 transition function) vs H_0 : 3 regimes (2 transition function)
LAW	F = 60.133111 (0.000)	F = 0.614165 (0.9753217)
CORP	F = 152.159801 (0.000)	F = 0.237512 (0.873164)
SOCIO	F = 54.675632 (0.000)	F = 0.135312 (0.9215342)
INVP	F = 39.263448 (0.000)	F = 0.4123211 (0.97512)
EXTC	F = 40.426303 (0.000)	F = 0.25124123 (0.94153241)
DEMO	F = 129.142938 (0.000)	F = 0.5197413 (0.97416322)
GOVS	F = 33.412432 (0.000)	F = 0.062312 (0.999321323)
INTC	F = 57.680642 (0.000)	F = 0.964213 (0.9985312)
RELP	F = 35.601357 (0.000)	F = 1.3154231 (0.8963234)
BUR	F = 20.010848 (0.000)	F = 0.2416421 (0.99731452)
ECTH	F = 3.476912 (0.006)	F = 0.17313421 (0.99531543)
MILP	F = 122.749673 (0.000)	F = 0.862134 (0.9993123)

accountability (DEMO) and Government stability (GOVS) (77.734, 30.240 and 30.236 respectively). We conclude for those indicators that the transition is rather rough and the PTR framework of Hansen (1999) is indicated to assess FDI-growth nexus the slope parameter tends towards the infinity. This implies that an effort by MENA country just below the threshold value of 0.006 (0.206 and 0.206 respectively) is likely to result in a sharp increase of the elasticity of growth with respect to FDI, from 0.0 to 0.006 respectively. For Law and order (LAW), Corruption (CORP), Socioeconomic conditions (SOCIO), External conflicts (EXTC), Internal conflicts (INTC), Military in politics (MILP), Bureaucracy quality (BUR), Religion in politics (RELP) and Ethnic tension (ECTH), we find a smooth transition and consequently the PSTR is well adapted because the slopes of transition functions are low (the highest value is 3.350 for Law and order). It means that conditionally to those variables, the relationship between FDI and growth cannot be reduced to a limited number of regimes.

This result, so far, confirms the idea that FDI's growth is enhanced only in countries with a low level of corruption. We point out that high quality of institutions in host countries influence FDI and consequently growth. When institutions are strong, the legal system works effectively and attracts FDI. The share of FDI is higher in countries with strong institutions. We conclude that FDI and institutions go hand in hand and FDI is fostered by the effectiveness of institutions. This illustrates clearly that an improvement of those indicators will lead to a greater increase in the growth impact of FDI because they have an immediate potential for fostering FDI-economic growth impact. MENA countries need to achieve a minimum level of institutional quality in order to benefit from the advantages offered by FDI. Over all, the main result of this study is that it shows that a better contribution of FDI to economic growth requires taking into account the interrelationship and the complementarity between FDI and institutions.

4. CONCLUDING REMARKS AND FUTURE LINES

Motivated by the important role of FDI for economic growth, this paper has shed new light on understanding this relationship by focusing on the role played by the institutional quality in host countries. Using a panel of 19 MENA countries for the period 1984-2011, this paper highlights the impact of FDI on economic growth conditional on the institutional quality. The empirical evidence captured by within the PSTR approach confirms that institutional quality clearly influences the impact of FDI on growth in MENA countries. The PSTR is adopted for 9 measures of institutions quality (Law and order, Corruption, Socioeconomic conditions, External conflicts, Internal conflicts, Military in politics, Bureaucracy quality, Religion in politics and Ethnic tension).

The results suggest that public authorities in MENA countries must build appropriate institutions to attract

Table 7: FDI-Institutions and Growth: PSTR Model Estimation with Two Regimes

	LAW (PLSTR)	CORP (PLSTR)	SOCIO (PLSTR)	INVP (PLSTR)	EXTC (PLSTR)	DEMO (PLSTR)	GOVS (PESTR)	INTC (PLSTR)	BUR (PESTR)	RELP (PLSTR)	ECTH (PLSTR)	MILP (PLSTR)
SIZE	0.080	0.081	0.080	0.077	0.119	0.073	0.073	0.135	1.708	0.117	0.088	2.793
	(1.733) *	(1.248)	(1.733) **	(1.564)	(0.036)	(1.434)	(1.434)	(2.458) **	(1.395)	(2.379) **	(1.858) *	(6.930) ***
DI	0.055	0.017	0.055	0.073	0.073	0.088	0.088	0.117	8.315	0.052	0.049	2.992
	(2.233) **	(3.372 ***	(4.233) ***	(3.574) ***	(2.036) **	(1.801) *	(1.801) *	(2.179) **	(4.395) ***	(3.137) ***	(2.070) **	(6.930) ***
INF	-0.021	-0.053	-0.020	-0.171	-0.027	-0.150	-0.150	-0.205	-1.663	-0.086	-0.039	-1.981
	(2.110) **	(2.277) **	(2.110) **	(3.840) ***	(3.032) ***	(1.720) *	(1.720) *	(2.932) ***	(3.396) ***	(2.447) ***	(2.202) ***	(6.930) ***
EXCH	-0.627	-0.551	-0.626	-0.691	-0.936	-0.846	-0.846	-1.015	-1.178	-0.703	-0.661	-1.968
	(2.331)**	(1.348)	(2.331) **	(2.410) **	(0.036)	(2.899) ***	(2.899) ***	(3.017) ***	(1.395)	(2.521) **	(2.336) **	(6.930) ***
POP	0.532	0.443	0.532	0.559	0.854	0.576	0.576	0.850	9.281	0.689	0.528	5.911
	(2.810)***	(1.399)	(2.810) ***	(2.745) ***	(0.036)	(2.846) ***	(2.846) ***	(3.685) ***	(1.395)	(3.402) ***	(2.773) ***	(6.930) ***
TRD	0.129	0.135	0.128	0.149	0.181	0.143	0.143	0.083	1.699	0.040	0.160	1.588
	(1.074)	(0.953)	(1.074)	(1.204)	(0.036)	(1.125)	(1.125)	(0.622)	(1.395)	(0.327)	(1.324)	(6.930) ***
CP	0.071	0.093	0.071	0.031	0.101	0.075	0.075	0.063	1.472	0.057	0.073	1.064
	(3.727) ***	(2.806)***	(4.727) ***	(4.318) ***	(2.036) **	(1.726) *	(1.726) *	(2.599) **	(3.395) ***	(4.577) ***	(2.741) **	(6.930) ***
constante	0.184	-0.140	0.184	0.183	-9.542	0.458	0.458	-1.149	-1.418	-0.174	0.533	-3.449
	(0.141)	(0.079)	(0.141)	(0.130)	(0.012)	(0.294)	(0.294)	(0.740)	(1.394)	(0.126)	(0.379)	(6.924) ***
FDI	-0.005	-0.039	-0.004	0.001	1.987	-0.005	-0.005	0.085	4.956	-0.030	-0.018	2.045
	(0.092)	(0.467)	(0.092)	(0.027)	(0.012)	(0.101)	(0.101)	(0.929)	(1.394)	(0.512)	(0.374)	(6.927) ***
G	-5.477	1.744	-1.063	4.464	1.935	2.420	2.420	2.537	1.080	8.520	0.025	2.561
	(0.268)	(0.001)	(4.697) ***	(3.518) ***	(0.056)	(2.481) ***	(2.481) ***	(3.527) ***	(0.347)	(1.837) *	(0.014)	(0.129)
FDI*G	1.227	1.993	3.466	0.006	3.794	0.206	0.206	0.061	0.030	0.619	0.064	0.007
	(0.488)	(0.001)	(10.450)***	(0.010)	(0.052)	(0.621)	(0.621)	(1.082)	(0.052)	(0.675)	(0.245)	(0.007)
Slope: γ	3.350	0.396	1.884	77.734	0.012	30.240	30.236	1.258	0.070	0.757	1.193	0.037
	(6.473)***	(0.669)	(0.686)	(0.018)	(0.019)	(0.004)	(0.043)	(11.091)***	(0.157)	(1.392)	(8.255) ***	(0.038)
Threshold: c	1.157	1.548	5.865	3.426	4.386	1.755	1.755	4.018	1.980	2.060	0.495	2.617
	(3.645) ***	(0.007)	(0.174)	(0.291)	(0.010)	(6.875) ***	(6.877) ***	(5.446) ***	(0.105)	(1.088)	(2.154) **	(6.144) ***
Ljung-Box												
Lag (6)	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**	14.931**
Lag (12)	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**	25.813**
Lag (18)	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**	29.931**
Lag (24)	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**	35.985**

Note: Real GDP per capita is the dependent variable. Foreign direct investment (FDI), Inflation (INF), Trade (TRD), Government size (SIZE), Population (POP), Domestic Investment (PI), Exchange rate (EXCH), Commodity Price (MP), Law and order (LAW), Corruption (CORP), Socioeconomic conditions (SOCIO), Investment profile (INVP), External conflicts (EXTC), Democratic accountability (DEMO), Government stability (GOVS), Internal conflicts (INTC), Military in politics (MILP), Bureaucracy quality (BUR), Religion in politics (RELP) and Ethnic tension (ECTH). c: the threshold .parameter and γ the slope parameter. Standard errors are corrected for heteroskedasticity. The numbers in parentheses are absolute value of t-statistics. *, **, and *** indicate statistical significance at the 1%, 5%, and 10% level.

Appendix 1: Data Measurement

Variables	Definition	Source
Growth (GDP)	Real GDP per capita	World Development Indicators
FDI (FDI)	Net inflows of Foreign direct investment	World Development Indicators
Inflation (INF)	Change in consumer price index	World Development Indicators
Trade (TRD)	Import plus export divided to GDP	World Development Indicators
Government size (SIZE)	Ratio of Government final consumption to GDP	World Development Indicators
Population (POP)	Growth rate of total population	World Development Indicators
Domestic Investment (PI)	Gross fixed capital formation as a share of GDP	World Development Indicators
Exchange rate (EXCH)	Real Effective Exchange rate	DataStream
Commodity Price (CP)	Commodity Price Index (2000=100)	UNCTAD
Law and order (LAW)	Measure of the law and order tradition of a country. It ranges from 6, strong law and order tradition, to 1, weak law and order tradition.	International Country Risk Guide (ICRG)
Corruption (CORP)	The level of corruption ranges from 1 (high level of corruption) to 5 (low level).	International Country Risk Guide (ICRG)
Socioeconomic conditions (SOCIO)	This is an assessment of the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.	International Country Risk Guide (ICRG)
Investment profile (INVP)	This is an assessment of factors affecting the risk to investment that are not covered by other political, economic and financial risk components. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.	International Country Risk Guide (ICRG)
External conflicts (EXTC)	The external conflict measure is an assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc) to violent external pressure (cross-border conflicts to all-out war). The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.	International Country Risk Guide (ICRG)
Democratic accountability (DEMO)	This is a measure of how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a non-democratic one.	International Country Risk Guide (ICRG)
Government stability (GOVS)	This is an assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.	International Country Risk Guide (ICRG)
Internal conflicts (INTC)	This is an assessment of political violence in the country and its actual or potential impact on governance. The highest rating is given to those countries where there is no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people. The lowest rating is given to a country embroiled in an on-going civil war. The risk rating assigned is the sum of three subcomponents, each with a maximum score of four points and a minimum score of 0 points. A score of 4 points equates to Very Low Risk and a score of 0 points to Very High Risk.	International Country Risk Guide (ICRG)
Militay in politics (MILP)	The military is not elected by anyone. Therefore, its involvement in politics, even at a peripheral level, is a diminution of democratic accountability. However, it also has other significant implications.	International Country Risk Guide (ICRG)

Bureaucracy quality (BUR)	The institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change. Therefore, high points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training.	International Country Risk Guide (ICRG)
Religion in politics (RELP)	Religious tensions may stem from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process; the desire of a single religious group to dominate governance; the suppression of religious freedom; the desire of a religious group to express its own identity, separate from the country as a whole.	International Country Risk Guide (ICRG)
Ethnic tension (ECTH)	This component is an assessment of the degree of tension within a country attributable to racial, nationality, or language divisions. Lower ratings are given to countries where racial and nationality tensions are high because opposing groups are intolerant and unwilling to compromise. Higher ratings are given to countries where tensions are minimal, even though such differences may still exist.	International Country Risk Guide (ICRG)

more FDI flows and consequently increase the rate of economic growth. Also, they should promote the international integration of MENA countries in Europe and Asia. A good understanding in host countries of the positive externality of FDI on growth requires the complement and the interrelationship between institutions and FDI.

As a future line of research, it would be valuable to investigate more in-depth the effects of institutions quality on the growth-FDI nexus in emerging and developed countries.

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