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FDI Inflows to the MENA Region: An Empirical Assessment of their Determinant and Impact on Development

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Directed By
Khalid Sekkat, Université Libre de Bruxelles, Belgique

In collaboration with
INSEA, Rabat, Morocco
IEP, Strasbourg, France
CERDI, Clermont Ferrand, France
CEFI, Université de la Méditerranée France

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FDI Inflows to the MENA Region: An Empirical Assessment of their Determinant and Impact on Development

Coordinated by

Khalid Sekkat* (ULB, Brussels, Belgium)

With contributions by:

Lahcen Achy (INSEA, Rabat, Morocco)

Pierre-Guillaume Méon (IEP, Strassbourg, France)

Marie-Ange Veganzones (CERDI, Clermont Ferrand, France)

* CP. 140, Université Libre de Bruxelles, avenue F.D. Roosevelt 50, Brussels 1050, Tel : 32 2 650 41 39, Fax : 32 2 650 39 01, Email : ksekkat@ulb.ac.be.

PART I:

Trade and Foreign Exchange Liberalization, Investment Climate and FDI in the MENA Countries*

Abstract:

The paper assess the relative importance of trade and foreign exchange liberalization, infrastructure availability and economic and political stability in increasing Middle East and North African (MENA) countries attractiveness with respect to FDI. The analysis is conducted for total FDI and for FDI in manufacturing. The results show that trade and foreign exchange liberalization, infrastructure availability and sound economic and political conditions increase FDI inflows. Their effects are much higher for FDI in the manufacturing sector than for total FDI. This result is robust to alternative indicators of trade and foreign exchange liberalization, and to change in the specification. The message to MENA's policy makers is twofold. First, efforts toward trade and foreign exchange liberalization should be initiated or further increased in order to make the region attractive to foreign investors. Second improvements in other aspects of the investment climate are important complements to liberalization and result in additional and sensitive increase of FDI inflows.

I. Introduction

The disappointing growth and employment records in the MENA countries are due, at least in part, to the low integration of the region in the world economy (e.g. Makdissi et al, 2000 and Dasgupta et al, 2002). Abstracting from oil, the region scores one of the lowest ratios of export to GDP among all region of the World but Sub-Saharan-Africa.[1] It has also the lowest ratios of FDI to GDP among all region of the World. This ratio only reached 0.9% in average in the 1990s, against 2.5% in Africa, 3.8% in East Asia and 4.5% in Latin America. Moreover, contrary to the other regions where FDI flows increased during the 1990s, the progression was very small in the MENA.[2] Although some countries like Morocco or Tunisia attracted more FDI than the regional average, these results remains very disappointing.

FDI inflows can represent additional resources a country needs to improve its economic performance. By increasing capital stock, FDI can increase country's output and productivity through a more efficient use of existing resources and by absorbing unemployed resources. For instance, De Gregorio (1992) shows, in a panel of 12 Latin American countries, that FDI is about three times more efficient than domestic investment (see also UNCTAD, 1992 and Blomstrom et al, 1992). FDI can also act as a catalyst for local investment by complementing local resources and providing a signal of confidence in investment opportunities. Agosin and Mayer (2000), using a panel of 32 countries over the period 1970-96, finds that FDI crowds-out domestic investment in Latin America and crowds-in in Asia. Finally, FDI can stimulate the development and dispersion of technological skills through transnational corporations' internal transfers and through linkages and spillovers among firms. Borensztein et al (1998), focusing on 69 developing countries, supports the effect of FDI flows on economic growth through a "catch-up" process in the level of technology. It also reveals a strong complementarily between FDI and human capital. FDI has an overall positive effect but its magnitude depends on the stock of human capital available in the host country.

The reason for the poor export and FDI performance in the region has been related to prolonged application of inward-looking strategies based on import-substitution (Nabli and De Kleine, 2000). This is why, during the 1980s, some of the MENA countries engaged in a process of economic reform, involving a more outward orientation of their economies, the lowering of trade barriers, privatization of many industries and reform of the foreign-exchange market. However, other MENA countries are still lagging behind (Nabli and Veganzones, 2003). Moreover, international evidence (see Dasgupta et al, 2002) suggests that trade and foreign exchange policies might not be sufficient and companion policies would be needed to further increase the attractiveness of a country. Such policies aim at strengthening the investment climate. They include the availability of adequate infrastructure and the quality of the economic, the political and the institutional framework.

[1] Sekkat and Varoudakis (2002) and Achy and Sekkat (2003) focus on manufactured exports in the MENA.

[2] 6,3 % on average against 17% in Africa, 10% in East Asia, 22% in Latin America and 13% in South Asia.

The paper addresses two questions. First, whether the reforms undertaken by some MENA countries can help improving their record in term of FDI attractiveness. Second, can improvement of other aspects of the business climate (physical infrastructures and political and economic stability) further increase, and to what extent, FDI attractiveness of the region. For this purpose, an econometric model of the determinants of FDI has been set up and estimated over a large sample of developing countries. The results show that countries having undertaken trade and foreign-exchange market reforms are able to attract more FDI. The improvement in other aspects of the business climate can result in an increase of FDI inflows that is comparable to the one resulting from trade and foreign exchange policies.

The paper goes a step further by conducting a similar exercise using FDI in manufacturing instead of total FDI. This is motivated by two facts. First, in some countries FDI may be due to natural resource abundance and their inflows may be little affected by the business climate. Second, the manufacturing industry is more conductive to growth than agriculture or mining. Although caution is recommended due to the limited number of countries in the sample (only 21), the results suggest that the impact of trade and foreign exchange market reforms and of improvement of the business climate is higher for FDI in manufacturing than for total FDI.

The paper is organized as follows. Section 2 introduces the literature. Section 3 presents the econometric analysis. Section 4 assesses the likely impact of reforms on MENA's FDI inflows. Section 5 concludes.

II. Determinants of FDI Inflows

Various motivations of FDI were put forward in the literature. The eclectic theory of FDI groups them into three categories (Dunning 1981 and 1988). First, ownership-specific advantages that allow firms to compete with the other firms in the markets it serves regardless of the disadvantages of being foreign. Second, transaction costs associated with trade and licensing that make the internalized transactions through FDI more efficient. Third, location advantages that make the chosen foreign country a more attractive site for FDI than the others. Given the objective of the study, we will focus on the latter. We group country's advantages into three categories: basic economic factors, trade and foreign exchange policy and other aspects of the business climate.

II.1. Basic Economic Factors

An early survey by Agarwal (1980) summarized the basic economic determinants of country attractiveness with respect to FDI: the difference in the rate of return on capital across countries, portfolio diversification strategy of investors and market size of the host country. The difference in the rate of return is dependent on incentives for foreign investors and supply of cheap labor. Empirical evidence shows that the effect of incentives provided by the host country on FDI is only marginal however. Agarwal explains this unexpected finding by the fact that incentives are generally accompanied by a set of restrictions and requirements. The supply of cheap labor appears as a more convincing explanation of FDI. Overall, empirical evidence on the relationship between inter-country differences in the rates of return and FDI does not provide any

conclusive results. This ambiguous finding is due, according to Agarwal, to statistical and conceptual problems. Theoretically, FDI is a function of expected profits but available data are on reported profits. In addition, reported profits may not be similar to actual profits since transactions between the parent company and its affiliates are subject to intra-company pricing rather than to market pricing.

The portfolio diversification hypothesis stresses the fact that investors select their locations taking into account both the expected profits and the perceived risk. Portfolio diversification helps reducing the total risk as long as returns are highly correlated within the country and weakly correlated between the home and the host countries. The empirical evidence in favor of this hypothesis remains weak. Some authors attempted to understand why multi-national companies tend to contribute more to FDI than to portfolio investments which are more likely to provide better instrument for geographical diversification. They argued that this preference might be due either to the absence of organized security markets (the case of LDCs) or to presence of high inefficiencies on these markets when they exist.

Finally, FDI is considered to be a function of output or sales on the host market. Most empirical studies reviewed by Agarwal have lent support to the relationship between FDI and market size of the host countries. This view is, however, challenged by Lucas (1993). Focussing on seven Asian countries (Indonesia, Malaysia, Philippines, Singapore, South Korea, Thailand and Taiwan) over the period 1960-87, he considered two measures of market size. One concerns the export market and the other concerns the domestic market. The results revealed a weak relationship between the size of domestic market and the volume of FDI and a high degree of responsiveness of FDI to incomes in major export markets. This may reflect the outward orientation of foreign firms located in this region. FDI inflows are also found to be more responsive to wages than to costs of capital including taxes.

II.2.Trade and foreign exchange policy

The impact of trade and foreign exchange policy was examined, among others, by Hufbauer et al. (1994), Froot and Stein (1991), Cushman (1985) and Goldberg and Kolstad (1995). Hufbauer et al. (1994) show that the size and openness of the host country are important determinants of FDI flows from the United States and Japan. The relationship between FDI flows and exchange rate was examined by Froot and Stein (1991) who found that FDI inflows are negatively correlated with the value of the dollar. This implies that a depreciated currency can stimulate in buying control of productive corporate assets. Cushman (1985) focussed on the effects of real exchange rate risk and expectations on FDI. The results show significant reductions in US direct investment associated with increases in the current real value of foreign exchange, and very strong reductions associated with the expected appreciation of real foreign exchange. Goldberg and Kolstad (1995) explore the implications of short-term exchange rate variability on FDI flows and support the hypothesis that volatility contributes to the internationalization of production.

Some studies focused on other policies such as grants, subsidies, tax abatement, loan's guarantees and interest subsidies. Gubert and Mutti (1991) found that incentive schemes designed to attract FDI flows were effective in altering foreign investment decisions. Brewer (1993) points out that these policies can either increase or decrease

market imperfections and therefore increase or decrease levels of FDI. Loree and Guisinger (1995) suggest that the effect of policies on FDI may differ between developing and developed countries. Finally, Castanaga et al (1998) found that exchange rate distortions in the host country do not have a negative effect on FDI flows while growth expectations exert a positive effect and corruption a negative one.

II.3. Other aspects of the business climate

Economists generally acknowledge the important role of infrastructure in stimulating growth and investment. Wheeler and Mody (1992) found that infrastructure quality is an important determinant of FDI inflows to LDCs. Labor costs and the existing foreign investment also play an important role. Their results also suggested that incentive variables to attract more FDI flows such as tax breaks or short run grants have only a limited effect because transfer pricing and deduction of foreign taxes provide alternative ways to reduce the amount of paid taxes. Richaud et al (1999) provided additional support to the positive impact of infrastructure on FDI. Drawing on endogenous growth theory, they set up a four-equation model to investigate the impact of infrastructure on growth, trade, domestic investment and FDI. Their estimates confirmed the positive impact of infrastructure on FDI.

Political instability is expected to have a negative effect on FDI flows through its impact on profit uncertainty. Root and Ahmed (1979) tested for the effect of economic, social and political variables on FDI. They found that four economic (per capita GDP, GDP growth rate, economic integration, importance of transport, commerce and communication) one social (degree of urbanization) and one political (the number of constitutional changes in government leadership) variables have an effect on FDI. Schneider and Frey (1985) reexamined the issue and concluded that both economic and political factors are crucial for FDI flows to LDCs. As far as economic factors are concerned, FDI reacts positively to per capita GNP and negatively to the balance of payments deficit. Growth of GNP and the workers' skill level are found to have weak effects on FDI decisions. Regarding political determinants, the amount of bilateral aid coming from Western countries has a strong positive effect on FDI flows, while the government's ideological position (right or left wing position) does not have any significant effect.

The role of institutions is crucial in terms of commitments to and enforcement of rules. Corruption is generally put at the heart of the non-enforcement of rules in LDCs. It is found to depress growth and domestic investment and to contribute to an unfair wealth distribution (Mauro, 1995). Wei (2000) carefully examined the relationship between FDI and corruption. He used three measures of corruption, all of which are based on surveys of international entrepreneurs. The estimation results showed the existence of a negative relationship between corruption level in the host country and inward foreign direct investment. Henisz (2000a) examined the effect of commitment to rules on growth and investment. He focused on the effect of frequent or arbitrary changes in taxation, regulation and other relevant economic policies. He found that commitment to rules has a statistically and economically significant impact on growth and that this result is robust to various specifications. Henisz (2000b) focused on the effects of political hazard and contractual hazard on investment decision of multinational corporations. The results confirm that firms are more likely to enter wealthier countries with large population and credible political rules.

III. The Empirical Analysis

III.1. Trade and Foreign Exchange Liberalization

Empirical studies differ with respect to FDI specifications. The differences concern both the variables to be included in the specification and their definition (nominal versus real measures and levels versus growth rates). A common specification relates nominal FDI to GDP, per capita GDP and the growth rate of GDP (see UNCTAD, 1998). Here, we adopt this basic specification to which we add indicators of trade and foreign exchange liberalization:

$$\text{Log}(FDI) = \alpha_0 + \alpha_1 \log(GDP) + \alpha_2 \log(GDPpc) + \alpha_3 RGDP + \alpha_4 Lib + \mu \qquad (1)$$

With

FDI:	nominal FDI
GDP:	nominal GDP of the host country
GDPpc:	real per capita GDP
RGDP:	real GDP growth rate of the host country
Lib:	trade and foreign exchange liberalization indicator
μ:	error term.

GDP captures the size of the host country's internal market. A higher GDP is assumed to imply better market opportunity and more attractiveness for FDI $(\alpha_1 > 0)$. *GDPpc* is related to the wealth of the resident of the host country and then to demand effectiveness. A higher real GDP per capita is also supposed to increase the attractiveness for FDI $(\alpha_2 > 0)$. The *RGDP* reflects the dynamism of the host country and its future market size. An increase in the growth rate of real GDP characterizes a dynamic economy which may be more attractive for investors $(\alpha_3 > 0)$.

Finally, we expect trade and foreign exchange liberalization to participate in a friendly climate for business and investment and to lead to more FDI inflows $(\alpha_4 > 0)$. A synthetic indicator of trade and foreign exchange liberalization is provided by Sachs and Warner (1995). This is a dummy variable (*S-W*) taking the value one for the years during which a country was classified as liberalized and the value zero otherwise. A country is classified as liberalized according to the following criteria: (a) Non-tariff barriers covering less than 40 percent of traded goods, (b) average tariff rates below 40 percent, (c) a BMP of less than 20 percent, (d) no extreme controls in the form of taxes, quotas or state monopolies on exports and (e) the country is not considered a socialist country.

Equation (1) was first estimated using the above indicator (*S-W*). We, then, split this indicator into four components: one concerns openness to trade and the others concern foreign exchange market.

Trade openness measured as the ratio of trade to GDP has been used extensively in the literature. This ratio is not appropriate for the case of MENA countries. Several MENA countries have high trade ratios reflecting partly the nature of their factor

endowment (oil in particular). We therefore use an indicator which correct for this bias. The indicator chosen is calculated as the ratio of imports plus exports to GDP from which we have deducted the "Natural Trade Openness" of the economies calculated by Frankel and Romer (1999)[3], as well as the exports of oil and mining products. This indicator reflects better the trade policy (*TPol*) of a country than the simple trade openness ratio.

Regarding exchange market, we use the dollar real exchange (*RER*), its volatility (*RERVol*) and the Black Market Premium (*BMP*). The latter — which is a widely used measure of distortion in foreign exchange market — as well as RER volatility and appreciation are expected to affect negatively FDI flows.

$$Log(FDI) = \alpha_0 + \alpha_1 \log(GDP) + \alpha_2 \log(GDPpc) + \alpha_3 (RGDP) + \alpha_4 \log(TPol) + \alpha_5 \log(RER) + \alpha_6 \log((RERVol) + \alpha_7 \log(BMP) + \mu \quad (1')$$

Equations (1) and (1') were estimated using a sample of cross-section and time series data. The sample includes annual data from 1990 to 1999 and covers 48 to 72 countries (excluding OECD and East European countries, see *Annex* 1 for the list of countries). We used panel data econometric methodology. Tests of fixed and random effects were conducted to select the most adequate models. The estimates are heteroskedastic consistent.

[3] The "Natural Openness" of the economy is calculated by Frankel and Romer (1999) by taking into account the size and the distance of the markets of the countries concerned.

Table 1: Trade and Foreign Exchange Liberalization
(Dependant variable Logarithm of total FDI)

Specifications	Specification 1		Specification 2		Specification 3		Specification 4		Specification 5	
Variables	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
GDP	1.57*	(6.95)	2.35*	(7.35)	1.90*	(4.76)	2.06*	(6.23)	1.57*	(3.99)
GDP per capita	1.37*	(2.72)	0.06	(0.08)	0.41	(0.50)	0.05	(0.06)	0.79	(0.90)
GDP growth	0.01	(1.33)	0.01	(1.35)	0.02	(1.24)	0.01	(1.19)	0.02	(1.13)
Indicator S-W	0.49*	(2.01)								
Trade Policy			1.00*	(2.57)	1.00*	(2.18)	0.99*	(2.47)	0.99*	(2.12)
Real Exchange Rate			-0.50**	(-1.64)	-0.28	(-0.47)	-0.41	(-1.39)	-0.21	(-0.36)
Black Market Prem.					-0.18*	(-2.80)			-0.18*	(-2.57)
RER Volatility							-0.30*	(-2.94)	-0.26*	(-2.25)
Number of countries	72		49		48		49		48	
Number of observations.	646		434		298		428		295	
Adjusted R^2	0.84		0.84		0.83		0.85		0.83	
Fixed effects	F(71,570)=12.7		F(48,380) = 13.2		F(47,244) = 7.5		F(48,373) = 13.6		F(47,240) = 7.4	
Random effects	CHISQ(3)=39.1		CHISQ(5)=45.7		CHISQ(6)=148.5		CHISQ(5)=23.4		CHISQ(6)=16.9	

Note: Data have been compiled from WDI (2002).
* and **: significant at the 5% and the 10% respectively.
Source: Authors' estimations

Table 1 reports the estimation results. There are four specifications: the first one incorporates the Sachs-Warner indicator; the remaining three include trade policy and various combinations of exchange market indicators. The fixed effects and the random effects tests support the focus on the fixed effects model.

In specification 1, all the coefficients are significant (except for GDP growth, *RGDP*) with the expected sign. This is the case of the coefficient of the Sachs-Warner indicator of trade and foreign exchange liberalization (*S-W*). This indicates that trade and foreign exchange reforms increase total FDI inflows. In the other specifications, the coefficients of per capita GDP (*GDPpc*), GDP growth (*RGDP*) and real exchange rate (*RER*) are never significant (at the 5% level) while having the expected sign. In contrast, the coefficients of trade policy (*TPol*), *BMP* and exchange rate volatility (*RERVol*) are consistently significant across specifications.

In other words, a high degree of trade openness of the host country has clearly increased total FDI inflows. As well, exchange rate volatility and distortions in the foreign exchange market had a negative impact on total FDI inflows. These results are consistent with Lucas (1993) who found high degree of responsiveness of FDI to incomes in major export markets for Asian countries and related it to the outward orientation of foreign firms located in this region. Note also that Hufbauer et al (1994)

have found that the size and trade openness of the host countries are important determinants of FDI flows.

III.2. Investment Climate

The above results lend clear support to the positive impact of trade and foreign exchange liberalization on total FDI inflows. However, international evidence (see Dasgupta et al, 2002) suggests that companion policies aiming at strengthening the investment climate would be needed to further increase the attractiveness of a country. To disentangle the role of the various determinants, we augmented and re-estimated equation 1 with indicators of infrastructure availability, economic and political stability. Given the reported strong complementarily between FDI and human capital (Borensztein et al, 1998) an indicator of the availability of adequate human capital is also considered. The indicators were first introduced separately and then simultaneously (see Equation (2)).

We used the aggregate Sachs and Warner (1995) index of trade and foreign exchange liberalization (*S-W*) and did not use a similar split as in Table 1. Otherwise — given the missing observation for exchange rate variables (*RER* and *RERVol*) and *BMP* on the one hand and those for the additional variables on the other hand — we would have ended-up with a very limited number of observations.

As an indicator of human capital we used the secondary school enrolment ratio (*Enrol2*). The number of fixed phones per capita proxies the availability of infrastructure (*Phone*). The indicators of economic and political stability were drawn from the International Country Risk Guide (1999) where a numerical value is assigned to a predetermined range of risk components The scale awards the highest value to the lowest risk and the lowest value to the highest risk. The economic risk rating (*EcoStab*) provides an assessment of a country's current economic strengths and weaknesses[4] while the aim of the political risk rating (*PolStab*) is to provide a mean of assessing the political and institutional framework of the countries[5] (see ICRG, 1999).

$$Log(FDI) = \alpha_0 + \alpha_1 \log(GDP) + \alpha_2 \log(GDPpc) + \alpha_3 (RGDP) + \alpha_4 (S-W) + \alpha_5 \log(Enrol2) + \alpha_6 \log(Phone) + \alpha_7 (EcoStab) + \alpha_8 (PolStab) + \mu \quad (2)$$

[4] The economic risk rating includes: GDP per capita, real GDP growth, annual inflation rate, budget and current account balance as percentage of GDP.

[5] The political risk index is composed of 12 indicators: government stability, socioeconomic conditions, investment profile, internal and external conflicts, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability, bureaucratic quality.

Table 2: Trade and Foreign Exchange Liberalization and Business Environment
(Dependant variable Logarithm of total FDI)

Specifications	Specification 1		Specification 2		Specification 3		Specification 4		Specification 5	
Variables	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
GDP	1.39*	(5.77)	1.04*	(3.58)	1.22*	(5.00)	1.53*	(6.26)	0.75*	(2.44)
GDP per capita	1.12*	(2.14)	0.12	(0.19)	1.10*	(2.22)	1.37*	(2.66)	0.35	(0.52)
GDP growth	0.01	(1.19)	0.01**	(1.73)	0.00	(1.03)	0.01	(1.52)	0.01*	(2.23)
Indicator S-W	0.64*	(2.49)	0.50**	(1.99)	0.44	(1.43)	0.51**	(1.71)	0.59**	(1.74)
Education	1.19*	(2.24)							0.85	(1.42)
Fixed Phones			0.79*	(3.59)					0.45**	(1.90)
Political Stability					0.03*	(4.61)			0.02*	(2.24)
Economic Stability							0.03**	(1.88)	0.03*	(2.31)
Number of countries	70		71		64		63		62	
Number of observations.	624		548		572		554		469	
Adjusted R^2	0.85		0.87		0.85		0.85		0.87	
Fixed effects	F(69,549)=13.3		F(70,472)=12.9		F(63,503)=13		F(62,486) = 14		F(61,399) = 13.6	
Random effects	CHISQ(4)=39.0		CHISQ(4)=20.1		CHISQ(4)=16.7		CHISQ(4) = 35.7		CHISQ(7) = 22.7	

Note: Data have been compiled from the WDI (2002) and from ICRG (1999) for political and macroeconomic stability.
* and **: significant at the 5% and the 10% respectively.
The results are those of the fixed effect model.
The estimates are heteroskedastic consistent.
Source: Authors' estimations

The estimation results are presented in Table 2. A first interesting result concerns the liberalization index (*S-W*). This variable is always significant (except in the third specification)[6] and its coefficient level is broadly similar across specifications (i.e. between 0.44 and 0.64, see Tables 1 and 2).

When additional determinants of FDI are introduced separately (i.e. human capital (*Enrol2*), fixed phones (*Phone*), political (*PolStab*) and economic stability (*EcoStab*)), their coefficients are always significant with the expected positive sign. When these are introduced simultaneously, the coefficient of human capital (*Enrol2*) become insignificant — due to possible co-linearity.

At this stage of the empirical analysis, we can conclude that the impact of trade and foreign exchange liberalization is robust and consistent across specifications. This impact is rather strong: one standard deviation of the *S-W* indicator leads to an increase of 0.2 point of the log of FDI. The results also confirm that a friendly

[6] In this case — although positive — the significance level of the coefficient is slightly below 10%.

business climate complements trade and foreign exchange reform in further attracting FDI7. For instance, one standard deviation improvement of physical infrastructures leads to an increase of 0.11 point of the log of FDI.

III.3. FDI in Manufacturing

In the previous section, we have empirically validated the positive role of trade and foreign exchange liberalization, as well as of the investment climate on total FDI flows to the developing world. FDI in manufacturing being more productive than total FDI, it is interesting to ask the question of its determinants.

In this section, we have investigated if trade and foreign exchange liberalization, as well as the investment climate have constituted pertinent explanatory factors of the attractiveness of a country in terms of FDI flows to the manufacturing industry. Equation (2) has been tested by replacing total FDI by FDI in manufacturing.

The equation has been estimated using a sample of 20 to 26 countries from 1990 to 1999 (see *Annex 1* for the list of countries). Due to the lack of information on FDI in manufacturing, our sample has been substantially reduced. As before, we used panel data econometric techniques.

The estimation results are presented in Table 3. As previously, the liberalization index (*S-W*) is positive and significant in all specifications. The impact of trade and foreign exchange liberalization on FDI inflows (total and in manufacturing) is therefore robust and consistent.

[7] In addition, our estimations show that the coefficients of the control variables (*GDP*, *GDPpc* and *RGDP*) have the expected sign and are comparable to those in the first specification in Table 1. Like the later, only the GDP coefficient is consistently significant across specification, but unlike it, the two other coefficients became significant in many instances.

Table 3: Trade and Foreign Exchange Liberalization and Business Environment
(Dependant variable Logarithm of FDI in the manufacturing industry)

Specifications	Specification 1		Specification 2		Specification 3		Specification 4		Specification 5		Specification 6	
Variables	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.	Coef.	t-stat.
GDP	1.22*	(3.05)	1.33*	(3.05)	0.77	(1.55)	0.24	(0.55)	1.15*	(2.66)	0.48	(0.74)
GDP per capita	1.08	(1.13)	1.40	(1.35)	0.47	(0.36)	1.11	(1.33)	1.12	(1.17)	1.41	(1.07)
GDP growth	-0.01	(0.74)	-0.01	(1.04)	-0.01	(0.41)	-0.02**	(1.68)	-0.01	(0.61)	-0.02	(1.51)
Indicator S-W	1.04*	(2.31)	0.93**	(1.98)	1.1*	(2.41)	1.09*	(2.59)	1.06*	(2.27)	0.87*	(2.1)
Education			0.77	(0.88)							-1.36	(1.56)
Fixed Phones					0.79*	(2.2)					0.21	(0.55)
Political Stability							0.05*	(4.25)			0.05*	(3.7)
Economic Stability									0.01	(0.4)	-0.03	(1.3)
Number of countries	21		21		21		20		20		20	
Number of observations.	148		148		139		144		144		135	
Adjusted R^2	0.9		0.9		0.91		0.91		0.89		0.92	
Fixed effects	F(20,123)=18.3		F(20,122)=18.2		F(20,113) = 19.4		F(19,119) = 18.2		F(19,119) = 18.2		F(19,107)=19.2	
Random effects	CHISQ(3)= 6.3		CHISQ(4)=17.2		CHISQ(4)=0.65		CHISQ(4)=4.7		CHISQ(4)=6.0		CHISQ(4)=8.3	

Note: Data have been compiled from the WDI (2002), from UNCTAD for the FDI in the manufacturing industry and from ICRG (1999) for political and macroeconomic stability.
* and **: significant at the 5% and the 10% respectively.
The results are those of the fixed effect model.
The estimates are heteroskedastic consistent.
Source: Authors' estimations

Another important finding consists in the magnitude of the coefficient of the liberalization index. This coefficient is almost double than in the case of total FDI (0.9 to 1.1 compared to 0.44 to 0.64). This makes trade and foreign exchange liberalization an even more important factor for the attractiveness of a country when more productive FDI is concerned. This can be justified by the fact that trade and foreign exchange liberalization introduces more competition, provides more market opportunities and allows for more technology transfers. These conditions can be considered as good incentives for the manufacturing sector to invest — especially when export oriented.

When additional determinants of FDI are introduced separately in the equation (i.e. human capital (*Enrol2*), fixed phones (*Phone*), political (*PolStab*) and economic stability (*EcoStab*)), their coefficients have the expected positive sign but are not always significant. This is the case of education (*Enrol2*) and of economic stability

(*EcoStab*). When these indicators are introduced simultaneously, only the coefficient of political stability (*PolStab*) remains significant [8].

In summary, the estimation of the determinants of FDI in the manufacturing industry has revealed to be more difficult than the one of total FDI. Some results seem, however, robust. This is the case of the size of the market (which gives to the foreign investors a positive signal to invest in a country), of trade and foreign exchange liberalization (which impact on FDI flows is always significant), as well as of political stability. These are interesting findings which should not be neglected if a country wants to attract more productive FDI.

Other factors — such as education, core infrastructure or macroeconomic condition — could also have played a significant role in attracting more productive FDI. The small size of our sample however — when focusing on FDI in the manufacturing industry — must explain the difficulties in estimation. These factors should, nevertheless, be considered carefully when implementing the reform agenda of the MENA countries.

IV. Trade and Foreign Exchange Liberalization and Investment Climate in the MENA Countries

In this section, we use the econometric results to assess the respective impact of liberalization and investment climate on the low attractiveness of the MENA countries in term of FDI (see Table 4). The impact of liberalization will be assessed using the S-W index.[9] Using equation (2) (specification 5) we find that FDI flows to the region could have been of 2.3% of GDP (instead of 1.2%) during the 1990s, if trade and foreign exchange liberalization had reached the level of East Asia. In the case of *Algeria*, *Egypt*, *Iran* and *Syria*, FDI flows to GDP could have reached respectively 1.8%, 2.8%, 1.5% and 2.4% (instead of 0.3%, 1.3%, 0% and 2.4%, see Table 4). These figures enlighten the high contribution of the deficit in trade and foreign exchange reforms to the low attractiveness of the MENA countries.

Impact of trade and foreign exchange liberalization is even stronger in the case of FDI in the manufacturing sector (see Table 3, section 3.3). These flows have been very high in East Asia where trade and foreign exchange reforms have always been significant. If MENA had undertaken the same level of reforms, FDI in manufacturing could have increased by 1.2 % of GDP (for a lower level than total FDI).

Similar conclusions can be drawn for physical infrastructures (proxied by the number of fixed phones). Identically, the gap with East Asia explains significantly the deficit in FDI flows to the region. In the 1990s, if the MENA countries had increased their infrastructures to the level of the East Asian economies, FDI flows could have reached 2.5% of GDP (compared to 1.2%). As far as countries' experience is

[8] In addition, the coefficient of GDP has the expected sign, but is only significant in half of the cases (specifications 1,2 and 5). On another side, GDP per capita (*GDPpc*) and GDP growth rate (*RGDP*) are never significant.

[9] For Tunisia, Morocco, Jordan and Yemen the index is equal to 1 over the 1990s. Hence, the impact of improvement can not be computed in the present framework.

concerned, *Yemen*, *Morocco*, *Algeria* and *Egypt* have shown a low development in physical infrastructures. In the case of these countries, a level of equipment similar to the one of East Asia would have boost FDI which could have increased by 1.4 to 1.7% of GDP.

Improvement in either economic or political stability gives similar impact to the one of liberalization. In the 1990s, if the MENA countries have had comparable records to the East Asia in terms of economic or political stability, FDI flows to GDP could have increased by around 1.1 percentage point. Assuming that sound governance could have improved both indicators, the total impact on FDI becomes twice the one of liberalization. As far as countries' experience is concerned, the largest impact concerns *Algeria.* The impacts for the other countries are comparable.

Finally, if trade and foreign exchange liberalization, development of infrastructures, and sound governance are considered at the same time, FDI flows to MENA could have significantly catch up with East Asia.

Table 4: FDI to GDP in the 1990s (%) and expected improvement

	Actual	Increase with improvement in				Potential
		Trade and exchange rate policies	Fixed Phone	Economic stability	Political stability	
Algeria	**0,3**	1,5	1,4	*1,3*	*1,5*	**6,0**
Egypt	**1,3**	1,5	1,3	*1,1*	*1,2*	**6,4**
Iran	**0,0**	1,5	1,2	*1,2*	*1,1*	**5,0**
Jordan	**1,2**		1,3	*1,1*	*1,1*	**4,6**
Morocco	**1,6**		1,4	*1,1*	*1,1*	**5,2**
Syria	**0,9**	1,5	1,2	*1,2*	*1,1*	**5,8**
Tunisia	**2,1**		1,3	*1,1*	*1,0*	**5,5**
Yemen	**2,0**		1,7	*1,3*	*1,2*	**6,2**
MENA	**1,2**	1,1	1,3	*1,1*	*1,1*	**5,8**

Source: Authors' calculations

V. Conclusion

The paper shows, for a panel of 26 to 72 countries studied during the 1990s, that trade and foreign exchange liberalization has constituted a key factor for the attractiveness of a country in terms of FDI. This result is robust regardless the type of FDI (total or in manufacturing), the indicator of trade and foreign exchange liberalization, and the specification used. The findings also highlight the important role of various aspects of the investment climate in increasing countries' attractiveness in term of FDI.

Our analysis supports the argument that the weak FDI record of the MENA region can largely be explained by the lack of reforms of the economies. This is the case of trade and foreign exchange reforms which has been insufficient compared to other more successful countries in East Asia and Latin America. Actually, the deficit in reforms constituted a real obstacle for foreign investors which could have almost doubled their participation if MENA countries had reached in the 1990s the same level of liberalization than in East Asia. This impact is even stronger if one considers FDI in the manufacturing sector. Similar conclusions were reached regarding the quality of

governance and the availability of physical infrastructures. The gap between the MENA and East Asia regarding each of these factors has caused deficits of, respectively, 2.2% and 1.3% in term of FDI, to GDP, flows to the region.

The message to MENA's policy makers is twofold. First, trade and foreign exchange liberalization are key factors to the attractiveness of the region in terms of FDI. Second improvements in other aspects of the investment climate are important complements to liberalization and can result in a sensitive increase of FDI inflows. The latter is comparable to the one resulting from liberalization policies. Hence, although institutional reforms can take time, they deserve the necessary efforts given their outcomes as compared to other reforms. All MENA countries are concerned by a substantial effort to improve their investment climate. When liberalization, governance and infrastructures effects are taken together, FDI flows to MENA catch up with East Asia. This should not be forgotten when implementing the reform agenda of the MENA countries.

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Appendix 1: List of countries in the various Samples

Sample size	72	49	48	26
Country				
Angola	Y			
Argentina	Y	Y	Y	Y
Bangladesh	Y	Y	Y	Y
Benin	Y			
Bolivia	Y	Y	Y	Y
Botswana	Y	Y	Y	
Brazil	Y	Y	Y	Y
Burkina Faso	Y	Y	Y	
Cameroon	Y	Y	Y	
Central African Republic	Y			
Chad	Y			
Chile	Y	Y	Y	Y
China	Y	Y	Y	Y
Colombia	Y	Y	Y	Y
Congo, Rep.	Y			
Costa Rica	Y	Y	Y	Y
Cote d'Ivoire	Y	Y	Y	
Cyprus	Y			
Dominican Republic	Y			
Ecuador	Y	Y	Y	Y
Egypt	Y	Y	Y	
El Salvador	Y	Y	Y	
Ethiopia	Y			Y
Gabon	Y			
Gambia	Y	Y	Y	
Ghana	Y	Y	Y	
Guatemala	Y	Y	Y	
Guinea	Y			
Guinea-Bissau	Y			
Haiti	Y			
Honduras	Y			
India	Y	Y	Y	Y
Indonesia	Y	Y	Y	Y
Iran.	Y	Y	Y	
Israel	Y	Y	Y	
Jamaica	Y			
Jordan	Y	Y	Y	
Kenya	Y	Y	Y	Y
Kuwait		Y	Y	
Madagascar	Y	Y	Y	
Malawi	Y	Y	Y	
Malaysia	Y	Y	Y	Y
Mali	Y			
Mauritania	Y			

Mauritius	**Y**	**Y**	**Y**	
Morocco	**Y**	**Y**	**Y**	**Y**
Mozambique	**Y**	**Y**	**Y**	
Nepal	**Y**			
Nicaragua	**Y**			
Niger	**Y**	**Y**	**Y**	
Nigeria	**Y**	**Y**	**Y**	
Pakistan	**Y**	**Y**	**Y**	**Y**
Papua New Guinea	**Y**			
Paraguay	**Y**	**Y**	**Y**	**Y**
Peru	**Y**	**Y**	**Y**	**Y**
Philippines	**Y**	**Y**	**Y**	**Y**
Rwanda	**Y**			
Senegal	**Y**	**Y**	**Y**	
Sierra Leone	**Y**			
Singapore	**Y**	**Y**		**Y**
South Africa	**Y**	**Y**	**Y**	
Sri Lanka	**Y**	**Y**	**Y**	**Y**
Syria	**Y**	**Y**	**Y**	
Tanzania	**Y**	**Y**	**Y**	
Thailand	**Y**	**Y**	**Y**	**Y**
Togo	**Y**	**Y**	**Y**	
Tunisia	**Y**	**Y**	**Y**	**Y**
Turke***y***	**Y**			
Uruguay	**Y**	**Y**	**Y**	
Venezuela	**Y**	**Y**	**Y**	**Y**
Yemen, Republic	**Y**			
Zambia	**Y**	**Y**	**Y**	**Y**
Zimbabwe	**Y**			**Y**

PART II:

Does the quality of institutions limit the MENA's integration in the world economy?

Abstract

Using a large sample of countries over the nineties, this paper examines the extent to which institutions' functioning disables a greater participation of Middel East and North Africa (MENA) in the world economy. It focuses on the impact on manufactured exports and FDI attractiveness and considers a broad index of political risk as well as indices targeted toward specific aspects of governance (corruption, government effectiveness and the rule of law). The results are robust to different econometric approaches and lend strong support to the hypothesis that the functioning of institutions may disable the participation of MENA countries in the world economy. They suggest that the impact of an improvement in the quality of institutions may result in a sensitive increase of FDI inflows and manufactured exports. That increase is comparable to the one resulting from liberalization policies. Hence, although institutional reforms can take time, they deserve the necessary efforts given their outcomes as compared to other reforms.

1. Introduction

Many professionals attribute the disappointing growth and employment records in the Middle East and North Africa (MENA) to the low integration of the region in the world economy (see Dasgupta et al., 2002, for a discussion).[10] Abstracting from oil, the region scores one of the lowest ratios of export to GDP among all regions of the world but Sub-Saharan-Africa. In term of FDI inflows it also shows a similar picture.

Previous researches have identified restrictive trade and exchange rate policies among the reasons for the low exports and FDI performance of developing countries. For instance, Sachs and Warner (1995) have showed that more liberalized economies tend to adjust more rapidly from primary-intensive to manufactures-intensive exports. Sekkat and Varoudakis (2002) focused specifically on the MENA and investigated whether trade policy reforms can increase the share of manufactured exports in GDP. Their results suggest that trade policy matters for the region's performance. A similar conclusion was reached by Achy and Sekkat (2003) regarding the impact of exchange rate policy in the MENA. However, recent research suggests that for countries to fully benefit from openness strategies the functioning of institutions might be crucial.

As far as trade is concerned, Anderson (2001) suggested that the ill functioning of institutions impairs foreign trade, because it increases both the costs and risks of trading abroad. Anderson and Marcouiller (2002) accordingly observe that bad institutions reduce the volume of trade. Finally, Dollar and Kraay (2002) report a positive correlation between openness and the quality of institutions with a potential bi-directional causality between the two variables. Regarding FDI, a first study by Wheeler and Mody (1992) failed to establish a significant relationship between FDI and institutions. These results being inconsistent with popular wisdom, Wei (2000) carefully re-examined the issue using a comprehensive data set on bi-lateral FDI flows. The results of his estimation show the existence of a negative relationship between corruption in the host country and FDI. Henisz (2000) moreover finds that foreign firms are more likely to enter wealthier countries with large population and credible political rules.[11]

[10] On the relationship between trade and growth in general see for instance Edwards (1992), Rodriguez and Rodrik (2001) and Frankel and Romer (1999).

[11] The literature also suggests direct effects of institutions on growth. See Mauro (1995), Hall and Jones (1999), and Olson et al. (2000).

The present paper builds on these researches to examine the impact of institutions on manufactured exports and FDI attractiveness of the MENA. Econometric specifications of manufactured exports supply and FDI inflows' determinants are estimated including both traditional explanatory variables and indicators of the quality of institutions. Six indicators of institutions are considered. Three of them concern corruption: the Corruption Perception Index published by Transparency International, the corruption index provided by the World Bank and Wei (2000)'s indicator. The other three cover different aspects of governance: government effectiveness, the rule of law (both drawn from Kaufmann et al., 1999) and a broad index of the quality of governance published in the International Country Risk Guide.

The paper is organized as follows. Section 2 discusses the MENA's recent macro-economic performance and its participation in the world economy. Section 3 briefly presents the literature linking institutions to trade and FDI. Section 4 discusses the econometric approaches. Section 5 presents the results and section 6 concludes.

2. The MENA's economic performance in an international context

Over the last fifteen years growth performance in the MENA has been disappointing relative to that of the rest of developing countries. The growth rate of per capita GDP in the region declined from around 3.45% on average during the sixties and seventies to around 0.1% on average during the eighties and the nineties. The disappointing growth record reflected in high unemployment rate that amounts to around 15%. While the decreasing pattern of growth rate is similar for oil-exporting and non-oil-exporting countries, the unemployment rate is much higher for non-oil-exporting countries and amounts to around 25%.

Researches on the source of growth in the MENA have shown that trade has not been utilized as a momentum for growth (see Makdisi et al., 2000 for a recent investigation). This is due to the lack of export diversification in the region. Abstracting from energy export, the region continues to be among the least integrated regions in the world in terms of trade and FDI. It is even losing ground in this respect relative to other regions.[12] The lack of export diversification makes the growth pattern

[12] While world trade has been expanding in the past decade by about 8 percent a year, the MENA's trade has only been growing by about 2.7 percent a year.

in the region highly volatile. In oil-exporting countries it is closely related to energy price cycles while in others, such as Morocco, it is highly dependent on drought conditions due to the importance of agriculture in the economy. Such a situation impacts these economies capacity to invest, import, manage foreign exchange and hence their growth.

The move from primary commodity exports to manufacture and service exports can be an important factor of sustained economic growth for at least two reasons. First, the demand for such exports increases more with income increase than the demand for primary products. Hence, growth prospects for a country's exports are higher if its exports are diversified than when it is specialized in primary products. Second, the development of the manufacturing sector induces substantial dynamic productivity gains, and growth, arising from economies of scale, learning effects, and externalities among firms and industries.

The MENA's record is disappointing in terms of export diversification. Figure 1 shows that the MENA, Sub-Saharan Africa (SSA) and Latin America exhibited the lowest ratios of manufactured exports to GDP in 1990. Over the 90's, the ratio stagnated for the MENA while it increased markedly for Latin America and slightly for SSA, thereby leaving the MENA in the last position in 1999. Inside the region, there are important differences among countries. Oil-producing countries such as Libya, Saudi Arabia, Oman, Kuwait and Algeria were not diversified at the beginning of the decade and did not improve their record. Others like Oman, Tunisia, Egypt, Syria, Jordan, Morocco, and Qatar showed significant improvement.

FDI inflows provide developing countries with the additional resources they need to improve their economic performance. FDI inflows are expected to increase a country's output and productivity, to encourage local investment and to stimulate the development and dispersion of technology.

The MENA's record in terms of FDI attractiveness is also disappointing. The region's share in global investment and private capital inflows is small and falling. The ratio of FDI flows to GDP was on average around 0.83 percent for the the MENA region during 1990s while it was 1.51 in Eastern Europe, 1.66 in SSA, 2.35 in Latin America and 2.82 in East Asia. Moreover, in contrast to most developing countries where FDI in percentage of GDP is increasing, the ratio in the MENA remained constant over the last decade (see figure 2).

Except for Tunisia, FDI inflows to the MENA are highly dependent on the presence of energy and on political conditions. For instance, investment in Algeria, Iraq or Sudan has been frightened away by political turmoil while Saudi Arabia and Egypt attracted further FDI in the last years. The flows of FDI to Tunisia reached 13 percent of GDP, which is slightly above the average of developing countries.

Figure 1: Manufactured Export as % of GDP

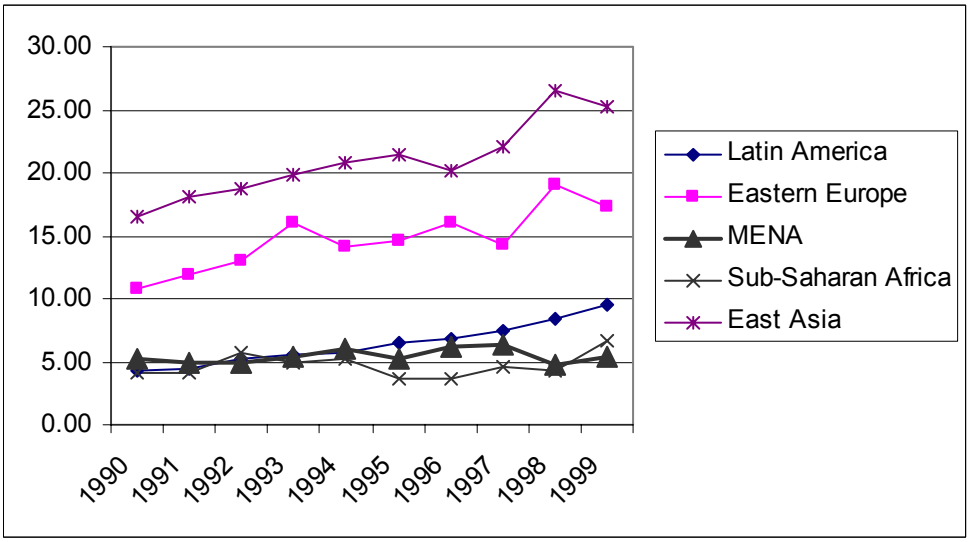
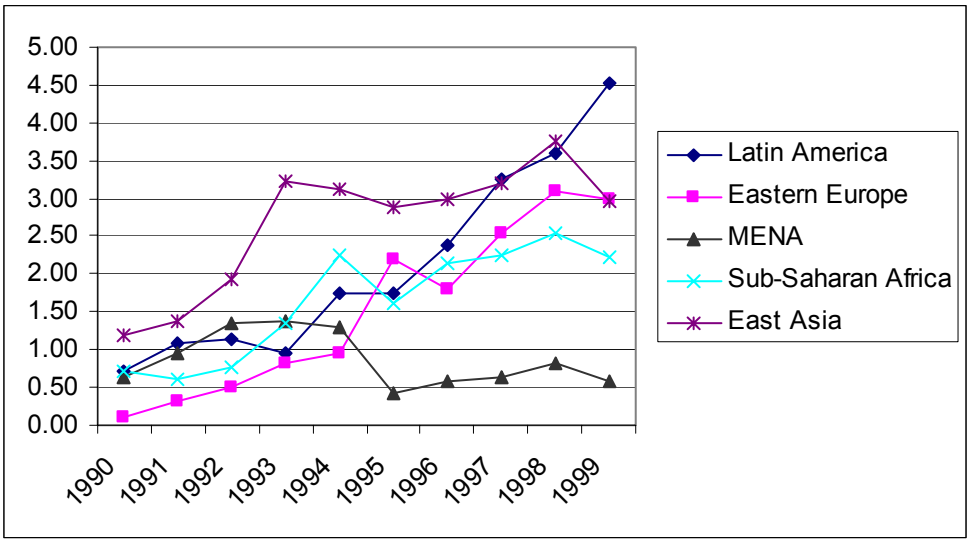


Figure 2: FDI Inflows as % of GDP



3. Conceptual framework

Although there is empirical evidence that the MENA's disappointing performance may be due to distorted and inward-looking policies, openness strategies may not be sufficient unless they are complemented by institutional reforms.[13] The present section documents how institutions can affect export performance and FDI attractiveness and provides a conceptual framework for testing such effects.

3.1. Institutions and trade

Studies of the relationship between institutions and trade are receiving increasing attention. Institutions can either directly affect the willingness of agents to trade abroad, or affect economic variables that may in turn lower the propensity of agents to trade. [14]

The direct impact of institutions on the propensity to trade runs through the reduction of the expected return of trading abroad. A theoretical analysis by Anderson and Young (1999) suggests that the lack of enforcement of contracts may act as a tariff on risk-neutral traders and therefore reduce trade.[15] Rodrik (2002) points out that the main impediment to international trade may indeed be the problem of contract enforcement, which is of particular relevance in international transactions since they confront traders in countries whose legal and political jurisdictions differ. Using gravity models, Anderson and Marcouiller (2002) lend empirical support to the impact of the quality of institutions on trade. Deterioration of the former induces a positive mark-up on the price of exports that reduces foreign demand and then exports.

The impact of institutions on trade may also result from their effect on the risks associated with international transactions (Anderson and Marcouiller, 1997). Insecurity may prevent trade even though it offers potential mutual gains. For instance, predation reduces trade not only because it is a direct deduction on the flow

[13] Elbadawi (1999) has already pointed to the inadequate institutional support for investment and private sector development in the region.

[14] Some authors argue that the causality between institutions and trade may run in the other direction (Rodrik, 2002, Treisman, 2000, and Hisamatsu, 2003). This reverse causality seems, however, to be statistically fragile (Knack and Azfar, 2003). While aware of the possibility of a two-sided causality between institutions and trade, we abstract from this issue here.

of traded goods, but also because it diverts resources from their productive allocation towards the defense of property rights. It follows that good institutions that may help bar predation may also foster trade.[16]

In addition to their direct effects, institutions may also indirectly affect trade through their impact on other variables that determine trade flows. Investment being an important determinant of trade (Rodrik, 1995 and Elbadawi, 1998), the impact of the quality of institutions on investment (Brunetti and Weder, 1998, Mauro, 1995, Knack and Keefer, 1995) induces their indirect impact on trade. Furthermore, deficient institutions impact both productivity (Hall and Jones, 1999) and its growth (Olson et al., 2000). As lower productivity is an impediment to competitiveness, countries with deficient institutions are likely to meet difficulties trading abroad.

3.2. Institutions and foreign direct investment

The relationship between FDI and institutions has attracted greater interest than the relationship between institutions and trade. The literature underlines, however, the same type of mechanisms: direct effects stemming from the impact on the return and the risk associated with investing abroad and indirect effects coming from the impact on other variables, such as human capital or infrastructure, that were found to influence FDI inflows.

The literature suggests that the main institutional impediment to FDI may not lie in its effect on the return of investing abroad but on the excess risk that it entails. Unlike trade, foreign investment is not only subject to a risk of predation and hold-up but also, and chiefly, to a risk of expropriation and nationalization. Harms and Ursprung (2002), focusing on democracy, argue that authoritative regimes are associated with a greater risk of policy reversals, due for example to the dictator's own whims, the need to raise public support through populist measures, or simply coups. Furthermore, Vinod (2003) points out that the impact of institutional risk on foreign investment may be even larger than expected if agents found their decisions on value at risk methods. Indeed, those methods tend to attach an extra weight to the

[15] Contract enforcement becomes crucial when traders incur significant sunk costs resulting in a hold-up problem. Robert and Tybout (1997) document that such costs may be large and have dramatic consequences on trade.

[16] In addition, defective institutions also seem to distort the geographic structure of trade, as Lambsdorff (1998, 2000) observes. He finds that some countries, like Belgium, France, Italy, the Netherlands and South Korea, are persistently over-represented in the imports of corrupt countries and that others like Sweden and Malaysia tend to trade less with corrupt importers.

worst scenario and may therefore deter FDI more than what standard models of economic behavior suggest.

Recently, Gastanaga et al. (1998) find that corruption, bureaucratic delays and imperfect contract enforcement are associated with lower FDI to GDP ratios. Globerman and Shapiro (2002) also observe that various measures of governance quality are related to FDI inflows. Finally, Wei (2000) describes the consequences of corruption on bilateral FDI flows as a tax on foreign investors. Other studies examine separately the impact of the quality of governance and the impact of the risk associated with it. Campos et al. (1999) report that the predictability of corruption is a significant determinant of the investment ratio. A similar observation was made by Brunetti et al. (1998). Lambsdorff (2003) finds that the predictability of corruption has an impact on inward capital flows that is distinct from the impact of the level of corruption

Finally, institutional deficiencies may also have an indirect effect on FDI flows through their impact on other variables. The literature has shown that FDI flows are sensitive to human capital, health of the workforce and the quality of public infrastructure (Mody and Srinivasan, 1998, and Globerman and Shapiro, 2002). It has precisely been observed that defective institutions tend to be associated with lower adult literacy rates (Kaufman et al., 1999), larger public investment in unproductive assets (Mauro, 1998), and lower expenditures devoted to the maintenance of past projects. Hence, by encouraging unproductive public investments that result in less efficient public facilities and a slower accumulation of human capital, defective institutions also indirectly hamper countries' attractiveness for foreign investment.

4. Data and Methodology

To assess the impact of the quality of institutions on manufactured exports and FDI, we rely on traditional econometric specifications of these variables to which we add measures of the quality of institutions. Various indicators are now available to proxy the quality of institutions. They include the International Country Risk Guide (ICRG) index, the Transparency International (TI) index, and a set of the World Bank (WB) indices covering various dimensions of institutions' quality. However, apart from the ICRG index and, to some extent, the TI index, all the other indices are time invariant. While the ICRG index provides a broad measure of institutions' quality, the others

have the advantage that each is designed to measure a specific aspect of governance, which is a useful piece of information for our study.

In order to take advantage of the time dimension in the ICRG and the TI indices, and of the precision in the WB indices two econometric approaches are adopted. One consists of using the whole time series-cross section sample (including ICRG and TI) as it stands and apply the Panel Data analysis. The other estimates a Fixed Effects model using basic specifications for manufactured trade and FDI and then use the estimated Fixed Effects as a dependent variable to be explained by institution indicators and relevant control variables.[17] A detailed description of the approaches is provided below.

4.1. The Panel data approach

We apply the same panel data approach to both manufactured exports and FDI. However the relationships that we estimate are naturally different and are consequently presented separately.

a. Manufactured exports

To test for the impact of institutions on manufactured exports, we extend a specification that was used by Sekkat and Varoudakis (2000). We assume the following relationship between exports of manufactures and the quality of institutions:

$$\log(XM_{it}) = \alpha_{0i} + \alpha_1 * \log(E_{it}) + \alpha_2 * RYP_{it} + \alpha_3 * \log(IM_{it-1}) + \alpha_4 * \log(Inst_{it}) + \mu_{it} \qquad (1)$$

Where, XM_{it} is country i's ratio of manufactured exports to GDP for year t. E_{it} stands for country i's real effective exchange rate for year t; an increase in E_{it} implying an appreciation of the exporters currency. RYP_{it} measures the GDP growth rates of country i's partners. IM_{it-1} is year t-1's investment in the manufactured goods sector over GDP. $Inst_{it}$ stands for an index of the quality of country i's institutions for year t, higher values of $Inst_{it}$ standing for a lower quality of its institutions. Finally, μ_{it} is the error term.

[17] This method is described in Hsiao (1986, section 3.6.1.). For an application to institutional measures, the interested reader may refer to Olson et al. (2000).

We use the ratio of manufactured exports as the dependent variable to correct for the differences in countries' sizes.[18] α_{0i} is a fixed country effect that accounts for systematic cross-country differences that are not explained by the other independent variables. It therefore accounts for unmeasured or unobservable country specificities related to countries' socio-economic characteristics. The control variables are standard in the literature and all have a well-defined expected impact on manufactured exports. The coefficient of the exchange rate should be negative, as an increase in E_{it} means an appreciation of the exporter's currency. We expect a positive coefficient for the growth rates of a country's partners. If a country's partners grow faster, they will increase their demands for goods produced in that country, thereby raising its exports. Finally, we complement our set of control variables by the ratio of investment in the manufactured goods sector to GDP. This is based on the presumption that investment in the manufactured goods sector should raise its capacity, resulting in greater supply of manufactured goods hence higher exports. We accordingly expect the exports ratio to be positively correlated with investment. As institutional indicators, we use here the two time varying indices: the index published in the International Country Risk Guide and the Corruption Perception Index constructed by Transparency International.

The International Country Risk Guide provides, among others, a synthetic indicator of the political risk associated with a country on an annual basis. That indicator is constructed so as to encompass a wide variety of political factors that may influence the risk of investing in a country. Those factors are so diverse that it is not possible to associate the ICRG political risk indicator with any specific aspect of governance.[19] It is therefore best interpreted as a synthetic measure of risk, broadly defined. The original index ranges from zero to one hundred, the latter corresponding to the lowest possible risk. To insure coherence with the other indicators, we re-code it such as an increase reflects higher risk. We therefore expect our ICRG index to be negatively related to the ratio of manufactured exports.

[18] In so doing, we may well underestimate the impact of governance on exports of manufactures. Namely, as worse governance is associated with a lower GDP (Mauro, 1995, or Knack and Keefer, 1995), both the numerator and the denominator of the exports ratio are negatively affected by defective institutions. This suggests that the impact of governance on exports may be stronger than what our point estimates already imply. That comment also applies to the FDI ratio used below.

[19] As a matter of fact, that indicator results from the aggregation of twelve basic components, unevenly weighted. Those components respectively assess: the stability of the government, socioeconomic conditions, the government's attitude toward investment, the degree of political violence, the potential for external conflict, corruption, the role of the military in politics, the role played by religion in politics, law and order, ethnic tensions, the government's democratic accountability, and the quality of the bureaucracy (ICRG, 1999).

Unlike the ICRG index, the TI index focuses on a specific aspect of governance, i.e. corruption. It ranges from zero to eight, the latter corresponding to an absence of corruption. It was also re-coded such that an increase in that index reflects higher corruption. Thus, we expect the modified index to be negatively associated with manufactured exports.[20]

b. Foreign Direct Investment

The strategy we employ to assess the impact of institutions on FDI is quite similar to the one we use for exports of manufactured goods. Namely, we add an index of the quality of institutions to a standard set of explanatory variables (see UNCTAD, 1998). The relationship that we estimate is therefore the following:

$$\log(FDI_{it}) = \beta_{0i} + \beta_1 * \log(Ypc_{it}) + \beta_2 * RY_{it} + \beta_3 * \log(Prim_{it}) + \beta_4 * RYP_{it} + \beta_5 * \log(Inst_{it}) + \upsilon_{it} \quad (2)$$

Where FDI_{it} is country i's FDI to GDP ratio for year t and Ypc_{it} its current GDP per capita for year t. RY_{it} stands for country i's current GDP growth rate for year t. $Prim_{it}$ measures country i's primary school enrolment ratio for year t. υ_{it} is the error term. RYP_{it} and $Inst_{it}$ are defined as in (1).

Here again, the dependent variable is scaled by GDP to abstract from the difference in the size of countries. We tried to use FDI in the manufactured sector to get a better measure of the attractiveness of countries but such series are available for too few countries, only two of which (Morocco and Tunisia) are part of the MENA region.[21] Once these series are used with governance indicators, we end up with only one MENA country (Morocco).

As in (1), β_{0i} is country i's fixed effect, which controls that country's specificities that are not measured by the other explanatory variables. The control variables are, as before, fairly standard. An increase in per capita income is associated with higher purchasing power and is supposed to attract more FDI: β_1 should consequently be positive. Faster GDP growth suggests dynamism of the economy and is expected to

[20] Note that Transparency International warns against year to year comparisons of its index on the ground that its composition may change for one year to another. We nevertheless decided to use that index in our panel estimations for comparison with the ICRG.

attract more FDI: β_2 should also be positive. A better educated, hence potentially more productive, workforce should also attract foreign investors. We therefore expect a positive β_3. As faster growth of main trading partners implies more opportunity for exports FDI may also increase: β_4 should be positive. Finally, as bad institutions are assumed detrimental to investment, we expect β_5 to negative.

4.2. Cross section of Fixed Effects

Apart from the ICRG risk index and the Transparency International index, other institutional indicators exist which have the advantage of being designed to measure a specific aspect of governance. These indicators are however time invariant. To take advantage of the information in these indicators, we use another econometric approach. In a first step we separate the explanatory variables used before into two sub-sets: those which vary in time (first sub-set) and those which do not (or almost not). The latter sub-set includes the new institutional indicators, human capital, and per capita GDP.[22] In a second step we estimate a specification where explanatory variables are fixed country effects and the ones included in the first sub-set. The fixed country effects therefore capture all the cross-country differences that are not explained by the differences in, and variations of, the time-varying variables. In the third step the estimated fixed country effects coefficients are used as dependent variables to be explained by institutions indicators, the other non-time varying variables (second sub-set) and other control variables. The third step therefore assesses to which extent systematic cross-country differences are attributable to differences in measured time-invariant variables, including chiefly the quality of institutions.

a. Manufactured Exports

The specification to be estimated in the second step for exports of manufactures is the same as (1) except that only E_{it}, RYP_{it}, and IM_{t-1} are included among the regressors.

[21] Using total FDI may blur the impact of governance because such flows can also be driven by natural resources abundance.
[22] Although per capita GDP varies in time, the variations over the sample period appears to be slow enough for its inclusion in the second subset to improve the results.

In the third step, we used the fixed country effects estimated in the second step as a dependent variable. The specification estimated in the third step is :

$$\alpha_{0i} = \eta_0 + \eta_1 * \log(Inst_i) + \eta_2 * \log(Pot_i) + \varepsilon_i \quad (3)$$

Where α_{0i} is country i's fixed effect as estimated in the second step. $Inst_{it}$ is an index of the quality of country i's institutions. Pot_i measures country i's market potential. ε_i is the error term.

Four time-invariant indicators of institutions are considered. The first and second ones are indices of corruption (labeled Wei and WB respectively) and are drawn form Wei (2000) and Kaufmann et al. (1999). The two other indicators shed light on the impact of two different facets of governance: the rule of law and government effectiveness. Both draw on Kaufmann et al. (1999). Government effectiveness concerns the "perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of the civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies". The rule of law is "the extent to which agents have confidence in and abide by the rules of society". For the sake of comparability, the two governance indicators used before (ICRG and TI) are also considered. They are simply averaged over the sample period. We re-scaled all indices so that higher levels mean lower quality of governance. Their coefficients should consequently be negative.

We used a country's market potential as a control variable in the exports regressions. That variable is defined as the distance-weighted average of a country's partners' GDP's. It therefore measures how close a country is to other markets. That variable was computed by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) and was downloaded form its website. Our presumption is that the closer a country to rich economies the more it will export. We therefore expect the market potential variable to be positively correlated with a country's exports of manufactures ratio.

b. Foreign Direct Investment

Regarding FDI, the specification that we estimate in the first step is similar to (2). Only RY_{it}, $Prim_{it}$ and RYP_{it} are used as explanatory variables however. Once that

relationship is estimated, the country fixed effect can be used as the dependent variable in the third step, using the following specification:

$$\beta_{0i} = \lambda_0 + \lambda_1 * \log(Inst_i) + \lambda_2 * \log(Ypc_i) + \lambda_3 * Nfpp_i + \lambda_4 * \log(Pot_i) + \xi_i \quad (4)$$

Where β_{0i} is country i's fixed effect as estimated the second step and $Inst_{it}$ an index of the quality of country i's institutions. Ypc_i stands for country i's average per capita GDP. $Nfpp_i$ is a dummy variable equal to one when country i is classified as an exporter of primary products (including oil) by the World Bank. Pot_i measures country i's market potential. ξ_i is the error term.

The measures of institutional quality are the same as before and so are the expected sign of the coefficients. A new control variable is introduced here: $Nfpp_i$. It takes account of the fact that natural resources abundant countries can attract more FDI independently of their institutional framework: λ_3 should be positive.

5. Empirical Results

In this section, we successively present the results of our computations with the panel data approach and the cross-section of fixed effects.

5.1. The Panel data approach

Tables 1 and 2 display the estimation results of equations (1) and (2) respectively. Both equations are estimated using a sample of cross-section and time series data. All series, except institution indicators, are drawn from the World Development Indicators. The sample includes annual data (1990-1999) and covers a number of countries between 34 and 107 (see the appendix). We use the panel data econometric methodology: tests of fixed and random effects are conducted to select the most adequate models. The estimates are heteroskedastic consistent. The fixed effects and the random effects tests support the focus on the fixed effects model. The overall quality of fit is very high for exports and high for FDI.

a. Manufactured Exports

In the regression with the ICRG index, all coefficients of the control variables are significant and have the expected sign. Faster growth in a country's partners leads to an increase in its exports of manufactures, the appreciation of the exporter's currency harms its exports. Investment in the manufactured goods sector is associated with higher exports. The coefficient of the ICRG index also has the expected sign and is significant, confirming that higher political risk disables a country's participation in world trade.

The regression where the TI corruption index is used among the explanatory variables confirms the main results obtained above: the governance index is significantly correlated with manufactured exports and a reduction in the level of corruption results in an increase of such exports. However, the control variables lose their significance. This may be due to the drastic reduction in the sample's size or to the fact that, as suggested by TI itself, the index should not be used in a temporal perspective.

In a nutshell, a quick glance at table 1 seems to confirm the importance of institutions in determining a country's participation in international trade. One may however wonder what the quantitative importance of governance is and, more to the point, what that result means for MENA countries. To answer those two questions, we use our estimations to compare the observed exports ratio of the MENA countries comprised in our sample with what it may be if their governance improved.[23]

[23] Due to limitations in the availability of data, there are only six MENA countries in our sample for which we could run that exercise.

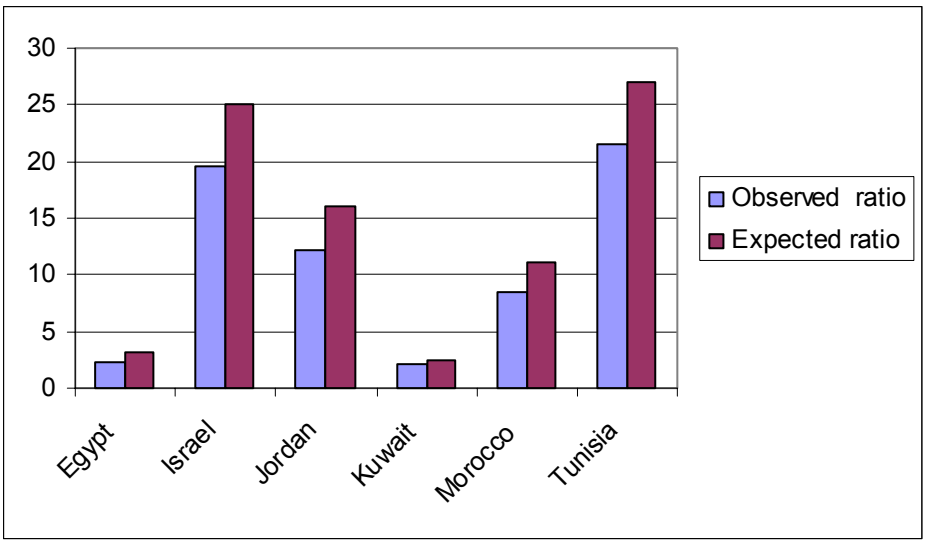
Table 1: Regression results. Dependent variable: Ratio of manufactured exports to GDP

Explanatory variables	**Institutional indicator used in the specification**	
	Political risk (ICRG)	Corruption (TI)
Exchange rate	–0.43**	–0.19
	(2.52)	(0.7)
Partners' growth	0.044***	–0.04
	(2.67)	(1.61)
Investment	0.12***	–0.02
	(3.92)	(0.75)
Institutional indicator	–0.78***	–0.25**
	(3.80)	(2.17)
Number of observations	357	125
Adjusted R^2	0.95	0.97
Fixed effects	108.86	106.17
Random effects	$X^2(3) = 27.6$	$X^2(1) = 0.65$

Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. Fixed effects are not reported. The estimates are heteroskedastic consistent.

Given the quality of its results, we focus on the degree of political risk as measured by the ICRG index. Our estimation reveals that the elasticity of the manufactured exports to the index is 0.78. This means that if any country decreased its political risk by one percent, during any particular year, its exports ratio would be expected to rise by 0.78%. To grasp the true meaning of that figure, let us take the example of Morocco. In 1997, that country's ICRG score amounted to 68.8 and its exports of manufactures to 10.4% of its GDP. Let us now assume that during that year Morocco could have raised its ICRG index to Switzerland's level, which is the country that on average ranks highest on the ICRG scale, with an index of 85.08 in 1997. The choice of the highest level score may seem excessive. The outcomes are proportional however: assuming that the gap between Morocco and Switzerland is only reduced by half will result in one half of our computed outcome. Hence, one can easily compute the result of different scenarios.

Figure 3: The expected impact of an improvement of governance in MENA countries on their exports ratio



Assuming the Swiss index will result in a 23.75% increase in Morocco's ICRG index that, according to our estimation, would have resulted in a 18.45% increase in Morocco's exports of manufactures ratio. Morocco's exports ratio would therefore have amounted to 12.32% instead of 10.4% in 1997, a ratio similar to Poland's. The impact on manufactured exports ratio is far from negligible. For instance, Sekkat and Varoudakis (2002) have found that the trade liberalization program adopted in Morocco since 1983 has resulted in an increase of the manufactured exports ratio by around 40%. Hence, the impact of improvement in the quality of institutions could be one half that of twenty years of trade liberalization.

We ran the same exercise for every year and every MENA country in the sample. The average difference between the observed ratio and the predicted ratio if governance improved is reported in Figure 3. This shows marked differences in the observed trade of manufactured goods ratio from one country to another. Tunisia appears to be the most open country in the sample of MENA economies, whereas Kuwait is the least open economy. More to the point, it shows that an upgrading of the political risk indicator to Switzerland's level would have resulted everywhere in an increase of the exports of manufactured goods ratio. However the magnitude of the average variation differs from one country to another. For instance, Kuwait could only raise its exports of manufactured items by 0.33 percentage points while Tunisia could obtain a 5.40 points increase in that ratio.

b. Foreign Direct Investment

The results for the FDI ratio using the ICRG index show that a higher per capita income and a faster growth of trading partners increase FDI inflows. The domestic growth and human capital coefficients are non-significant. The ICRG index is significantly and negatively correlated with the FDI ratio. This suggests that political risk is a severe impediment to FDI.

When one looks at the regression where the TI corruption index is used instead of the ICRG index, the above diagnosis is, however, qualified. It appears that the coefficient of that index is not significantly different from zero. We therefore observe no meaningful relationship between FDI and corruption, as measured by the CPI index.

The results therefore underline the role of political risk in general, rather than only one aspect of bad governance i.e. corruption, in diverting FDI from a country. A sensible question is to determine by how much it does. To provide an order of magnitude, we ran the same simulation for the FDI ratio as we did for the exports of manufactures ratio. We therefore assessed the potential impact of an improvement of the political risk of the MENA countries in our sample to Switzerland's level. The results of our computations, based on an estimated elasticity of 1.91, are plotted in Figure 4 below.[24]

[24] As FDI data are more easily available than data on exports of manufactures, we could run our simulation on a larger sample of MENA countries.

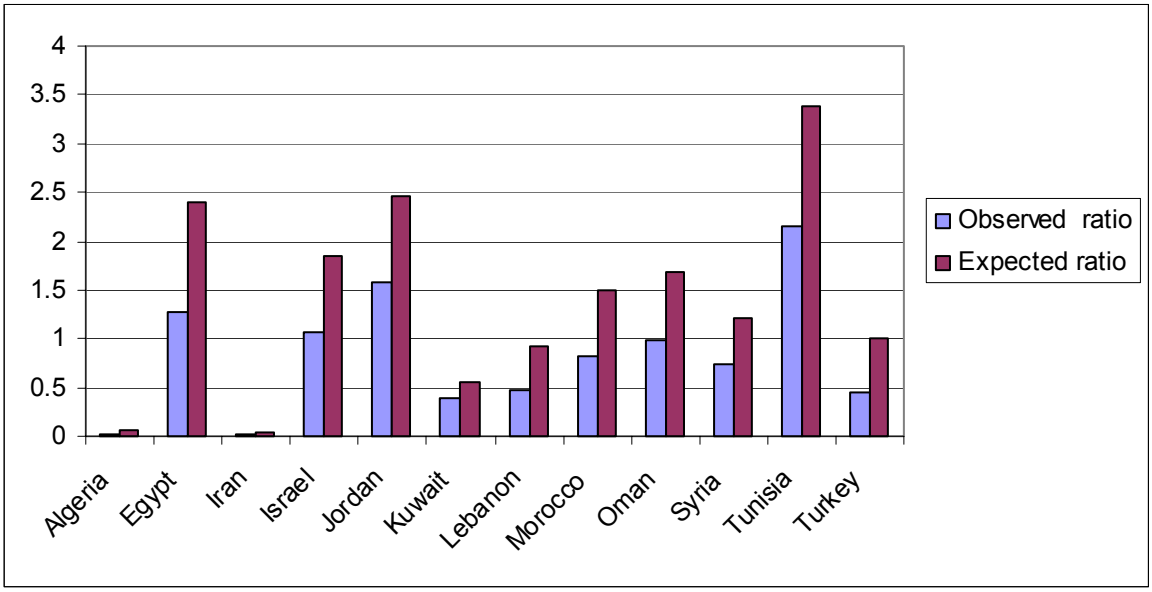
Table 2: Regression results. Dependent variable: Ratio of FDI to GDP

Explanatory variables	**Institutional indicator used in the specification**	
	Political risk (ICRG)	Corruption (TI)
GDP per capita	1.32*** (2.98)	3.58** (2.44)
Growth rate	0.0076 (1.30)	–0.02 (0.94)
Primary schooling	0.42 (1.13)	3.66** (2.40)
Partners' growth	0.063** (2.11)	–0.054 (0.74)
Institutional indicator	–1.91*** (6.05)	0.013 (0.02)
Number of observations	833	215
Adjusted R^2	0.67	0.78
Fixed effects	15.96	9.55
Random effects	$X^2(3) = 15.97$	$X^2(5) = 32.72$

Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. Fixed effects are not reported. The estimates are heteroskedastic consistent.

Like figure 3, figure 4 displays significant differences in the observed FDI attractiveness of the MENA countries of our sample. With a ratio equal to 2.15 percent, Tunisia is the most attractive economy, followed by Jordan, whose FDI ratio amounts to 1.60 percent. On the other hand, Algeria and Iran's FDI ratios, that hardly exceed 0.2 percent, are the least attractive in the sample.

Figure 4: The expected impact of an improvement of governance in MENA countries on the FDI ratio



The feature of interest in Figure 4 is the increase in the FDI ratio that would result if the countries in our sample reduced their degree of political risk. It appears that the improvement measured in relative terms would be greater for the FDI ratio than for the exports ratio, due to the greater estimated elasticity of FDI to political risk. Some countries, such as Turkey or Egypt, might accordingly almost double their FDI ratio.

In absolute terms, Tunisia and Egypt would be the chief gainers of an improvement of their political risk. They would accordingly raise their FDI ratio by more than one percentage point if they upgraded their risk to the level of Switzerland. The FDI ratios of Morocco, Israel and Jordan would also increase, although to a lesser extent. Finally, the case of Algeria is worth emphasizing. Our estimations imply that that country might more than double its FDI ratio if it cut down its political risk. However, as that country attracts very little FDI, the increase measured in absolute terms would appear almost negligible.

Those results are based on a specific definition of governance, i.e. political risk as measured by the ICRG political risk index. To get a better view of the impact of institutions, using a more refined definition of institutions would be desirable. However, as the alternative measures of institutional quality are unfortunately time-

invariant, our method must be adapted accordingly. That is the aim of the following section.

5.2. Cross section of Fixed Effects

In this section, we first study the relationship between the quality of institutions and the exports of manufactures ratio, then focus on the determinants of the FDI ratio.

a. Manufactured Exports

Table 3 presents the result of the relationship between various dimensions of governance and manufactured exports. Given that the sample is only cross-section, the overall quality of fit is good. The results show that the proximity of large markets has a significantly positive impact on the exports of manufactured goods, since market potential exhibits a positive and significant coefficient. Moreover, all the governance variables appear significantly in the regressions and exhibit their predicted sign. The regressions, therefore, unanimously suggest that institutional quality has an impact on manufactured exports, regardless of which aspect of governance is taken into account. More interestingly, the regressions underline the importance of a country's institutions on its exports of manufactured goods in spite of the inclusion of an additional explanatory variable. In other words, all the governance variables remain significantly correlated with the ratio of exports of manufactured goods and the sign of their coefficients remains unaffected.

To get a clearer picture of the meaning of those results for MENA countries, we complement the insights of table 3 by a quantitative evaluation of the impact of institutions on the exports ratio of those countries. To do so, we follow the same procedure as in the previous section and use our results to simulate the consequences of an improvement of the institutions of MENA countries for their exports ratio.

Table 3: Regression results. Dependent Variable: Fixed Effects of manufactured exports ratio.

Explanatory variables	Institutional indicator used in the specification					
	Political risk (ICRG)	Corruption (TI)	Corruption (Wei)	Corruption (WB)	Rule of law	Government effectiveness
Constant	–9.03*** (4.29)	–5.96*** (3.05)	–5.73*** (2.62)	–4.72** (2.13)	–9.02*** (4.35)	–9.12*** (4.61)
Market potential	0.59** (2.23)	0.75*** (3.61)	0.77*** (3.45)	0.64*** (2.87)	0.63** (2.03)	0.65** (2.18)
Institutional indicator	–0.05*** (2.76)	–0.73*** (3.18)	–1.10** (2.32)	–1.41*** (3.37)	–2.19** (2.10)	–2.16** (2.24)
Number of observbations	40	38	34	38	38	38
Adjusted R^2	0.34	0.39	0.32	0.42	0.42	0.42

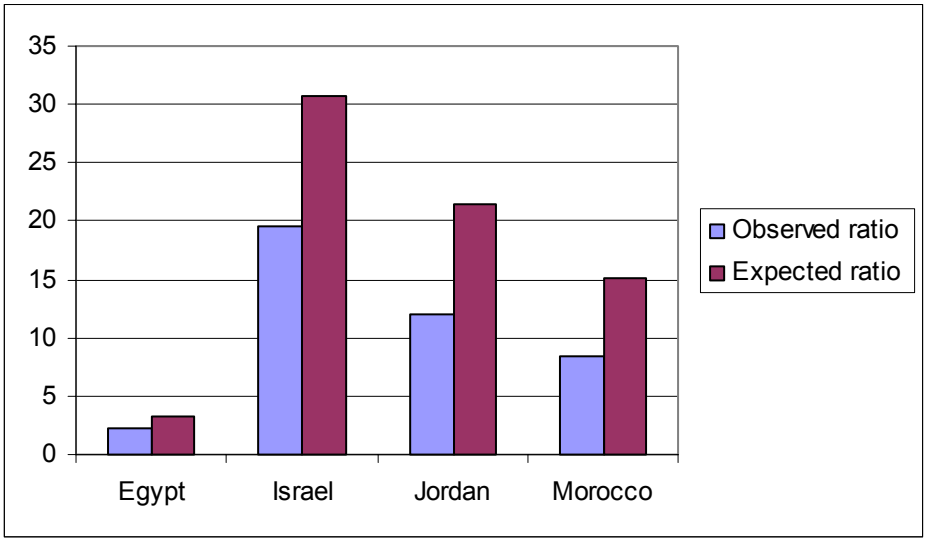
Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. The estimates are heteroskedastic consistent.

Let us accordingly focus on Wei (2000)'s measure of corruption and assume that the MENA countries included in our sample were able to reduce the pervasiveness of corruption to Finland's level. That country, which scores 1.3 on Wei (2000)'s corruption scale, is the least corrupt country in our sample according to Wei (2000). Such an improvement would for instance result in a 71.7 percent reduction in Morocco's corruption index. According to the point estimate of the elasticity of exports of manufactured goods to corruption, such an evolution would result in a 78.9 percent increase in that country's exports ratio. That would take it to 15.1 percent, a ratio comparable to France's. The increase here is higher than with the ICRG index and becomes comparable to the one resulting from liberalization. We followed the same line of reasoning for the four MENA countries for which data were available. The outcome of our estimations is summarized in Figure 5.

Figure 5 shows differences in the relative impact of a better control of corruption between countries. Thus, it appears that Morocco and Jordan might almost double their exports of manufactured goods ratio while Egypt would only raise it by one third. As the estimated elasticity of the exports of manufactured goods ratio is the same for all countries, these differences are due to the difference in the quality of

governance in each country. Thus, according to Wei (2000), Egypt fares better than Morocco and Jordan in terms of corruption. An improvement of Egypt's degree of corruption to Finland's consequently results in a smaller relative improvement than for the other countries.

Figure 5: Expected impact of an improvement in governance on the exports of manufactures ratio in some MENA countries



Regarding the absolute impact of an improvement of a country's degree of corruption, Israel would obtain the largest gain. If Jordan succeeded in controlling corruption as well as Finland, it would obtain an exports of manufactured goods to GDP ratio equal to 21.4 percent, which would be similar to Austria's. It would thus rank among the top ten exporters of manufactured goods as a percentage of their GDP.

b. Foreign Direct Investment

Table 4 reports the results of the relationship between various dimensions of governance and FDI. The regressions lead to a somewhat more mixed impression than the regressions displayed in table 3. First, the overall quality of fit is very low, even for a cross-section data.

Second, there is no consistent pattern of control variables significance. When significant, they tend to exhibit the right sign. The coefficient of human capital is positive and significant in four instances out of six. The coefficient of per capita GDP is significant in three instances and is negative. This sign contradicts the one found in

the cross-section time-series sample. It is, however, not necessarily wrong since in a pure cross-section (cross-country) dimension it is interpreted as a proxy for (the inverse) return on capital (Edwards, 1991). Higher per capita GDP should therefore be associated with less foreign investment.

Table 4: Regression results. Dependent variable: Fixed effects of FDI ratio.

Explanatory variables	**Institutional indicator used in the specification**					
	Political risk (ICRG)	Corruption (TI)	Corruption (Wei)	Corruption (WB)	Rule of law	Government effectiveness
Constant	–18.77***	–6.38**	–5.23**	–7.15**	–7.56***	–7.56***
	(4.52)	(2.95)	(2.17)	(2.60)	(4.08)	(4.01)
Per capita GDP	–0.24*	–0.22*	–0.26*	–0.09	–0.06	–0.06
	(1.76)	(1.67)	(1.98)	(0.50)	(0.40)	(0.35)
Human Capital	0.04	0.43**	0.49**	0.42*	0.40*	0.40
	(0.19)	(2.20)	(2.31)	(1.79)	(1.67)	(1.55)
Primary products exporter	0.07	0.42	0.42	0.46	0.47*	0.47*
	(0.25)	(1.63)	(1.62)	(1.57)	(1.78)	(1.70)
Market potential	–0.14	0.26	0.22	0.18	0.19	0.19
	(0.58)	(1.24)	(0.96)	(0.82)	(0.90)	(0.88)
Institutional indicator	–4.07***	–0.34	–0.85*	–0.14	0.84	0.00
	(3.33)	(1.24)	(1.94)	(0.24)	(0.01)	(0.00)
Number of observations	107	84	76	88	88	88
Adjusted R^2	0.17	0.05	0.08	0.04	0.04	0.04

Absolute *t*-statistics are displayed in parentheses under the coefficient estimates. *: test-statistic is significant at the 10% level ; **: significant at the 5% level ; ***: significant at the 1% level. The estimates are heteroskedastic consistent.

Finally, only the coefficients of the ICRG political risk index and the corruption index, as measured by Wei (2000)'s, exhibit significant signs. The signs of those coefficients correspond to their predicted signs. This suggests that political risk or corruption tend to impede FDI. The results on corruption are, however, not confirmed by the other indicators. The result regarding, the ICRG index is coherent with our previous findings. Here again, the results suggest that this is political risk in general, rather than only one aspect of bad governance, which reduces FDI to a given country.

As before, we tried to illustrate the meaning of those results for the four MENA countries for which data were available. We therefore supposed that those countries were able to upgrade their institutions so as to reach an institutional quality similar to Finland's. Using our point estimate of the elasticity of the FDI ratio to Wei (2000)'s

corruption index, we could compute the predicted variation of those countries' FDI ratios. The results of our computations are displayed in Figure 6 below.

Figure 6: Expected impact of an improvement in governance on the FDI ratio in some MENA countries

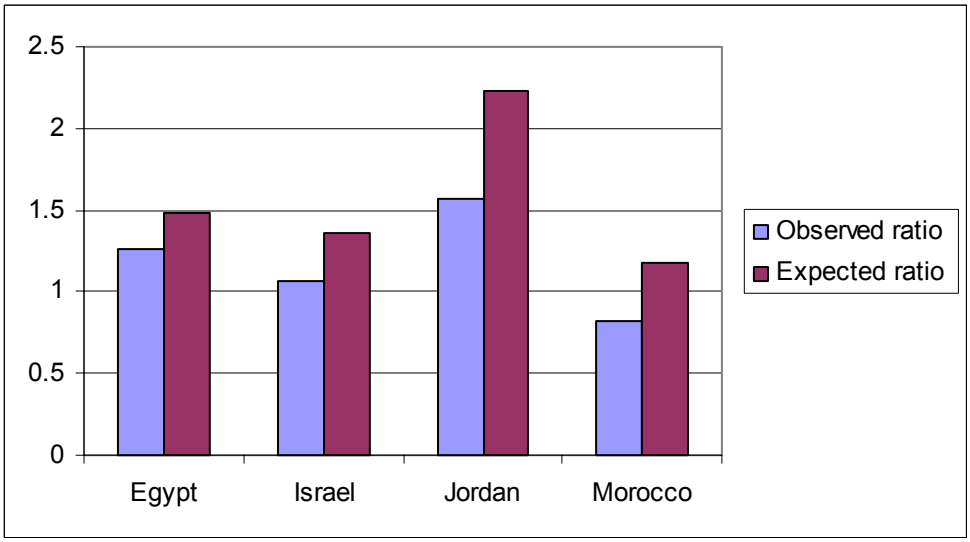


Figure 6 confirms that institutions matter for MENA countries. Namely, if the MENA countries in our sample could control corruption, as measured by Wei (2000)'s index, our estimations predict that they would all experience a rise in their FDI ratio. As before however, one can observe marked differences in the impact of controlling corruption from one country to another. Thus, in relative terms, Morocco and Jordan would gain more than Israel and Egypt.

5. Conclusion

The present paper examines the extent to which ill-functioning institutions disable a greater participation of MENA countries in the world economy. It builds on recent research emphasizing the importance of the quality of institutions for growth, trade and investment. The paper focuses on manufactured exports and FDI attractiveness as the main indicators of the region's integration to the world economy. The latter is

seen as an important mechanism which can enable the MENA to meet the growth and employment problems it is facing.

The empirical analysis relies on basic specifications of manufactured exports supply and FDI inflows' determinants to which indicators of the quality of institutions are added. The latter includes a broad index of political risk as well as indices targeted toward specific aspects of governance such as corruption, government effectiveness and the rule of law. The estimation is conducted on a large sample of countries over the nineties and uses different econometric approaches in order to check for the robustness of the results.

Overall, the results lend strong support to the hypothesis that the functioning of their institutions may disable the participation of MENA countries in the world economy. From an econometric point of view, the results for manufactured exports are, however, stronger than for FDI. It is found that deterioration of the quality of institutions is, in general, associated with low performance in terms of manufactured exports and FDI attractiveness.

Simple simulations resting on our econometric results suggest that the impact of an improvement in the quality of institutions may result in a sensitive increase of FDI inflows and manufactured exports. Depending on the institutional indicator used, the latter can improve by an amount comparable to the one resulting from liberalization policies. For instance, institutions improvement in Morocco is found to entail an increase of the ratio of manufactured exports to GDP at least equal to one half of the impact of the liberalization policy initiated twenty years ago. Hence, although institutional reforms can take time, they deserve the necessary efforts given their outcomes as compared to other reforms.

Appendix: Countries in the sample *

Albania	***Ethiopia***	***Lebanon***	***Russia***
Algeria	Finland	***Madagascar***	***Senegal***
Angola	France	***Malawi***	***Sierra Leone***
Argentina	Gabon	Malaysia	Singapore
Australia	***Gambia***	***Mali***	***Slovak Republic***
Austria	***Germany***	Malta	South Africa
Bangladesh	***Ghana***	***Mexico***	Spain
Bolivia	Greece	***Mongolia***	***Sri Lanka***
Brazil	***Guatemala***	Morocco	***Sweden***
Bulgaria	***Guinea***	***Mozambique***	***Switzerland***
Burkina Faso	***Haiti***	Netherlands	***Syria***
Cameroon	***Honduras***	New Zealand	***Tanzania***
Canada	Hungary	***Nicaragua***	***Thailand***
Chile	***Iceland***	***Niger***	***Togo***
China	***India***	Nigeria	Tunisia
Colombia	***Indonesia***	Norway	***Turkey***
Congo Republic	***Iran***	***Pakistan***	***Uganda***
Costa Rica	Ireland	***Panama***	United Kingdom
Cote d'Ivoire	Israel	***Papua New Guinea***	United States
Cyprus	Italy	***Paraguay***	Uruguay
Czech Republic	***Jamaica***	***Peru***	Venezuela, RB
Denmark	Japan	Philippines	***Vietnam***
Dominican Republic	Jordan	Poland	***Zambia***
Ecuador	***Kenya***	Portugal	***Zimbabwe***
Egypt	***Korea, Republic***	Romania	
Ethiopia	Kuwait		

* Countries in italic do not enter the exports sample.

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LES EFFETS DES INVESTISSEMENTS DIRECTS ETRANGERS SUR LA PRODUCTIVITE DES PAYS MEDITERRANEENS

Laurence Cecchini*

Charles Lai Tong**

Résumé

Nous examinons la relation entre l'investissement direct étranger et la productivité totale des facteurs des pays méditerranéens partenaires de l'Europe dans le cadre d'un modèle de panel cointégré.

Les résultats, obtenus à partir des données de sept pays méditerranéens partenaires de l'Europe (Algérie, Egypte, Israël, Jordanie, Maroc, Tunisie, Turquie) sur la période allant de 1980 à 2000, indiquent que l'IDE et le capital humain sont complémentaires dans l'acquisition des gains de productivité. Nous identifions le seuil de capital humain à partir duquel les investissements étrangers reçus génèrent des effets bénéfiques.

De manière plus générale, l'amélioration de la productivité totale des facteurs *via* l'ouverture internationale ne résulte que des effets indirects liés aux transferts de technologie.

Abstract

We examine the relation between the foreign direct investment and the total factor productivity of the Mediterranean partner countries of Europe within the framework of a cointegrated panel model.

The results, obtained from data on seven Mediterranean partner countries of Europe (Algeria, Egypt, Israel, Jordan, Morocco, Tunisia, Turkey) from 1980 to 2000, show that FDI and human capital are complementary in the acquisition of productivity gains. We identify the threshold level of human capital from which the received foreign investments generate beneficial effects.

In a more general way, the improvement of the total factor productivity *via* the international openness results only from the indirect effects related to the transfer of technology.

* CEFI - Université de la Méditerranée et IUFM de Lyon

** CEFI - Université de la Méditerranée

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I. INTRODUCTION

Le classement de la CNUCED (2002) des pays sur la base de l'indice d'investissement direct étranger (IDE) effectif[1] indique que seuls trois pays parmi les pays du Sud et de l'Est de la Méditerranée partenaires de l'Europe[2] (PM) reçoivent un niveau relativement élevé d'IDE sur la période 1998-2000 : Israël, Malte et la Tunisie. Cinq autres, à savoir Chypre, l'Egypte, la Jordanie, le Liban et la Syrie ont un indice d'IDE potentiel[3] supérieur à l'effectif. Les autres étant les moins dynamiques. Les rapports précédents du FEMISE soulignaient un risque de marginalisation de la région. Les chiffres des dernières années montrent que cette tendance n'est pas, à ce jour, inversée. Ainsi, les IDE dans la région du Sud et de l'Est de la Méditerranée, principalement d'origine européenne[4], restent relativement faibles et instables (voir l'annexe 1 pour des données chiffrées).

Cette faiblesse est-elle un handicap pour les PM ? Autrement dit, est-ce que les partenaires euro-méditerranéens peuvent s'appuyer sur les IDE pour faciliter le développement des PM ?
Plusieurs arguments théoriques viennent accréditer cette idée. Tout d'abord, à côté des échanges commerciaux, les flux d'IDE participent à l'ouverture d'un pays sur l'extérieur. Tous deux représentent une opportunité pour stimuler l'activité économique. Le commerce international permet à chaque nation d'augmenter sa productivité en se spécialisant en fonction de ses avantages comparatifs. L'IDE, en accroissant le stock de capital, contribue à l'accroissement de la productivité grâce à l'absorption des ressources inemployées et une meilleure utilisation des ressources existantes. Il conduit également à une meilleure allocation des ressources en stimulant la concurrence. Ensuite, les développements récents des théories de la croissance endogène mettent en évidence le rôle majeur de la recherche et développement[5] et du capital humain[6] dans la croissance. Le commerce international et l'IDE sont alors des vecteurs de diffusion du progrès technique.
Nombre d'analyses empiriques ont également confirmé une relation positive entre la croissance, ou la productivité totale des facteurs, et les variables explicatives suivantes : la R&D, l'ouverture commerciale, le capital humain et l'IDE, qui sont introduites de manière séparée ou combinée. En mettant en évidence les canaux de transmission et en affirmant la portée universelle des bienfaits du commerce international et des IDE, la majorité des travaux des années 1990 a contribué au développement du mouvement de libéralisation commerciale de nombreux pays en développement (PED). En ce qui concerne le commerce international, Coe et Helpman (1995) montrent que la productivité totale des facteurs (PTF) d'un pays dépend du stock de R&D domestique mais aussi du stock de

[1] Cet indice compare la part d'un pays dans le total mondial des flux d'IDE et sa part dans le PIB mondial. Un indice supérieur à l'unité signifie que le pays attire davantage d'IDE que ne le justifie son poids économique.
[2] Maghreb (Algérie, Maroc, Tunisie), Mashrek (Egypte, Jordanie, Liban, Syrie, Palestine), Turquie, Israël, Chypre et Malte.
[3] L'indice d'IDE potentiel est construit à partir de facteurs structurels et classe les pays en fonction de leur potentiel d'attraction.
[4] Selon EUROSTAT, l'Union Européenne, en 1998, est à l'origine de 50% des IDE cumulés des pays de l'OCDE dans les pays méditerrannéens. Les Etats-Unis sont à l'origine de 43% et le Japon de 7%. La part des investisseurs de l'UE est supérieure à 70% au Liban, au Maroc, en Syrie, en Tunisie et en Egypte.
[5] Romer (1990) et Grossman et Helpman (1995) fournissent les premiers modèles théoriques.
[6] Le modèle de Lucas (1988), notamment, établit le rôle de l'accumulation du capital humain dans la croissance.

R&D de ses partenaires commerciaux[7]. Ils mettent en évidence que la R&D étrangère joue un rôle d'autant plus important par rapport à la R&D domestique que le pays est plus ouvert. Krueger (1997), soutient la libéralisation commerciale des PED : mettant en parallèle la croissance des exportations et la croissance du PIB, elle constate que les pays les plus ouverts connaissent à long terme les meilleures performances en matière de croissance. Quant à l'IDE, Findlay (1978) suggère qu'il accélère le progrès technique du pays d'accueil grâce à un effet de "contagion" des technologies plus avancées, des pratiques de management, *etc.* des firmes étrangères implantées. Wang (1990) intègre cette idée dans un modèle où la connaissance appliquée à la production est une fonction de l'IDE. Sur le plan empirique, une étude de l'UNCTAD (1992) conclut au rôle majeur de l'IDE comme moteur de la croissance dans les PED, conclusion atteinte également par Blomstrom, Lipsey et Zejan (1992). Par ailleurs, des comparaisons entre les performances de l'IDE et de l'investissement domestique ont été faites. De Gregorio (1992) notamment, à partir d'une étude sur 12 pays d'Amérique latine, trouve que l'IDE est trois fois plus efficient que l'investissement domestique.

Toutefois, d'autres travaux prenant en compte les spécificités des PED, comme la nature de leur spécialisation (Choudhri et Hakura, 2000), ou le niveau de qualification de la main d'œuvre (Borensztein, De Gregorio et Lee, 1998) aboutissent à des résultats moins optimistes sur le rôle de l'ouverture au commerce et aux capitaux étrangers, divergeant de la masse des travaux menés sur les pays développés. Ces travaux récents soulignent que le débat n'est pas clos quant aux effets du commerce international et des IDE sur le développement.

L'effet bénéfique de l'ouverture, et plus particulièrement des IDE, qui ne semble pas être automatique, existe-il pour les PM ? A quelles conditions pourrait-il être développé ?

Notre travail consiste donc à étudier comment les différentes théories et relations entre l'IDE, le commerce international et la croissance peuvent être appliquées et spécifiées dans le cas des PM. Dans la mesure où la productivité totale des facteurs mesure l'efficacité du processus de production, et joue ainsi un rôle majeur dans le développement, nous centrons notre recherche sur l'analyse de la PTF. Dans un premier temps, nous estimons la PTF de sept pays méditerranéens (Algérie, Egypte, Israël, Jordanie, Maroc, Tunisie, Turquie) au moyen d'une fonction de production Cobb-Douglas. Nous étudions, ensuite, les déterminants de la PTF de ces PM de la manière suggérée par Coe et Helpman (1995), en intégrant les apports de Lichtenbergh et Van Pottelsberghe (1998) et de Borensztein, De Gregorio et Lee (1998). Notre analyse empirique sur des données de panel couvre la période allant de 1980 à 2000.

Notre étude est organisée de la manière suivante. Dans la deuxième section, nous présentons les relations théoriques entre l'IDE et la PTF, que nous confrontons à la réalité des PED. Dans la troisième section, nous exposons notre modèle et les résultats sur l'effet des IDE et d'autres variables explicatives sur la PTF. La quatrième section constitue la conclusion de ce travail et propose des indications en matière de politique économique.

[7] Ils prolongent ainsi les travaux de Griliches (1988) et Coe et Helpman (1993) sur rôle positif de l'accumulation de la R&D domestique sur la productivité.

II. LES RELATIONS THEORIQUES ENTRE L'IDE ET LE DEVELOPPEMENT CONFRONTEES A LA REALITE DES PED

Les avantages du libre échange ont été mis en avant tant par la théorie traditionnelle du commerce international que par les nouvelles théories intégrant des éléments de concurrence imparfaite. Quelques articles remettent, toutefois, d'une certaine façon en cause les effets bénéfiques de la libéralisation sur le développement des PED. Pour Greeneway, Morgan et Wright (2002), qui utilisent trois mesures différentes de la libéralisation[8] et testent un modèle dynamique de croissance sur des échantillons alternatifs de PED, l'effet favorable de la libéralisation sur le PIB par tête peut se produire, mais il reste modeste et est différé dans le temps. Choudhri et Hakura (2000) soulignent l'importance de la nature de la spécialisation des PED : dans la mesure où l'avantage comparatif des PED se situe probablement dans des secteurs traditionnels à faible croissance, un commerce international non régulé pourrait cantonner la production à de tels secteurs, et conduire, finalement, à un taux de croissance de la productivité inférieur[9]. Ils réalisent une analyse empirique sur 33 PED s'appuyant sur le modèle de "gap technologique" de Krugman (1985)[10] et concluent que l'intensification de la concurrence par les importations augmente la croissance de la productivité globale seulement lorsqu'elle a lieu dans les industries manufacturières enregistrant une croissance moyenne. Dans les industries traditionnelles (à faible croissance) ainsi que dans les industries de haute technologie, l'accroissement des importations n'a pas d'effet sur la croissance de la productivité globale.

L'effet des IDE sur le développement des PM est d'autant plus attendu que le commerce international n'a pas réussi à enclencher une dynamique positive et forte des avantages comparatifs pour la plupart de ces pays.

Les voies d'action des IDE sont multiples, directe ou indirectes.

- Les IDE reçus augmentent le stock de capital disponible dans le pays hôte. Ils offrent la possibilité de pallier la faiblesse de l'épargne nationale, souvent invoquée pour expliquer la médiocrité des performances. Toutefois, Reis (2001) attire l'attention sur le fait que les investissements étrangers peuvent faire l'objet de rapatriements. Son modèle, construit à partir du travail de Grossman et Helpman (1991, chapitre 4) intègre l'effet

[8] Un premier indicateur consiste en une variable muette traduisant l'intervention de la Banque Mondiale. Le second est basé sur le travail de Dean et al. (1994), et prend en compte quatre éléments : les droits de douane, les quotas, les promotions et entraves à l'exportation et les mésalignements des taux de change. Le troisième correspond à l'indicateur de Sachs et Warner (1995) qui intègre cinq critères : l'étendue des produits sans droit de douane, les droits de douane moyens, la prime de change sur le marché noir, si l'économie est socialiste ou non, si un monopole d'Etat existe sur les principales exportations. Les conclusions de leur travail restent similaires quel que soit l'indicateur utilisé.

[9] Cette possibilité est discutée dans la théorie de la croissance endogène. Grossman et Helpman (1991, chapitres 18 et 19) présentent un certain nombre de cas où le libre échange réduit la croissance de la productivité d'un pays désavantagé sur le plan technologique.

[10] Trois secteurs sont considérés, chacun connaissant un taux constant mais différent de progression de la technologie (bas, moyen, haut). Les pays moins avancés acquièrent les meilleures techniques avec un écart temporel supérieur. Ils ont ainsi un désavantage comparatif dans les industries où la productivité croît plus rapidement. L'idée que le commerce international facilite le transfert de technologie est introduite en autorisant l'écart technologique d'un pays dans un secteur à être inversement lié à l'ouverture du secteur. La taux de croissance de la PTF à long terme est la moyenne pondérée par les parts dans la production des taux sectoriels.

positif pour le pays hôte d'une baisse des coûts de l'introduction d'un nouveau produit dans l'économie, du fait que la technologie est déjà connue (effet technologique), mais aussi l'effet négatif des rapatriements de revenus de l'investissement à l'étranger (effet de fuite). L'effet final sur la richesse du petit pays dépend du poids des deux composantes.

- Les flux d'IDE sont moins volatils que les flux d'investissement de portefeuille. D'abord, la décision d'investir est un processus long comparé à celui de l'achat d'une obligation. Les IDE, plus encore que les prêts bancaires, sont précédés d'analyses détaillées de la situation du pays, du secteur, *etc*. Ensuite, dans le cas des IDE, le délai entre la décision d'investir et le transfert effectif de fonds se compte en mois. Une seule décision d'IDE peut même donner lieu à plusieurs années de flux, quand l'achat de capital ou l'investissement dans le processus de production se fait en plusieurs étapes. Autre caractéristique, l'IDE est rarement un flux isolé. Il fait en général partie d'une stratégie d'investissement, d'un plan à long terme dans un pays ou une zone, avec des coûts d'entrées-sorties très importants. Cela les distinguent des flux de portefeuille, pour lesquels les coûts de transactions restent limités. Cette stabilité relative des investissements directs est en soit favorable au développement du pays d'accueil.

- Les IDE peuvent avoir un effet stimulant sur l'investissement domestique. Ils constituent alors un catalyseur du progrès technique et de l'investissement domestique en créant des effets complémentarité externe (Bourgain et Pieretti, 1998). Ils complètent les ressources locales et fournissent un signal de confiance à propos des opportunités d'investir. Mais, ici, l'effet peut-être inversé : *a contrario*, les IDE peuvent produire un effet d'éviction. Si l'IDE se fait dans une activité déjà réalisée par les entreprises nationales l'effet d'éviction peut se produire pour deux raisons : d'une part, la concurrence peut dissuader l'entrée des firmes domestiques et anéantir les moins performantes et, d'autre part, l'appel éventuel des firmes étrangères au marché des capitaux local peut faire augmenter le taux d'intérêt. Lorsque l'IDE concerne une activité nouvelle sur le marché domestique, seul ce deuxième mécanisme peut se mettre en œuvre, ce qui rend l'effet d'éviction moins probable.
Plusieurs études récentes portent sur ces effets négatifs sur l'investissement domestique. Ainsi, l'UNCTAD (1999) estime que l'effet d'éviction apparaît dans certains pays d'Afrique sub-Saharienne et d'Amérique Latine. Agosin et Mayer (2000) développent un modèle théorique d'investissement incluant l'IDE au sein duquel les effets de l'IDE sur l'investissement sont autorisés à varier selon les pays, en fonction de la politique interne et de la nature des flux d'IDE (à savoir dans des activités nouvelles ou des activités existantes), et selon les secteurs, en fonction de la technologie : on s'attend à une complémentarité de l'IDE et de l'investissement domestique lorsque l'IDE est orienté vers les industries de haute technologie et à une substitution du premier au second lorsque l'IDE concurrence directement les firmes locales. En testant leur modèle sur un panel de 32 PED, sur la période 1970-1996, les auteurs obtiennent un effet positif de l'IDE sur l'investissement domestique ("*crowding-in effect*") pour l'Asie, mais un effet négatif ("*crowding-out effect*") en Amérique latine, et un effet neutre pour l'Afrique.

- Un effet positif attendu de l'IDE sur la croissance provient de l'accroissement de la concurrence. La présence de nouvelles firmes sur le marché incite les firmes domestiques à rationaliser et à moderniser leur structure productive. Tandis que les firmes nationales gagnent en productivité, les FMN étrangères investissement de manière croissante pour

conserver leur avance technologique (Glass et Saggi, 1998). Toutefois, d'un point de vue sectoriel, la PTF des firmes domestiques peut diminuer à la suite des IDE : si les firmes étrangères occupent une large part du marché, les économies d'échelle vont diminuer pour les firmes domestiques. Si le secteur affecté par la concurrence est un des plus dynamique, c'est la PTF globale qui peut régresser. Nous rejoignons ici le débat sur la protection des industries naissantes.

- L'effet positif attendu le plus important de l'IDE sur la croissance est associé au transfert de technologie. La présence d'IDE au sein de l'économie hôte a un impact favorable puisque :

- l'IDE encourage l'utilisation de nouveaux biens intermédiaires. Ainsi, comme dans le modèle de Romer (1990), une augmentation de la variété de biens intermédiaires, ou une plus grande spécialisation de chacun d'entre eux, va entraîner une augmentation de la production ;
- de même, l'assistance technique auprès des fournisseurs locaux incite ces derniers à s'adapter aux nécessités de production en terme de qualité et de délais des investisseurs étrangers ;
- l'IDE accroît le stock de connaissance du pays hôte grâce à la formation du personnel et à l'acquisition de compétences de la population active ;
- il permet également l'adoption de nouvelles méthodes de gestion et d'organisation ;
- de façon plus générale, la diffusion des savoirs tacites est plus facile dans le cas des IDE que des importations.

La diffusion de la technologie *via* l'IDE a reçue relativement moins d'attention que le commerce international, en particulier du fait de la pauvreté des données en ce domaine. En ce qui concerne le commerce international, les chercheurs ont obtenu, en utilisant différentes approches, la même conclusion sur le rôle significatif du commerce international dans la transmission des connaissances, même si les estimations quantitatives diffèrent[11]. Pour l'IDE, le consensus n'existe pas, même au niveau qualitatif. Hejazi et Sarafian (1999), notamment, estiment des effets de diffusion importants des six plus grands pays développés vers des pays plus petits durant la même période. A l'inverse, Lichtenberg et Van Pottelsbeghe (1998, 2001) et Xu et Wang (2001) trouvent que les flux d'IDE entrants n'ont pas permis la diffusion de la technologie parmi les pays de l'OCDE durant les années 1970-1990. En distinguant les IDE entrants et sortants comme sources de transferts technologiques, Lichtenberg et Van Pottelsbeghe (2001) aboutissent au constat que le transfert *via* l'IDE ne se fait que dans un sens : la productivité d'un pays est accrue s'il investit dans des pays étrangers à forte intensité en R&D mais pas si les pays à fortes intensités en R&D investissent chez lui. Ces résultats vont à l'encontre de la majorité des travaux sur la question menés sur les pays développés mais sont cohérents avec le paradigme OLI de Dunning (1994) selon lequel les firmes préfèrent investir à l'étranger, plutôt qu'exporter, afin de profiter de leur avance technologique et non pas pour diffuser cet avantage à l'étranger. Xu (2000) trouve que le transfert de technologie des firmes multinationales américaines a contribué à la croissance de la productivité des pays développés mais pas des économies moins développées. Les conclusions de Sadik et

[11] Par exemple, Coe et Helpman (1995) trouvent que l'investissement en R&D des pays du G7 génère un revenu supplémentaire de 30% pour les autres pays de l'OCDE (au dessus du taux de revenu sur l'investissement en R&D domestique), ceci en augmentant leur PTF. Bernstein et Mohnen (1998) estiment que la diffusion de le R&D des EU vers le Japon est bien plus élevée que celle du Japon vers les EU.

Bobol (2001)[12] vont dans le même sens . Ils distinguent deux effets liés à l'IDE : d'une part, il augmente le capital disponible, et d'autre part, il peut modifier l'efficacité du capital par la diffusion du progrès technologique. Ils estiment, pour six pays arabes, que les IDE contribuent à l'accroissement du capital, mais pas à une meilleure efficience de celui-ci : si l'investissement global et la croissance du PIB ont un lien positif pour tous ces pays, le lien entre IDE et croissance est négatif et significatif pour trois d'entre eux.
Par ailleurs, le caractère limité de la diffusion de la technologie à une partie restreinte de l'activité apparaît également. En réalisant une étude sur l'industrie chinoise, Yu et Démurger (2002) montrent que l'impact positif de l'investissement direct étranger sur la croissance économique n'apparaît clairement que pour l'industrie des biens de consommation et non pour les industries des biens intermédiaires et des biens d'équipement.
Enfin, Borensztein, De Gregorio et Lee (1998)[13] mettent en lumière le caractère conditionnel de l'effet bénéfique des IDE reçus. Leur test mené sur 69 PED révèle une forte complémentarité entre les IDE et le capital humain de sorte que l'effet positif n'apparaît qu'à partir d'un seuil minimal de capital humain dans le pays hôte. Lorsque le stock de capital humain est faible, les IDE ont même un effet négatif sur la croissance. Le capital humain forme avec le capital physique disponible les capacités d'absorption des nouvelles technologies (ce qui renvoie aux théories de l'accumulation). Nelson et Pack (1999) ajoutent à cela, même s'il est difficile de les appréhender, les capacités d'innovation de la population (théories de l'assimilation) : l'esprit d'entreprise, le goût du risque, mis en avant par Schumpeter, sont facteurs d'assimilation de la technologie véhiculée par l'IDE.
L'analyse montrent ainsi que l'IDE opère un transfert technologique plus fort si l'écart entre la technologie ainsi reçue et la technologie domestique est supérieur, et parallèlement, si les capacités d'absorption de ces technologies nouvelles et complexes sont disponibles[14].

Les travaux précédents nous conduisent à émettre des réserves sur le caractère automatique des bienfaits des investissements directs étrangers. A la lumière de la littérature sur les investissements directs, il semble que la productivité globale des facteurs des pays du sud et de l'est de la Méditerranée devrait bénéficier des IDE, d'autant, voire à condition, qu'ils ne concurrencent pas "trop fortement" les firmes locales, que le stock étranger de R&D est important, et que les capacités d'absorption des nouvelles technologies véhiculées par l'IDE et le commerce international sont élevées, en particulier que la force de travail est qualifiée. Ces caractéristiques se présentent-elles pour les pays partenaires méditerranéens ?

[12] L'étude porte sur l'Oman, le Maroc, l'Arabie Saoudite, la Jordanie, la Tunisie et l'Egypte sur la période 1978 à 1998. Bien que cela soit souvent la cas, il faut noter que le pouvoir explicatif de leur équation de croissance est faible.
[13] Ils trouvent qu'un impact positif sur la croissance apparaît à partir d'un stock de capital humain de 0,52 année d'éducation secondaire des adultes. Leur calcul du niveau moyen d'éducation se fait de la manière suivante : si 10% de la population des plus de 25 ans a atteint le niveau secondaire et si, 75% ont effectué le cycle complet de 6 ans et le reste seulement 3 ans, le niveau d'éducation secondaire est : 0,1(6*0,75+3*025)=0,52.
[14] Voir Sjoholm (1999) à propos de l'écart technologique et Nelson et Pack (1999) au sujet des capacités d'absorption.

III. LES DETERMINANTS DE LA PTF DES PAYS MEDITERRANEENS

III.1. Estimation de la PTF

La productivité totale des facteurs est au cœur de la croissance économique. L'accroissement de la productivité est la source d'un meilleur niveau de vie pour les générations futures. La productivité affecte aussi la position concurrentielle d'une nation : plus elle est productive, plus elle est capable d'être compétitive sur le marchés mondiaux. La croissance de la PTF correspond au rapport entre la croissance de la production et la croissance pondérée des facteurs de production. Une hypothèse couramment acceptée consiste à utiliser une fonction de production Cobb-Douglas avec les parts des facteurs dans le total des coûts comme pondération de chaque facteur. Il est vrai que cette méthode nécessite de faire des hypothèses contraignantes[15], mais elle demeure la moins biaisée.
Ainsi, nous estimons la PTF de la manière suivante :

$$PTF_t = Y_t / \left(K^{\beta} L^{(1-\beta)} \right)$$

avec *PTF* la productivité totale des facteurs,
Y la production,
K le stock de capital,
L le travail
t l'indice temporel
β la part du capital dans la rémunération des facteurs

Nous avons estimé la PTF des pays méditerranéens à partir du PIB total[16]. Les données utilisées sont présentées en annexe 3. Le paramètre β varie selon les pays et reste stable sur la période considérée. Son niveau, pour chaque pays, est fixé à partir de travaux antérieurs[17] : 0,22 pour le Maroc (cf. Zaimi (2002)) ; 0,16 pour l'Egypte et 0,25 pour la Tunisie (cf. Bouoiyour et Yazidi (2000)) ; 0,25 pour la Turquie (cf. Menegaldo (2001)) ; nous fixons β en Jordanie au même niveau qu'au Maroc.

Les gains de productivité sont présentés dans le tableau 1 et les évolutions de la variable sont exposées sous forme graphique en annexe 2.

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[15] Tout d'abord, les rendements d'échelle sont supposés constants, ainsi on attribue peut-être à la PTF ce que l'on devrait attribuer à la présence d'externalités. Mais, s'il est possible de choisir une fonction de production à rendements d'échelle croissants ou décroissants, cela nécessite de donner au départ la bonne valeur à ce paramètre, ce qui paraît une hypothèse au moins aussi contraignante. Ensuite, les variables de stocks de capital sont encore moins fiables pour les PED que pour les PD. Enfin, et de façon liée, la mesure de la PTF est très sensible à la mesure de la part de chaque facteur dans la valeur ajoutée. C'est pourquoi, pour connaître la part du capital et du travail, nous nous sommes appuyés sur d'autres travaux sur les PM.

[16] Un travail a été réalisé dans le cadre de cette étude sur l'industrie manufacturière à partir des statistiques d'UNIDO mais les résultats obtenus en matière de productivité n'apparaissent pas cohérents, reflétant le manque de fiabilité de ces sources pour les pays concernés.

[17] Senhadji (2000) obtient des coefficients β plus faibles en mesurant la part du travail pondéré par un indice de capital humain. Mais les séries de travail ajusté en terme de qualité de Senhadji ne sont disponibles que sur la période 1960-1994 et sont très délicates à construire. Nous préférons ainsi travailler directement à partir de l'emploi. La qualification sera intégrée plus tard dans nos régressions sur les déterminants de la PTF.

Tableau 1 : Taux de croissance annuel de la PTF basée sur le PIB entre 1980 et 2000 (%)

	Moyenne	Ecart-type
Algérie	-1,25	2,30
Egypte	1,68	1,63
Israël	0,69	1,78
Jordanie	-1,88	5,17
Maroc	0,23	5,38
Tunisie	0,99	2,66
Turquie	1,26	3,95

Les résultats portant sur la PTF sont cohérents avec les valeurs produites dans les travaux sur les PM[18]. Dans l'ensemble, la PTF évolue de façon irrégulière, soulignant l'absence de stabilité de ces économies, très dépendantes de l'évolution des cours du pétrole, des aléas climatiques (au Maroc, par exemple, la PTF régresse avec les sécheresses en 1989, 1992 et 1995), ou encore des événements politiques et sociaux.
Sur l'ensemble de la période, les gains de productivité sont importants seulement pour trois pays : l'Egypte, la Tunisie et la Turquie. Pour Israël et le Maroc, les gains de productivité sont modestes, avec un taux de croissance annuel moyen inférieur à 1%[19]. Enfin, l'Algérie et la Jordanie subissent entre 1980 et 2000 une dégradation de leurs PTF.

III.2. Le modèle théorique

Notre étude s'appuie sur deux types de travaux :

1) d'une part, les travaux de Coe et Helpman (1995) et Lichtenbergh et Van Pottelsberghe (1998) qui explorent le lien entre le transfert technologique et l'ouverture sur l'extérieur, *via* le commerce international pour les premiers, et *via* l'IDE pour les seconds ;

2) d'autre part, l'article de Borensztein, De Gregorio et Lee (1998) qui porte sur le rôle du capital humain dans le transfert technologique.

Ces travaux découlent eux mêmes des nouveaux modèles théoriques de croissance, largement discutés dans la littérature et qui ne sont donc pas repris ici. Ils se réfèrent en particulier à Grossman et Helpman (1991), Helpman (1992), Romer (1990), et Barro et Sala-i-Martin (1995).

Coe et Helpman (1995) se sont attachés à montrer que la PTF d'un pays dépend non seulement de sa propre accumulation de capital sous forme de R&D mais aussi du stock de R&D de ses partenaires commerciaux. Si tous les biens intermédiaires sont importés, la relation de base entre la PTF et l'accumulation de la R&D, mise en évidence dans les modèles de croissance endogène, reste valide, sauf que la mesure pertinente de la R&D n'est plus le stock domestique mais le stock mondial. Dans la mesure où, dans les cas pratiques, une partie seulement des biens intermédiaires est importée, les variations dans la PTF sont expliqués à la fois par les stocks domestique et étranger de R&D. Coe et Helpman proposent de calculer le stock étranger de R&D en tenant compte à la fois de la

[18] Notamment, les travaux précédemment cités qui utilisent des sources de données en partie différentes des nôtres.
[19] Les taux de croissance annuels moyens, proches de la moyenne des taux de croissance annuels sont de 0,46% pour le Maroc et 0,36% pour Israël.

structure des importations, *ie* de la part des différents partenaires, et du niveau des importations. Ainsi,

$$LogPTF_i = \alpha_i + \alpha_i^d \log S_i^d + \alpha_i^f m_i \log S_i^f$$

où $S_i^f = \sum_{j \neq i} \frac{M_{ij}}{M_i} S_j^d$

avec *i* et *j* les indices des pays

PTF la productivité totale des facteurs

S^d le stock domestique de capital en R&D

S^f le stock étranger de capital en R&D

m_i la part des importations dans le PIB du pays *i*

α^d l'élasticité de la PTF par rapport au stock de R&D domestique

$\alpha^f m$ l'élasticité de la PTF par rapport au stock de R&D étrangère

M_{ij} les importations de *i* en provenance de *j*

Lichtenberg et Van Pottelsberghe (1998, 2001) prolongent le travail de Coe et Helpman dans deux directions. D'une part, ils mettent en évidence un "biais d'agrégation" dans le calcul des stocks de R&D étrangers des précédents auteurs et proposent une mesure alternative théoriquement moins biaisée et qui donne de meilleurs résultats empiriques[20]. D'autre part, ils montrent par une étude économétrique que l'IDE est également un vecteur de transfert de la technologie par delà les frontières. Leur contribution revient à tester l'équation précédente en intégrant différentes mesures du stock de R&D étranger, dont deux correspondent bien à notre problématique :

$$LogPTF = \alpha_i + \alpha_i^d \log S_i^d + \alpha_i^f \log S_i^f$$

avec S_i^f calculée des deux façons suivantes :

$$S_i^{f1} = \sum_{j \neq i} \frac{m_{ij} S_j^d}{y_j} \; ; \; S_i^{f2} = \sum_{j \neq i} \frac{f_{ij} S_j^d}{k_j}$$

En introduisant simultanément les deux mesures du stock de R&D, ils peuvent associer la première mesure au stock de R&D étrangère incorporé dans les importations et la seconde mesure au stock de R&D étrangère incorporé dans l'IDE entrant. L'identification de la nationalité des importations évite le "biais d'agrégation" dans la mesure où les efforts de R&D des partenaires commerciaux sont pondérés par le niveau de leurs exportations. Les IDE du pays *j* vers *i*, notés f_{ij} sont normés par la FBCF du pays *j*, k_j.[21]

Borensztein, De Gregorio et Lee (1998) s'intéressent à l'effet des IDE sur la croissance économique. Leur étude empirique, sur 69 pays en développement durant les deux décennies 80 et 90, trouve ses fondements dans un modèle de croissance endogène au sein duquel le principal déterminant de la croissance de long terme est le progrès technique généré par l'introduction de nouvelles variétés de biens constituant le capital. Les firmes multinationales possédant une avance technologique introduisent les biens intermédiaires dans le pays hôte à un coût inférieur. Toutefois, l'application de ces technologies plus

[20] Keller (1998) a également formulé une critique forte sur la mesure proposée par Coe et Helpman : en utilisant des pondérations aléatoires pour les partenaires commerciaux, ils obtiennent des effets de diffusion de la technologie étrangère supérieurs et un meilleur ajustement en termes de R^2.

[21] Les auteurs ont obtenus des résultats similaires en remplaçant la FBCF par le PIB de *j*.

avancées nécessite la présence d'un niveau suffisant de capital humain dans le pays d'accueil. A l'instar de Nelson et Phelps (1966) ou Benhabib et Spiegel (1994), le stock de capital humain limite la capacité d'absorption du PED. Avec un modèle illustratif proche de celui proposé par Barro et Sala-i-Martin (1995, chapitre 6), ils testent empiriquement plusieurs variantes de la relation de base suivante :

$$g = c_0 + c_1 FDI + c_2 FDI * H + c_3 H + c_4 Y_0 + c_5 A$$

avec g le taux de croissance du revenu

FDI les flux d'IDE en provenance des pays de l'OCDE

H le stock de capital humain appréhendé par le niveau initial des années moyennes de scolarité des hommes dans le secondaire, indicateur proposé par Barro et Lee (1993)

Y_0 le PIB par tête initial

A un ensemble d'autres variables qui affectent la croissance économique et qui sont fréquemment introduites comme déterminants de la croissance dans les études en coupe (cross-country)[22].

III.3. Application du modèle aux pays méditerranéens

Il existe plusieurs sources pour les données d'IDE. La Banque Mondiale (World Development Indicators) et le FMI (International Financial Statistics) fournissent des données sur les flux d'IDE globaux nets et entrants. L'OCDE publie des données plus détaillées concernant les IDE des pays membres envers eux mêmes et certains PED. Les pays à l'origine des flux sont identifiés, ce qui permettrait, notamment, de pondérer les IDE entrants par le stock de R&D du pays d'origine. Toutefois, d'une part, parmi les pays du sud et de l'est de la Méditerranée, seuls l'Algérie, la Turquie, l'Egypte et le Maroc figurent en pays partenaires, et d'autre part, de nombreuses données sont manquantes pour ces pays. Ainsi, afin de mieux couvrir l'espace méditerranéen, nous utilisons les données de la Banque Mondiale.

Par rapport aux arguments théoriques présentés ci-dessus, nous introduisons une simplification consistant à négliger le stock de R&D domestique. En effet, dans la plupart des pays en développement, les dépenses de R&D sont négligeables. Nous supposons donc qu'elles sont suffisamment faibles pour être ignorées.[23] Nous testons d'abord l'équation simple (1) contenant un indicateur d'ouverture commerciale, les IDE et un indicateur du capital humain. Nous intégrons ensuite, dans l'équation (2), la R&D véhiculée par les importations. Enfin, afin de tester si l'effet des IDE sur la PTF est positivement corrélé au niveau du capital humain, nous estimons l'équation (3) incluant l'effet croisé des deux variables.

Les équations retenues prennent les formes suivantes :

$$LogPTF_{it} = \alpha_i + \alpha^{ide} IDE_{it} + \alpha^{ouv} OUV_{it} + \alpha^{e} E_{it} + \varepsilon_{it} \qquad (1)$$

$$LogPTF_{it} = \alpha_i + \alpha^{ide} IDE_{it} + \alpha^{sr} \log SR_{it} + \alpha^{ouv} OUV_{it} + \alpha^{e} E_{it} + \varepsilon_{it} \qquad (2)$$

$$LogPTF_{it} = \alpha_i + \alpha^{ide} IDE_{it} + \alpha^{eide} IDE_{it} E_{it} + \alpha^{sr} \log SR_{it} + \alpha^{ouv} OUV_{it} + \alpha^{e} E_{it} + \varepsilon_{it} \qquad (3)$$

[22] Ces variables correspondent à la consommation du gouvernement, la prime de risque sur le marché noir des taux change, une mesure de l'instabilité politique, une mesure des droits politiques, une "proxy" pour le développement financier, le taux d'inflation, et une mesure de la qualité des institutions.

[23] Quoi qu'il en soit peu de données sont disponibles sur les pays méditerranéens, ce qui rend la construction des stocks de R&D domestiques particulièrement délicate et difficile.

où i et t sont les indices respectifs des pays méditerranéens et des périodes annuelles ;

PTF est la productivité totale des facteurs ;

IDE représente l'investissement étranger ;

SR représente le stock de capital étranger consacré à la R&D incorporé dans les importations ;

OUV est le degré d'ouverture appréhendé par l'indicateur classique des exportations et importations rapportées au PIB ;

E est le taux de scolarisation dans le second degré[24] ;

α_i est une constante spécifique au pays ;

ε est le terme d'erreur.

Les sources de données et les méthodes de calcul sont décrites en annexe 3. L'indisponibilité des données d'IDE par pays d'origine pour la plupart des PM nous empêche de calculer le stock de R&D incorporé dans les IDE. Les stocks de R&D étrangère pour chaque pays méditerranéen sont calculés comme les sommes pondérées par les importations des stocks de R&D de 21 pays de l'OCDE. La pondération adoptée est celle proposée par Lichtenberg et Van Pottelsberghe de la Potterie (1998), et présentée ci-dessus.

A l'instar de Coe et Helpman (1995), Lichtenberg et Van Pottelsberghe (1998), ou Kao, Chiang et Chen (1999) nous cherchons à estimer une relation de cointégration entre nos variables. Notre étude empirique se déroulera en trois étapes. D'abord nous testons l'existence de racines unitaires sur nos variables à l'aide de tests de racine unitaire en panel de Im, Pesaran et Shin (2003). Les résultats, présentés dans l'annexe 5, montrent que nos variables sont non-stationnaires et intégrées d'ordre 1. Nous vérifions ensuite l'existence d'une relation de cointégration en mettant en œuvre les tests de cointégration en panel de Pedroni (1999). Enfin, puisque l'hypothèse de cointégration n'est pas rejetée par les données, nous estimons les coefficients de long terme des équations (1) à (3). Le tableau 2 présente les estimations, réalisées à l'aide du programme FM-OLS de Pedroni (2000)[25].

[24] C'est l'indicateur le plus pertinent disponible pour les PM sur des séries longues. Nous avons introduit alternativement d'autres indicateurs du capital humain, à savoir le taux de scolarisation dans le tertiaire et le pourcentage d'étudiants du tertiaire dans les formations scientifiques et d'ingénieurs ; ces variables sont apparues peu significatives. Le nombre d'élèves dans le secondaire donne des résultats similaires à ceux obtenus avec le taux de scolarisation à ce niveau. D'autres indicateurs, comme le nombre de scientifiques ou d'ingénieurs dans la R&D sont très mal renseignés pour les PM et sont donc inutilisables.

[25] L'estimateur FM-OLS (Fully Modified OLS) de Phillips et Hansen (1990) permet de corriger les éventuels biais qui peuvent survenir dans l'estimation des coefficients d'une relation de long-terme en raison de la nature endogène des régresseurs. Pedroni (2000) modifie cet estimateur FM-OLS traditionnel pour l'adapter aux panels cointégrés en permettant l'hétérogénéité sur les dynamiques de court terme ainsi que sur les effets fixes. Il démontre les bonnes performances de son estimateur « group mean FM-OLS » même en présence de petits échantillons.

Tableau 2 : Estimations par FM-OLS des modèles (1) et (2)

	(1)	(2)	(3)
IDE	0,017	0,001	-0,024*
	(1,126)	(0,408)	(-2,469)
IDE*E			0,044*
			(2,707)
OUV	0,007*	-0,001*	-0,0009*
	(2,520)	(-4,035)	(-3,378)
LSRD		0,140*	0,149*
		(11,315)	(12,580)
E	0,008*	0,003*	0,002 *
	(7,407)	(4,513)	(3,037)

*Les variables sont corrigées des moyennes temporelles, ce qui équivaut à inclure des muettes années communes dans les panels. Les T-ratios figurent entre parenthèses, et * indique que le paramètre est significatif au seuil de 1%.*

Le tableau 2 fait apparaître des résultats intéressants quant aux effets des IDE sur la PTF des PM. Dans la régression (1), les IDE ont un impact positif sur la PTF mais statistiquement non significatif. L'introduction de l'interaction entre les IDE et le capital humain, dans l'équation (3), montre leur nécessaire complémentarité dans l'acquisition des gains de productivité. Elle permet, en outre, de montrer deux effets distincts : le coefficient attaché aux IDE est négatif et significatif tandis que celui associé au terme d'interaction est positif et également significatif. Ainsi, les effets liés aux transferts de technologie existent et améliorent la PTF des PM à condition que la qualification soit suffisante. En revanche, d'autres effets, en particulier de concurrence, conduisent à la baisse de l'investissement et de la production dans des secteurs dynamiques (cf. section II. P.5 et 6) entraînant une régression de la PTF globale des pays d'accueil.
Les valeurs des coefficients obtenus dans la régression (3) indiquent que tous les pays qui ont des taux de scolarisation dans le secondaire au-dessus de 55%[26] tirent avantage des IDE ; le premier effet l'emportant sur le second. Dans notre échantillon, tous les PM, à l'exception du Maroc, dépassent ce seuil en 2000 [27], et ce dès le début de la période pour Israël, dès le milieu des années quatre-vingt pour l'Egypte et l'Algérie et dès le milieu des années quatre-vingt dix pour la Tunisie, la Turquie et la Jordanie[28]. Ainsi, par exemple, dans une économie avec un taux de scolarisation dans le secondaire de 80%, une augmentation de un point de pourcentage des IDE rapportés au PIB améliore la PTF de 1,1%.

L'analyse des échanges commerciaux conduit à des conclusions similaires. Dans l'équation (1), les échanges de produits manufacturés ont des effets positifs sur la PTF, conformément aux résultats de la littérature théorique. Toutefois, lorsque nous incorporons la R&D véhiculée par les importations, dans les équations (2) et (3), nous

[26] Pour la construction de la variable IDE*E, le taux de scolarisation n'est pas exprimé en pourcentage afin d'avoir un coefficient dont l'ordre de grandeur peut être comparé au coefficient de la variable IDE.
[27] Là encore, il faut tenir compte des limites mais aussi des intérêts du taux de scolarisation utilisé pour approximer le capital humain.
[28] Plus précisément, ce seuil est atteint en 1984 pour l'Egypte, en 1987 pour l'Algérie, en 1994 pour la Tunisie et la Turquie. La Jordanie enregistre un taux supérieur au début des années 1980, qui se dégrade jusqu'en 1992 pour redevenir supérieur en 1995.

pouvons distinguer deux effets liés aux échanges : l'ouverture a un effet négatif sur la PTF tandis que l'effet indirect des transferts de technologie, qui se diffusent par les importations, est clairement positif. Une explication plausible de l'impact négatif du commerce international repose sur la nature des échanges et de la spécialisation. Certains produits importés nuisent à la compétitivité des firmes domestiques. Les productions de biens technologiques, comme les biens d'équipement, ne peuvent se développer face à la concurrence des produits étrangers et la réallocation des ressources vers des industries peu porteuses de gains technologiques et vers les services tend à diminuer la productivité totale.

De manière claire, dans les équations (2) et (3) , la R&D des pays de l'OCDE incorporée dans les importations joue un rôle positif sur la PTF. Nous rejoignons ici les conclusions de Coe et Helpman (1995), Coe, Helpman et Hoffmaister (1997) ou Lichtenbergh et Van Pottelsberghe (1998) obtenues sur d'autres groupes de pays. Sur notre échantillon, une augmentation de 1% de la dépense de R&D importée entraîne une augmentation de 0,14% (équation 2) ou 0,15% (équation 3) de la PTF.

Enfin, le signe positif associé au capital humain et la significativité de cette variable, dans les équations (1) à (3), confirme les résultats de la théorie de la croissance endogène. Même si l'indicateur du taux de scolarisation dans le secondaire est critiquable, dans la mesure où scolariser un individu ne signifie pas qu'il entrera dans la population active et que sa formation sera adaptée aux besoins, il donne une mesure de l'effort consenti par un pays pour faire évoluer son stock de capital humain[29], et cet effort a été considérable pour les PM (voir l'annexe 4). Dans l'équation (3), une augmentation de un point de pourcentage de la scolarité améliore la PTF des PM de 0,2%.

Finalement, nos résultats indiquent qu'actuellement, pour les pays étudiés pris dans leur ensemble, les effets négatifs de l'ouverture commerciale et aux IDE sont plus que compensés par des effets positifs issus des transferts technologiques.

IV. CONCLUSION

Il semble que le commerce international, en renforçant le plus souvent le commerce inter-branche, ne soit pas à même d'enclencher une dynamique de développement des pays méditerranéens. De manière plus générale, l'amélioration de la productivité totale des facteurs *via* l'ouverture internationale, tant en termes de commerce que d'IDE, résulte essentiellement des effets indirects liés aux transferts de technologie.

Dans ces conditions, si des mesures fiscales visant à accroître l'attractivité globale des IDE peuvent être mises en œuvre, il faut tenir compte du fait que celles-ci sont coûteuses et qu'elles risquent de capter des ressources publiques pour des projets qui n'apportent pas les externalités suffisantes pour justifier leur mise en œuvre. Une action plus ciblée en direction des industries susceptibles de diffuser des externalités positives, et de favoriser les transferts de technologie apparaît préférable.

[29] Un autre argument en faveur de l'utilisation d'une mesure portant sur la scolarisation dans le secondaire est que l'enseignement secondaire constitue une formation de base permettant l'adaptabilité des individus aux activités demandées dans l'entreprise.

Ainsi, les firmes multinationales pourraient contribuer aux transferts de technologie en jouant le jeu d'une logique de long terme, en cherchant à exploiter les avantages comparatifs dynamiques par l'intégration dans des activités à plus forte valeur ajoutée, en introduisant de nouvelles méthodes de production plus productives et à forte intensité en connaissance. Parallèlement, les firmes multinationales à vocation exportatrice pourraient s'intégrer davantage dans les économies méditerranéennes développant progressivement des liens avec les fournisseurs locaux. Cette intégration devrait être profitable aux deux parties en rendant les exportations durables et en élevant la compétitivité des entreprises locales. Reste aux économies locales à créer les conditions favorables à de tels projets, en particulier grâce à l'amélioration du climat des affaires.

Par ailleurs, les capacités d'absorption étant nécessaires à l'acquisition des nouvelles technologies, l'effort sur la qualification de la main d'œuvre doit être accentué, plus en terme qualitatif désormais, que quantitatif. Il s'agit pour les gouvernements locaux de définir les priorités en matière d'éducation et de formation en fonction des besoins industriels et des ressources disponibles, et, pour les partenaires européens, de renforcer la coopération dans le domaine de la formation.

Ces perspectives d'un partenariat plus favorable au développement des PM ne sont pas exhaustives, mais elles font apparaître que le développement implique des efforts consentis par les deux rives de la Méditerranée.

Les effets bénéfiques de diffusion internationale du progrès technique *via* les IDE et les importations existent, ils restent donc à être développés.

ANNEXE 1 LES INVESTISSEMENTS DIRECTS ETRANGERS DANS LES PAYS DU BASSIN MEDITERRANEEN

Graphique A1. Flux entrants nets, millions de $ constants 1995 (source : Banque mondiale, WDI 2003)

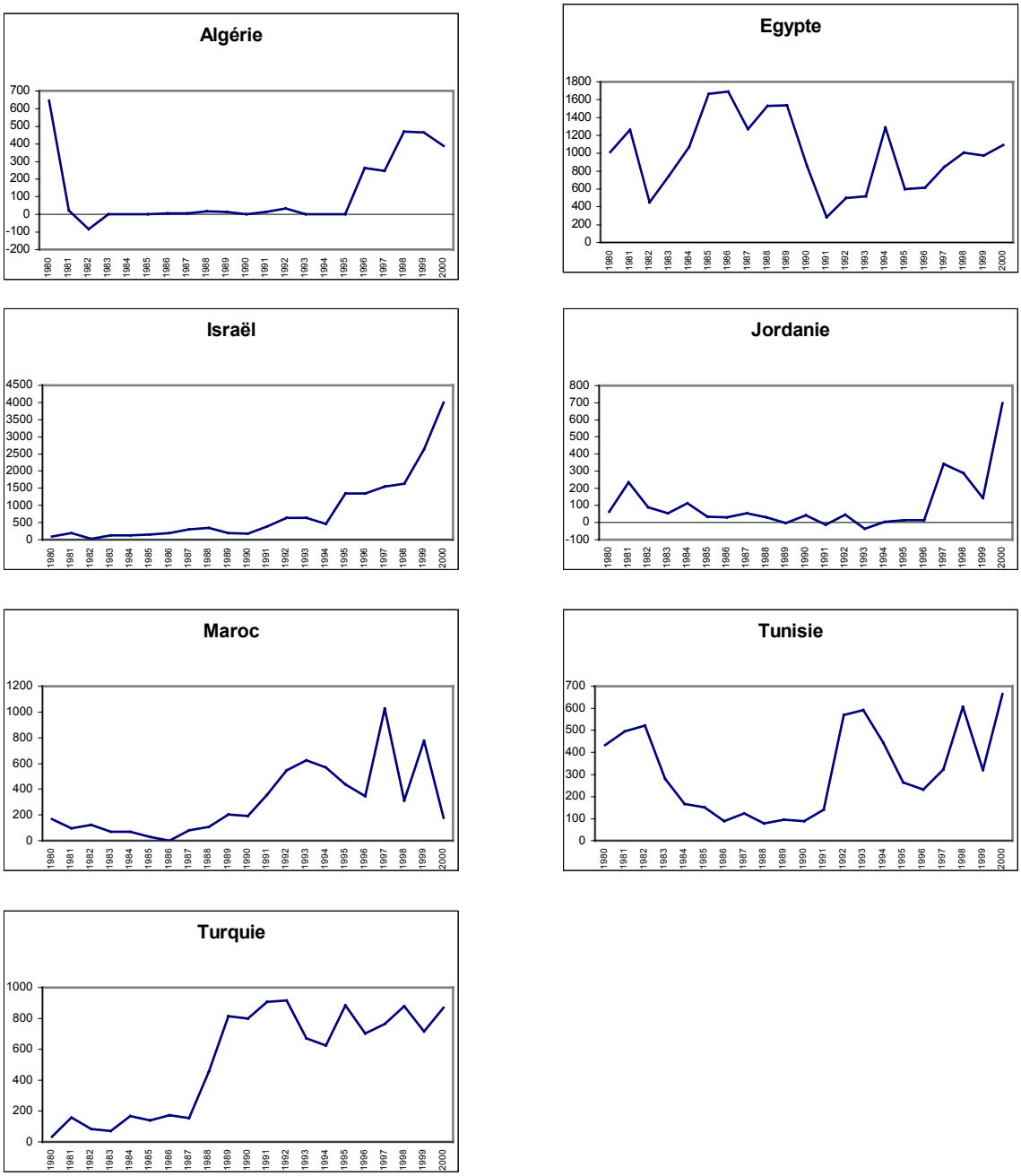
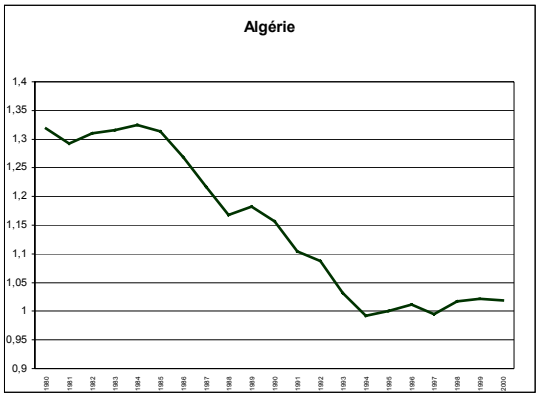


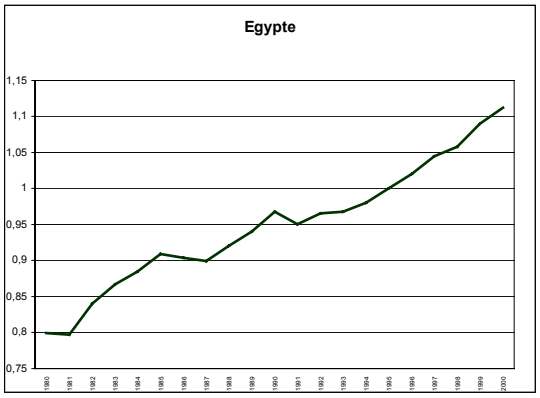
Tableau A1. Part des PM* dans les flux d'IDE*

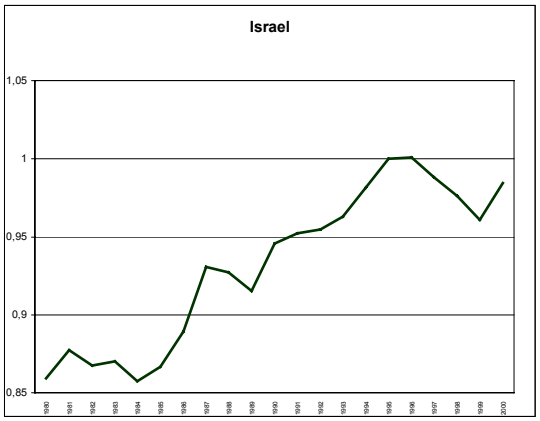
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
1,05	1,35	1,89	1,42	1,56	1,20	1,12	1,27	0,90	0,74	0,69

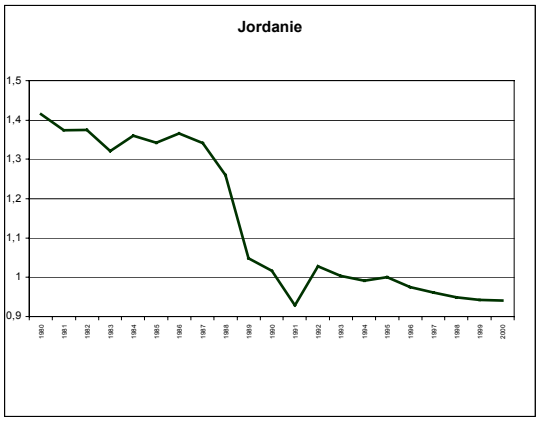
** 12 PM moins Palestine ; ** IDE entrants nets*
Source : Banque mondiale, WDI 2003 - Calculs des auteurs

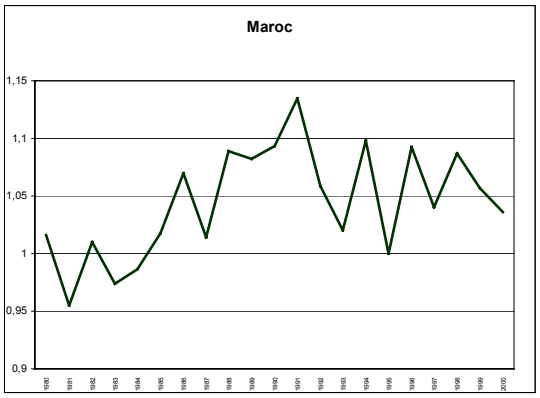
ANNEXE 2 EVOLUTION DE LA PTF DANS LES PM (indice 1 en 1995 ; calculs des auteurs)

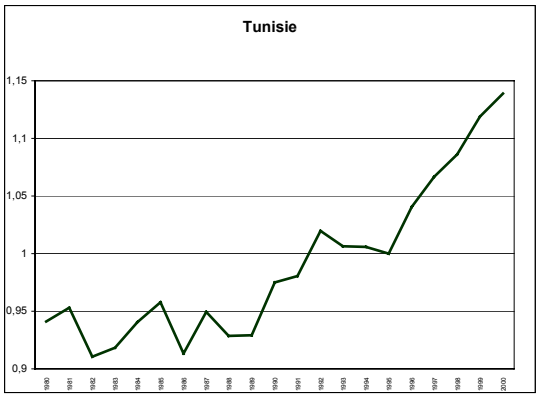


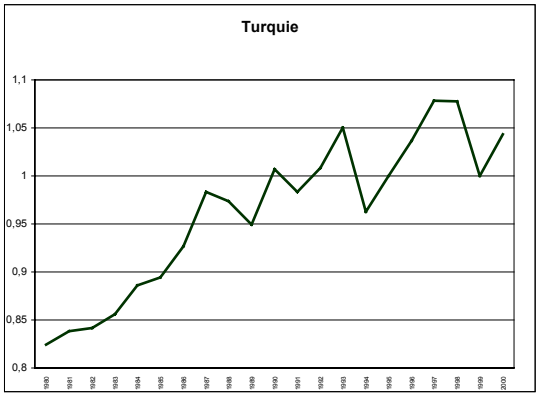












ANNEXE 3 DEFINITIONS ET SOURCES DES DONNEES

- *PTF* : La productivité totale des facteurs (PTF) est définie à partir d'une fonction de production Cobb-Douglas faisant intervenir le capital et le travail :

$PTF_{it} = Y_{it} / K_{it}^{\beta} * L_{it}^{(1-\beta)}$

avec Y le PIB réel
K le stock de capital fixe
L la population active (en nombre de personnes ; dans la mesure où l'emploi total et le taux de chômage sont très mal renseignés)
β la part du revenu du capital dans le PIB.

Les données concernant le PIB et la population active sont extraites de *World Development Indicators 2003* de la Banque Mondiale. Le PIB a été réexprimé en prix constants 1987 pour être compatible avec les données de capital. Le stock de capital fixe provient de la base de donnée de Nehru et Dhareshwan publiée par la Banque Mondiale de 1980 à 1990. Les années suivantes ont été obtenus par une extrapolation réalisée par K. Sekkat et nous-mêmes à partir de la FBCF de *WDI*. La PTF est prise sous forme d'indice unitaire en 1995.

- *IDE* : Les flux d'IDE sont les flux entrants nets en pourcentage du PIB de *WDI 2003*, mesurant ainsi la part des firmes étrangères dans la production totale du pays.

- *SRD* : Les données sur la R&D des pays de l'OCDE sont issues de *Basic Statistics of Technology and Science* de l'OCDE. Il s'agit des dépenses totales du pays en R&D (DIRD) (en $ contants 1995) [30].

Les valeurs manquantes ont été complétées en supposant un taux de croissance annuel moyen constant entre les deux périodes renseignées. Les données manquantes en fin de période d'estimation ont été calculées en supposant un taux de croissance annuel moyen constant et identique à celui obtenu sur les cinq dernières années.
Les stocks de R&D des pays de l'OCDE sont calculés en suivant la méthode de l'inventaire permanent. Le stock au temps t est égal au nouvelles dépenses faites en t plus le stock de $t-1$ diminué par la dépréciation. Ainsi :

$$SRD_t = I_t + (1-\delta)SRD_{t-1}$$

Le stock initial est calculé en supposant un taux de croissance annuel constant des investissements passés :

$$SRD_t = I_t + (1-\delta)\lambda I_t + (1-\delta)^2\lambda^2 I_t + (1-\delta)^3\lambda^3 I_t + \ldots$$

D'où,

$$SRD_t = \frac{I_t}{1-\left(\frac{1}{1+r_t}\right)(1-\delta)}$$

avec SRD_t le stock de R&D en t

[30] L'introduction d'une mesure alternative, correspondant aux dépenses d'investissements en R&D des entreprises (DIRDE) donne des résultats similaires.

I_t les dépenses d'investissement en R&D en t

r_t le taux de croissance annuel moyen de I_t

δ le taux de dépréciation (constant sur la période d'estimation)

Le taux de dépréciation est généralement fixé entre 5% et 15%. Nous le fixons au niveau intermédiaire de 10%.

Les 21 pays de l'OCDE pris en compte sont les suivants : Australie, Autriche, Belgique, Canada, Danemark, Finlande, France, Allemagne, Grèce, Irlande, Islande, Italie, Japon, Pays-Bas, Nouvelle-Zélande, Norvège, Portugal, Espagne, Suède, Royaume-Uni, Etats-Unis.

Les pondérations sont calculées à partir des importations des PM (indicés par *i*) en provenance de chaque pays de l'OCDE (*j*) issues de *CHELEM* du CEPII :

$\frac{M_{ij}}{\sum_j PIB}$, les deux en $ courants.

- *OUV* : L'ouverture des pays méditerranéens sur l'extérieur est représenté par les exportations et importations de produits manufacturés des PM rapportées PIB :

$$OUV = \frac{X + M}{PIB} * 100 .$$

Les exportations et importations proviennent CHELEM. Toutes les variables sont en $ courants.

- *E* : Les données sur l'éducation correspondent aux taux de scolarisation, en pourcentage, dans le second degré. Elles proviennent de *WDI 2003*.

Lorsque les données étaient manquantes entre deux dates, nous avons supposé un taux de croissance annuel constant entre les dates renseignées. Pour les données manquantes en fin de période (2000), nous avons appliqué un taux constant sur les dix dernières années renseignées.

ANNEXE 4 TAUX DE SCOLARISATION DANS LE SECONDAIRE

	1980	1985	1990	1995	2000
Egypte	50,5	61,4	76,2	76,5	85,7
Israël	72,9	80,3	85,4	88,0	93,3
Jordanie	59,1	52,2	44,6	55,3	87,7*
Maroc	26,0	35,4	35,3	38,5	39,3*
Tunisie	27,0	38,9	44,9	60,4	78,3
Turquie	34,6	41,6	47,3	56,9	57,7*

** chiffre de 1999*

Source : WDI 2003

ANNEXE 5 TESTS DE RACINE UNITAIRE ET DE COINTEGRATION

- **Tests de racine unitaire en panel**

Il est maintenant traditionnel en macroéconomie de tester la présence d'une racine unitaire au sein d'une série chronologique. Les versions panel de ces tests ont été récemment développées pour remédier au manque de performance des tests de racine unitaire traditionnels lorsque le nombre de périodes est relativement limité.

Nous utiliserons l'approche proposée par Im, Pesaran et Shin (2003) - que nous appellerons par la suite le test IPS - qui permet d'analyser la non-stationnarité dans le cadre d'un panel hétérogène, c'est-à-dire autorisant une dynamique propre à chaque pays composant le panel. Le test est construit à partir des régressions, désormais bien connues, de Dickey-Fuller augmentées estimées sur chaque pays séparément. Une statistique *tbar* est construite en faisant la moyenne des statistiques ADF obtenues pays par pays. Cette moyenne est ensuite normalisée de façon appropriée (les moyennes et les variances dans cette normalisation sont simulées empiriquement par IPS pour diverses combinaisons de T, nombre de périodes, et du nombre de retards dans la partie augmentée des tests ADF). On obtient alors une statistique appelée *w-tbar* qui converge vers une loi normale centrée réduite sous l'hypothèse nulle de non-stationnarité.

Le test IPS suppose l'indépendance des termes d'erreur. S'il existe sur les variables étudiées une corrélation contemporaine entre les différents membres du panel, l'interprétation des résultats risque d'être faussée. Ce type de dépendance (sur la dimension individuelle) peut être neutralisé par l'ajout de variables muettes temporelles communes, ce qui constitue une approche assez standard dans les modèles de panel classiques. Techniquement, cela revient à soustraire à chaque variable sa valeur moyenne sur la dimension individuelle pour chaque période (« demean » en anglais).

Les résultats des tests IPS menés sur nos variables en niveau puis en différence première sont présentés dans le tableau A2.

Tableau A2. Tests de racine unitaire en panel

	Niveau	Différence première
LPTF	1,292	-4,782
IDE	1,308	-7,142
IDE*E	3,937	-5,793
LSR	-0,552	-4,545
OUV	-0,267	-3,330
E	3,735	-1,391

Tests de Im, Pesaran et Shin (2003), statistiques w-tbar

Sur les variables en niveau, les statistiques *w-tbar* sont toutes supérieures à la valeur critique de -1,645, donc on ne rejette pas, au seuil de 5%, l'hypothèse nulle de la présence d'une racine unitaire sur chacune des variables. Ces tests sont effectués avec 2 retards sur la partie augmentée de la régression ADF. L'ajout d'un trend déterministe spécifique à

chaque pays ne change pas nos conclusions. Concernant les tests IPS sur les variables prises en différence première, on rejette cette fois-ci l'hypothèse nulle au seuil de 5%, à l'exception de la variable E pour laquelle le rejet s'effectue au seuil de 10%. Nous concluons donc que nos variables sont toutes non-stationnaires et intégrées d'ordre 1.

En présence de variables non-stationnaires, il existe une possibilité d'obtenir des régressions factices entre nos variables. Une façon de contourner ce problème est d'utiliser les techniques de cointégration habituelles. Notre nombre relativement limité d'observations entraîne une perte importante de puissance sur l'utilisation des tests de cointégration développés pour les séries chronologiques. Ceci peut nous conduire à accepter l'hypothèse nulle de non-cointégration alors que l'hypothèse alternative est vraie. C'est pourquoi il est préférable de mettre en oeuvre les techniques de cointégration développées récemment dans le cadre des données en panel.

- **Tests de cointégration en panel**

Pedroni (1999) généralise, dans le cadre des données en panel, le test de non-cointégration en deux étapes d'Engle-Granger (1987) qui consiste à vérifier la non-stationnarité des résidus issus de la régression cointégrante. Comme pour le test de racine unitaire IPS, les tests de Pedroni autorisent une hétérogénéité entre les pays du panel. La régression cointégrante est estimée séparément pour chaque pays et on étudie la présence d'une racine unitaire sur les résidus ainsi obtenus selon une dynamique propre à chaque pays. Pedroni agrège les résultats selon la dimension intra (donnant lieu à des tests de cointégration appelés « Panel ») ou selon la dimension inter (donnant lieu à des tests de cointégration appelés « Group »). Les statistiques « Panel » ou « Group » sont calculées en se basant sur l'approche de Dickey-Fuller Augmenté (ADF) ou l'approche non-paramétrique de Phillips-Perron (PP). Les statistiques de test sont ensuite normalisées de façon appropriée en prenant les valeurs pour la moyenne et la variance publiées par Pedroni (1999, tableau 2). On obtient ainsi différentes statistiques qui convergent vers une loi normale centrée réduite sous l'hypothèse nulle de non-cointégration. Comme pour le test IPS, le rejet de l'hypothèse nulle s'effectue selon un test unilatéral : si la statistique calculée est inférieure à -1,645 on rejettera l'hypothèse nulle de non-cointégration au seuil de 5%.
Les résultats des tests de Pedroni sont présentés au tableau A3 ; ces tests incluent, comme pour le test IPS, des variables muettes temporelles communes.

Tableau A3. Tests de cointégration en panel

	Modèle (1)	Modèle (2)	Modèle (3)
panel PP	-2,224	-2,999	-2,708
panel ADF	-1,970	-2,530	-2,725
group PP	-2,931	-4,713	-4,898
group ADF	-2,577	-3,682	-4,438

Les tests de Pedroni (1999) ont été effectués à l'aide de son programme sous RATS

Les quatre statistiques de test sont inférieures à -1,645, ce qui nous conduit à rejeter l'hypothèse nulle d'absence de cointégration pour les trois modèles.

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