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Extended Abstract

*HOW DOES ECONOMIC GROWTH REACT TO FDI INFLOWS AND TRADE
LIBERALIZATION IN MOROCCO?: ANALYTICAL
AND EMPIRICAL APPROACHES*

**Dr. Brahim MANSOURI, Director of the Group of Research on Economics and Finance
(GREF), Faculty of Law and Economics, Cadi Ayyad University, Marrakesh, Morocco.**

**Email: b-mansouri@lycos.com or contact@mansouribrahim.com
Website: www.mansouribrahim.com**

Introductory Remarks

Economic growth in Morocco is characterized by its sharp fluctuations and heavy reliance on rain falls even though the agricultural value added is only about 16 percent of GDP. In addition to its fluctuations, economic growth in Morocco is still lower in a context of slow industrialization and inadequate technological progress. Lower and fluctuating economic growth coupled with an income distribution biased against the poor results in increasing poverty and worsening human development.

While the standard growth model predicts that labor and capital inputs are able to explain the bulk of economic growth patterns in a given country, there is still a scope to account for the role of other explanatory factors in driving output changes. Such factors may be considered on the basis of further theoretical foundations as well as country-specific characteristics. Among such factors, the recent literature on economic growth has centered on foreign direct investment (FDI) as a possible growth-enhancing variable. However, while the role of FDI has received some attention in the recent studies, less effort has been done to better understand how FDI and trade liberalization may interact to explain growth. FDI would probably boost economic growth depending on the trade regime adopted in a given country. Countries with more liberal trade regime would perform better in attracting FDI and using it as a catalyst for

economic growth. A liberal trade regime would create an investment climate that is conducive to learning and goes along with the human capital and new technology infused by FDI. Moreover, trade openness also provides access to a larger market and, therefore, is likely to attract FDI. In a context of trade liberalization, FDI would strongly contribute to the transfer of modern technology and innovation from developed to developing countries, and, therefore, would boost trade transactions and foster economic growth.

Given these considerations, the interactive impact of FDI and trade openness on economic growth deserves more attention, especially in the context of Morocco which has been involved in a wide program of trade liberalization and other structural reforms, and aspires to attracting further FDI. The present paper project is dealing with this issue. The general objective is to analytically and empirically grasp the impact of FDI-trade regime interactions on economic growth in Morocco. The remainder of the abstract of our paper project is organized as follows. Section 2 presents a critical review of the literature on the interactive impact of FDI and trade openness on economic growth. Section 3 deals with the situation of FDI and trade in Morocco. Section 4 concerns our conceptual and methodological framework. Section 5 presents our empirical results, and section 6 formulates some policy implications and concludes.

2. A Critical Review of the Literature

The existing literature has often centered on the isolated impact of trade and investment on economic growth. In the recent literature, certain studies have used the endogenous growth theory framework to explore the interrelationship between trade, FDI and growth. They suggest that an export-oriented trade environment could be a catalyst in attracting FDI while both trade and FDI contribute to growth (see, for instance, Nath, 2004). Growth enhancing effects of FDI would be stronger in countries with more liberal trade regime. A liberal trade regime is likely to provide an appropriate environment conducive to learning that must go along with the human capital and new technology infused by FDI. Moreover, trade openness also provides access to a larger market and, therefore, is likely to attract FDI. Thus, these studies seem to suggest that FDI and trade interact to have a positive effect on growth in the host country. However, the nature of such interaction and its effect on growth and output performance in different countries are largely empirical questions (Nath, 2004; Gabor, 2004; Cernat and Vranceanu, 2002). FDI enables investment receiving countries to achieve investment levels beyond their own domestic saving. More importantly, FDI is an important means of transferring modern technology and innovation from developed to developing countries. The growth-enhancing

impact of FDI depends however on the nature of the trade policy regime (Kohpaiboon, 2004). The starting point in this framework is the so-known 'Bhagwati hypothesis' (Bhagwati, 1973, 1994) according to which gains from FDI are likely to be far less or even negative under an import substitution (IS) regime compared to a policy regime geared to export promotion (EP) regime (Kohpaiboon, 2004:2-3). FDI can even have adverse effects on growth in an environment of trade restrictiveness (De Melo, 1999; Lipsey, 2000; Xu, 2000). Recent studies on the interactive impact of trade and FDI have often used cross-country analysis with all its well-known shortcomings as quantitative techniques. There is therefore a need for systematic time-series analyses of specific country experiences in order to broaden our understanding of this important issue (Kohpaiboon, 2004:3).

When studying the interactive impact of trade and FDI using time-series analysis, one can be interested in understanding how the regional trade regime functions and how a free trade area affects FDI inflows (Worth, 2004). A regional free trade regime, which aims to achieve neutrality in incentives, would be superior to a restricted one, especially in reaping gains from FDI. In such a liberalized trade system, FDI can operate in an environment that is relatively free from distortions. This also leads to the output expansion in internationally competitive and export oriented product lines. Moreover, the production of firms in an EP regime is not limited by the size of the domestic market and has the potential to reap economies of scale through international market penetration (Kohpaiboon, 2004; Nath, 2004). FDI is also an important channel of R&D spillover (including human capital development) from developed to developing countries (Grossman and Helpman, 1991)[1]. There are several ways that FDI likely generates technology spillovers to host countries such as training local staff, enhancing production standard for backward and forward related industries, and enhancing the competitive pressure to local entrepreneurs. Moreover, localization of foreign subsidiaries generates the demonstration effect on domestic firms on technological choices, managerial practice, etc. (Kohpaiboon, 2004; Worth, 2004; Nath, 2004). Well, favorable technology spillovers require a conducive investment climate which is itself associated with trade liberalization. In a more liberalized trade area, FDI can generate favorable spillover effects because, in such a situation, FDI is mostly attracted to industries in which the country has comparative advantage. Local firms have a greater potential to catch up with foreign firms and achieve productivity improvement. This generates healthy competition and allows host countries to maximize the gain from technology spillover from foreign firms.

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[1]- As Saggi (2001) argued, "without adequate human capital or investments in research and development, FDI spillover fails to materialize."

Even though the existing theoretical literature predicts that FDI would probably interact with trade liberalization to boost economic growth, empirical studies continue to analyze just the isolated impact of FDI and trade on economic growth. Much efforts are still needed to better understand the joint impact of FDI and trade openness. Our research project aims at filling the gap in this research domain, trying to better understand how the interaction between FDI and trade openness affect economic growth in the Moroccan case[2].

3. **FDI and Trade: The Place of Morocco**

In the long run, available data show that the Moroccan trade has experienced steady increases in exports and imports. Over the period 1977-2002, exports witnessed an increase of about 11.3 percent against 9.1 percent for imports and 8.8 percent for the GDP. Export growth was more rapid in the 1980s (13.8 percent) in comparison with the 1990s (only 7.8 percent over the period 1991-2002). In the short run however, exports have been more volatile and dependent on drought cycles and exogenous shocks such as fluctuations in oil prices and the business cycle of the main trading partners.

Trade openness, as measured by the ratio to GDP of the sum of exports and imports, passed from 41 percent in 1977 to 52 percent in 2002, reflecting a relatively strong insertion into the World economy (Institut de la Méditerranée and ERF, Morocco Country Profile, 2004). Exports amounted to 21 percent of GDP in 2002 against 12 percent in 1977. Even though export growth has been always slightly higher than import growth, with a capacity of exports to cover imports of about 66 percent in 2002 against only 44 percent in 2002, the Moroccan trade balance continues to produce a structural deficit. This reflects the existing shortcomings of the Moroccan productive system and the sensitivity to exogenous shocks. Nevertheless, Morocco performed relatively well in exporting manufactured goods which represent more than 50 percent of total

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[2]- As Müller-Jentsch (2004) pointed it out, the MENA region has failed to use trade and FDI as an engine for economic development – in stark contrast to countries such as Chile, Malaysia, or Slovakia. EU enlargement to the East and fierce global competition by countries like China or India, threatens to further erode the international competitiveness of the counties in the region. In a recent interview with the Moroccan newspaper *'L'Economiste'*, Patrick Artus has argued dthat the weakness of trade transactions between North Africa (especially Morocco and Tunisia) is largely due to the weakness of FDI in this region. He has pointed out that a major proportion of trade remains dependent on FDI flows. The interactive impact of trade and FDI deserves further research efforts.

exports, reflecting a gradual shift from export of primary goods to export of higher-value-added products.

Beside the gradual trade openness, Morocco is currently one of the MENA countries which receive more foreign direct investment (FDI). In 2003, for instance, Morocco attracted 90 investment project among a total of 275 projects finalized in the region covered by the MEDA program, for an amount of more than 3 billion Euros (Sztejnhorn and Saint-Laurent, 2004 ; quoted in Institut de la Méditerranée and ERF, Morocco Country Profile, 2004).The take-off of FDI in Morocco started in the second part of 1980s, notably following the abrogation in 1983 of the *Moroccanization Dahir* promulgated 10 years before. However, FDI significantly increased only in ealy 1990s following the privatization process, macroeconomic stabilization and improvements in the private sector environment. Over a period of 10 years, Morocco has become one of the main countries receiving FDI in Africa, absorbing about 10 percent of FDI going to the Mediterranean countries of the European Union (Institut de la Méditerranée and ERF, Morocco Country Profile, 2004). A record of FDI inflows was observed in 2001 for an amount of 3 248 million Euros, representing 8.5 percent of GDP, thanks to the purchase of Morocco Telecom by Vivendi Company (2.3 billion Euros) and a contribution of Telephonica Company to Midi Telecom for an amount of 180 million Euros. In 2002, FDI inflows were modest with an amount of only 520 million Euros while the year of 2003 witnessed a significant FDI recovery when the Spanish Company Fadesa invested an amount of 1.5 billion Euros to construct a tourist complex of eight hotels.

4. <u>**The Conceptual and Empirical Approach**</u>

The starting point to empirically study growth determinants in a given country is the well-known growth model:

$$Y = f\left(A, L, K\right) \tag{1}$$

where *Y* is real GDP, *A* is total factor productivity, and *L* and *K* stand for labor and capital inputs respectively.

It is important to note that *A* captures the total factor productivity (TFP) of growth in output not accounting for increasing in factor inputs (*K* and *L*). Following the new endogenous growth theory, *A* is endogenously determined by economic factors. Given that available data on FDI do not fully capture addition to domestic investment by foreign firms (Lipsey, 2001; Kahpaiboon,2004), it is

not possible to separate local and foreign components of domestic investment. However, assuming reasonably that the method of FDI estimates has been consistent over the period, impact of FDI on economic growth may operate through total factor productivity (*A*). On the basis of Bhagwati's hypothesis, it seems also reasonable to assume that impact of FDI on *A* depends on the trade policy regime. In turn, a proxy variable for the openness of trade policy regime (*TR*) may be incorporated into the equation. Therefore, one can write:

$$A = g\left(FDI, FDI * TR\right) \tag{2}$$

Substituting (2) in (1), we obtain:

$$Y_t = F\left(FDI_t, FDI_t * TR_t, L_t, K_t\right) \tag{3}$$

To account for the isolated impact of trade openness on economic growth, we introduce *TR* as an explanatory variable[3]. To take into account the specificities of the Moroccan economy, we account for impact of drought cycles on economic growth in the particular case of Morocco[4]. Indeed, we finally add a proxy for drought (*DR*) to equation (3), to yield[5]:

$$Y_t = G(FDI_t, TR_t, FDI_t * TR_t, L_t, K_t, DR_t) \tag{4}$$

where *DR*, as a proxy for drought, is the inverse of the cereal yield per hectare.

In our model (4) above, variables are measured as follows:

- *Y* is measured as GDP in constant prices, that is nominal GDP deflated by the GDP deflator;
- *FDI* is the value in dirhams of the gross foreign direct investment flows;

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[3]- Thanks to anonymous referees for their proposition to add this variable to the final equation. On the impact of trade on economic growth, see Vacziarg (2001) who argued that trade openness exerts a positive and significant impact on economic growth thanks to the accelerated accumulation of physical capital, sustained technological transfer and improvement in macroeconomic policies.

[4]- Mansouri (2004) has pointed out that drought plays a major role in depressing private consumption and investment in Morocco. Since these two private spending components are parts of GDP, drought is expected to depress economic growth as well. Note that in Mansouri (2004), drought has been measured as a dummy variable taking values from 0 to 8 depending on the growth rate of the cereal yield per hectare.(see also Mansouri, 2001).

[5] - See Mansouri (2005) for details on the model, estimates and tests.

- *TR* is measured: a) as the ratio to GDP of the sum of export and import values; or b) the ratio of exports to gross output in the manufacturing sector;
- FDI-trade interaction is measured as the product of *FDI* and *TR* (that is *FDI*TR*);
- *L* is measured as the volume of the total labor force;
- since a time-series on the capital stock is not directlty available for Morocco, *K* is approximated through the ratio (*gcf*) to GDP of the gross capital formation (this proxy for capital stock has been used in many previous studies. See for instance, Barro, 1999; Balasubramanyam *et al.*, 1996; Kahpaiboon, 2004);

- we take the inverse of the cereal yield as a good proxy for drought because the agricultural production in Morocco is heavily concentrated in cereals which are very sensitive to rain falls.

The final selected form of the model may be presented as follows:

$$Log(Y_t) = \alpha_0 + \alpha_1.fdi_t + \alpha_2.tr_t + \alpha_3.fdi_t*tr_t + \alpha_4.gcf_t + \alpha_5.Log(LT_t) + \alpha_6.Log(DR_t) + \eta_t$$
$$(?) \quad (?) \quad (?) \quad (?) \quad (?) \quad (?)$$

(5)

where the α_i ($i \in \{0, 1, 2,...6\}$) are the parameters to be estimated, variables in small characters stand for ratios to GDP, *Log* is the natural logarithm, η is a random variable, and the other variables are as already defined.

To empirically analyze the interactive impact of FDI and trade openness, we focus on equation (5) estimated over the period 1975-2002 for which we have data. Estimates and tests rely on modern time series analysis (stationarity tests, cointegration tests, error-correction models, short and long run causality tests, etc.)[6].

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[6]- To use variables in levels, all variables must be found to be stationary individually. If variables are found to be nonstationary, they should be cointegrated. To test for stationarity, we will use a unit root test developed by Fuller (1976) and Dickey and Fuller (1981). The difference between Dickey-Fuller (DF) and augmented Dickey-Fuller (ADF) tests is that the latter accounts for autocorrelation in residuals if it exists. If the null hypothesis of a unit root (non-stationarity) is rejected, a time series can be considered as integrated of order zero, i.e. *I(0)*, in levels; if not, the time series is not stationary in levels, but can be stationary in the first difference, etc.

If variables are integrated of the same order, *I(1)* for example, there is a possibility that they will be cointegrated. Then, a cointegration test will be conducted. The approach to cointegration was developed by Johansen (1988, 1991) and Johansen and Jusilius (1990). This new approach, based on a Maximum likelihood procedure, is particularly preferable when the

5. __Empirical Results__

The starting point in our empirical analysis is the ADF test on the variables introduced in equation (5). Our ADF tests in table 1 indicate that *Log*(Y), *fdi*, *tr* and *tr*fdi* are integrated of order 1 while the remaining variables are stationary in levels[7]. As reported in table 2, Granger causality tests based on the principle of the maximum of likelihood reveal that the four nonstationary variables are cointegrated. Thus, in the error correction model, in addition to an error correction term, we introduce the nonstationary variables in first differences and the other variables in levels.

Introducing $Log(Y_{t-1})$ as an error correction term, we obtain the following error correction model where the statistically non significant coefficients are dropped from the final equation:

$$dLog(Y_t) = 1.34 + 1.97.fdi_{t-1}*tr_{t-1} + 0.53.gcf_t + 0.58.Log(L_t) - 0.10.Log(DR_t) - 0.50.Log(Y_{t-1})$$
$$\quad\quad (1.90)\ (1.88) \quad\quad\quad (3.11)\quad\quad (3.97)\quad\quad (-10.61)\quad\quad (-4.45)$$

$$(6)$$

R^2 = 0.92; adjusted R^2 = 0.90; F-statistic = 46.27 (probability = 0.0000); Durbin-Watson statistic = 2.43; <u>*White heteroskedasticity test*</u>*: F-statistic = 0.85 (probability = 0.58), Number of obs. X R^2 = 8.46 (probability = 0.49);* <u>*residual normality test*</u>*: Jarque-Bera = 1.29 (probability = 0.53);* <u>*Chow forecast test*</u>*: F-statistic = 0.60 (probability = 0.45), Log likelihood ratio = 0.82 (probability = 0.37).*

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number of variables exceeds two variables, due to the possibility of existence of multiple cointegration vectors[6]. When variables are found to be cointegrated, the behavior of growth should be specified as an error- correction model (Engle and Granger, 1991).

[7]- The fact that the variable *Log(DR)*, considered as a proxy for drought turns to be strongly stationary in level has not to surprise us since the cereal yield per hectare in Morocco has experienced sharp fluctuations over time.

Table 1: ADF tests of the variables introduced in equation (5)

Variable	Number of lags	t-statistic	Mackinnon value (1%)	Mackinnon value (5%)
Log(Y)	1^(**)	-2.98	-4.32	-3.58
fdi	1^(*)	1.82	-2.66	-1.95
tr	3^(**)	-3.45	-4.32	-3.58
*fdi*tr*	2^(*)	1.65	-2.66	-1.96
gcf	1^(**)	-4.36	-4.32	-3.58
Log(L)	1^(**)	-4.96	-4.35	-3.59
Log(DR)	0^(**)	-6.13	-3.68	-2.97

NB: *(***), (**) and (*) indicate respectively that the intercept and trend are statistically significant, the intercept is significant, and neither trend nor intercept is statistically significant in the ADF equation. The number of lags is chosen so as the Aquake criterion is minimal. All variables integrated of order 1 are seen to be stationary in first differences.*

Table 2: Johansen Cointegration Tests on the four variables integrated of order 1

Eigen Value	Likelihood Ratio	5% Percent Critical Value	1% Critical Value	Cointegration?
0.72	65.73	53.12	60.16	Yes
0.54	35.54	34.91	41.07	Yes
0.37	16.60	19.96	24.60	No
0.21	5.65	9.24	12.97	No

NB: *In the VAR used to test the cointégration of the variables integrated of order 1, the intercept is statistically significant and the number of lags equals one.*

As shown in equation (6) above, our empirical results reveal that, in line with the traditional growth model, the coefficients associated with *L* and *gcf* have their expected positive signs, suggesting that labor and capital positively

affect economic growth. Our estimated error correction model indicates that 1 percentage of GDP increase in gross capital formation would result in 0.53 percentage point increase in the rate of growth of real GDP and that 1 percent increase in labor would induce 0.58 percentage point increase in real GDP growth. As expected, drought, as approximated through the inverse of the cereal yield per hectare, negatively and dramatically affects economic growth in Morocco. Our empirical results in equation (6) show that 50 percent decrease in the cereal held per hectare (like in 1997 for example) would result in 5 percentage point decrease in the economic growth rate.

More importantly, *fdi* which we have dropped from the final equation has entered with a negative but statistically nonsignificant impact while the FDI-trade interaction impact is seen to boost economic growth. This does not mean that FDI does not affect the output growth in the Moroccan case. Our empirical results reveal instead that FDI flows are growth-enhancing when they are accompanied with trade liberalization. However, since the variable $\Delta(fdi_t * tr_t)$ is not statistically significant and, then, has been dropped from the final equation, the FDI-trade interactive impact holds more in the long rather than in the short run. According to estimates and tests, 1 percentage point improvement in FDI-trade interaction would result in 3.94 percent increase in real GDP in the long run when the trade regime is approximated through the ratio to GDP of the sum of exports and imports. This means that FDI and trade liberalization interact to drive economic growth but this joint impact needs more time to foster real output.

6. Policy Implications and Concluding Remarks

Policy Implications we can draw from our empirical results seem to be important. For Morocco to benefit from the growth-enhancing effects of foreign direct investment, it should continue to liberalize its trade transactions. Within the framework of the Euro-Moroccan free trade area planned to come into force by 2010 and the signed free trade area with the USA, FDI inflows toward Morocco are expected to contribute to economic growth, especially in the long run.

For Morocco to benefit from technology transfer and spillover effects, FDI should be encouraged but it should be accompanied with trade openness. In an environment of trade restrictions, FDI inflows cannot be a catalyst for long run economic growth. The positive interactive impact of FDI and trade openness on economic growth would probably hold in other countries of the MENA region.

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