

Mechanisms to Explain FDI Impacts in Less Developed Countries Growth: The Case of the Industrial Development Level in Turkey, Egypt and Morocco

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ABSTRACT – *The industrial development level proposed in this essay is the key factor to explain how Foreign Direct Investment (FDI) impact may turn from positive to negative. It is shown that, the role of FDI inflows in host countries' growth will be effective for those applying not only the right policies, but also raising their local aggregate industry level up from a certain threshold (without necessarily applying home country content policies). Interaction between industrial development level and FDI may also be considered to be the second and long term effect of the FDI on a country's growth. Hence, when lacking or too weak, industrial development level may be crushed by FDI, turning the interaction from positively impacting on growth to play the malign role, and then explaining why in some countries FDI appear negatively related to local development.*

KEY WORDS: *FDI, growth, net outward investment position, industrial development level, less developed countries*

Introduction

What the matter with FDI impact is? That's a question worthy of interest; many works have been published about the effects of FDI in the host countries. Although those studies cover numerous different countries, doubts and questions still remain concerning the real impact of foreign investments in emerging and developing countries. Hypotheses differ greatly about the ways to earn a positive impact from FDI. For instance, Blomstrom et al. (1994) writing about the effect of FDI in host countries, argue that: „ *a positive growth-effect of FDI may be real whether the country is sufficiently rich*”². Following the argument of the previously quoted authors, poor countries are excluded from having any positive impact from FDI in their development. A sizable number of studies are discussing these issues, but their findings diverge either in their conclusions, or in the theoretical background relative to the impact of foreign investment in less developed countries. It may not be surprising within the field of economics to disagree on concepts or theories; in the present case it is assumed that countries lacking capital to boost their development should benefit from long - term capital flows coming from abroad. In the main two opposing concepts or approaches, in the

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² Duyster, Nguyen, Patterson, Sander (2009) “Foreign Direct Investment absorptive capacity”
https://smartech.gatech.edu/bitstream/handle/1853/35267/1238510767_HN.pdf;jsessionid=A514B1099FE67A027DAEE69A39DC003F.smart1?sequence=1



economic literature for the impact of FDI, the first one which predicts positive effects is known as *Benign*, and the second, *malign* is completely the contrary, seeing FDI as a problem for the country's welfare. We also underline the fact that the present essay does not cast on the impact of FDI in host countries, we stressed on a particular factor: that the **industrial development level** is the missing link that might explain the discordance between facts and theory. This variable must be integrated into the system to better appreciate the FDI impact on a developing country's growth for instance, and should be criterion enabling to conclude to a positive or a negative impact. A closed idea was put forth by Carkovic and Levine (2002) about a certain „*interaction term from income per capita and FDI*”³, that enabled them rejecting the earlier above assumption by Blomstrom et al.(1994). For empirical tests, we apply the Net Outward Investment position model of **Dunning** and use it as a proxy for the aggregate industrial development. Time series models are applied for each country after carefully specifying their features. The results show a positive and significant impact of both related FDI variables for Turkey, while Egypt and Morocco failed in showing any positive and significant impact. The findings are in accordance with theoretical development arguing that countries with a high industrial development level are more suitable to get FDI impacts.

Our essay is articulated as it follows, the first part discusses briefly the concepts of benign and malign FDI, and then, the second part introduces the concept of aggregate industrial development, and presents the Net Outward Investment approach used to proxy industrial development, finally part three and four present the empirical estimations and discuss the economic meaning of the results.

The two main approaches about FDI impact

The section focuses on both concepts below for a brief presentation of their meaning and in order to underline some misunderstandings in their use. The benign and more classical approach is presented first, thereafter the malign approach follows.

The Benign approach

International trade theories fail in their endeavor to position FDI against trade. FDI was often considered to be a substitute for trade, but recent findings have shown a more complementary relationship between them, to the point that trade openness was proved to be relevant as a determinant for FDI flows in some cases. Impacts of trade openness and FDI are two subjects still under discussion, particularly for poor countries. When asking about the impacts of **FDI in the host countries, one refers indirectly to the impact of trade openness**, since a complementary relationship between them has been proven. Models often analyze trade and investment together; for instance the Neo-institutional model predicts *three mechanisms will benefit from trade and investment*⁴. We borrow the second of the three mechanisms which states that: „*trade and investment are expected to create positive externalities*

³ Wan X.(2010) “A literature review on the relationship between foreign direct investment and Economic growth” International Business Research, vol 3, N°1, Jan. 2010

⁴ For more information see Matthias Beck and Nataliya Acc-Nikmehr (2007) “The failed promise of foreign direct investment:some remarks on ‘Malign’ investment and political instability in Former Soviet States” page 10



which extend to a process where the introduction of new products and processes by foreign firms creates spillovers for the domestic economy" (Teece, 1977)⁵. This affirmation may implicitly assume that processes to capture externalities from FDI are automatic or autonomous, but there was formerly no such a thing in most for poor countries. The economic literature acknowledges the fact that a positive effect of FDI can be found, but such effects follow different mechanisms to impact on a country's development. Following that logic, Borenstein et al. (1998) proposed „a threshold of human capital" as one such mechanisms conducive to positive FDI effects. Although in many cases empirical findings tend to confirm the earlier proposition, it may still be stressed that a specialized human resource on particular fields is what foreign multinationals are often looking for. Firms themselves are the institutions which create the need for that specialized human capital and often invest in interior training; by so doing, they anticipate host country governments' action in creating centers for specialized training. The case of central and eastern European countries integrated into the European Union clearly illustrates the point. Studies show that those countries earlier in their integration process already had an significant pool of human resource, but the labor forces' background could not make them useful enough for foreign investor operators, thereby turning the effect a little bit less important mechanism for catching FDI effects⁶. A second reason could be that, since FDI in less developed countries mainly focuses on assembly activities, human capital may not be of a relevant importance because employment in such activities doesn't need any particular skill (according to the center-periphery outsourcing model). The misunderstanding in the benign FDI's case is solely within the use of the concept. Mechanisms explaining the positive impact of FDI on countries are considered to be „stylized facts". Unfortunately within the analysis, countries' idiosyncrasies are not taken into account.

Moran (1998) wrote that „perhaps the most prevalent version of the beneficial conceptualization begins with a stylized description of how FDI may help the host country to break out of the vicious cycle of underdevelopment"⁷ The same author continues with a clear description of what he means by stylized facts, according to the latter description, he assumed that „under reasonably competitive conditions-which the foreign presence will enhance- FDI should raise efficiency, expand output, and lead to higher economic growth in the host country". The Question here then is whether the FDI fall to enhance competition, should there be any positive effect on the local market structure? The main problem in this theoretical concept is that even as FDI assets are taken for granted. Yet, multinational firms are not eager to share their competitive advantage or their technologies with local firms. In addition, according to the multinational theory, foreign investments are motivated by market imperfections because they are able to garner advantages from those imperfections, thanks to their interior resources and capabilities. Therefore, multinationals will tend to create more imperfections in the market in order to weaken competition. FDI is designated wherever it goes to make profits for their owners, so the impact they will have on a country depends on

⁵ Teece (1977) is quoted by Matthias Beck and Nataliya Acc-Nikmehr (2007) in page 10

⁶ Although less than expected, a certain positive impact of FDI in central and eastern European countries have been found. Those countries still trail the European 15 group countries concerning the assumed convergence which was told to be boosted by foreign investments.

⁷ Moran T. H. (1998) *Foreign Direct Investment and development*. Page 19



different factors, obviously linked to the theoretical conceptualization which proposes them, and specific to countries (between rich and poor countries, the effects of FDI tend to differ. For the former they are often positive, but for the latter they are either positive or negative according to the country specificities). The conventional theory believes that, the FDI impact should be positive because they will increase country capital accumulation, they will increase currencies reserve, increase demand for workers and then may result in an increase of wages, and finally may drive poor countries to converge. In the aftermath of this somehow naïve belief of theory about the positive impact of FDI, the next paragraph discusses the opposed effects and its conceptual misunderstanding.

The malign approach

This section focuses on the negative effects that FDI are supposed to have on the host countries' development. As stated previously, foreign multinational assets are not granted to the host countries. However since these countries are supposed to benefit from the investments, the way those benefits should be raised is the real problem in which most theoretical conception are rooted when evaluating the malign side of FDI. In the economic literature, two main approaches try to show how expectations of welfare from FDI could turn from positive to negative. They underlined the negative impact of government policies in developing countries, when trying to keep control over foreign investments (Moran, 1998). On the one hand, Moran (1998) shows that, within the neoclassical concept⁸ of promoting FDI, industrial sectors which are attracting foreign investor will receive subsidies from the government for exports („*export requirement strategy*”), while other sectors will progressively fall. Although the other hypothesis⁹ behind the idea remains questionable, the neoclassical framework may in some ways be assumed to cause the negative impact by promoting the development of some sectors only. In those countries, resource sectors are emerging, while overall country welfare often decreases in the course of time. In such situations, the view that FDI effects on the host countries are negative may be justified. On the other hand, Moran (1998) again introduces the „*strategic – trade framework*”, which differs from the previous analysis' hypothesis. In this case, imperfect competition is assumed, and government policies may be to focus on local „*infant- industry*”. The „*infant-industry*” needs protection against foreign investors, but Moran's question was about the choice of the industrial sector on which to focus; governmental policies under imperfect competition assumption are not targeted towards foreign investments. In such an environment, cooperation relations between foreign subsidiaries and local industries are not promoted; externalities and spillover effects should be difficult to catch. This strategy cannot help developing countries to close the technological gap; therefore, they will not be able to escape from the malign effect of FDI because of their weak competitiveness. The country's development will not be possible as a consequence of the above inconvenient policies. The whole subject of host countries policies toward foreign investor is well known under the expression of „*Domestic content requirement*” that have also been denounced by Moran(1998) and the conventional theory, considered to be inefficient.

⁸ The concept is based on the perfect competition assumption.

⁹ The hypothesis is that “production costs in the local market must be higher than world prices” this hypothesis shouldn't be a motivation for foreign investor to locate in developing countries.



Another important point that may wipe out the positive effects of FDI to negative in host countries is „the repatriation of benefit” (Beck and Acc-Nikmehr, 2007 and Moran, 1998).

Unfortunately not much has been said about this point. Nevertheless, it is well known from the macroeconomic theory that the balance of payment will be impeded along the way by such practices, finally turning developing countries from capital importers to capital exporters. Repatriating Profits is not an isolated event; on the contrary, such practices could be seen as a consequence of the „*vanishing of investment opportunities*” (or poor investment opportunities) in less developed countries, due to the absence of local demand, inadequate policies and to the lack of sustainable growth of the host industrial environment, this is the incapacity of host countries to absorb FDI stocks.

The misunderstanding in the malign approach of FDI most of times is also rooted on chosen hypotheses. Many analyses already view FDI itself as negative. For instance, Beck and Acc-Nikmehr (2007) underlined that **Moran** implicitly hypothesized (in an analysis) that „*rather than contributing to institutional development and productivity, certain types of FDI have the potential to undermine existing institutional growth trajectories and, in so doing, forestall future economic growth and development*”¹⁰. Radical views on the impact that foreign multinationals will have on host countries’ development are critical. Mainguy (2004)¹¹ said that the malign view of FDI impact is from Marxist analysis, according to which, *capital will be accumulated for capitalists only, so the repartition of activities in industrial sectors is affected, because of the technology dependence of host countries*. For Marxist analysts, FDI appears to be a continuity of imperialism with a different form, and the location in „*extra-capitalists*” countries is obviously negative. Here below, we quote some cases of empirical studies to illustrate how they dealt with the problem of FDI impacts.

Empirical survey of FDI impacts

This paragraph describes how FDI impacts have been analyzed in less developed countries, with examples of some countries that will be studied in the empirical work. Until now studies appraising FDI impacts outline some common characteristics. In particular, they outline the possibility for a double impact, direct and indirect impact. They also show that those impacts are country specific; that is to say the mechanisms by which FDI will impact differ from country to country or group of countries.

There are studies that attempt to measure the impact within econometric models including more than a single variable (FDI flows or stocks and other variables) that affect economic growth, but there are also studies that try directly to search the causality, if any, between FDI and country growth. In our samples of countries, Turkey has often constituted a case study. Bilgiç (2007) analyses the export-led growth strategy of Turkey from FDI. According to him, in 2005 Turkey was ranked 23rd largest exporter. However, the export effect was quickly compensated for by an increase in the imports of intermediate goods. Such

¹⁰ Beck and Acc-Nikmehr (2007) “*The failed promise of foreign direct investment: some remarks on ‘Malign’ Investment Political Instability in Former Soviet Union*”

<http://eprints.whiterose.ac.uk/3471/2/beck12007.pdf> Page 16-17

¹¹ Mainguy C. (2004) « *l’impact des investissements directs étrangers sur les économies en développement* »
Revue Région et développement n°20 -2004



goods represented 60% of the total amount of import of the country (Bilgiç, 2007). In his empirical test for the FDI impact on growth, he found a positive and significant impact of FDI in the growth of Turkey despite the huge amount of imports. In another test for causality between FDI and growth, however, he found that FDI was not a Granger cause of growth in Turkey, which means FDI might not cause growth, however, they still have a certain impact on enhancing growth possibilities. Other studies confirm these results such as Johanson (2008) and **Hisarciklilar, Kayam, Kayalica and Ozkale**.¹² In a 2010 report on Morocco from OECD, the flows of FDI are characterized as „*reflecting the opportunities offered by the privatization programme*”¹³

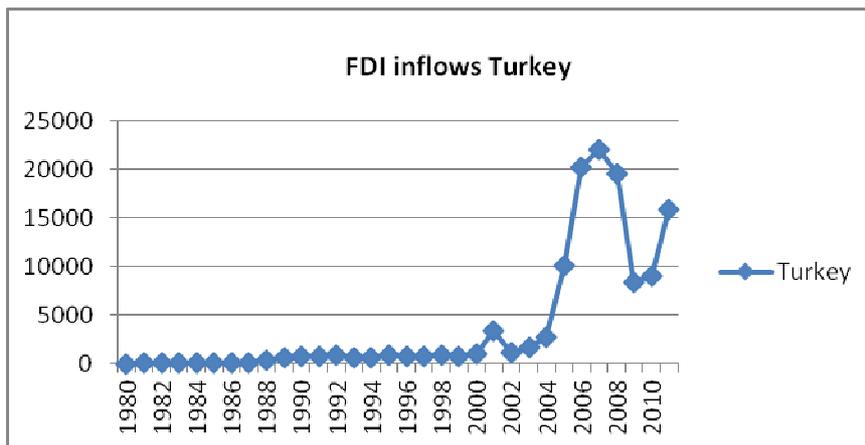
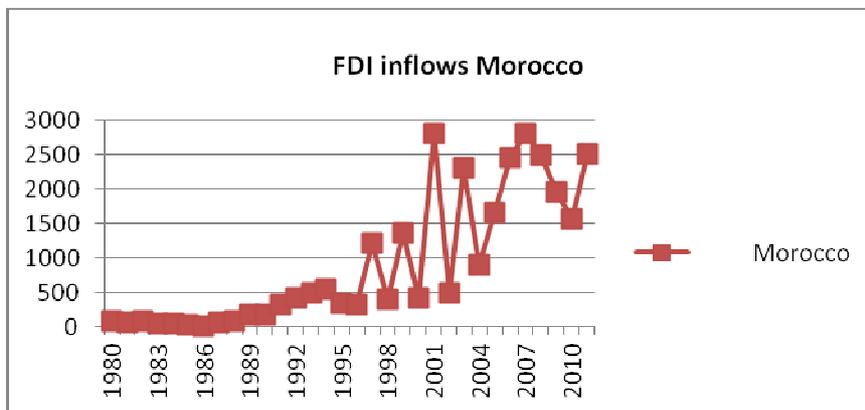
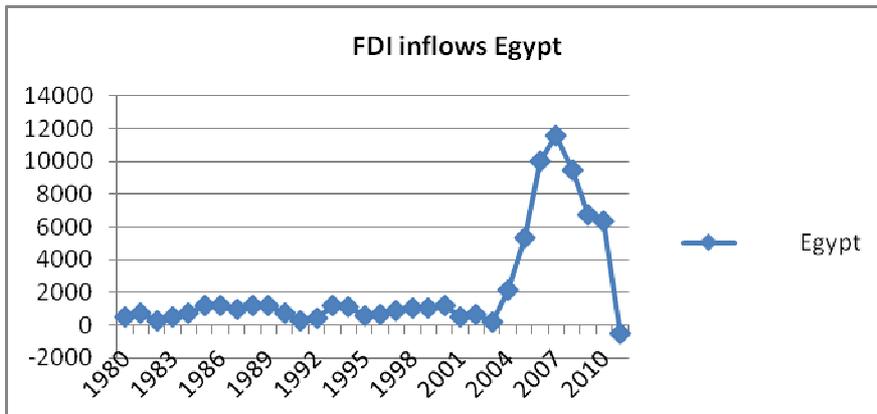
There is a lack of case study of FDI impact in Egypt and Morocco, although their case is briefly included in the study of **Hisarciklilar, Kayam, Kayalica and Ozkale**. When a causality test is conducted for many Mediterranean countries, the results for Egypt and Morocco show that FDI do not cause economic growth. With the imports picture showing a striking rise to \$130 billion in 2006 from \$8 billion in 1980 (Emrah Bilgiç, 2007), Turkey's case helps to emphasize the necessity for host countries to dispose of an industrial development level capable of supplying foreign multinational needs for intermediate goods. As we can see in the below graphics, FDI flow in some countries may not be enough to drive economic growth. Quick observations among the three countries indicate a large gap of the total flows. Turkey shows a very different picture as the increase of flows after 2004 is almost five times higher. The pick of FDI inflows in Turkey which seems to be the same in Egypt have reached more than \$20 billion in 2007 while in Egypt it was only \$12 billion followed by a nonstop decrease and finally divestment after 2010. Morocco seems to follow a different logic mostly because of the low amount of FDI inflows and also because they are correlated with the country privatization program which begun in 1994. We also pictured out the importance of the FDI stocks in the national economy, reporting the FDI stocks to the national GDP. The corresponding graphic shows a very different picture with the two small economies (Egypt and Morocco) having the best percentage. FDI stocks in Morocco hit the highest level, weighing more than 51% of total GDP in 2007.

¹² Here is illustrated a case of benign FDI, despite a deeply unfavorable trade balance the above studies show a significant impact of FDI on Turkey's growth. **Their findings are based on the neoclassical concept of stylized effects of FDI in host countries.**

¹³ OECD (2010), "The Role of Foreign Direct Investment in Morocco's Economic Development", in OECD, *OECD Investment Policy Reviews: Morocco 2010*, OECD Publishing, doi: 10.1787/9789264079618-3-en pp 5



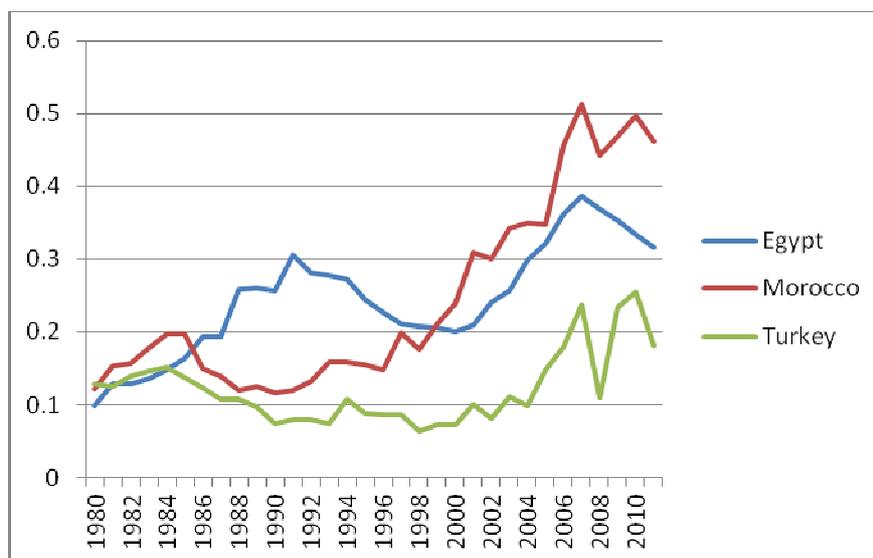
Graphic 1. FDI flows per country¹⁴



¹⁴ For scale's matter we rather present each country with a different graphic



Graphic 2. FDI stocks reported to GDP for each country



The aggregate industrial development level concept

We assume that foreign investments are not only oriented to natural resources, and that foreign multinationals apply a vertical division of labor to include poor host countries in the production process of some parts of their final products. Here is another relevant issue for countries which is related to the nature of the incoming foreign Direct Investment. Efficiency oriented FDI may be less beneficial than import substitute FDI, in the sense that the content for the former is mostly poor, resulting in restricted technology transfer and low value added by host countries, while the latter are supposed to bring green field subsidiaries whose production will be destined for the local markets. Following the first inflows of FDI into the host countries, some authors observe an initial positive impact on Balance of Payments. The role of government policies appear then to be of relevant, because they will try to increase the positive effects brought about by the initial flows of FDI. This phenomenon should be seen as the first expected impact that FDI has on the host country's development, by focusing on the *export led development strategy*. Some studies show that unfortunately this impact in developing countries last for a very short term (Hossai, 2005)¹⁵, because foreign investors quickly turn to increasing their imports to fill the need for incremental exports. The reason this happens is that foreign multinationals need „intermediate goods and services“ that cannot often be supplied within the host countries, mostly because of the non existence of a competitive sector that could produce these intermediate goods. Evidence and lessons may be taken from west European Multinationals when extending their activities into nearby countries.

The success of FDI in Hungary for example is not just related to the proximity parameter, but it is most due to the availability of local suppliers to respond promptly and accurately to the needs for intermediate goods. The same success was not seen either in Greece or in

¹⁵ Hossain M. A. "Impact of direct investment in Bangladesh's balance of Payments: some policies implications" PN 0805



Morocco, Egypt or Tunisia. West European companies present a good example since the strategies they have adopted to extend their activities into nearby destinations focused mostly on Mergers and Acquisitions, meaning that similar companies existed at the host countries, but with certainly a different technological frontier. It seems misleading to conclude that the impact of FDI on poor countries can solely be appraised from the stylized facts, showing that, the first impacts on economic growth from FDI may last quickly. The real FDI impact measured in empirical work matches only with the short term. Focusing solely on the latter impact may drive us to an underestimation of the full FDI impact, whether positive or negative. In the extraction of natural resources, foreign investors seldom face competition in developing countries, because of huge amounts of investments that constitute an irreversible barrier to entry for local industries.¹⁶ But when applying a vertical division of labor, it is assumed that host countries will be able to supply some intermediate goods and services. Yet, the host countries capacity to supply foreign investor needs is conditioned by the presence of initial industrial development (not necessarily with a strong local content policy) before the foreign entry, which will match with FDI to sustain a positive impact.

Once a high level of industrial development is controlled, we then assume that **cooperation relations** have been established between foreign multinationals and the local industry. In such a case, FDI must have a second impact *by interacting with the local industry*, which will be supplying the intermediate goods and services, thereby diminishing the amount of imports. The *export-led development strategy* will be successful in this case, and the host country welfare promoted. For macroeconomic purposes, the use of the industrial structure may not be appropriate; if such is the case, we then substitute a more aggregate variable, for it one which takes into account the entire industrial development level and its international competitiveness. Moran (1988)¹⁷ stresses that „*how competitive the industry and the economy are where the FDI takes place*” is important to understand the „*interaction between FDI and host country development*”. The interaction of both FDI and aggregate industrial development offers more opportunities for sustained growth in developing host countries. Whether or not a host country lacks such a threshold of industrial development the expected positive impact from FDI slumps, and finally vanishes.

The key role of the industrial development level is to interact with FDI in a way that will enhance the expected impacts of foreign multinational activities. A host country with a high level of industrial development is more likely to benefit from FDI. In the case of less developed countries, strong industrial development of the local industry is necessary because it will contribute to enhancing the technological composition of FDI, and strengthening the ability of the local industry to learn by reaping externalities from FDI, then

¹⁶ We have recently witnessed a situation in Cameroon where a Korean company claimed to have discovered an important stock of diamond, which however were already extracted by local villagers with very poor and inefficient means. Despite the local opposition, this part of the country has been conceded to the Korean company. In the aftermath of this concession, local villagers still wait to see the social benefits of this huge investment. The first accreditation of these diamonds should be issued this year to allow their commercialization.

¹⁷ Moran, T. 1988. *Foreign Direct Investment and development*. Chap. 1, page 21.



resulting in the expected competitive market. **Picciotto (2003)**¹⁸ showed in her study that, when subcontracting relationships exist between the foreign multinationals and local industries, the former often transfers some technologies the latter needs to supply intermediate goods responding to the multinational standards. The ability to understand the foreign technology requires some strong initial level of industrial development that developing countries lack in most cases. Host countries should have promoted their own industrial development before allowing foreign entrance in their local markets. For empirical purposes, the industrial development level is modeled below.

Dunning's IDP model as a proxy for industrial development level

The convergence hypothesis among its main principles suggests that, poor countries should be able to duplicate production methods and technologies, and that their rate of diminishing capital return is slower than in developed countries. This hypothesis will barely hold as long as all the mechanism to enable host countries reaping benefits from FDI will not clearly be identified. The aim while trying to draft of a model of the level of industrial development of poor countries is to find the best proxy to be used as a variable in econometric models. The best proposition to fit the needs must be a macroeconomic variable, one that shows the strength of competitiveness in the host country's industry. Those hypotheses exclude the possibility for the local country's domestic capital stock to be used as a proxy despite fitting one of the conditions. The model chosen for this study is the *Investment Development Path* (IDP) first proposed by Dunning (1981). This approach introduces the Net Outward Investment (NOI) position of a country as the difference between the outward FDI stock and the inward FDI stock of a country.

The proxy for industrial development level will be the NOI, particularly because it fits both previous criteria well. An important particularity is that this variable comes from an evolutionary approach, which stipulates that: „with an economic development, a country's NOI faces different stages”¹⁹. It means that both capabilities, either to attract foreign investment or to become a foreign investor in other countries depend upon the economic growth of the country. Dunning (1981) proposed five different steps followed by countries either as an FDI destination or as an outward investor. The industrial development level will not follow any steps; however, it should be influenced by those steps in a certain way. On the one hand, countries that demonstrate the first step comply with the original model simply FDI destination, without any outward investment because of their low level of development. That group of countries will expect only the first impact of FDI, in their balance of payment, capital accumulation and employment, and will receive less impact from FDI, sometimes showing mitigate conclusion in empirical studies²⁰. On the other hand, less developed countries evolution is confined to the second step because of their weak internal market growth. They are characterized by a broad negative NOI.

¹⁸ Picciotto B. «L'investissement direct vers les nouveaux adhérents d'Europe Centrale et Orientale ce que l'élargissement pourrait changer», Notre Europe 2003.

¹⁹ Mold A. (2004)“The investment development path hypo thesis : evidence from the Portuguese case-A panel data Analysis” page 3 Revue Region et Développement n° 20

²⁰ Should we remember for example the mitigate conclusion of empirical researches over North Africa commercial openness with European Union Members?



The problem with using NOI as a proxy for industrial development level is that the focus is confined to a set of industries only: those that are internationalized. However, that set of industries sheds light on the competitiveness of the host countries, and should be seen as a comparable macroeconomic feature. In fine, the model to be estimated in the study takes the following form for each country:

$$(1) \quad y_t = a_0 + a \sum x_t + u_t$$

The variable y_t represents the logarithm of GDP in current prices at time t ; x_t represents a set of independent variables at time t , while u_t is the error term.

$$(2) \quad NOI_t = OutwFDI_t - InwFDI_t \text{ (This is t original definition by Dunning)}$$

$$(3) \quad FDINOI_t = NOI_t * \ln(InwFDI)_t$$

$FDINOI_t$ is assumed to capture the interaction between the inward FDI and the host country industrial development level.

$OutwFDI$ means the outward flow of foreign investment and $InwFDI$ is the inward foreign investment, while NOI is the Net Outward Investment position, as defined in the model by Dunning

In order to arrive at the **best estimations** of the regression, we add two more control variables into regression. The first one commercial, and the second the percentage of tertiary enrolment, both variables are very none in the model to enhance FDI effects. The proxy for commercial openness is the ratio of the sum of exports and imports divided by GDP values. The final regression to be estimated is the following:

$$(4) \quad \ln(GDP)_t = a_0 + a_1 FDINOI_t + a_2 \ln(InwFDI)_t + a_3 Cop_t + a_4 school_t + u_t$$

Where $\ln GDP_t = y_t$

This is a time series model and the specification will depend on the quality of the data we have from each country. That is we cannot assume what the best estimator will be for each country, but the simplest one may be the Ordinary Least Square (OLS). We intend to study the quality of the data first through analysis of stationary hypothesis. Accordingly one specific model will be specified for each of the country.

Empirical work and economic meaning of the results.

Data for the empirical work have been collected from two sources; the World Bank provided data for exports and imports that was used to compute the commercial openness observations, the tertiary education enrolment in percentage of total school enrolment, and the Gross Development Product (GDP). The UNCTAD database provided data for both inward and outward FDI stock. The sample period is from 1980 to 2011. The inward FDI data are convert with the logarithm for two main reason, first to control for non stationary variance, and secondly to avoid eventual collinearity with the generated observations for **FDINOI**.

Before processing to the stationary test, we first selected the optimal lag number for each variable. This simple process has the advantage that, while running the stationary test, we



will know exactly the limit of lags for the variable, and will then be able to progressively them from zero to the optimal, as long as the presence of the unit roots hypothesis will not be rejected. The best way to get the optimal lag to assess the series using *information criterion procedures*. The commonly used are Akaike's information criterion, Schwarz's information criterion, and Hannan and Quinn information criterion. The common assumption is that the optimal lag is the one predicted by the three information criterion. The maximum number of lags introduced for each case is 3.

Table 1. Lag's selection test result (with maxlag(3))

	Turkey #lags	Morocco #lags	Egypt #lags
lngdp	1	1	1
lnfdi	2	1	3
school	3	1	1
cop	1	3	2
fdinoi	3	1	3

The next step in this empirical work is to run stationary tests, we choose to use Phillips-Perron unit-roots test, which is robust²¹ related to the Augmented Dickey-Fuller.

We followed the three steps for the unit-roots test starting with the regression integrating a trend, then regression with a constant, and then regression without constant and trend. The null hypothesis of no unit-root has not been rejected for each variables. The test were run with the lags from zero to the maxlags as suggested from the above table. We run the test again after first differencing the variables, the results show that all our variables are stationary, that's is I(0), or the unit-roots hypothesis was accepted.

Table 2. Phillips-Perron stationary test results

	Turkey Unit root	Morocco Unit root	Egypt Unit root
Lgdp	I(1)	I(1)	I(1)
Lfdi	I(1)	I(1)	I(1)
School	I(1)	I(1)	I(1)
Cop	I(1)	I(1)	I(1)
Fdinoi	I(1)	I(1)	I(3) ²²

Once the variables are differentiated (using the first differences), we first check for any possibility of cointegration among variable. This step is necessary since we have the variables for Turkey and Morocco showing the same level of integration I(1). The

²¹ The robustness of the test relies on the general form of heteroskedasticity (robust to serial autocorrelation), and that users may not feel obliged to specify the numbers of lags

²² We had some particular troubles with this variable, as it shows an I(3).



cointegration hypothesis assumed that there is a long term relationship that always sends back the variables to certain equilibrium. This relationship shows that if a set o variables (dependant and independent variables) show the same level of integration like those in our specification, there might be a vector of their difference showing an inferior level of integration. For the purpose of this study we follow the two-step **Engel-Granger test**.

First step: determination of the residual for each country before the differentiation.

For this step, we run a simple OLS model before the first difference of the variable, and we predict residuals, for each of the countries. The estimated OLS model and determination of predicted residuals appear below.

$$y_t = \alpha_0 + \alpha \sum x_t + u_t$$

$$y_t - (\alpha_0 + \alpha \sum x_t) = u_t \rightarrow I(0)$$

Second step: After the prediction of the residual, the next step is to run the Dick-Fuller test to check for unit-roots hypothesis. If the null hypothesis is rejected, that is the residual is I(0), then we have a case of cointegration, and we must run a model of error correction integrating a lagged predicted residual as explanatory variable. If this variable in the final model is significant negatively, the model specification is good; otherwise we have to run a different model.

Table 3. Dfuller test for predicted residual

Turkey	Z(t)	5% value	p. value	Morocco	Z(t)	5% value	p. value
Lag	1			Lag	0		
Trend	-2.067	-3.580	0.5647	Trend	-4.331	-3.580	0.0028
Const	-2.243	-2.986	0.1909	Const	-4.366	-2.986	0.003
Nocons	-2.288	-1.950	-	Nocons	-4.441	-1.950	-

We use the same above technique to determine the suitable number of lags. Results for each country are shown in individual table.

Turkey shows a stationary predicted residual, for the regression with no constant. We can see that the Z(t) value (-2.288) is smaller than the critical value at 5% (-1.950). We will then apply a model of error correction, with expectation that it will meet the above condition that is the lagged predicted residual must be significant negative.

For Morroco, all the Z(t) value reject the null hypothesis of unit-roots, meaning we have a second case of error correction model, since the predicted residual here is also stationary.

For Turkey and Morocco, the model that will be used here is the following:

$$\Delta \ln(GDP)_{t-1} = \alpha_0 + \alpha_1 \Delta FDINOI_{t-1} + \alpha_2 \Delta \ln(InwFDI)_{t-1} + \alpha_3 \Delta Cop_{t-1} + \alpha_4 \Delta school_{t-1} + u_t + \alpha_5 \epsilon_{t-1}$$

(5)



Where e_{t-1} is the lagged predicted residual for the error correction model.

The following tables contain the results for Turkey and Morocco. We have checked for possibility of residual autocorrelation by performing the Breusch-Godfrey test. This test happens in steps.

Step1: We run a normal OLS estimation and we predict the residuals.

Step2: We run an auxiliary OLS regression using the predicted residuals as dependent variables, and including one lag of the residual in the regression as independent variable. Then we have to compute the statistic $(R^2 \cdot N)^{23}$ and compare to the Chi-squared statistics at 5%. If the computed value is greater than the Chi-squared statistic, then the null hypothesis of no residual autocorrelation can be rejected. Following the results of the tests, both regressions will be estimated using the Prais-Winsten estimator of time-series, with AR (1), as the tests show that we cannot reject the null hypothesis of autocorrelation of residuals. We have reported the test's statistics in bold into the small tables.

Table 4. Test output and Prais-Winsten estimation for Turkey

scalar list N R2 NR2	Turkey	Robust	R²=0.4830		
N = 31	$\Delta \ln (GDP)_{t-1}$	Coef.	Std. Err.	t	P>t
R ² = .51802003	$\Delta \ln (InwFDI)_{t-1}$	.5427158	.1099069	4.94	0.000
NR ² = 16.058621	$\Delta FDINOI_{t-1}$	.0051867	.0017515	2.96	0.007
. scalar chi15=invchi2 (1, .05)	$\Delta School_{t-1}$	.0060775	.0130094	0.47	0.644
. scalar list chi15	Δcop_{t-1}	-.1722078	.050429	-3.41	0.002
chi15 = 3.8414588	e_{t-1}	-.302232	.1300224	-2.05	0.029
	_cons	.0664891	.0261755	2.54	0.018

As expected, we see the lagged residual significant and negative here which means our model is correctly specified.

Table 5. Test output and Prais-Winsten estimation for Morocco

N = 29	Morocco	Robust	R²=0.4970		
R ² = .42702798	$\Delta \ln (GDP)_{t-1}$	Coef.	Std. Err.	t	P>t
NR ² = 12.383811	$\Delta \ln (GDP)_{t-1}$	Coef.	Std. Err.	t	P>t
. scalar chi15= invchi2 (1, .05)	$\Delta \ln (InwFDI)_{t-1}$	.1699077	.240335	0.71	0.487
. scalar list chi15	Δcop_{t-1}	-.0401275	.022467	-1.79	0.087
chi15 = 3.8414588	$\Delta FDINOI_{t-1}$	-.0002511	.008114	-0.03	0.976
	$\Delta School_{t-1}$	.0295516	.0227886	1.24	0.227
	e_{t-1}	-.7018424	.1703423	-4.12	0.000
	_cons	.040329	.0236139	1.71	0.101

²³ R² is from the auxiliary regression, and N is the number of observation



We can also do the same earlier remark that the lagged residual is significant negative, confirming that the model for Morocco is also well specified.

The regression for Egypt can now be estimated with the normal OLS method. But our first estimation looks very poor as the P-value is very higher than 5%.

We can easily see that computed statistic NR^2 (0.18097813) is inferior to the Chi-squared value, which means we can accept the null hypothesis of no autocorrelation of residuals.

Table 6. test output and GLM estimations for Egypt

scalar list N R ² NR ²	Egypt	Robust			
N = 28	$\Delta \ln(GDP)_{t-1}$	Coef.	Std. Err.	z	P>z
R ² = .0064635					
NR ² = .18097813	$\Delta School_{t-1}$	.0025285	.0017015	1.49	0.137
. scalar chi15=invchi2 (1.05)	Δcop_{t-1}	-.0516638	.0269838	-1.91	0.056
. scalar list chi15	ΔFDI_{t-3}	-.0035651	.0051928	-0.69	0.492
chi15 = 3.8414588	$\Delta \ln(InwFDI)_{t-1}$	.084927	.1642549	0.52	0.605
	_cons	.0301787	.026189	1.15	0.249

Performing a model for Egypt shows a lot of challenge, first because of the strange level of integration for FDI_{t-1} , and also because the MCO estimation does not give a satisfactory result. We must advise that Egypt had a lot of missing observations, the school variable had almost half of the observations missing, that we automatically generated on Stata. We decide to perform with the Generalized Linear Model, as this is the most general statistical model that we believe may give better estimation.

Results Interpretation and their economic importance

The aim of the estimated regression was to check the significance and the sign (positive or negative) of two main variables. The first one is the variable of interest of the present study FDI_{t-1} , a proxy for industrial development level; this variable is what we have called in the course of this study, the long term impact of FDI. Besides, there is the so called stylized effect of FDI, that we designed by the short term impact of FDI, this impact can last very quickly and whenever this happens without an existing local industrial development, which could enhance with foreign firms to generate a competitive market, they FDI impact simply wiped out. As we could redefine it at this point of the research, the general hypothesis of this study aimed to converge with the belief that the interaction of local industrial development and FDI help enhancing the positive impact of FDI on least developed countries.

The regression specifications are related to some characteristics of each country, then we have Morocco and Turkey modeled in the same manner, while Egypt comes out with a different model specification. We were unable to predict the sign for FDI_{t-1} , this can be positive or negative according to the country, and to the level of FDI it is receiving. Positive simply means FDI are a blessing for the country, while negative shows the malign effect. This study also tries to show that, the malign effect could mainly be felt on the long term.



The first regression for Turkey overwhelmingly show the short term and long term FDI effect positive and significant on the country's growth at 1% and 5% respectively. This definitely means Turkey has already caught up or is at the point to do so, then appearing with a developed country picture in this study. The effect shows here confirm our intuitions that FDI are successful whether they promote competition. However, we see the commercial openness with a negative and significant sign. This is certainly due to the fact that trade openness comes with a reduction of country revenue and taxes from imported products and services. This finding is in the same vein with Yanikkaya (2003)²⁴ findings that trade barriers are positively linked to economic growth, so trade openness normally has the negative effect that our results pictured out. In his study, he showed that giving more emphasis on trade policies than on trade volume²⁵ may conduct to wrong conclusions. We also found school impact on growth to have a positive impact but not enough to be significant. In the case of Turkey the percentage of enrolment at the tertiary education level appears with no significant impact on growth. This may be probably due to the choice of the variable, but we couldn't point out this positive and significant impact. They are many studies portraying the effect of education economic growth in Turkey. Most of them use different education levels; our findings on education are same with those of Deniz and Dogruel(2008)²⁶ that university level (tertiary education) has no impact on economic growth.

The results from Morocco show a very different picture, and emphasize the difference of the development level with Turkey. The FDI impact on short term is showing a positive sign, but not significant on growth. The more impressive with the results for Morocco is the negative sign we observe for the coefficient of the interaction between industrial development level and FDI. This long term impact of FDI although non significant has an apparently influence or will have some at long term if suitable actions are not designed. We observe while running this research that, the inward FDI has a better coefficient and better student statistic alone than when pooled together with the variable for the interaction between FDI and country's industrial development level. We somehow felt this may be caused by a possible collinearity among variable, but after checking out, we reject the possibility of collinearity as the Variance Inflation Factor (VIF) obtained after an OLS regression was less than 10 and $1/VIF > 0.01$. We then go forward saying that there is no FDI impact in Moroccan economic growth, and that the industrial development level in Morocco if any, will be impacted negatively as the amount of FDI will be increasing, this is a case of competition destructive FDI instead of competition enhancing. Our findings are supported by existing works and statistics showing that the behavior of FDI in Morocco has been for a very long time determined by the strategy of privatization initiated by the Government. The OECD Investment review (2010) observed however that, „the entry of foreign investors has a

²⁴ Yanikkaya H. 2003. "Trade openness and economic growth: a cross-country empirical investigation." *Journal of Development economics*, 72(2003) 57-89.

²⁵ This is using like in our study import and export data for trade volume. Yanikkaya in his trade and growth survey, somehow highlighted that, volume variables are better off than policies variable, because of the lack of clear definition of trade openness.

²⁶ Deniz Z., and Dogruel S. 2008. "Desaggregated education data and growth: some facts from Turkey and MENA countries". <http://www.luc.edu/orgs/meea/volume10/PDFS/PaperbyDeniz&Dogruel.pdf>, Jel classification J24, O43



positive impact on employment and labour skills and facilitates the expansion and internationalization of Moroccan enterprises"²⁷. This impact here is mostly the short term which may last quickly, this explains probably why we observe a positive impact but non significant. The percentage of tertiary school enrolment here as a proxy for the level of instruction showed a positive sign, but is not significant at 10% level. North African countries however have a certain level of high educated persons, but this may not be enough to boost growth, or their skills are not suitable, particularly if this variable effect is to enhance FDI impact. We find trade openness coefficient in Morocco also negative and significant. Mansouri (2009)²⁸ found in his study that FDI was negative and non significant in Morocco, while he showed that the interaction between FDI and trade openness was positive and significant on the country's growth, the real impact of trade openness is still difficult to capture. We pointed earlier in this study that the case of openness to European Union of North Africa countries never showed the expected positive impacts, outlining mainly a mitigate impact.

Results from Egypt show exactly the same behavior than the earlier from Morocco. Both coefficients for FDI and FDI's interaction with industrial development are non significant at 10%. Their signs are exactly the same with those of the Moroccan regression (i.e positive for FDI alone and negative for FDI interacting with industrial development level). Only trade openness shows a negative and significant coefficient. School is also positive but not significant at a 10% level, however, its impact in Egypt is slightly better than in the other countries, as we obtained a p-value of 13.7%, while Morocco has for the same coefficient 22.7% and Turkey 64.4%²⁹. The negative impact of the FDI interacting with industrial development level is more relevant in Egypt than in Morocco with respective p-value 49.6%, and 97.6%. The FDI interaction with industrial development Level can be dropped from the regression of Morocco.

Conclusion and policy review

We tried to identify the long term impact of Foreign Direct Investment into country's growth. We perform a critical theoretical survey that aims at highlighting the reasons that may drive FDI from positively impacting to either zero significant impact or to completely negative. We used the Net Outward Investment position of a country to capture the industrial development level of a country and its competitive position. To the question whether FDI have any impact in Less Developed Countries, we confirm that this is true whether we can find both short term and long term positive and significant impacts. This means that FDI should further a country's development on two main points; the first being the so called stylized facts and the second one that we identified in this study as the interaction between FDI and the local industrial development. Our empirical research find

²⁷ OECD Investment review. 2010. "The role of Foreign Direct Investment in Morocco's Economic Development." http://www.keepeek.com/Digital-Asset-Management/oecd/finance-and-investment/oecd-investment-policy-reviews-morocco-2010/the-role-of-foreign-direct-investment-in-morocco-s-economic-development_9789264079618-3-en

²⁸ Mansouri B. 2009. *Effets de l'IDE et de l'ouverture commerciale sur la croissance économique au Maroc*.

²⁹ We should remind that the less the p-value of coefficient, the more the impact is relevant on the dependant variable



this interaction existing, positive and significant for Turkey, while Morocco and Egypt show both no FDI impact on growth and a possibility of FDI malign impact at long term. The research regarding FDI impact on growth may still be ongoing as we really don't know all the mechanisms that may help us catching their impacts. However, this study clearly underlined one of the most important, that many studies have thought of, to be important without being able to prove it empirically. This method may show the impact of FDI on most of the developing world to be non significant or even malign in some case. The true from the observed facts and statistics can't be refuted; we barely saw multinationals action in poor countries related with their growth. Asian nations are getting out of this short list because of their very strong policy commitment toward foreign investors. Foreign direct investments don't enhance growth in poor Less Developed Nations, should these countries continue investing their sparse means to attract, and compete with rich one on FDI, probably no. Less developed countries should rely on Aid Development Funds to first get a certain local industrial development that will be able to reap externalities from multinationals. Those local firms will then be part of the industrial realm of the host country, contracting with foreigners to provide intermediary services and goods, and any expertise, while learning by doing and enhancing managerial knowledge, and some basic technologies. The responsibility is not only from Foreign Investors, most of the countries are unable to absorb the bulk of foreign capitals, due most of times to the wick industrial level of countries. At this point, policies matter, as means to create a better environment and best legislation so that foreign direct investments could have defined frameworks for their activities. A foreign investor usually enters into contract with host countries, weak negotiations may derive in the loss of most expected positive impacts. Country local content of FDI production then seems to be unavoidable.

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³⁰ CEMAFI stands for Center for Macroeconomics and International Finance, former laboratory at the University of Nice. This lab has actually merged with the GREDEC



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Mehanizmi uticaja stranih direktnih investicija na rast manje razvijenih zemalja: primeri nivoa industrijskog razvoja Turske, Egipta i Maroka

REZIME – Nivo industrijskog razvoja koji je predöčen u ovom radu je ključni faktor za objašnjenje kako se uticaj stranih direktnih investicija (SDI) može promeniti sa pozitivnog na negativni. Prikazano je da uloga upliva SDI-a na rast neće imati efekta samo ako se primene odgovarajuće mere, već da mora postojati rast agregatnog nivoa industrijske proizvodnje sa određenog minimalnog nivoa. Interakcija između nivoa industrijskog razvoja i SDI može se smatrati kao drugi i dugoročni efekat SDI na rast zemlje. Dakle, u nedostatku ili prilikom niskog nivoa industrijskog razvoja, može doći do gušenja od strane SDI, što dovodi do pretvaranja interakcije sa pozitivne na negativnu, objašnjavajući zašto se u pojedinim zemljama SDI pojavljuje u negativnoj konotaciji sa lokalnim razvojem.



KLJUČNE REČI: *strane direktne investicije, rast, spoljna neto pozicija, nivo industrijskog razvoja, manje razvijene zemlje*

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