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# **Foreign Direct Investment and Economic Growth: Simultaneous Equation Model Case of Southern Mediterranean Countries (SMC)**

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# Foreign Direct Investment and Economic Growth: Simultaneous Equation Model Case of Southern Mediterranean Countries (SMC)

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## Summary

In this work we study the effect of FDI on the economies of the South Mediterranean countries. Taking into account the positive effects and starting from the establishment of a simultaneous equation model applied to 8 countries, we tried to demonstrate the mechanisms through which FDI acts on economic growth. The estimation of our model shows that the level of human capital exports and to a lesser extent domestic investment, are the most prominent factors in creating positive effects. However, these results, while important, remain weakly motivating to generate positive growth or at least to reduce the negative effects of FDI.

Keywords: Foreign Direct Investment, Economic Growth, Simultaneous Equation Model

## 1. Introduction

In a global context that is pushing for greater economic openness and the shortage of resources needed to finance their long-term development, countries are opening up to global markets with the aim of finding opportunities and attracting FDI flows. . South Mediterranean countries, like all countries in the world, are very interested in FDI. Economic reforms initiated by these countries over the past twenty years to attract more FDI flows, with the aim of increasing the level of development and catching up with neighboring countries and neighboring countries in the north. Although all SMCs have many advantages, such as geographical proximity, available labor and lower costs compared to EU countries, these countries stay away from the influx of 'FDI compared to emerging countries.

The objective of this chapter is to study the effect of FDI on the economies of eight countries on the southern shores of the Mediterranean, for the period 1985-2018. A simultaneous equation model applied to give panel is developed to examine the mechanisms and channels through which the IDE acts on the economy. The advantage of this model is that it has helped us to have a clarification of the determinants of FDI that is moving towards these Mediterranean countries.

## 2. Review of the empirical literature on the relationship between FDI and economic growth

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Various factors that, according to the theories of endogenous growth, can explain long-term growth, such as human capital factors, capital accumulation, international trade, government policy and the transfer of technology, all of which are provided by the IDE. The latter stimulates growth through the creation of dynamic comparative advantages resulting from the transfer of technology, the accumulation of human capital and the intensification of international trade (Bende et al, 2000 and OECD, 2002). These dynamic benefits, often known as spillovers, are complementary, related to one another, and should not be studied separately (Alaya, 2006). In fact, the gain generated by FDI on a growth factor can stimulate the development of other factors and constitutes a kind of synergy (Bende et al, 2000).

## **2.1. The effects of FDI formation on the host economy**

Developing countries consider FDI as an important external source of capital, it stimulates various macroeconomic indicators such as employment, exports, domestic investment and the integration of new technologies to the private sector. It is therefore a source of growth and productivity gains. In the presence of comparative wealth, developing countries are trying to attract more FDI. However, the magnitude of these effects is unclear; it is highly dependent on the quality of technology transferred by foreign firms and the capacity of the host country to absorb new knowledge and technology transfer.

### **2.1.1. FDI and economic growth**

In several cases studied, empirically the externalities of the FDI have proved that they are very beneficial for the host countries. Thanks to a study of the manufacturing sector in countries such as Australia, Canada, Mexico and Venezuela, Aitken and Harrison (1991) have shown that the presence of FDI has a positive impact on business productivity. local. They concluded that the external effects are very important, especially on the economic growth of the host country.

In contrast to these studies, Brewer (1991) empirically demonstrated that there is a negative correlation between FDI and economic growth. This negativity is characterized by a dominating effect exerted by foreign firms that discourages local firms to develop their own research and development activities. In turn, Singh (1988) and Hein (1992) found no significant effect of FDI on economic growth.

Hermes and Lensink (2003), and from a study conducted in 1970-1995 that covered 67 developing countries, noted that there is a negative impact of foreign direct investment on economic growth. But, in the presence of two new variables integrated alternately in the model, this impact is reversed and becomes positive. These two new variables are the enrollment rates (indicating human capital) and the financial market efficiency variable, respectively.

To study the nature of the relationship between FDI and economic growth, Darrat et al. (2005) carried out a comparative analysis involving 23 countries belonging to two different regions: Central

and Eastern Europe , and on the other hand, the region of North Africa and the Middle East (MENA). Using data from the period 1979-2002, and from an ordinary least-squares estimate, they found that only in the candidate countries of the EU is economic growth stimulated by Foreign direct investment, while it has no effects on growth in MENA countries and non-candidate countries, or has negative effects in this regard. Thus, according to Darrat et al, the application to become a member of the EU will have positive effects in relation to the influence of FDI flows on economic growth, through a rigorous implementation and a wider application. more effective of some reforms.

After a study that highlights the relationship between FDI and economic growth in the countries of the North Africa and Middle East region, Meschi (2006) found that FDI has no positive impact on Economic Growth. Thus, and based on an econometric study of panel data from 14 countries in North Africa and the Middle East, for the period 1980-2003, he perceives that the effect of FDI on economic growth is generally negative. , and exceptionally; sometimes significant. He explains these findings, that it is mainly in the primary sector and particularly hydrocarbons where FDI is concentrated in these countries.

As for Bashir (2001), and through a study that focused on five countries of the Mediterranean (Tunisia, Algeria, Egypt, Jordan and Turkey) over the period 1975-2000, tried to test the relationship between foreign direct investment and GDP / head growth in these countries. Thus, and based on estimates derived from a model used with a random effect, he found that the FDI coefficient is positive but not significant. The author attributes this result to the low levels of FDI flows channeled by these countries during the 1980s. In addition, Bashir reported a negative and significant coefficient of human capital (glimpsed by the gross secondary school enrollment rate). This observation is expected according to Bashir, it comes down to the low gross enrollment rate in high school that all these countries have.

For Boukolia and Zatlá (2001), and in a study that affected 9 countries in the South and East Mediterranean Basin, tried to analyze the effects of FDI through the analysis of the factors of its location and determination. its effect on economic growth. They note that the level of influence of FDI on economic growth in southern Mediterranean countries is weakly significant

### **2.1.2. The effect of FDI on the development of human capital**

Borensztein.E et al (1998), being the first authors to analyze the effects of FDI on economic growth. Based on Romer's model, they seek to explore the importance of technology transfer in the process of economic growth. By expanding the number of varieties of capital goods available in the economy, they introduce FDI as capital goods produced by foreign firms imported from a host country. By reducing the cost of introducing new varieties of capital goods, FDI plays an important role in economic growth. These authors have shown empirically that FDI has a positive impact if the host

country's human capital exceeds a certain threshold, and that the positive effect of FDI on the economy will depend on its interaction with human capital.

According to Borensztein.E et al. (1998), and thanks to the integration of new technologies transferred by MNCs into the training of workers, FDI contributes to the accumulation of human capital.

Ben Abdallah, M et al (2001) have empirically shown that FDI plays a catalytic role in the growth and development of countries that, over time, improve their stock of human capital. This is a minimum threshold of human capital, from which FDI will have a positive effect on growth

Human capital is, on the one hand, an attractive factor for multinational enterprises, Lucas (1998), and on the other hand, a factor stimulating investment and promoting the transfer of technology, Meddeb.R and Drine.I (2000). ).

In a recent study, Blömstrom.M and Kokko.A (2003) raise the potential stimulating role of FDI in improving the quality and level of human capital. In fact, the demand for skilled labor by multinational companies and foreign companies allows host countries to invest more in education, especially in higher education.

Certainly, investment will generate growth, but both are often correlated with improvements in productivity and the quality of training and education. This encourages local people to improve their level of education, which results in improved stock and the quality of human capital (Grier, 2001).

### **2.1.3. FDI and the development of foreign trade**

Fontagne and Pajot (1999) show that FDI improves the competitiveness of companies operating in the host country's domestic market and has a positive impact on foreign trade, especially exports. It also brings positive externalities through the effects of outsourcing and exploiting technological progress

In countries with low innovation capacity, the dominance of foreign firms can inhibit local learning and discourage local firms from developing their own research and development. This does not mean that less developed countries can not benefit from technology transfer, the local productive sector out of step, may be slightly beneficial for growth. Findlay.R (1978) suggests that, in order to ensure technological catch-up through FDI between lagging and industrialized countries, the technological distance between these countries should not be too great.

In a comparative analysis of Hungary and Vietnam on the role of FDI in the evolution of foreign trade of countries in transition, Mainguy.C and Rugruff.T (2003) suggest that openness to FDI disrupts integration and the specialization of Hungary, while the influence on Vietnam is rather modest. In 1993, foreign-owned firms accounted for more than half of Hungary's exports, but it was only in the second half of the 1990s that their influence became decisive. It is estimated that in 1998 they were responsible for 85.9% of exports.

In an empirical study conducted by Menegaldo, F and Moustier.E (2002), on SMCs and Europe between 1985 and 1997, in order to demonstrate the effects of FDI on trade, the results indicate that a relationship exists. cointegration for the case of Morocco, Tunisia and Turkey, which has confirmed the existence of a long-term relationship between FDI and trade, while for Egypt the result is rather mixed .

The results of an econometric model conducted by Soliman.M (2003) on four southern Mediterranean countries (Egypt, Morocco, Tunisia and Turkey), between the periods 1975 and 1997, indicate that FDI has a positive effect on manufacturing exports. But in general, the importance of this effect is so small to take advantage of export performance.

Balasubramanyan et al. (1996) find that the effect of exports on growth is stronger in countries with an export promotion policy than in countries pursuing an import substitution policy.

#### **2.1.4. The effect of FDI on domestic investment**

FDI creates comparative advantages in the economy. It is therefore important for the State to promote the implementation of these investments, which encourages the creation of strong and favorable relationships, and it will therefore be highly recommended to ensure investment attractiveness and sustainability at the same time. the region. According to Bosworth.P and Collins.M (1999), FDI effectively stimulates domestic investment in the host country where asset inflows appear to have almost no noticeable effect on investment. On the other hand, FDI is more resilient than other assets to economic shocks. Indeed, FDI is usually in the form of machinery or infrastructure, it is difficult, if not impossible, to repatriate it during an economic crisis, and that is what makes the difference with portfolio investment which are characterized by high volatility and sensitivity to economic conditions.

Agosin.M and Mayer.R (2000) analyzed the effect of delayed FDI inflows on host countries' investment rates to examine the effect of FDI on domestic investment (effect eviction or training effect) over the period 1970-1995. They found different results from one sample to another. Thus, it is a ripple effect in Asian countries, a neutral effect in Africa and a crowding out effect in Latin American countries. These authors show that the effects of FDI are not always beneficial for all countries.

For the PSM countries, Boukha.F and Zatl.N (2001) exclude the existence of complementarity between FDI and domestic investment and did not eliminate the hypothesis of foreclosure effect, which decreases the contribution of these two variables to economic growth. To explain this idea, the two authors have adopted the hypothesis that "beside potential threshold effects or insufficient technological capacity of local firms, it is just as much the absence of complementarity. between foreign and local capital that would explain the low impact of FDI on the growth of the South and East Mediterranean economies " .

MNFs, with superior collateral and profitability, benefit from easier access to local banks at the expense of local firms, as has been demonstrated by Harrison.AM and McMillan.M (2002) in their study. for the case of Côte d'Ivoire between 1974 and 1987, with the aim of identifying the relationship between FDI and the financial markets. A similar result is reported for Morocco between 1984 and 1992, where it was found that FDI increased business risk in industries dominated by local producers to access local credit markets which became more difficult, Vora.A (2001).

### **2.1.5. The effect of FDI on technology transfer**

According to Xu (2000), one can have an economic divergence because of the effects of FDI not only because of the lack of absorptive capacity of the host country, but partly because of the bad quality of technologies transferred to developing countries. This contrasts with Romer (1993) who assumes that FDI has a positive impact on technology transfer through the role of MNCs in reducing the technological gap between countries at different levels; by providing new knowledge, which is an important factor for economic growth.

Ben Abdallah, M. et al (2001) also report that the volume and nature of the technology transferred is largely influenced by the level of competitiveness of the host country. A worker's competitiveness is in fact his ability to absorb and assimilate foreign technology.

Cantwall (1989) examined, during the period 1955-1975 within the European market, found that the most significant positive impact on local technology is observed in companies that have a barge of technological adaptation in their process of production. He concluded that the externalities are clearer in the industry with a small technology gap.

Haddad.M and Harrison.A (1993) have shown that a significant technological gap hinders the external effects of FDI.

According to Chudnovsky.D and Lopez.A (1999), technology transfer in developing countries depends on local absorptive capacity, adaptation of this technology to the needs of countries, skills of employees, etc.

According to an endogenous growth model incorporating FDI, inspired by Romer (1990) and Berthelemy.J, C and Démurger.S (2000), the larger the gap in technology, the higher the growth rate will be. greater gap between foreign and local firms.

However, in the work of Blomstrom and Wolff on the case of Mexico, the result of their research was theoretically unexpected. The authors indicate that the technology gap has clear externalities between firms that adopt technology in the production process and others that do not. Indeed, their interpretation is based on the influence of competition from foreign firms that can force the use of advanced technologies to local companies. The existence of technological capacity and a stock of human capital therefore seem to condition the assimilation of knowledge developed elsewhere. Host

countries must have a minimum stock of human capital and know-how that allows them to assimilate foreign technologies (Blomstrom et al, 1992, Borenszein et al, 1998).

Improving the stock of human capital and developing learning activities are essential and generators of the technological gap between different countries to obtain the most positive impact of FDI on growth. Nowadays, the accumulation of human capital and learning are considered essential factors in the process of technology transfer.

Empirical studies by Blomstrom and Kokko (1996) consider FDI as a technology transfer vehicle for developing countries. This work shows that the importance of technology transfer depends on certain characteristics of the host country and its industry sector. For example, intensified competition, higher fixed capital formation, higher education and less restrictive conditions imposed on foreign firms all contribute to the transfer of technology.

A favorable effect of FDI on a host economy is first associated with the diffusion of spillovers to local firms by foreign firms. However, according to Kumar.N and Pradhan.J, P (2002), these externalities may not take place due to links with restrictive and / or low absorptive local firms.

All these empirical studies show that FDI accelerates growth and generates convergence effects if host countries have a sufficient level of education and economic development. This shows that the empirical relationship between FDI and economic growth is not unambiguous. These different studies also point out that the effect of FDI depends on several characteristics of host countries.

Finally, it can be argued that the impact of FDI depends in particular on the characteristics of the host country, and that these results have identified, in particular, the existence of important factors and development thresholds for FDI a positive impact on the growth of the least developed countries.

All these elements show the desirability of foreign direct investment in developing countries. On the other hand, low levels of human capital and low levels of development can hinder a beneficial effect of FDI. It is also possible that the regulatory and institutional framework is a particular place that hinders the exploitation of the benefits of society.

Therefore, of all the above, two problems arise through the double game of these obstacles. On the one hand, because of these barriers, FDI would not stimulate growth and help reduce poverty in some host countries. On the other hand, these obstacles can also affect the attractiveness of a country.

The importance of FDI is obvious and no longer to be demonstrated, it will be interesting in the practice that follows to give first a more precise framework for foreign direct investment by identifying its various determinants. Then we go on to demonstrate the importance of the attractiveness process, focusing on the fundamental conditions and principles that allow the host country to attract FDI.



The interaction between the efficiency of financial market regulation, FDI and economic growth has been the subject of an empirical study by Durham (2004) and Alfaro.L et al. (2004). The results of this study indicate that FDI flows are directed more towards countries that have a better financial market regulatory system and subsequently achieve a higher growth rate.

### 3. Method of estimation and presentation of the variables

The structure of our model, which assumes a linear form, is represented as follows:

$$GDP_{it} = a_0 + a_1 FDI_{it} + a_2 HK_{it} + a_3 TRD_{it} + a_4 DI_{it} + a_5 TT_{it} + \varepsilon_{1it} \quad (\text{Eq1})$$

$$FDI_{it} = b_0 + b_1 GDP_{it} + b_2 TRD_{it} + b_3 Infl_{it} + b_4 Infra_{it} + b_5 HK_{it} + b_6 Enrg_{it} + b_7 Cred_{it} + b_8 Tax_{it} + \varepsilon_{2it} \quad (\text{Eq2})$$

$$HK_{it} = c_0 + c_1 FDI_{it} + c_2 EDUEXP_{it} + c_3 DR_{it} + c_4 Infra_{it} + \varepsilon_{3it} \quad (\text{Eq3})$$

$$TRD_{it} = d_0 + d_1 FDI_{it} + d_2 EXR_{it} + d_3 Tax_{it} + \varepsilon_{4it} \quad (\text{Eq4})$$

$$DI_{it} = e_0 + e_1 FDI_{it} + e_2 Cred_{it} + e_3 RATE_{it} + e_4 SAV_{it} + \varepsilon_{5it} \quad (\text{Eq5})$$

$$TT_{it} = g_0 + g_1 FDI_{it} + g_2 HK_{it} + g_3 TRD_{it} + g_4 DR_{it} + \varepsilon_{6it} \quad (\text{Eq6})$$

With

#### Endogenous variables

-GDP: Real Gross Domestic Product per capita

-FDI: Foreign Direct Investments

-HK: human capital

-TRD: foreign trade

-DI: Domestic Investments

-TT: Technology Transfer

#### Exogenous variables

-TRD: Opening rate

-Infl: the rate of inflation

-Infra: the infrastructure

-Tax: taxes on exports

-Cred: domestic credit provided to the private sector

-Enrg: energy production in 1000 TEP (ton oil equivalent)

-EXR: the real effective exchange rate

-RATE: the interest rate

-SAV: domestic savings

-RD: research and development

-EDEXP: education expenditure

The expected sign of the different variables, are synthesized in this table

#### 4. Estimation technique

The "xtsur" technique corresponds to a "jump" regression model with several equations of the variable  $y_1$  on the variables  $x_1$  and the variable  $y_2$  on the variables  $x_1$  or  $x_2$  and etc., using random effects estimators in the unbalanced panel data context. The approach of this command is based on the construction of a step-by-step algorithm using the Generalized Lesser Squares (GCM) and Maximum Likelihood (MV) procedures. The method was originally developed by Erik Biorn (2004).

#### 5. Interpretation of results

##### 5.1. The effect of FDI on economic growth

Table 4: Estimation of GDP determinants

Variable of interest: GDP growth rate (GDP)		
Variable	Ratio	Probability
FDI	-0.1004464	0.480
DI	3.064268	0.000
TRD	-0.2070917	0.000
HK	-0.1073138	0.000
TT	2.820104	0.000

Estimates show that domestic investment and technology transfer contribute positively and significantly to economic growth. Indeed in terms of elasticity, a 1% increase in domestic investment and technology transfer causes an increase in economic growth of 3.06% and 2.9% respectively. Different arguments explain these findings, all of which is due to privatization, as domestic investment has become a source of economic growth. Technology transfer brings an important benefit to all economies through the transfer of new technology for countries seeking to develop by following a policy of promotion and attractiveness.

The results of the model highlight a negative and significant contribution of exports and human capital to economic growth. Exports have a significant negative impact on economic growth at 1%, this essentially amounts to the narrowing of competitiveness for products for which it has a strong specialty (textiles and clothing), to the benefit of Asian countries. Indeed, the Mediterranean textile and clothing sector is today in a very difficult situation, its price competitiveness is too low to be able to confront Asian manufacturers. In 2008, European textiles and clothing imports from SMCs fell by 4.5%. Suppliers who score points are China and Vietnam, but also Egypt with more than 7%. While Morocco's sales to Europe fell by 3.8%, those in Turkey fell by 11%. In Tunisia, exports of clothing products fell by 28.6% in volume and 7.3% in value.

Restrictive trade policies can also explain a significant and inefficient state intervention in the economy, for example by granting subsidies to the poorest companies.

Concerning the non-significance of exports on economic growth, Aitken et al. (1997) conclude that these countries have failed to improve their production apparatus to cope with the rise of China and Vietnam, which partly explain their growing structural problems. Southern Mediterranean countries are unable to move upmarket, as Southeast Asian countries have diversified their economic activities and are increasingly concentrated in technology-intensive sectors. where demand is stable and competition with other developing countries has not reached significant levels. The latter countries have already begun to gradually abandon traditional sectors such as low technology textiles, and are starting to have dynamic comparative advantages in so-called developer sectors such as the electronics, biotechnology and computer sectors. etc.

Human capital has a significantly negative sign at 1%. This unexpected sign has just been explained by the inadequacy of human capital, which has not reached a certain threshold to positively affect economic growth. In the southern Mediterranean countries, where education systems can be characterized as immature, the negative effect of human capital on economic growth can be explained by the lack of material resources and the rather basic research applied. Concentrated in universities and with a weak university-enterprise link, as well as weak research at the firm level. The negative sign could be due to the quality education which does not meet the immediate needs of the companies, rather turned towards a general education in connection with a technical education; a school system unsuited to the economic needs of the country, a mismatch between the training courses solicited by companies and those offered by general and technical education. As a result, the reform of the education system, in order to be in line with the country's needs, is indispensable. Education must be quality and based on scientific and technical knowledge.

FDI has a negative, non-significant impact on economic growth (GDP), which can be explained by the nature of FDI that is more oriented towards the hydrocarbon sector and by the low level of FDI monopolized by these countries. comparison of other nearby countries such as Asian countries and countries of Central and Eastern Europe. These results confirm the work of Bashir (2001), Hermes and Lensink (2003), Darrat et al. (2005) and Meschi (2006). It appears that FDI inflows in these countries have not yet reached a threshold level to generate positive effects on economic growth.

## 5.2. Determinants of the FDI

Table 5: Estimation of the determinants of FDI

Variable of Interest: Foreign Direct Investment (FDI)		
Variable	Ratio	Probability
GDP	0.1554146	0.000
HK	0.0598723	0.000
TRD	0.1884098	0.000
infra	-0.0114593	0.000
enrg	0.02623	0.000
cred	-0.0264072	0.000
Infl	-0.0222306	0.000
tax	-0.0909676	0.000

The results relating to the second equation of our model, shows that economic growth, human capital, and natural resources (energy) are factors of attractiveness of foreign direct investments at 1%, as well as openness that reflects the extension of internal markets to international markets. This variable explains the effect of global economic integration through agreements signed with different partners. Openness would be an opportunity for companies in developing countries to modernize their production activities through access to goods and / or new services.

Infrastructure quality is an important variable for developing countries seeking to attract FDI, but is less important for developed countries that already have good infrastructure. Empirical studies that have studied the effect of infrastructure on FDI inflows are very rare. This is mainly due to infrastructure data that is not available for most developing countries and essentially our sample.

The impact of infrastructure is negatively significant on FDI at 1%, this can be explained by the fact that the majority of FDI flows to the countries of the PSM region go to exploitation of resources areas in which infrastructure is not important and also by the problems of centralization which affects almost all developing countries where there is a concentration of infrastructure in specific areas of the country, which is an obstacle to encouraging IDE to settle. Note that this result confirms the conclusions of some econometric studies that have been conducted on this topic, such as Onyeiwu (2003) and Mohamed and Sidiropoulos (2010).

Cheng and Kwan (2000) examine the determinants of FDI location in 29 Chinese regions from 1985 to 1995 and find that road density in 29 Chinese regions has positive effects on FDI flows.

In terms of macroeconomic stability, we note the effect of inflation on FDI inflows was statistically significant with an expected negative sign, this result confirms the work of Chan and Gemayel (2004).

The tax variable has a negative effect at 1% for the PSM, which can be explained by the nature of the tax system which is complicated.

The credit granted or the private sector has a negative impact on the attractiveness of the FDI flows, which explains why the financed market remains less developed and more cautious towards the borrowers. These results confirm the conclusion of Durham (2004) and Alfaro et al. (2004), who examined the trilogy: efficiency and regulation of financial markets - FDI - and growth. They find that countries with better systems and better regulation of the financial market are better able to exploit FDI more efficiently and achieve higher growth rates. Our result shows that financial development has a negative impact on the attractiveness of FDI inflows and the latter has a negative impact on economic growth.

### 5.3. The effect of FDI on human capital

Table 6: Estimation of Human Capital Determinants (HK)

Variable of Interest: Human Capital (HK)		
Variables	Ratio	Probability
FDI	2.778727	0.000
DUEXP	5.809631	0.000
DR	-3.532331	0.002
infra	0.118124	0.000

The estimate indicates that FDI contributes positively and significantly to 1% of human capital development in terms of elasticity  $(\Delta HK) / \Delta FDI = 2.77\%$ , ie if the FDI 1% increase capital accumulation increases by 2.77%.

As for the development of infrastructure, it has a positively significant impact on human capital at 1%, for this same group of countries.

For the education expenditure variable, a positive and very significant impact recorded at 1%. Indeed, if education spending increases by 1%, the development of human capital increases by 5.8% in terms of elasticity for SMCs.

The research and development variable has a negative impact at a rate of 1%, this is explained by the insufficient expenditure on research and development to improve the quality of education, or due to the corruption that affects all sectors mainly the sectors of education in the Arab world, that is why institutes in these countries are not very much in the academic ranking of the 2015 Shanghai World Universities.

#### 5.4. The effect of FDI on domestic investment

Table 7: Estimation of Determinants of Domestic Investment (DI)

Variable of interest: domestic investment (DI)		
Variable	Ratio	Probability
FDI	0.3694006	0.000
cred	0.0410188	0.000
rate	0.0245724	0.000
SAV	0.0441484	0.000

The results show that FDI has a stimulating effect on local investment and the relationship is "crowding in" unlike the work of Bouklia and Zatlá (2001), this finding confirms the work of Bosworth and Collins (1999), who A study has shown the effect of foreign capital flows on investment in 58 developing countries during the period 1978-1995. The authors distinguish three types of flows: foreign direct investment, portfolio flows, and international bank loans as a percentage of GDP; it is generally found that private capital flows have a positive impact on domestic investment, especially when it comes to direct investment. The probability that a dollar increase in these flows is associated with a dollar increase in domestic investment is equal to 50%.

The credit variable granted to the private sector also has a significant positive effect on domestic investment, indicating that the financial systems of these countries encourage and support domestic investment. The interest rate variable has a significant effect on domestic investment, confirming the positive role of borrowing. In fact, to stimulate domestic investment, the governments of these countries encourage domestic investment by reducing interest rates, which explains the positive impact of the credits granted to the private sectors on investment.

The savings variable makes a significant positive contribution to domestic investment at 1% for SMPs.

#### 5.5. The effect of FDI on trade

Table 8: Estimation of the determinants of foreign trade (TRDE)

Variable of interest: foreign trade (TRDE)		
Variable	Ratio	Probability
FDI	1.847898	0.000
RATE	-0.0019819	0.000
tax	0.4602061	0.000

The results of the trade equation are presented in indicate that FDI significantly explains the evolution of exports in the countries of the PSM region. This result suggests that a large number of

subsidiaries located in these countries adopt a vertical strategy and export their production to their country of origin or their parent companies, thus contributing to the increase in export volumes in PSM countries. . Similarly, in their efforts to attract FDI, SMC countries have introduced a number of measures (such as the creation of free zones, the abolition of certain import and export barriers, fiscal incentives, etc.) increased trade between these countries and the rest of the world. All their activities contribute to the increase in the volume of exports of the host countries. These results confirm the conclusion of Menegaldo and Moustier (2002) and Soliman (2003).

The tax variable, which indicates the barriers to trade and the costs of export transactions, has a significant positive impact on foreign trade at 1%.

The coefficient of the exchange rate variable has a significant negative effect on the foreign trade variable. Indeed this variable is very important for trade, once the country practices a depreciation of their currency it can gain in terms of competitiveness and vice versa.

**5.6. The effect of FDI on technology transfer**

Table 9: Estimation of Technology Transfer Determinants (TT)

Variable of Interest: Technology Transfer (TT)		
variable	Ratio	Probability
FDI	-0.156868	0.000
HK	0.1659274	0.000
DR	1.235728	0.000
TRDE	0.0308854	0.000

In recent years, investments have become increasingly specialized in the information and communication technology sectors (FIPA, 2012). This brings an important benefit to all economies through the transfer of new technology for countries seeking to develop following a policy of promotion and attractiveness. The results of the sixth equation show that FDI has a negative and significant impact 1%. These results reflect the lack of real uptake and the lack of ownership of the technology, unlike the developed countries, which, on the other hand, experience a substitution and diffusion effect of new technologies over existing ones, this confirms that most of these flows of FDI are taking place in the hydrocarbon sectors and in recent years.

Lack of investment in absorptive capacity can lead to a blockage in the capacity to create and innovate, and this can result in an inability to detect new external knowledge. Knowledge is considered according to Cohen and Levinthal (1990) as a critical determinant that allows the company to increase its ability to acquire and exploit new external knowledge. They consider that the construction of absorptive capacity is based on the ability of the company to identify, assimilate and exploit new knowledge acquired through external sources. Technology transfer is a complex

problem that focuses on the technological gap and the difficulty of technology transfer between developed and developing countries.

The human capital variable has a positively significant impact on technology transfer at the rate of 1%. Regarding the research and development variable, it has a positive and significant effect on technology transfer at 1%. Indeed this can be explained by the introduction of research and development in subsidiaries abroad. As well as the role of FDI induces competition is subsequently to encourage local companies to increase research and development and therefore innovation.

## **Conclusion**

SMCs have been able to some extent in the last decade to increase inflows of foreign direct investment. For these countries, one of the biggest problems is the uncertainty of the policies adopted and the lack of transparency in general. For FDI to these countries, it has long been concentrated in limited sectors, such as coal, oil and natural gas. They are thus called upon to diversify their sectors of activity. In recent years, FDI flows have affected other sectors, such as banking, construction, telecommunications and materials (cement, glass, etc.).

According to the results of the estimation of our model, there is no direct and significant impact of FDI on economic growth for these countries. But when we look at the individual results, we can see a significant and positive relationship in Algeria, Egypt, Lebanon and Israel (occupied Palestine) and a negative effect for Turkey.

The effects of FDI on growth are not easy to understand. Our results on panel data show that FDI has no significant direct effect on growth. While the structure of our model shows that FDI still plays an indirect role in growth through its positive effects on human capital formation, exports and domestic investment.

The biggest challenge for SMCs, therefore, is how to leverage the presence of multinationals in their territories and how to turn them into engines of growth and economic development.

SMCs need to make more effort to improve their attractiveness for FDI through a series of more ambitious structural policies (trade openness and regional integration, institution and infrastructure development, etc.). Such requested reforms will contribute to creating a more conducive environment for benefits, as they improve the social return on domestic and foreign investment.

Many weaknesses must be overcome by these countries in the region to improve their business climate and attract more FDI.



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