FDI attractiveness factors in the Southern and Eastern Mediterranean Countries (SEMC) A panel data analysis

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Abstract

The objective of this manuscript is to determine the attractiveness factors of FDI in the Southern and Eastern Mediterranean Countries (SEMC). To do this, a modified gravitational model is constructed. It use a dynamic GMM panel, which takes into account the variables of attraction and repulsion of FDI in these countries over the period 1980-2020.

Keywords: FDI, Attractiveness, SEMC, Panel Data.

Introduction

Since the mid-1980s, FDI has experienced significant growth but unevenly distributed between countries. Indeed, FDI appears to be the domain of developed countries. Over the period 2000-2020, these countries were at the origin of 90% of outward FDI flows and they received 70% of flows incoming.

Before the 1980s, SEMCs attracted little FDI. However, since the beginning of the 1990s, the International Monetary Fund (IMF) has recommended supporting Structural Adjustment Plans (SAP) with policies to open up both the trade and capital accounts.

Therefore, these countries have put in place a set of stabilizing economic policies and incentive measures in order to improve their attractiveness for FDI.

So strict application of the SAP (Aoudia. O 2006) has made it possible to achieve macro-economic stability. The business climate has also improved significantly in the region, especially by implementing significant tax advantages for foreign investors.

In addition, all the countries have established free zones and reduce remarkably administrative formalities. Thus, the mass of reforms undertaken in the SEMCs from the beginning of the 1990s were able to improve their attractiveness for FDI.

In this work, the objective is to see if the determinants of inward FDI in the SEMEC are the same as those of other developing countries. A review of the literature is presented in the first part. It highlights the factors behind FDI inflows into developing countries.

The second part offers an econometric study of the determinants of FDI in the SEMCs. A modified gravitational model is constructed. It is analyzed in a dynamic GMM panel, which takes into account the variables of attraction and repulsion of FDI in the SEMCs over the period 1980-2020. Our sample is made up of five countries: Egypt, Jordan, Morocco, Tunisia

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and Turkey. The choice of the sample is explained by the commitment of these countries since the end of the 1970s to a policy of increased openness. In addition, these countries alone received 70% of the FDI received by the SEMCs over the period of analysis.

Literature Review

The attractiveness of foreign direct investment (FDI) has been the subject of several empirical researches. Indeed, many authors have been interested in the factors that explain the influx of these investments into host countries. The effect of an FDI attractiveness factor varies from one country to another.

Moutia (2019) uses multiple linear regression on panel data consisting of 88 developing countries from Africa and Asia studied over the period 2000-2014. The results show that the quality of host country institutions is an important determining factor. However, this factor becomes more repulsive to FDI if there is an increase in taxes on profits or volatility in the exchange rate.

Athiam and Biwole (2023) use an econometric analysis of attractiveness policies using the fixed effect model from 2009 to 2019 for UEMO member states. The results indicate that political stability, government effectiveness, rule of law, freedom of expression, and trade openness have a positive and significant effect on FDI while, the quality of institutions and fight against corruption have an insignificant effect.

In an analysis concerning Morocco, Belhaj (2019), concluded that it is the policies adopted by the Moroccan government which have overall positive effects on the attractiveness of this country for FDI. Makossa and Akiana (2023), for their part, show that risk and political instability remain the primary determinants of low FDI in the MENA region. In a study on the role of governance indicators as a determinant of FDI in African countries, between 1985 and 2015, on a sample of 44 African countries, Ed-dib and Aichi (2021) show that the size of the market, the fight against corruption, the execution of regulations, political stability, infrastructure act negatively on FDI flows to African countries.

Cedric (2019) uses a panel data model on the determinants of the attractiveness of Foreign Direct Investment (FDI) in CEMAC over the period from 1987 to 2017. It shows that inward FDI in CEMAC is an increasing function financial development index, urbanization rate, natural resources, public debt rate, population growth rate, economic growth rate, public investment rate and degree of commercial openness.

In a study relating to the Democratic Republic of Congo, Dunia used the ordinary least squares method over the period 1990-2020. He considered variables of economic performance such as GDP, variables of macroeconomic instability such as inflation and unemployment, as well as variables of the quality of institutions such as: the corruption perception index and the index of political dependence. It showed that GDP, inflation and unemployment have no impact on the attractiveness of FDI. Only variables linked to the quality of institutions have a significant and positive effect.

In a relative production costs approach, Buch and Lipponer (2018), Sekkat and Vegansones-Varoudakis (2015) as well as Lafay (2014) showed that the level of exchange rate from the point of view of its effect on relative costs of production factors has a negative effect on the attractiveness of a country to FDI.

Considering the empirical review of the literature, we note that most of the works

agree on the fact that the determinants of FDI depend on the host country or economic zone. These studies show also that certain factors are very often significant (market size, institutions, natural resources, etc.), while others are less significant (distance, monetary variables, etc.).

In this work, we apply a GMM dynamic panel model to the gravitational model which, in our opinion, is sufficiently robust to take into account the econometric inadequacies raised.

Empirical Analysis of FDI Attractiveness Factors in SEMCs

Our model is enriched by certain financial, economic and institutional variables, such as the inflation rate (INF), the exchange rate (EXC), the opening rate (OPEN), the interest rate (TINT) and country risk. The model used is as below:

$$\ln(FDI_{ijt}) = \beta_0 + \beta_1 \ln(FDI_{ijt(-1)}) + \beta_2 \ln(N_{it}) + \beta_3 \ln(N_{jt}) + \beta_4 \ln(DIS)$$
$$+ \beta_5 \ln(INFLA) + \beta_6 \ln(EXC) + \beta_7 \ln(OPEN_{(-1)}) + \beta_8 \ln(CR) + \beta_9 \ln(TINT)$$
$$+ \beta_{10} DUM + \beta_{11} \ln(INFRA) + \beta_{12} \ln(Y_i) + \beta_{13} \ln(Y_j) + \gamma_i + \theta_j + \mu_{ijt}$$

Where γ_i represents the origin country effect, Θj represents the host country effect of FDI and μ_{it} represents the error term,

$i = 1,…,N; j = 1,….,T-1; T = 1,…., J = N+1$ with the additional country represented by the

group of SEMC investing countries, i represents the country of origin of FDI, j the host countries and t time. Equation (1) represents the model to be estimated in a dynamic panel GMM.

Variables

We retain three types of variables: dependent variables, explanatory variables and instrumental variables. The instrumental variables will be chosen during the econometric tests and will be the values lagged by one year for the explanatory variables, and by two years for the lagged dependent variable. It is generally accepted in the literature that lagged values are good instruments for explanatory variables.

Dependent Variables

The variable explained is Ln (IDEijt). Generally, variables are expressed in logarithm. One of the advantages of estimating the relationship in logarithm is that we can interpret the parameters as elasticities. The amounts are expressed in current dollars or millions of dollars for each year t.

Explanatory Variables

Distance: Ln (Dij)

The distance generally used for the estimation is the distance as the crow flies. Most SEMC countries have trade relations with European countries, which is why we took the center of Europe as the access distance to Investing Countries (IP). It is therefore a distance going from a center taken as a proxy for the capital of the group (Brussels) to the different capitals of the SEMCs. We expect a negative sign between FDI and distance.

The infrastructure: Ln (INFRA)

This variable represents the quality of the infrastructure of each country invested in SEMCs at date t. It can play an important attractiveness factor. In the absence of sufficient data, we take the number of internet users per 100 people as a proxy for this variable. We expect a positive relationship between this variable and the entry of FDI.

Gross domestic product: Ln ((Yi and Yj))

The gross domestic product gives a measure of the extent of the market: the more this variable

is higher, the more the market size is able to attract FDI. In the literature, this variable turned out to be very relevant.

The population: Ln ((Ni and Nj))

As with income, population provides a measure of market size. The literature review shows that a country with a high population attracts more FDI than a country with a low population.

Opening: Ln (OPEN)

The openness of an economy is measured by an openness rate presented by the ratio of exchanges compared to GDP (X+ M/GDPX100). In addition to the importance of exchanges in

an economy, this ratio measures trade restrictions more indirectly. The review literature has shown that this openness ratio could be an attractive element for FDI, in particular, for countries with an export-oriented strategy. We therefore expect a positive sign between trade opening and the entry of FDI for the SEMCs.

The inflation rate: Ln (INF)

The inflation rate is used to capture the economic stability of a country. Empirical literature has shown that a high inflation rate will have a negative effect on the attractiveness of FDI.

The interest rate: Ln (TINT)

The interest rate measures the borrowing capacity of local resources by foreign investors. The lower it is, the more favorable it is to FDI inflows.

The exchange rate: Ln (EXC)

According to the literature review, the exchange rate influences FDI through the strategies adopted by multinationals (Sousa and Lochard (2009)). Indeed, in order to repatriate more profits, a high exchange rate practiced in the host country can encourage investors to invest in this country, if production is oriented towards the domestic market (horizontal FDI). Conversely, if production is oriented outward (vertical FDI), a high exchange rate reflecting high production factor costs may dissuade the investor from investing in that country.

Country risk: Ln (CR)

The assessment of the International Country Risk Guide (ICRG) is based on 22 variables classified into three risk subcategories: political risk, financial risk and economic risk. The expected sign of the relationship between this variable and FDI is negative.

The signing of the free trade agreement: DUM

This variable is used to evaluate the effect of the signing of the free trade agreement with the European Union. It is a dummy variable which takes 1 after the signing of the free trade

agreement in 1996 and 0 before then.

Statistical Data

Our statistical data is collected from the Central Banks of the SEMCs and especially on the website of the United Nations Statistics Division.

Data on country risk were collected from the website of the NGO specializing in the field (ICRG).

Statistical Estimation Method

Our gravity model was initially estimated in an ordinary least squares panel, then in a fixed effect panel. Unfortunately, these estimates raise some problems:

1-There is a strong correlation between the exogenous variables and the error term. This correlation introduces a bias into the OLS estimator.

2-We cannot use a fixed effect model because of the existence of constant variables over time, namely the distance and the Dummy variable.

So to solve this model, we use a dynamic panel using the generalized method of moments GMM (White version). This version addresses both autocorrelation and heteroskedasticity issues.

To test the overall significance of the model, we used three different methods. In a first model M1, the variables infrastructure and market size are introduced simultaneously. In a second model M2, the infrastructure variable is not considered and in a third model M3, the variables relating to market size are not considered.

Before making the estimation, we checked the stationarity of the series. We also carried out the nullity test of the coefficients which was rejected each time showing that all the variables used are useful.

Results

The results of the generalized method of moments (GMM) estimations carried out by eviews 5.1 are presented in the following table:

Table 1: Results of estimation by the GMM method

Dependent variable: ln (FDIij)

	M1	M2	M3
c	-	17.8014 (0.7131)	-
Ln (OPEN)	13.0024 (1.8321)**	0.2113 (0.8111)	16.4231 (1.9001)**
Ln (INFRA)	1.0002 (1.5601)*	-	1.93357 (3.1573)**
Ln (FDI(-1))	2.1441 (5.6177)***	2.0024 (11.8173)***	2.8117 (4.8815)***
Ln (yi)	1.2251 (1.7011)**	0.9421 (1.4332)*	

Ln (yj)	0.12241 (0.8177)	0.22269 (0.1115)	
Ln (Ni)	1.6681 (1.8411)**	2.4301 (1.6614)**	
Ln (Nj)	1.0001 (0.9114)	0.5541 (0.1321)	
Ln (CR)	-1.002 (-4.6711)**	-0.5512 (-0.9114)	-1.6641 (-4.9001)**
Ln (TINT)	0.0431 (0.1121)	0,3101 (0.0114)	-0.3221 (-0.0431)
Ln (EXC)	3.1442 (5.0021)**	2.0003 (4.8612)**	1.0002 (0.8861)
Ln (INFLA)	0.1704 (0.0913)	-0.1631 (0,1611)	0.4215 (0.1411)
R2	43%	62%	74%
R2 ajusted	46%	61%	78%
J statistique	49	64	102

The values in parentheses designate the Student tests estimated at (***) significant coefficient at the 1% threshold, (**) significant coefficient at the 5% threshold and (*) at the 10% threshold.

Our estimate gives for model M1 a coefficient of determination of 43% and a Sergan J statistic of 49. Model M2 has a coefficient of determination of 62% and a Sergan J statistic of 64. Model M3 has a coefficient of determination of 74% and a Sergan J statistic of 102.

The estimation results showed that economic openness is significant only for models M1 and M3. It is not for M2 in the absence of the infrastructure. Which shows that without good infrastructure, openness seems insufficient for the attractiveness of FDI.

The infrastructure variable is significant, showing the existence of significant infrastructure in these countries which have made a lot of efforts in this area for more than three decades.

The market size variables are not significant for the SEMCs whereas they are for the countries of origin. This result reflects the restrictiveness of SEMC markets which represent a handicap compared to the attractiveness of FDI. The country risk variable is significant in all three models with an expected negative sign.

For the monetary variables, we note that inflation and the interest rate are insignificant for the 3 models. This result can be explained by the dominance of vertical FDI which has no relationship with the national currency. The exchange rate is however significant for all three models with an expected negative sign.

This result can be explained by that detected by De Sousa and Lochard (2009) when they showed that relative prices have a dissuasive role in the entry of FDI, particularly vertical one. Indeed, when production is oriented towards the outside (vertical FDI), as is the case in the majority of SEMCs, a low exchange rate can encourage multinationals to invest in these countries while the practice of high rate can dissuade the investor. We notice, however, that lagged FDI is highly significant at the 1% level for all three models. This result reflects the importance of the knock-on effect exerted by already existing FDI on future FDI.

We subsequently estimated M1, M2 and M3 using fixed effects models. However, since we have fixed variables over time (the distance and the dummy variable), we created a second equation called the Individual Effect (IE).

$$IE = \beta_0 + \beta_1 DUM + \beta_2 DIS_{ij} + \varepsilon_{ij}$$

The estimation results of the individual effect by ordinary least squares (OLS) show a coefficient of determination of 68% and an adjusted coefficient of determination of 65% (see table 2).

Table 2: Estimation Of the Individual Effect Model

Dependent variable : FDI_{ijt}				
Number of variables : 85				
Variables	Coefficients	Standard deviation	Student test	Prob.
DIS	-1.0011	0.0054	-27.6841**	0,0001
DUM	0.3511	0.0021	18.1336**	0.0000
R^2	0.6801	Mean dpendant variable		-0.4351
Corrected R^2	0.6509	S.D dependant variable		0.0511
S.E of regrssion	0.0211	Akaike info criterion		-5.2141
Sum squared resid	0.0413	Schawrtz criterion		-5.1102
Log likelihood	288.0031	Durbin-Watson stat		2.8291

The values in parentheses designate the Student tests estimated at (**) a significant coefficient at the 5% threshold.

The two variables relating to distance and the signing of the free trade agreement with the European Union are significant at the 5% level. Like the majority of studies using the gravitational model, the distance has a negative sign reflecting the negative effect of transaction costs on the attractiveness of FDI to SEMCs. The dummy variable related to the signing of the free trade agreement has a positive effect. This reflects the importance of the vertical investment received by these countries. It consists of dividing production into several tasks and then re-exporting these components to parent companies, taking advantage of the absence of customs duties.

Conclusion

Overall, we can say that the commercial opening of the SEMCs, which continues to intensify, especially with the signing of the free trade agreement, has a significant positive effect on the attractiveness of these countries to FDI. However, the significance of this variable appears to be linked to the existence of a relatively developed infrastructure. The variables relating to the market size of this group of countries are insignificant, explaining the low attractiveness of these countries to horizontal FDI targeting the local market. Indeed, these countries have so far limited themselves to the attractiveness of vertical, export-oriented FDI by taking advantage of the openness of these countries, particularly towards the European countries. In this context, we noticed that the exchange rate is negative. Country risk is also significant and has, as

expected, a negative effect on the attractiveness of SEMCs for FDI. However, interest and inflation rates are not significant.

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