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Portuguese Foreign Direct Investments Inflows: An Empirical Investigation

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Portuguese Foreign Direct Investments Inflows: An empirical investigation

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Abstract This paper examines the link between Portugal's foreign direct investment (FDI) inflows from European Union (EU-15) countries using panel data and country specific variables for the period 1996-2006. This study applies a static and dynamic panel data approach (Fixed effects and GMM system estimators) to estimate the regression equations. Portugal's FDI inflows from EU are found to have significant associations with size market, macroeconomic stability, and geographical distance. The inflation seems to have a positive effect on attracting FDI inflows. This result was not expected.

Key words : FDI, Fixed Effects, GMM-SYS, Portugal.
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I. Introduction

Foreign direct investment (FDI) as in international trade is one channels for the globalisation of world economy (Rugman and Verbeke 2008). The multinational enterprises look for host countries/ news marketers because these enterprises intend to acquire localization advantages, and to involve there specific advantages. The reasons are explained by OLI paradigm (ownership-location –internalization) of Dunning (1992, 2003), and Dunning and Lundan (2008), and Dunning and Fortanier (2007).

Foreign direct investment has had an important role in Portuguese economy. The Portuguese inflows represented, in average, 2.5 % of GDP for the period 1996-2006.

The empirical studies consider that the factors of FDI localization are positively influenced by politics, legal and macroeconomics stability, namely low inflation.

This study analyses   the determinants of FDI localization in Portugal for the period 1996-2006. As the major determinants of FDI localization   in Portugal we consider: per capita income, market size, openness trade, labour cost, geographical distance and inflation.

This paper estimates a static and dynamic panel data models. We decided to introduce a dynamic panel because FDI has a dynamic nature. The estimator used (GMM-SYS) permits to solve the problems of serial correlation, heteroskedasticity and endogeneity of some explanatory variables. These econometric problems were resolved by Arellano and Bond (1991), Arellano and Bover (1995), and Bond (19988, 2000) that developed the first-differenced GMM estimator (GMM-DIF) and GMM system estimator (GMM-SYS).

The structure of the paper is a follows. The next section presents the Portuguese trend in FDI inflows. In section 3 we reflect about the literature review. Section 4 we formalized the econometrical model. Section 5 shows the estimation results. Section 6 we present the conclusions.

II. The Foreign Direct Investment in Portugal

The Portuguese democracy process began in April 1974 and in 1986 Portugal became a member of European Economic Community (1986). The Foreign

Direct Investment inflows (FDI) in Portugal improved only after Portugal adhesion to EEC. The Portuguese economy has been a net recipient of FDI.

According to table 1, the major Portuguese investors in terms of credit in Portugal are the United Kingdom (16.14%), Germany (13.26%), France (12.51%), the Netherlands (13.73%), and Spain (11.76%). The great investors in Portugal are European Union countries and more 70% of Portuguese inflows are due to European Union.

Table 1. Countries Investors in Portugal, 1996-2005 (Millions of Euros)

	Credit	**%**	**Debit**	**%**	**Balance**	**%**
European Union	**167 059 027**	85.12	**142 732 665**	88.33	**24 326 362**	70.14
Euro Zone	132 269 668	67.39	110 505 940	68.39	21 763 728	62.75
Germany	26 024 222	13.26	25 616 356	15.85	407 866	1.18
France	24 549 337	12.51	23 313 110	14.43	1 236 227	3.56
Netherlands	26 945 288	13.73	22 502 969	13.93	4 442 319	12.81
Spain	23 074 558	11.76	11 091 759	6.86	11 982 799	34.55
Others EU	34 789 359	17.73	32 226 725	19.94	2 562 634	7.39
United Kingdom	31 676 263	16.14	27 981 746	17.32	3 694 517	10.65
Rest of World	**29 206 570**	14.88	**18 850 187**	11.67	**10 356 383**	29.86
USA	6 584 635	3.35	5 811 100	3.60	773 535	2.23
Brazil	1 646 231	0.84	1 832 631	1.13	-186400	-0.54
Others	20 975 704	10.69	11 206 456	6.94	9 769 248	28.17
Total	**196 265 597**	100.00	**161 582 852**	100.00	**34 682 745**	100.00

Source: Bank of Portugal (2006)

III. Literature Review

The literature on FDI began in 1960s and 1970s with Hymer (1960), Kindleberger (1969), and Caves (1971). Hymer (1960) explained that activities of multinational enterprises do not involve capital mobility. Caves (1971) considered that relative production costs, technology, trade and barriers are the determinants of foreign direct investments (FDI).

Dunning (1981) with the eclectic theory of FDI, suggested that internalization could explain the movements of MNEs. The author introduced the eclectic paradigm in 1992. The OLI paradigm explains why the investors invest in host country. Ownership characteristics and advantages.

Ownership advantages could explain a free access to technology, new products. Firms have ownership characteristics (inputs) as in patents, brand, human

resources, and financial assets.

Localization advantages are explained by the motivation of FDI. In this topic, we need to think about efficiency, that J. Dunning calls movement of production where there are lower inputs costs (outsourcing of production). The author also analyses the foreign market proximity (strategic asset-seeking). In this case Dunning explains the relationships between foreign market proximity and exports, or foreign market proximity and new production (i.e, if it is better to move production).

Recently the researchers of international foreign investment as in, Jeon and Rhee (2008), Maniam (2007), Skabic, and Orlic (2007), and Rodríguez and Pallas (2008) explained the determinants of FDI by market size, labour costs, labour skills, openness risk,

macroeconomic and political stability and other factors. Other variables such as Knowledge capital (Markusen 1998), human capital (Sun et al.2002), similar language and cultural levels (Dunning 1981).

It is important to recognize that the relative importance of FDI determinants depend on the motive, the type of investment (vertical FDI export-oriented or horizontal FDI market access-oriented) and the investor's strategy. Vertical FDI is explained by lower production coats (cheap labour, tax incentives, and physical infrastructures). For horizontal FDI the size of host country and its growth is the most important (Helpman 2006).

Jeon and Rhee (2008) analysed the determinants of Korea's FDI from US between the period 1980- 2001. The authors concluded that Korea's FDI inflows from the United States have a significant association with real exchanges rates, relative wages coasts, and interest rate differentials using a pooled OLS estimation.

Maniam (2007) used an OLS estimator to analyse the determinants of FDI in Latin America for the period 1975-2003. The author concluded that FDI has increased rapidly in Latin America. According to Maniam (2007:13) there are relationships between the economics variables and investors expectations, latter on the host countries need to develope better their strategies.

Skabic and Orlic (2007) applied the fixed effects estimator from the period 1993 to 2005 for Central and Eastern European countries and Western Balkan counties. The work of Skabic and Orlic (2007: 348) demonstrates that Western Balkan countries should make additional efforts in order to cut corruption in their economies in order to become attractive to FDI.

Rodríguez and Pallas (2008) utilized a panel data to examine the determinants of FDI in Spain during the period 1993-2002. Ridríguez and Pallas (2008) consider that human capital and the export potential of the sector are the most important

determinants.

The recent literature as in Naudé and Krugell (2007), and Alguacil, Cuadros, and Orts (2008) consider that foreign direct investment is a dynamic phenomenon.

Nudé and Krugell (2007) specify a dynamic panel data (GMM-DIF) proposed by Arellano and Bond (1991). The study of Nudé and Krugell (2007) demonstrates that African policy makers have been intensifying their attempts to attract FDI, researching into the determinants of FDI in Africa.

Alguacil et al. (2008) analyses the correlation between European Union enlargement and FDI using a dynamic panel data.

Quazi (2008) investigates the determinants of FDI with a panel data regression model for the period 1995-2000 in East Asia. The study of Quazi (2008: 341) suggests that better domestic investment climate, larger domestic market size, and higher return on investment. So we can conclude that political instability causes the contrary.

IV. Econometrical Model

The dependent variable used is Portuguese FDI inflows. The explanatory variables are country- specific characteristics. The data for explanatory are sourced from Work Bank (2006), World Development Indicators. The source used for dependent variable, FDI inflows, is the Bank of Portugal.

IV.1. Explanatory variables and testing of hypothesis

Hypothesis 1: The FDI attracting will be influence by market size

 According to the literature (Kravis and Lipsey, 1982, Naudé and Krugell, 2007, and Maniam, 2008) we expected a positive sign.

In this paper we used the following proxies to market size:

- GDP_i is the absolute value of Portuguese   GDP per capita (PP, in current international dollars).

- GDP_k is the absolute value GDP per capita of European partner k (PP, in current international dollars).

- DIM is the average of GDP per capita, between Portugal and country k (PP, in current international dollars).

Hypothesis 2 :   FDI and the openness of economy has a positive correlation

TRADE, it is a proxy for trade openness, defined as the exports/GDP ratio. Sun et al. (2001), Skabic , and Orlic (2007)   found a positive sign.

Hypothesis 3: Macroeconomic stability influence the decision of foreign investors

The inflation rate is used to measure the level of economic stability. High level of inflation rate means low level of economic stability. It is expected a negative sign (Sun et al., 2002, Naudé, and Krugell, 2007).

Hypothesis 4: Countries with lower wages would attract more FDI

 Lipsey (1999), Wang and Swain (1995), Zhao, and Zhu (2000), and Skabic, and Orlic (2007) found a negative correlation between labour costs and FDI. Recently Contractor and Madambi (2008) demonstrate that human capital investment has an impact in international transactions.

Hypothesis 5: If the trade partners are close the FDI increase

The geographic distance between Portugal and each European partner in Km (DIST) is the variable used. According to the classic literature of international trade, which uses the gravity model, it is expected a negative correlation between distance and FDI.

IV.2. Model Specification

$$FDI_{it} = \beta_0 + \beta_1 X_{it} + \delta t + \eta_i + \varepsilon_{it} \tag{1}$$

Where FDI_{it} is the Portuguese foreign direct investment flows, X is a set of explanatory variables. All variables are in the logarithm form; η_{it} is the unobserved time-invariant specific effects; δt captures a common deterministic trend; ε_{it} is a

random disturbance assumed to be normal, and identical distributed (IID) with E (ε_{it})=0; Var $(\varepsilon_{it})=\sigma^2 \succ 0$.

The model can be rewritten in the following dynamic representation:

$$FDI_{it} = \rho FDI_{it-1} + \beta_1 X_{it} - \rho\beta_1 X_{it-1} + \delta t + \eta_i + \varepsilon_{it} \qquad (2)$$

V. Estimation Results

V.1. Analysis of the static panel data estimates

Table 2 presents the estimation results using fixed effects estimator. The general performance of the model is satisfactory. Almost all the variables are statistically significant and the explanatory power of the FDI regression is very high (Adjusted R^2= 0.745).

Table 2: Determinants of FDI in Portugal: Fixed effects estimator

Variables	Coefficient	Expected Sign
LogGDP	17.366 (2.465)**	(+)
LogGDP$_k$	9.022 (2.720)***	(+)
LogDIM	-24.683 (-2.481)**	(+)
LogTRADE	19.573 (1.2918)	(+)
LogW$_i$	-1.397 (-1.839)*	(-)
LogINF	1.880 (2.859)***	(-)
LogDIST	-1.565 (-5.515)***	(-)
C		
Adj. R^2	0.745	
Observations	142	

T-statistics (heteroskedasticity corrected) are in round brackets.
***/**/*- statistically significant, respectively at the 1%, 5%, 10% levels.

The hypothesis for market size (GDP, GDP$_k$) in logs presents a positive sign and is significant at 5%, and 1% level. Naudé and Krugell (2007), and Maniam, (2008) found a positive sign. The variable LogDIM (average of per capita GDP between Portugal and the partner considered) is statistical significant, but with the wrong sign.

7

The hypothesis four is confirmed: the lower wages in Portugal are an important factor to attracting FDI. As   in Lipsey (1999), Wang and Swain (1995), Zhao, and Zhu (2000), and Skabic, and Orlic (2007) we found a negative sign.

For the variable LogINF (inflation), that proxy the economic stability, it was expected a negative sign (Sun et al., 2002, Naudé, and Krugell, 2007). Our result is different: the coefficient is positive and significant at 1% level. May be the higher inflation rate allows, in Portugal, a specific type of FDI. It would be interesting to investigate this situation using a larger period of time.

The coefficient of LogDIST (Distance) is negative as expected. This result confirms the gravitational model and the importance of the neighbourhood.

V.2. Analysis of the dynamic panel data estimates

As table 3 shows, the equation presents consistent estimates, with no serial correlation (m1, m2 statistics). The specification Sargan tests   show that there are no problems with the validity of instruments   used for both equations. The instruments in levels used are: LogFDI $_{it}$ (2,7), Log DIM (2,7), LogW$_i$ (2,7), and Log TRADE (2,7) for first differences. For levels equations, the instruments used are first differences of all variables lagged t-1.

The model presents seven significant variables (LogFDI $_{t-1}$, LogGDP, LogGDP$_k$, LogDIM, LogTRADE, LogW$_i$, and LogDIST).

In relation to market size, the variables used (LogGDP, and LogGDP$_k$) are statistically significant. For these proxies a positive sign was expected and the results confirm this. Kravis and Lipsey, 1982, Naudé and Krugell, 2007, and Maniam, 2008 also found a positive sign.

For the openness trade (TRADE), the expected sign is positive, which is confirmed by the equation. Skabic , and Orlic (2007)   found a positive sign.

The real wage (W$_i$), the expected sign is negative and the estimate confirms this. The result is according to hypothesis formulated. Countries with lower wages would attract more FDI.
In relation to geographical distance (DIST), the theory predicts a negative sign. The results confirm the hypothesis formulated.

Table 3 : Determinants of FDI in Portugal : GMM-System Estimator

Variables	Coefficient	Expected signs
$LogFDI_{it-1}$	0.462 (2.09)**	(+)
LogGDP	20.418 (2.36)**	(+)
$LogGDP_k$	7.810 (1.77)*	(+)
LogDIM	-27.388 (-2.03)**	(+)
LogTRADE	41.437 (2.32)**	(+)
$LogW_i$	-1.792 (-2.15)**	(-)
LogINF	1.114 (1.21)	(-)
LogDIST	-0.997 (-1.74)*	(-)
C	-2.335 (-0.269)	
M_1	1.367 [0.172]	
M_2	-1.204 [0.229]	
Wjs	59.67 [0.000]	
	Df=8	
Sargan	3.757 [1.000]	
	Df=210	
Observations	130	
Individuals	14	

The null hypothesis that each coefficient is equal to zero is tested using one-step robust standard error. T-statistics (heteroskedasticity corrected) are in round brackets.

**/* - statistically significant, respectively at the 5% and 10% level.

P-values are in square brackets. Year dummies are included in all specifications (this is equivalent to transforming the variables into deviations from time means, i...e the mean across the fourteen countries for each period).

M1 and M2 are tests for first-order and second–order serial correlation in the first-differenced residuals, asymptotically distributed as N (0, 1) under the null hypothesis of no serial correlation (based on the efficient two-step GMM estimator). W $_{JS}$ is the Wald statistic of joint significance of independent variables (for first-steps, excluding time dummies and the constant term). Sargan is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of instruments' validity (with two-step estimator).

VI. Conclusions

In Portugal there have not been studies about the determinants for FDI inflows that utilize the static and dynamic panel data analysis. In contrast there is a vast empirical literature to the countries of Central and Eastern Europe with static analysis.

This article examined the link between Portuguese FDI inflows from European countries and their principal determinants. The FDI inflows from European Union are over 70% for the period 1996-205. The findings indicate that Spain, Netherlands, and the United Kingdom are the major investors. The main results can be summarized as follows.

FDI has a dynamic nature. In order to understand this we decided to apply an econometric dynamic panel data and we compared the results with a static panel. The results of the dynamic panel are confirmed in general by the results of static analysis. The lagged FDI variable presents an expected positive sign. Other explanatory variables as labour costs and market size (Portuguese GDP, and European trade partner GDP), openness trade and geographical distance are also statically significant. Only the inflation presents a contradictory sing. Further investigation is necessary   to understand why higher inflation in Portugal does not decrease FDI inflows. If we will use a panel data with more years and consider other explanatory variables perhaps we will have different results.

Such further research might also include industry characteristics into the analysis in order to investigate the impact of industry-specific factors.

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