

**THE INVESTMENT  
DEVELOPMENT PATH  
HYPOTHESIS: A PANEL DATA  
APPROACH TO THE  
PORTUGUESE  
CASE**

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# **THE INVESTMENT DEVELOPMENT PATH HYPOTHESIS: A PANEL DATA**

## **APPROACH TO THE PORTUGUESE CASE**

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### **Abstract**

Looking at the transformations that took place in the world economy after Second World War, as a result of liberalization, deregulation and market opening process, one of the most striking features was the significant expansion of Foreign Direct Investment. So, the main purpose of this paper is to discuss the positioning of Portugal – a small open economy in the extreme west of Europe - in this context.

Our analysis is based on the Investment Development Path (IDP) theory, according to which the inward and outward investment position of a country is tied with its economic development.

In the present research, this hypothesis is estimated empirically for Portugal and other 24 countries in different stages of development, between 1990 and 2006, using fixed-effects panel data models. Generally, our results find support for IDP paradigm, although it is impossible to capture all the stages predicted theoretically, given the lack of heterogeneity between the most countries of our sample and the relatively short time period considered.

Keywords: Multinational Enterprises, Foreign Direct Investment, Investment Development Path, Portugal, Spain

JEL classification: F21, C23

## **1. INTRODUCTION**

The main purpose of this paper is to analyse the Net Outward Investment (NOI) position of Portugal, in the period 1990-2005 at an aggregate level.

In this study, we have as methodological reference the Investment Development Path hypothesis, introduced by Dunning (1981) and further developed, among other authors, by Dunning and Narula (1996). The basic argument of this particular theoretical approach is that, with an increasing economic development, a country's NOI faces different stages, from an initial one – where the country is a net inward receiver of Foreign Direct Investment – to a matured one - where the country becomes a net outward investor. This evolution is supposed to be the result of firm-specific assets accumulation that allows them to engage in outward direct investment.

The paper is structured as follows: section 2 presents the theoretical background of this study, which includes a detailed description of the main features of its five stages of development and the limitations of the idealized pattern that originate a new approach to the model. Section 3 briefly reviews the most important empirical works carried out to test the validity of the Investment Development Path paradigm. Section 4 presents data and the fixed effects panel data models we used to test the relationship among the 26 countries' NOI and its level of development, paying special attention to the Portuguese economy. At the end the paper presents the conclusions and limitations of the study.

## **2. THE THEORETICAL MODEL – INVESTMENT DEVELOPMENT PATH**

### **2.1 Original model**

One of the latest developments in the analysis of Foreign Direct Investment (FDI) is the Investment Development Path (IDP) theory, that was originally introduced by Dunning in 1981 and thereafter refined by this author and others (Dunning 1986, 1988, 1993, 1997; Dunning and Narula 1996; Narula 1996; Durán and Úbeda 2001, 2005), maintaining its basic philosophy.

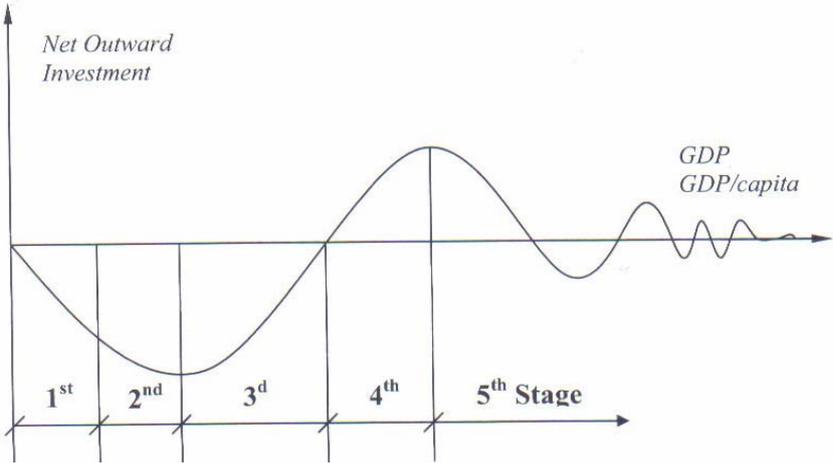
According to this theoretical approach, the FDI develops through a path that expresses a dynamic and intertemporal relationship between an economy's level of development, proxied

by the Gross Domestic Product (GDP) or GDP *per capita*, and the country's net outward investment (NOI) position, defined as the difference between outward direct investment stock and inward direct investment stock.

From IDP derives a main hypothesis: as a country develops, a structural change occur in the conditions faced by domestic and foreign companies, affecting FDI inflows and outflows which, in turn, changes the country's economic structure.

As shown by the Graph 1 below, we can consider five development phases. Along these stages the advantages of a country's firms - compared to those of other economies- change, making a country evolve from a position of inward to outward direct investor.

Graph 1: The pattern of the Investment Development Path



Source: Dunning and Narula (1996)

The 1<sup>st</sup> stage of the IDP refers to the least developed countries, that face a negative NOI position, because they are net FDI receivers, mostly to take advantage of the country's natural resources. On the other hand outward FDI is negligible or non-existent.

Countries that are at this stage of development normally have limited domestic market (low *per capita* income), workforce poor level of education, inappropriate infrastructure, and even political and/or economic instability. As a result, both inward and outward investments are extremely limited, and the multinational enterprises (MNEs) prefer to access these countries through trade as well as to enter into non-equity relationships with local firms.

At this stage of pre-industrialisation, a country owns few created assets<sup>1</sup> and only high natural-asset countries can attract a significant amount of FDI (*natural-resource-seeking FDI*).

The Government's role in this stage consists mainly in providing basic infrastructure and the upgrading of the economy's human capital, through educational and training programs, as well as implementing import-substitution and export-promotion policies, which affect the structure of local markets and industries.

The 2<sup>nd</sup> Stage is a natural development of the first one. The NOI position decreases because of an increased inflow of FDI, even faster than the GDP growth, while outward investment remains low or negligible.

Indeed, as a country develops, the improvement of its locational advantages leads to a growth of inward FDI, specially in primary commodities and natural resources, as well as in industries that are intensive in physical capital and low-qualified work, i.e. sectors whose endowment of created assets are scarce.

This opening up of the home market to foreign investors allows the construction of more and better infrastructures, which are technologically beneficial for training and qualification of local work, and the emergence of a national industry more intensive in resources. There is also an increased integration of domestic firms in MNE's production chain, as well as a learning-by-doing and know-how transmission process to local firms. This allows these firms to create or upgrade their ownership advantages, which induces the emergence of outward FDI directed to adjacent countries in order to find new markets (*market-seeking FDI*) and, to a lesser extent, *strategic asset-seeking FDI* in high-income countries may appear.

However government policies may influence this trend, through incentives or tariffs, being the competitiveness of the local firms at this stage is still very low and the outward FDI remain extremely low but larger than in the previous stage.

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<sup>1</sup> They differ from natural assets, because while these refer to physical assets of a country, such as natural resources, climate or geographical situation, the created assets imply a previous use of resources for an improvement of the development degree of a country. They are intangible, gathering technological or human capital resources.

The third stage of this Investment Development Path includes the so-called emerging countries. They exhibit a growing NOI position, due to an increased rate of growth of outward FDI and a gradual slowdown in inward FDI.

This intermediate stage shows an increase in the economy's income *per capita*, an acceleration of industrialization and a bigger specialization of demand oriented towards superior quality products. Competition in the domestic market rises as the ownership advantages of the inward investors diffuse through the local industry. As a result the domestic firms start developing their own advantages.

At the same time, the erosion of comparative advantages in labour-intensive activities and the possibility of producing scale economies (in result of the larger internal market and upgraded domestic innovatory capacity) lead to a shift of inward FDI towards horizontal FDI (i.e. associated with market access and/or efficiency considerations).

There is also an increase in the country's created assets, as a result of increasing expenses on education/training of workers and research and development (R&D), associated to a transference of knowledge by MNEs, that allows a knowledge accumulation in domestic firms, producing an increase of their competitiveness.

Although the ownership advantages of local firms are increasingly associated to the property of intangible assets, so less depending on government policies, the role of the government is still relevant and oriented towards a reduction of market failures and inefficient industries, as well as towards promoting an increasing integration of local and foreign companies, which minimize the delocalization risks.

The main objectives of the incentives given (for example, fiscal incentives) are to attract FDI in activities in which local companies do not have competitive advantages, as well as to stimulate domestic firms to exploit their own advantages in new markets.

These countries are still net receivers of direct investment, but their direct investment abroad is quite significant too, specially in countries at lower stages in the IDP (in order to explore the market and to build export platforms to other regions and places). However, we can also see them investing in developed countries, in order to acquire capacities and assets.

According to the initial (theoretical) approach, stage four of IDP is distinguished by a shift to a positive NOI position, as outward FDI stock exceeds inward FDI stock.

This happens because domestic firms' ownership-advantages develop, which allows them not only to compete locally with foreign firms but also to expand their activity abroad. These increased investments abroad are motivated by the search of new markets and cheap labour force (*efficiency-seeking FDI*) in countries located at lower stages of development. The acquisition of strategic assets (*strategic-asset-seeking FDI*) in high-level countries, assuming either the form of mergers & acquisitions, strategic alliances or other cooperation agreements with firms located in host markets is also a consideration.

At this stage, the country location advantages, traditionally associated to cheap labour force and natural resources, began to be based mainly on created assets (sophisticated markets, qualified labour, technological capacity of the more dynamic sectors, development of economies of agglomeration). The production processes are more capital-intensive, reflecting a lower cost of capital compared with the cost of labour.

Main foreign investors in the 4<sup>th</sup> stage economies are countries with identical development levels, whose FDI flows are mainly oriented towards rationalization projects and the search of strategic assets. However, there is some inward direct investment from countries at lower stages of development, which is likely to be of a market-seeking, trade-related and asset seeking nature.

Concerning the role of the government, it has to ensure competition among national and foreign companies and to suppress the existing market failures, although it starts developing a strategic intervention to support infant industries.

More recently, empirical evidence has showed that some fourth-stage countries, like Ireland and New Zealand -that have a developed country profile in terms of GDP *per capita*, level of structural development and economic and social infrastructure- still face low outward FDI intensities that sustain a negative NOI position. This is the result of their fewer endowment and generation of knowledge, or technologically-intensive intangible assets (Durán and Úbeda, 2001). The distinguishable feature of this type of countries – called late investors (i.e., recently industrialised or developed countries) – is not a negative sign of their NOI position but an exponential growth in their stock of direct investment abroad over a continued period of time.

Finally, in the 5<sup>th</sup> stage of IDP, proposed by Dunning in 1986, we find the most advanced countries, such as U.S.A., Japan or United Kingdom, which NOI positions tends to fluctuate around zero, but reflecting high levels of inward and outward FDI.

This is the result of the growing similarity between developed countries' economic structures (in terms of factor endowment, technologies and labour qualification), the NOI stock becoming irrelevant. This means that the countries' NOI will vary between a positive and a negative position, depending on the evolution of exchange rates and economic cycles, as well as on the firms' individual strategies.

As a consequence, FDI depends less and less on the characteristics of the home and host countries, which are similar, and more on the localization strategies of MNEs. So, the countries' capacity to attract and to invest abroad depends lastly on its endowment of created assets, and so the inward and outward FDI flows vary according to the technological and organizational capacities of each country.

At this stage, there is almost complete internalisation of transaction costs inside the multinational, instead of transactions through the market. This makes the relationship between the international investment position of an economy and its level of development lesser stable, as noted by Dunning and Narula themselves (1996), and the role of governments achieves a strategical dimension, increasingly behaving as oligopolist with MNEs and with other governments.

In synthesis, we can say that locational advantages, including appropriate government policies and basic infrastructures, are particularly relevant in the first three stages of the Investment Development Path, once the economies here included are mainly FDI receivers. On the other hand, the existence of a favourable institutional framework, which helps the development of ownership advantages in local firms, the increasing international mobility of operations and the accumulation of technological and knowledge-intensive assets, seem to constitute the acceleration factor of direct investment abroad and of the progression towards a fourth and fifth stages of development.

In this context, it's also relevant to refer a paper of Dunning, Kim and Lin (2001) having Korea and Taiwan as case study, where the IDP concept was extended. These authors argue that there is a link between trade and FDI and introduce a parallel concept of Trade Development Path (TDP). According to them the growth of trade and FDI are positively

correlated with Gross National Product *per capita* and with the created asset intensity of products.

## 2.2 Reconfigurations of the model

Dunning and Narula (1996) concluded that, in an increasingly globalised world-economy and as the national boundaries of firms have blurred, the IDP idealised pattern changed considerably since the 1980s.

In this new context, three methodological problems have been identified in the former analysis and to solve them a new approach was proposed.

*Firstly*, it was observed that the net outward investment FDI stock (NOI = Outward FDI stock – Inward FDI stock) does not constitute an appropriate indicator to analyze the effect of structural changes on inward and outward FDI, and its use produces some statistical problems.

In fact a net FDI position close to zero is a characteristic of countries in both the first stage of IDP (receiving very little FDI) and fifth (with high levels of inward and outward FDI). On the other hand, an increase on the net position of FDI, usually interpreted as increased competitiveness of the economy, can also be due to a disinvestment process in the country (a significant decrease of inward FDI stock) in response to a deterioration of its investment environment.<sup>2</sup>

These two problems can be overcome in the statistical analysis using inward and outward FDI stocks separately and in both absolute and relative terms, in addition to the net position of FDI stock (NOI), as proposed by Durán and Úbeda (1999).

*Secondly*, the GDP *per capita* alone is an insufficient indicator of a country's level of economic development.

In fact, although there has been some uniformity in the transformation inherent to the development process, there are considerable divergences between countries, and so the

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<sup>2</sup> See Buckley and Castro (1998) about Portuguese economy in the period after 1993

existence of economic structures and foreign investment structures that are significantly different at the same level of GDP *per capita*.

In order to deal with this issue, Dunning and Narula (1996) propose the additional inclusion of structural variables like gross capital formation *per capita*, gross enrolment ratio in secondary schools and universities, number of scientists and engineers in research and development or health expenditure, in order to reflect not only the degree of economic development but also each country's peculiarities.

According to them, each country tends to follow their own path and the speed and direction of movements along IDP stages depends on a sort of idiosyncratic elements (like the existence of natural resources, the geographical and cultural distances from home economies, the size of the country, the economic system or the development model), that influence its economic structure and the inward and outward FDI flows.

*Thirdly*, the econometric models were not considered an adequate tool for testing IDP.

In fact, to assess IDP empirically for a set of countries the quadratic equation suggested by Dunning (1981) was used:  $NOI_i = \alpha GDP_i + \beta GDP_i^2$ , where the variable to be explained (the dependent variable) is the net volume of a country's direct investment (NOI) and the explanatory variable is the country's GDP, both variables been standardized for the corresponding population.

However, some statistical inconsistencies were detected in this model (Narula, 1996): the quadratic equations show different forms if the sample of countries varies<sup>3</sup> and problems of heteroscedasticity arise, as developing countries show a greater variance of errors.

Given these limitations of the econometric model, an alternated multivariate analysis was proposed, combining three complementary tools. A factor analysis to test if there is (or not) a relationship between the degree of economic development and inward and outward FDI stocks; a cluster analysis to countries groups along the different stages of IDP based on their

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<sup>3</sup> Dunning and Narula (1996) show a J form of their quadratic equations, in which the relationship between GDP *per capita* and NOI *per capita* has a positive sign, while Tolentino (1993) obtains an inverted J form

structural similarities and a non-parametric test to show statistically that the differences in the volume of inward, outward and NOI stocks at different stages are consistent with the theory (Durán and Ubeda, 2001).

### **3. EMPIRICAL STUDIES**

During the last two decades, several econometric and descriptive studies have been made in order to test if the postulated relationship between a country's international investment position and its level of development can be empirically confirmed.

Two alternative ways have been considered.

One way is a “cross-section” analysis, whose use poses a methodological problem, since it is a statistical tool which seeks to determine the relationship between the level of development and the volumes of inward and outward FDI to a set of countries in a given period of time, thus contrasting with the dynamical nature of the Investment Development Path. The other is to focus on one country's NOI position either vis-à-vis all countries of the world or countries (regions of the world) that represent its main partners for FDI. These studies incorporate, in a varying degree, geographical factors into the analysis of the IDP and NOI positions of a given country with other groups of countries/regions or other specific countries, being longitudinal by nature.

In 1986, Dunning analysed 25 developing countries' NOIs, concluding that the ownership advantages of their MNEs derive from the owning of individual or unique assets, which distinguishes them from those of developed countries that result from internalizing a series of separate overseas activities, avoiding transaction costs of the market.

Pichl, in 1989, showed on the basis of FDI flows of 18 countries, that small and highly developed countries have a higher share of inward FDI in GDP than large countries. This points to an efficiency-type of FDI, while outward FDI is not dependent on country-size but explained by firm-specific attributes and by the level of economic development.

On the other hand, Tolentino's study in 1993 is particularly important because it tested the NOI of 30 countries, for the periods 1960-1975, 1976-1984 and 1960-1984, on a cross-sectional and longitudinal basis, using FDI flow data.

It was used the equation  $NOI = \alpha + \beta GDP_t + \gamma GDP_t^2 + \mu_t$ , proposed by Dunning in 1981, where NOI is net outward investment position, GDP is real gross domestic product and  $\mu$  is a regression error term. In this quadratic specification, the negative sign of the coefficient on  $GDP$  and the positive sign on the  $GDP^2$  coefficient (which are both statistically significant), provided evidence of a U or J-shape relationship between a country's economic development and its net outward position. Their results were consistent with the IDP theory for the first and third periods, but it was obtained an inverted J-form between 1976 and 1984, concluding that the structural change that occurred during the period surveyed was sufficiently large to nullify the relationship between NOI and *GDP per capita*.

Dunning and Narula (1994) applied the IDP model to explain the level and structure of US-Japanese FDI. They highlighted the difference between natural and created assets and proposed two modifications to the original model: first, the inclusion of macro-organisational policy variables and secondly, the importance of acquisitions of ownership advantages, where the latter suggests that a negative NOI position points to a strength of an industry, rather than a weakness.

Narula (1996) analysed FDI stock data of 40 developing countries for years 1975 and 1988, based on the quadratic equation used by Tolentino. However, his results contradict Tolentino's results, confirming in both periods the U or J-shape relationship predicted by the IDP concept (first, the NOI position decreases though with further development increases again), probably because he used FDI stock data instead of flow data.

In 1996, Dunning and Narula estimated the same equation used by Narula (1996), using cross-section data of 88 developed and developing countries for years 1980 and 1992. Their results generally confirm the IDP, although the small countries present an above average NOI in earlier stages, as the lack of economies of scale inhibits inward FDI and stimulate domestic firms to international markets in order to improve their production scale.

Buckley and Castro's study (1998) for Portugal used time series data and proposed a new relationship between NOI and GDP based on empirical evidence for 1943-1996. They suggest regressing NOI on  $GDP^3$  and  $GDP^5$  because of the better performance of projecting higher growth rate of inward FDI than of GDP at the first stage of IDP. So, the original quadratic equation was replaced by a polynomial one:  $NOI = \alpha + \beta GDP_t^3 + \gamma GDP_t^5 + \mu_t$ , which according to the authors better fits the characteristics of the Portuguese development model. It represents a function where the dependent variable grows very slowly at the early stages. Only at a second stage it grows faster than the independent variable, but soon slowing down and eventually reaching a minimum – the U-turn that corresponds to the transition between stages 2 and 3 when the country becomes a net investor.

The behaviour of Portuguese economy was very close to those predicted by the theoretical model, although it was found empirical support for the idiosyncratic nature of the IDP. They suggest that, beyond a country's level of development, non-economic factors like the governmental policy and some external political events, such as joining to EFTA and European Union, the 1974 Revolution, the fall of Berlin wall and the political changes in Central and Eastern European, affected significantly the levels of inward FDI in Portugal.

Bellak (2000) analysed Austrian IDP for the period 1990-1999, founding that its NOI position does not reflect the high level of development of the country in terms of GDP and largely varies according to industry-type and type of partner country. These results suggest, given the small domestic market size, the determining factors of the IDP seem to be the geographical and the industrial structure of domestic industries and the policies pursued, rather than the general level of development.

More recently, we can highlight Barry, Görg and McDowell's study, in 2003, based on Irish-US FDI flows for 1980-1999. They found empirical support for the IDP, although Irish MNEs do not follow the standard pattern, as its FDI outflows are disproportionately horizontal and concentrated in non-traded sectors.

Boudier-Bensebaa (2004) made an econometric test of the IDP for Central and Eastern European countries (CEECs), concluding that its net investment position has become more

and more negative over the 1990-2002 period, but CEECs' GDP has not steadily grown and sometimes even decreased. This evolution disturbs the relationship idealised by the theory, confirming its idiosyncratic nature.

Finally, in 2005, Vavilov concluded that IDP is less significant for resource-rich countries, specially the major petroleum producing and exporting countries, where the time lags between different stages are much longer than predicted by theory.

In general terms, the most recent tests of this hypothesis tend to analyse IDP for a particular country with respect to its total FDI flows and stocks or by introducing a breakdown of the world by region, country or industry sector, in detriment of the cross-section studies across countries, which reveals itself incapable of capturing the dynamics and the structural changes inherent to the economic development process, due to lack of data.

## **4. OUR STUDY**

### **4.1 Data**

Following most of the previous research carried out to test the IDP, in our study FDI stocks data have been used to estimate NOI and GDP has been used to proxy level of development. NOI was calculated according to UNCTAD's data on inward and outward FDI Stocks, data on GDP is derived from United Nations and data on population from Eurostat.

Our sample is composed of 25 countries (whose statistics are shown in Table 1 below) located in different stages of development: U.S.A., Japan, and 23 European Union countries. We have considered Belgium and Luxembourg together and we excluded Ireland from the study, because this country is an "outlier" when its IDP is compared to the idealized pattern. As mentioned before, although Ireland have a fourth-stage country profile in terms of GDP *per capita*, level of structural development and economic and social infrastructure, it is a net FDI receiver and still faces low outward FDI intensities that sustain a negative NOI position.

**Table 1: Country statistics (1990-2006)**

Country	Variable	Obs	Mean	Std. Dev.	Min	Max
Austria	noi	17	-3852.875	3481.187	-7888.763	5448.404
	gdp	17	223928.20	45648.01	164988.00	321730.00
Belg-Luxem	noi	17	-51110.07	45306.72	-178772.70	-15446.00
	gdp	17	291091.90	64720.51	215359.00	433226.00
Cyprus	noi	17	-1824.48	2466.163	-6202.008	810.6643
	gdp	17	10214.71	3711.595	5777.00	18221.00
Czech	noi	16	-23519.10	22434.94	-72401.50	-1815.80
	gdp	17	66577.47	32352.28	27154.00	141249.00
Denmark	noi	17	2642.022	4823.474	-9599.766	11671.50
	gdp	17	181831.90	42582.97	135839.00	277334.00
Estonia	noi	16	-3021.388	3354.205	-9350.20	40.40
	gdp	17	7048.176	3573.223	4206.00	16089.00
Finland	noi	17	16245.51	10193.95	4875.691	29944.93
	gdp	17	138124.00	33127.26	87354.00	209678.00
France	noi	17	110541.60	100374.60	12694.90	297378.80
	gdp	17	1550050.00	314553.10	1238259.00	2234388.00
Germany	noi	17	227133.80	164555.80	40350.00	502702.70
	gdp	17	2226448.00	352708.40	1714442.00	2888699.00
Greece	noi	17	-9154.118	4345.084	-19488.00	-2799.202
	gdp	17	172437.90	60154.45	108124.00	307856.00
Hungary	noi	17	-23947.42	20925.82	-69067.60	-372.1555
	gdp	17	59149.65	26249.39	34344.00	111990.00
Italy	noi	17	48513.98	23863.45	186.7482	80966.00
	gdp	17	1290660.00	256814.90	1020951.00	1848001.00
Japan	noi	17	242289.10	35236.67	191591.00	341933.60
	gdp	17	4238880.00	530431.80	3018112.00	5244251.00
Latvia	noi	16	-1929.011	2063.094	-7085.075	216.429
	gdp	17	8803.882	4274.851	4765.00	20101.00
Lithuania	noi	13	-3302.03	2952.151	-9756.09	-320.825
	gdp	17	13046.88	6883.286	6323.00	29283.00
Malta	noi	15	-1726.652	1244.736	-4765.002	-387.8546
	gdp	17	3931.647	1017.292	2561.00	5914.00
Netherlands	noi	17	77910.11	48374.32	38168.52	201142.20
	gdp	17	430579.80	112419.40	297711.00	663929.00
Poland	noi	17	-30569.94	31683.79	-92911.00	299.00
	gdp	17	170795.60	75249.64	64550.00	335675.00
Portugal	noi	17	-17502.77	5705.679	-30670.31	-9671.00
	gdp	17	123359.20	34328.64	75278.00	191777.00
Slovakia	noi	16	-6970.06	8778.467	-29045.00	-235.8192
	gdp	17	24667.18	12484.65	11606.00	55072.00
Slovenia	noi	17	-1994.45	1277.565	-4565.00	-407.90
	gdp	17	21530.00	7445.988	12523.00	36901.00
Spain	noi	17	-34316.09	39786.18	-80190.63	64695.67
	gdp	17	698992.80	225012.60	509851.00	1225007.00
Sweden	noi	17	34409.28	6812.988	16781.06	44577.82
	gdp	17	267942.70	51169.68	200048.00	382825.00
UK	noi	17	246252.20	195520.60	23795.32	580888.00
	gdp	17	1451270.00	447406.60	963854.00	2372504.00

Country	Variable	Obs	Mean	Std. Dev.	Min	Max
U.S.A.	noi	17	235585.90	187893.50	35610.00	604459.00
	gdp	17	8899576.00	2308310.00	5757200.00	13200000.00

## 4.2 Model and Results

In this paper, fixed-effects panel data models are used to estimate the relationship between a country's international investment position (*noi*) and its level of development (*gdp*).

This approach has several advantages to traditional cross-section or time-series models. Time-series models require a large amount of observations in order to capture the pattern of the IDP throughout its five stages. With cross-section models we can avoid this problem if we have countries in all of these stages. However estimates from these models are generally inconsistent due to omission of unobservable variables correlated with *gdp*.

The model we used can be describe by

$$noi_{it} = g(gdp_{it}) + \gamma d_t + \eta_i + \varepsilon_{it}$$

where  $noi_{it}$  and  $gdp_{it}$  are the values of *noi* and *gdp* for country  $i = 1, \dots, 25$  in time-period  $t = 1990, \dots, 2006$ ,  $g(gdp_{it})$  is defined by  $g(gdp_{it}) = \beta_0 + \beta_1 gdp_{it} + \beta_2 gdp_{it}^2$  or  $g(gdp_{it}) = \beta_0 + \beta_1 gdp_{it} + \beta_2 gdp_{it}^2 + \beta_3 gdp_{it}^3$ , where  $d_t$  is a temporal dummy,  $\eta_i$  a country specific effect and  $\varepsilon_{it}$  a disturbance term.

The regression has been run for the entire sample over the period 1990-2006, and we estimated four models according to different specifications of  $g(gdp_{it})$  and the inclusion of the temporal dummies,  $d_t$ .

The estimation results presented in Table 2 above are consistent with the IDP theory. The coefficients on GDP and on GDP-squared are significant and with the expected sign: the coefficient on GDP is negative and that on GDP-squared is positive. In other words, they provide evidence of the U or J-shape relationship between *gdp* and *noi* proposed by Dunning. Besides, the inclusion of the cubic term,  $gdp^3$ , does not change this conclusion and gives a better adjustment.

**Table 2: Regression models**

Variables	Model 1		Model 2		Model 3		Model 4	
	Coef	t-value	Coef	t-value	Coef.	t-value	Coef.	t-value
$gdp$	-0.5510	-9.29	-1.0970	-11.03	-0.4373	-4.27	-1.1214	-7.53
$gdp^2$	1.0E-05	9.48	3.9E-05	8.73	9.23E-06	7.00	3.9E-05	7.73
$gdp^3$			-4.14E-10	-6.66			-4.1E-10	-6.10
$d_{1991}$					199.2079	0.37	87.6928	0.17
$d_{1992}$					292.9779	0.54	185.5928	0.36
$d_{1993}$					144.4749	0.27	38.3507	0.07
$d_{1994}$					224.5267	0.42	162.0082	0.32
$d_{1995}$					219.1337	0.38	303.5635	0.56
$d_{1996}$					319.8310	0.56	412.3077	0.75
$d_{1997}$					425.8396	0.76	521.9871	0.98
$d_{1998}$					348.2639	0.61	489.5628	0.90
$d_{1999}$					418.4119	0.73	570.1809	1.04
$d_{2000}$					522.9816	0.94	686.8588	1.29
$d_{2001}$					488.5212	0.87	694.2537	1.30
$d_{2002}$					362.6585	0.62	664.2229	1.18
$d_{2003}$					121.3661	0.18	606.6617	0.92
$d_{2004}$					-666.1754	-0.86	134.7644	0.18
$d_{2005}$					-468.8678	-0.58	534.7058	0.67
$d_{2006}$					-1167.5410	-1.55	155.7802	0.18
<i>Const</i>	5407.925	8.32	7584.602	10.86	3576.4760	3.03	7535.5730	5.80
$\sigma_\eta$	4041.677		3982.459		3300.8746		4125.2196	
$\sigma_\varepsilon$	1727.141		1638.145		1733.9723		1655.3771	

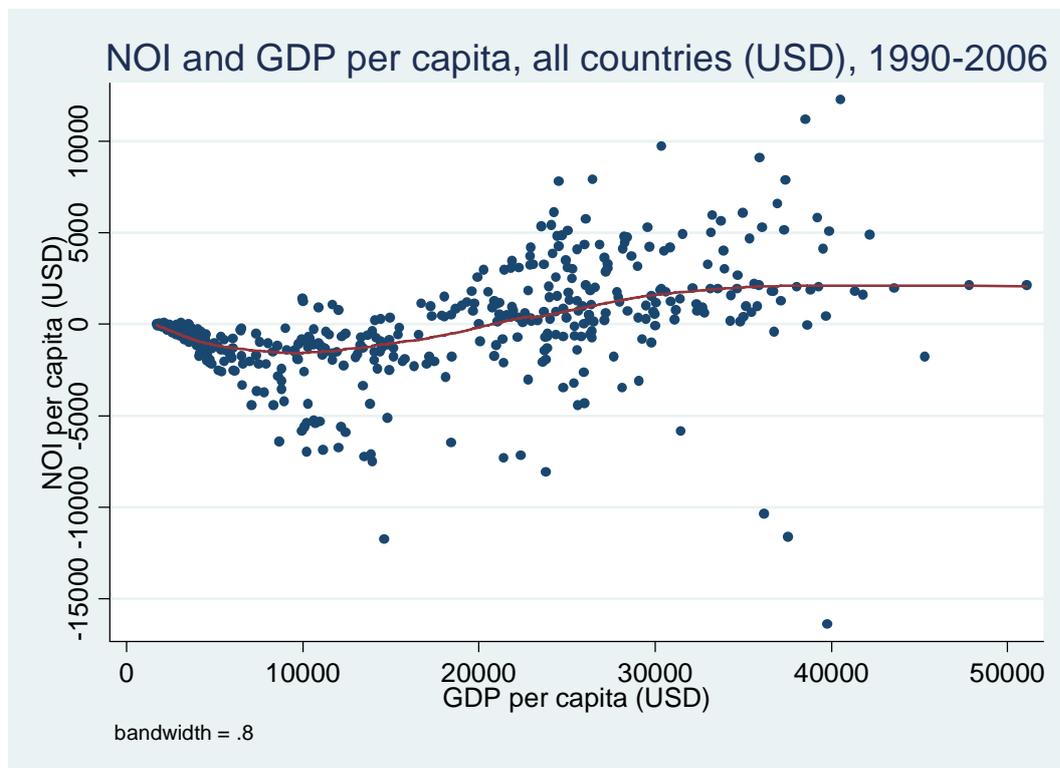
	Model 1		Model 2		Model 3		Model 4	
Variables	Coef	t-value	Coef	t-value	Coef.	t-value	Coef.	t-value
$\rho$	0.8456		0.8553		0.7837		0.8613	
<i>R square</i>	0.1896		0.2728		0.2168		0.2881	
<i>F stat</i>	45.38		48.40		5.72		7.90	

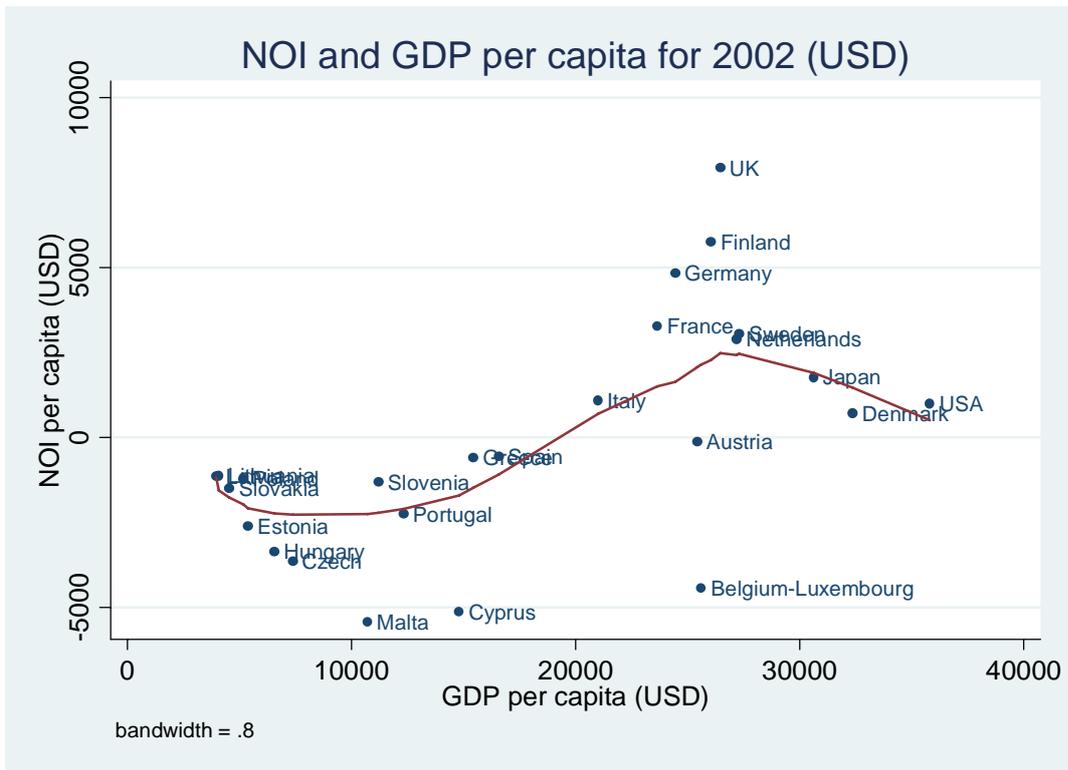
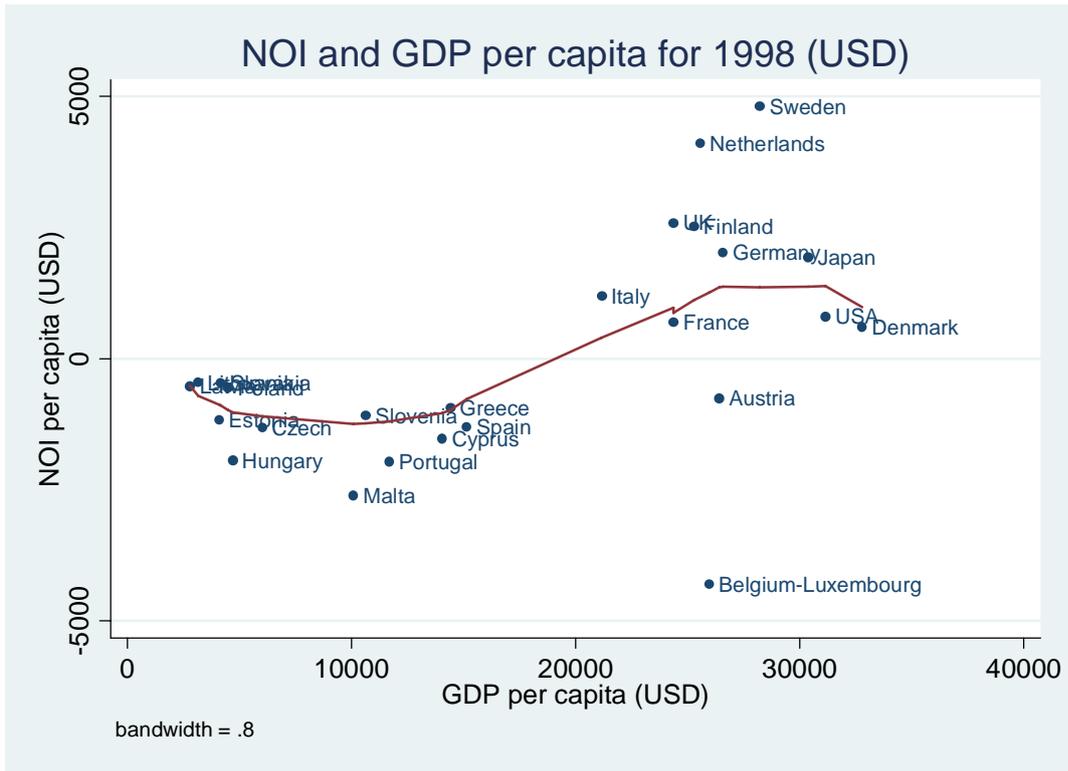
Note:  $\rho$  is the fraction of the variance due to the individual specific effects,  $\eta_i$

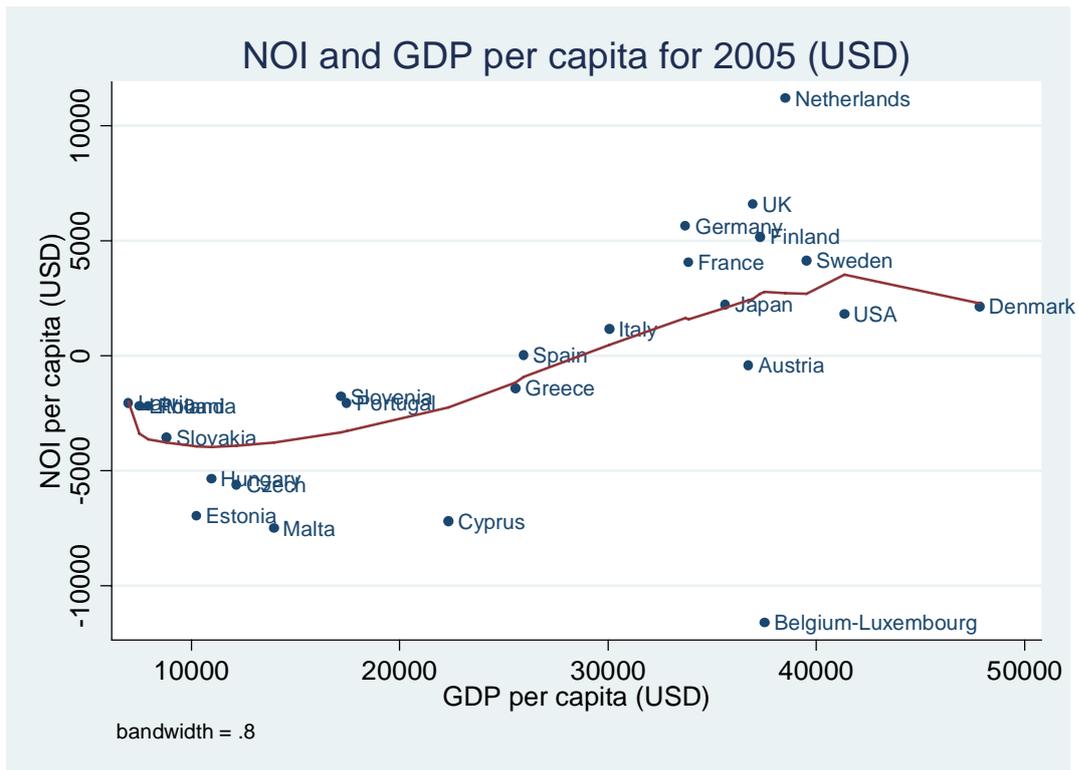
The graphs below are scatterplots, where dots are pairs of NOI and GDP values. In order to try catching some connection between the mentioned variables, we perform a non-parametric adjustment, using the lowless procedure.

The 1<sup>st</sup> graph includes all the countries in the period 1990 through 2006, while the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> are cross-sections for the years 1998, 2000 and 2005, respectively.

The main conclusion to retain from any of these graphs is about the existence of a relationship between the NOI and GDP values, as predicted by the theory. Therefore, higher developed countries in our sample are located in a higher position over the line, contrarily to what occurs, mostly, in Central and Eastern Europe countries.

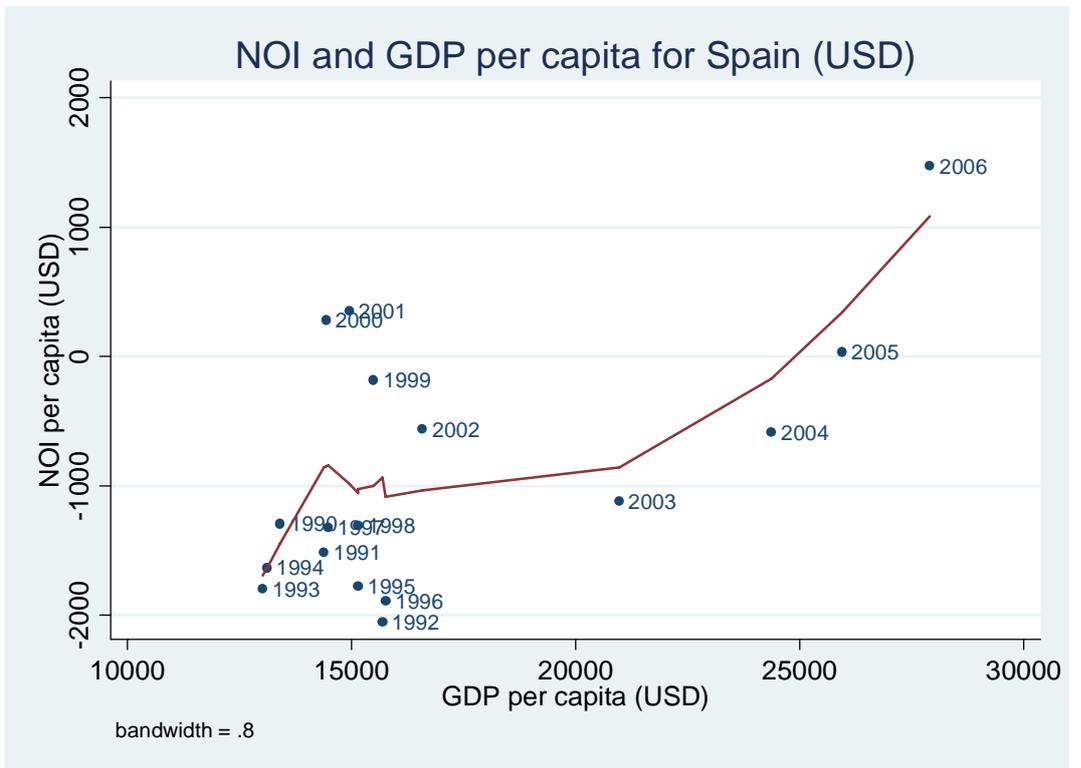
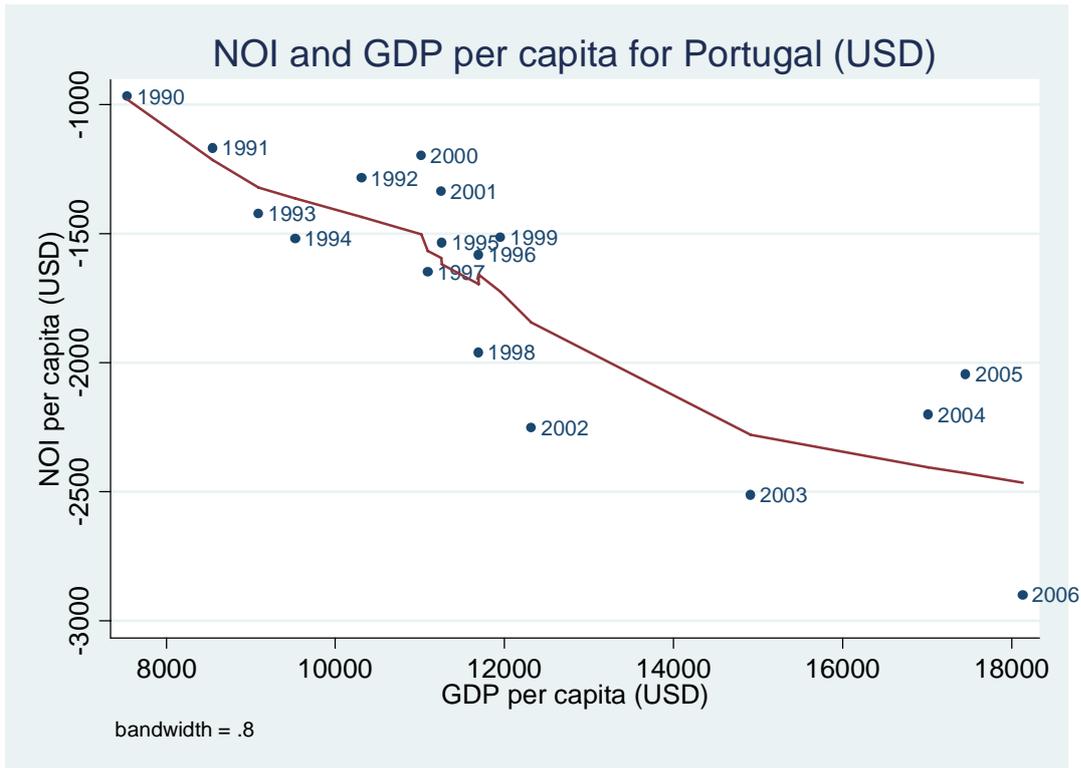






Particularly important are both graphics below, which are temporal and represent the evolution of the (noi, gdp) pair, between 1990 and 2006, both for Portugal and Spain.

In spite of the fact that these countries joined the EEC in 1986, that they have strong cross-border relations, and their ascending convergence and integration in the context of the Iberian Market, it is impossible not to notice the great differences in the integration of each one in the development path defined by the theory.



Although we can conclude that both countries behave accordingly to the IDP hypothesis, it is notorious that the Spanish economy is located in the ascending phase of the cycle, since 2002, reflecting the superior size of the country and its high economic performance, hence the strong affirmation capacity of its multinational firms in foreign markets.

On the other hand, the behaviour of the Portuguese economy does not confirm the possible inflexion of the curve, after 2003, that we have detected in a previous study (Fonseca *et al.*, 2007). Hence, it is possible to state that Portugal remains in the third stage of the path proposed by Dunning, presenting a negative NOI position, which leads to the necessity of a more favourable institutional background towards the development of ownership advantages in the national firms, as well as to the accumulation of technology and knowledge-intensive assets, that could accelerate the progression of the country to advanced stages.

## 5. CONCLUSIONS

From a conceptual point of view, most of the current research's results provide support to the Investment Development Path theory introduced by Dunning (1981) that relates a country's international investment position to its level of development. This means that generally the countries represented in our study follow the pattern idealised by IDP: a U or J-shape relationship between GDP and NOI. However, it is quite relevant to note that Ireland is an outlier. I.e. a point which lies far from the line, and thus has a large residual value, because it is a net FDI receiver, evidenced on the fact that there is a difference of about 15 percent between its GDP (that measures the total amount of goods and services that are produced within a country's geographic borders) and its GNP (that is the value of goods and services produced by citizens of a country).

Paying special attention to Portugal and Spain, during the 1990-2006 period, their relation between the economic development level and the net outward investment position was equally according to the hypothesis we are analysing. However, we can detect a strong contrast between their positioning in the idealized development path, reflecting the superior competitive profile of the Spanish enterprises and its higher competitiveness in the markets.

From a methodological point of view, we can detect some limitations in this study. In fact, it is impossible to capture all the stages predicted theoretically, given the lack of heterogeneity between the most countries of our sample, specially the EU-15. On the other hand, the number of observations and the short time period considered makes the results and conclusions partly questionable, as well as there are no FDI data on industry (or sector) level that would allow us to conduct a more detailed study.

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