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CENTRO STUDI LUCA D'AGLIANO

DEVELOPMENT STUDIES WORKING PAPERS

N. 183

December 2003

Location Choices of Multinational Firms in Europe: the Role of National Boundaries and EU Policy

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November 2003

Abstract

We examine the determinants of multinational firms' location choices in Europe by estimating a nested logit model on a data-set of 5,761 foreign subsidiaries established in 55 regions in 8 EU countries over the period 1991-1999. We find that firms perceive regions across different countries as more similar than regions within national borders. This might be revealing that the process of European integration has reduced the national specificities perceived by multinationals and that regions within Europe compete to attract FDIs more across than within countries. Controlling for regional market size and potential, agglomeration economies and labor markets conditions, we also find that EU regional policy, captured by Cohesion Funds and Objective 1 eligibility, played a significant role in attracting multinationals, thus mitigating the agglomeration forces at work. Differences emerge in determinants of EU and US multinationals location choices, with special reference to the role of labor markets.

JEL Classification: F23, O52, R30

Key words: Europe, Foreign Direct Investments; Location; Nested Logit Models.

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1. Introduction

Accelerating economic integration in Europe over the past decade has favored, *inter alia*, a significant flow of international investments from both within and outside the European Union (EU) borders. As a matter of fact, the EU has attracted over 40% of total world flows of foreign direct investments (FDIs) in the 1990's, becoming the largest recipient of multinational activity; multinationals account for a growing share of gross fixed capital formation in Europe (from 6% in 1990 to over 50% in 2000); and about one quarter of large firm R&D carried out in Europe has been conducted under foreign ownership, while the world average is just over one tenth.

However, this increasing inflow of FDI in Europe has not been equally distributed across countries and regions. In this perspective, this paper analyses patterns and determinants of the location of multinational activities in Europe over the nineties. In particular, we will focus on the role of European integration and of EU policies in MNEs location choices in European regions.

First, we try to assess whether national boundaries affect location choices of multinational firms. In fact, one could expect that European integration with the dismantling of trade barriers, free movement of people, goods and capital and the strong reduction of state aids, have contributed in making country boundaries more blurred[1]. In this regard, Fatàs (1997) suggests that national borders have seen their economic significance reduced over time as the process of integration has contributed increasing cross-border correlations in regional business cycles within the European Union. However, other empirical studies seem to suggest that country effects still play a role in determining, *inter alia*, regional growth in income per capita (Rodriguez-Pose, 1999) and trade flows (Head and Mayer, 2000) in Europe. A few studies have addressed the issue of national boundaries in localization decisions, but results are largely

[1] This is consistent with the argument put forth by Krugman (1991, p.8): "as Europe becomes a unified market, with free movement of capital and labor, it will make less and less sense to think of the relations between its component nations in terms of the standard paradigm of international trade. Instead the issues will be those of regional economics".

inconclusive as they have focused on specific categories of investors, such as Japanese or French multinationals (Head and Mayer 2002, Mucchielli and Puech 2002). Then, one could expect a variety of possible outcomes from economic integration processes, ranging from persisting national patterns of localization of foreign activities, to the emergence of sub-continental regions competing with each other across and within states for attracting foreign economic activities. Assessing the role of national boundaries in the location of foreign investments is highly relevant for policy. In fact it enables to identify the proper level of intervention (whether national, regional or supra-national) for the selection, control and support of multinational activities in Europe.

Second, we will focus on the role of EU policies (Structural and Cohesion Funds) as tools to attract foreign investors in backward regions. As noted in many recent theoretical and empirical works, in presence of increasing returns and local externalities, a greater economic integration leads to the spatial concentration of productive activities (Barrel and Pain 1999, Ciccone 2002, Fujiita, Krugman and Venables 1999, Martin 1999, Puga, 2001). The uneven spatial impact of economic integration motivates EU public support in favor of backward regions. Structural and Cohesion Funds aim to contrast this trend towards productive localization in core regions by creating favorable environmental conditions in the peripheral areas "thorough investment to strengthen the economic base in recipient regions" (EC 1996). Using aggregate data on regional gross value added, Midelfart-Knarvik and Overman (2002) show that European Structural Funds expenditure influenced the location of industry in Europe, thus mitigating the economic forces at work. Here, using micro data on multinational firms, we analyze whether and to what extent EU policies have affected the localisation of multinational activities within the continent[2].

[2] It is worth pointing out that, by assessing the impact of regional policies on the location of foreign investment, we are not trying to assess whether the geographic distribution of multinational activity eventually contributed to Europe's economic growth or regional cohesion. For a recent discussion of the impact of Structural and Cohesion Funds on regional convergence, see Rodriguez-Pose and Fratesi, 2004).

The analysis makes use of the Elios dataset (European Linkages and Ownership Structure), built at the University of Urbino and based on Dun & Bradstreet's Who Owns Whom, which provides information on location choices of 5,761 affiliates of multinational firms between 1991 and 1999 over a set of 55 regions in 8 EU countries (France, Germany, Ireland, Italy, Spain, Portugal, Sweden and United Kingdom). Parent companies are of different nationalities: the single largest home country are the US (25%), but the majority are from EU countries (60%). Additional data on regional and country characteristics are mainly drawn from Eurostat's Regio and Cambridge Econometrics.

A nested logit model is used to evaluate whether national boundaries affect location decisions and to what extent multinational firms consider regions belonging to different countries as close substitutes. We single out a number of location determinants capturing the role of regional market, agglomeration economies, experience of a multinational firm on each regional market, local labor market characteristics and policy measures both at the EU level (namely structural and cohesion funds) and at the national level (such as corporate tax rates and public infrastructures).

A number of previous studies address the determinants of location choices of foreign firms in European regions. Head and Mayer (2002) and Mayer and Mucchielli (1999) focus on Japanese investments, while Mucchielli and Puech (2002), and Disdier and Mayer (2002) deal with the location choice of French firms in Europe[3]. Other studies have also analyzed the location determinants of FDIs within single European countries (see, for example, Basile (2003) and Mariotti and Piscitello (1995) for the case of Italy; Crozet, Mayer and Mucchielli (2003), for the case of France; Barrios, Gorg and Strobl (2002) for the case of Ireland; Guimaraes, Figueiredo and Woodward (2000) for Portugal; Devereux, Griffith and Simpson (2003) for the United Kingdom).

[3] Devereux and Griffith (1998, 2003) and Barrel and Pain (1999) analyze location of US investments in European countries, but do not address the regional dimension.

This paper improves on the existing empirical literature from at least three points of view. First, this work extends the geographic span of host economies, covering a larger number of EU recipient countries than most previous contributions. Second, we are able to investigate how the nationality of the parent firm will determine a different sensitiveness to some location characteristics. Finally, we introduce a measure of firm's previous experience of regions based on the number of the established subsidiaries of the same group in a given location, which allows to capture persistence as well as the tendency of foreign firms to cluster in specific areas.

The main results of our analysis are that: (i) country borders do not matters, except for the case of Italy; (ii) EU policy contributed to mitigating agglomeration forces and attracted considerable investments in peripheral regions; (iii) labor market characteristics attract EU and US investments differently.

The paper is organised as follows. Section 2 describes the dataset and illustrates the regional distribution of new foreign establishments in Europe over the nineties. Section 3 briefly reviews the literature concerning the location determinants of foreign firms. Section 4 illustrates the nested logit model used for estimation. Section 5 presents the variables introduced in the econometric model. The empirical findings are discussed in Section 6, and Section 7 concludes the paper.

2. Regional distribution of FDI in Europe

As recalled earlier, FDIs directed towards EU countries have grown remarkably over the last decade. The flow of inward FDIs in Europe have increased by 14 times since 1990, reaching 808,519 millions Euros in 2000, and the cumulated flow over the period 1992-2002 amounts to slightly less than 1.8 billions Euros (Eurostat, 2002), representing over 40% of world's FDI flows (UNCTAD, 2002). Within this context we analyse the determinants of location choices of foreign multinationals in EU regions. Our analysis exploits a novel dataset, built at the University of Urbino, which collects information from Dun & Bradstreet's Who Owns Whom on a large sample of firms active in Europe. In particular, we have data on firms active in 8

countries (France, Germany, Ireland, Italy, Portugal, Spain, Sweden and the United Kingdom), which *inter alia* account for over 60% of total inward FDI flow in the EU. For each firm we have information on name and country of the ultimate owner, sector of activity (2-digit SIC), location, year of establishment. Exploiting the information on the country of the ultimate owner we identified foreign-owned firms and we restricted our analysis to those which were established over the 1991 to 1999 period. We ended up with a sample of 5,761 foreign-owned firms locating in one of the 8 countries considered over 1991-1999. Consistently with Eurostat's Foreign Direct Investment Statistics (Eurostat 2002), which reports that 72% of total inward FDIs over the nineties have been Intra-EU flow, 3,395 (out of 5,761) sample firms are subsidiaries of EU MNEs. Further comforting the idea that our large sample is a good representation of inward FDIs in the EU, the percentage distribution of foreign-owned firms in our sample across countries is remarkably similar to the actual distribution of cumulated FDI flows over the same period as registered by Unctad (see Table 1).

-- Table 1 about here --

Our analysis of location determinants of foreign-owned firms in Europe exploits the information on the region of establishment of each firm in our sample. In many cases such information was available at a rather fine level of aggregation (such as NUTS3 or even cities), but we had to confine our focus on NUTS1 regions, since in some cases (such as for German firms) this was the only available piece of information and also because this allows to keep computational complexity tractable in the subsequent econometric analysis[4]. Figure 1 illustrates the set of regions that we use in our analysis and highlights regions which are eligible for Objective 1 funds of the EU.

In Figure 2 and 3 we show how regions differ in terms of two key determinants of FDI attraction, namely market size and market potential. The former is proxied by gross value added (GVA) of region *i* in 1991, while the latter is the sum of GVA of all regions *j* weighted by the

[4] In three cases only one region has been identified in one country. In the case of Sweden and Portugal this was due to the lack of more disaggregated data, while in the case of Ireland Nuts1 corresponds to the whole country.

inverse of the (euclidean) distance from the largest cities in regions *i* and *j*[5]. It is not surprising that larger markets are regions in Western Germany (in particular Bayern, Baden-Wurttemberg, Nordrhein-Westfalen), France and Northern Italy, Catalunia in Spain and South East in the UK, while market potential is higher in Core regions and decreases with distance from Continental Europe.

The distribution of foreign investments (as proxied by the number of foreign-owned firms established over 1991-1999) in EU regions, reported in Figure 4, suggests that larger regions attract more FDIs. However, once controlled for market potential (Figure 6) some interesting insights can be drawn. In particular, it emerges that some Peripheral regions, such as Ireland, Scotland and Portugal have attracted considerably higher share of investments than the size of their own market would suggest. This can have to do with the fact that EU policy towards Objective 1 regions have contributed to attracting foreign investors. However, other Peripheral regions, such as the South of Italy, have attracted very few investments. This calls for a more accurate analysis assessing the role of EU policy in attracting FDIs controlling for other sources of regional heterogeneity.

- Figure 1 - 6 about here -

At a closer look, one might notice that the case of Italy is characterized by very low numbers of newly established subsidiaries in any region but Lombardia, while foreign presence is generally more diffuse across regions in other EU countries. One may venture saying that in the case of Italy a country effect is at play, decreasing the attractiveness of (almost) all regions within the national boundaries. Conversely, French and German regions exhibit a similar, relatively high, attractiveness, as measured by the number of new affiliates normalised to take into account market size and market potential (see Figure 5). Econometric results in Section 5 will shed further light on this aspect.

Finally, interesting differences emerge in the location of EU MNEs relative to firms from countries outside the EU (of which more than 50% are US MNEs). In particular, by comparing

[5] This measure has been proposed by Harris (1954) and utilized *inter alia* in Head and Meyer (2002).

Figures 5 and 6, it turns out that EU multinationals have a higher propensity to locate new subsidiaries in Southern Europe and in the North-East of Italy; while non-EU multinationals tend to locate their activities in Anglo-Saxon regions more than their EU counterparts. This result suggests that determinants might differ according to the national origin of MNEs, so that in the econometric analysis we will focus on location determinants for US MNEs as opposed to EU MNEs.

3. Location determinants of FDI

Location choices can be modeled as the outcome of a process where firms compare alternative locations and choose the profit maximizing one. Within this context, theoretical literature have identified a number of variables affecting firms' profits. In this Section, we shall discuss the hypotheses concerning the location determinants of foreign firms as suggested by the more 'traditional' literature on firms' location, by contributions which are more specific to international investments, and by the 'new economic geography'..

In the 'traditional' literature (see Beckman and Thisse, 1986), determinants of firms' location choice comprise measures of costs and accessibility to production factors (labor and raw materials), transportation costs, size and characteristics of the markets. If the investor produces easily transportable goods, local demand has little influence on location decisions. By considering the entire spatial area (Europe in our case) as its outlet market, the firm thus chooses its location on the basis of cost considerations and, then, exports to nearby locations. On the other hand, when transport costs are important, the local market size plays a major attraction role. Classic contributions on foreign direct investments and multinational activities have included 'location specific' factors as determinants of the geographical direction of foreign direct investments (Dunning 1981). More recently, the theory of international production has highlighted that "horizontal" investments are likely to occur in locations where markets are large and transport cost are high, while "vertical" investments arise when the cost of labour and intermediate inputs is low (see Markusen, 1995 for a review).

The traditional literature of location has also emphasized the role of regional promotion incentives and of public infrastructures in affecting the firm's cost function and thus its location decision. Policy incentives may take different forms: (a) financial incentives (public subsidies), (b) tax incentives, and (c) labor-promotion incentives. With regards to the role of public infrastructure (e.g. roads, railways and telecommunications), different analyses show that poorly infrastructured regions have relatively low levels of productivity and returns to private investments which may indeed be smaller than in regions with better infrastructures[6]. The relatively low returns to private investments within poorly-infrastructured regions reduces their attractiveness for both domestic and foreign investments.[7]

The literature on foreign firms' site selection has recently grown alongside with the advances in the 'new economic geography' (Fujiita, Krugman and Venables 1999). Following a typical cumulative causation approach, it is suggested that industrial firms tend to localize where other firms of the same industry are present. The benefits of this form of externality – connected with the number of manufacturing plants clustered in a specific area (agglomeration economies) – are well known: namely, access to a more stable labor market, availability of intermediate goods, production services and skilled manpower, and knowledge spillover between adjacent firms.

Admittedly, agglomeration economies tend to reach limit values, and agglomeration diseconomies eventually emerge. Firms operating in markets with relatively large numbers of firms face stronger competition in product and labor markets. This acts as a centrifugal force which tends to disperse activities in space. Once the centrifugal forces exceed the effects of the agglomeration economies in a region, firms will look for locations in contiguous regions where production costs are lower, while at the same time taking advantage to some degree of external economies, given the short distances involved. In this case, agglomeration economies would operate at a supra-regional level, giving rise to an external regional effect. This hypothesis is in

[6] See, for example, Vickerman (1990).

[7] Using data on FDIs from the US, Wheeler and Mody (1992) found that infrastructures play a major role in US multinationals' location decisions.

line with the process of progressive industrialization in the periphery proposed in Puga and Venables (1996), where the distance between economies plays a role in selecting location.

However, in the case of foreign-owned firms, agglomeration economies derive, not only from the generic number of local incumbents, but also from the number of other foreign firms operating in the same geographical area. As suggested by Head et al. (1999), "if foreign investors - who have less initial knowledge about regional locations than their domestic counterparts - only receive signals on costs and benefits of location decision, but face strong difficulties in observing them directly, they might mimic each others' location decision". Finally, agglomeration economies may be generated among firms belonging to the same business group. The idea is that to the extent that firms gain experience and get acquainted with a given context, uncertainty is likely to decrease and MNEs will perceive lower risks from further investments (Castellani and Zanfei, 2003). As a result, MNE experience will determine persistence in firms' location choices.

4. The econometric model

As observed in the previous Section, location choices can be modelled as the outcome of profit maximization. Firms choose to locate in the region which yields the highest expected profit, conditional on observable variables which include the above mentioned factors (demand, transportation costs, wages, accessibility to production factors, public incentive, infrastructure, agglomeration economies/diseconomies). The most used econometric modelling technique for this type of problem is the conditional logit model (CL) proposed by McFadden (1974). The CL can be derived from profit maximizing firm behaviour under appropriate assumptions concerning the stochastic term in the profit function[8].

Each firm i obtains a profit π_{ij} from location j determined by a set of observable characteristics or attributes of the decision maker and the regions, which is captured by a

[8] Original formulations of CLM models are based on the consumer's problem of utility maximization, but extension to the firm's problem is straightforward.

deterministic part, V_{ij}, and by some unobservable factors, which are captured by introducing a stochastic term, $\varepsilon_{ij.}$

$$\pi_{ij} = V_{ij} + \varepsilon_{ij} \qquad (1)$$

Firm *i* locates in region *j* if it yields a profit higher than all the alternative locations. In other words, the probability that a firm *i* chooses to start up a plant in region *j* is

$$P_{ij} \equiv \Pr(y_i = j) = \Pr(\pi_{ij} \geq \pi_{ik}) = \Pr(\varepsilon_{ik} - \varepsilon_{ij} \leq V_{ij} - V_{ik}), \forall k \neq j \qquad (2)$$

Given the deterministic parts of the profit functions, this probability will depend on the assumption on the distribution of the error term. McFadden (1974) shows that under the assumption of independently and identically distributed error terms, ε_{ij}, with type I extreme-value distribution, the probability of choosing location *j* is:

$$P_{ij}^{CL} = \exp(V_{ij}) / \sum_{j=1}^{J} \exp(V_{ij}) \qquad (3)$$

It turns out that this model yields a globally concave likelihood function, and consequently estimation is straightforward. A major problem with the CL model is the assumption of independence of errors across choices. If two alternatives are similar, errors will likely be positively correlated and CL parameters will be biased (Hess, 2002). In our context, the choice of a firm of locating in regions within countries of the EU is very likely to suffer from such a problem. For example, if some country effect occurs, one may argue that firms consider regions within a country relatively similar, or at least that the degree of similarity of regions within a country is higher than for regions of different countries. The nested logit model (NL) extends the CL to overcome this problem. The basic idea is that alternatives can be grouped into nests, according to their degree of similarity. Independence of the error terms holds outside the nests, while positive correlation is allowed within each nest.

Extension of the CL is straightforward. Let us assume that the J alternatives are grouped in to K nests, that is each alternative *j*, belongs to a nest B_k. The profit function can be generalized to:

$$\pi_{ij} = W_{i,k} + Y_{i,j|k} + \kappa_{i,k} + \nu_{i,j|k}, \text{ for } j \in B_k \qquad (4)$$

where W_{ik} denotes profit deriving from every alternative within nest *k*, and Y_{ik} denote the profit stemming the specific alternative *j*. The probability of choosing region j can thus be expressed as the product of two probabilities: the probability of choosing region *j* conditional on having chosen nest *k* times the marginal probability of choosing nest *k*, $P_{ij}^{NL} = P_{i,j|k} \times P_{i,k}$, where

$$P_{i,j|k} = \frac{\exp(\mu_k Y_{i,j|k})}{\sum_{j \in B_k} \exp(\mu_k Y_{i,j|k})}, \qquad (5)$$

$$P_{ik} = \frac{\exp[\gamma_k (W_{i,k} + (1/\mu_k) IV_{i,k})]}{\sum_{\ell=1}^{K} \exp[\gamma_\ell (W_{i,\ell} + (1/\mu_\ell)\ IV_{i,\ell})]} \qquad (6).$$

$IV_{ik} = \log\left(\sum_{j \in B_k} \exp(\mu_k Y_{i,j|k})\right)$ is called inclusive value, and measures the expected utility that a firm *i* obtains from locating in a region within nest *k*[9]. Substituting (5) and (6) into P_{ij}^{NL} yields

$$P_{ij}^{NL} = \frac{\exp[\gamma_k (W_{i,k} + (1/\mu_k) IV_{i,k})]}{\sum_{\ell=1}^{K} \exp[\gamma_\ell (W_{i,\ell} + (1/\mu_\ell)\ IV_{i,\ell})]} \frac{\exp(\mu_k Y_{i,j|k})}{\sum_{j \in B_k} \exp(\mu_k Y_{i,j|k})} \qquad (7)$$

Equation (7) can be estimated by maximum likelihood without many problems, but complexity raises with the number of elemental choices (*J*) and nests (*K*) and with the number of nesting levels. A key parameter in (7) is $\theta_k = \gamma_k / \mu_k$. This coefficient, known as the inclusive value parameter, since it is the estimated coefficient of IV_{ik}, can be interpreted as a measure of the perceived dissimilarity between regions within a nest. In fact, $(1 - \theta_k)$ turns out to be a measure of correlation among the error terms within a nest. Therefore, a higher value of θ_k means greater independence of the unobserved portion of profits among regions within the

[9] See Hensher and Greene (2002), Hess (2002), Louviere, Hensher, Swait (2000), Train (2002).

same nest. A value of $\theta_k = 1$ suggests complete independence. When $\theta_k = 1$ for all *k* the NL collapses into the CL indicating that no nesting is necessary to improve the estimation and, in our case, that foreign investors perceive all regions in the EU as close substitutes. Values of $\theta_k > 1$ suggest that regions within a nest are considered more dissimilar to regions within their nest than to regions outside. This can be interpreted as evidence that the nesting structure is not appropriate. In fact, as noted above, the goal of NL is to group similar alternatives together. In these cases, estimates can be improved by trying a different nesting structure.

Hensher and Greene (2002) notice that estimation requires some normalization in θ_k, and suggest to set the numerator to 1. In other words, the estimated IV parameters are $1/\mu_k$. This solution is implemented in LIMDEP 7.0 and NLOGIT 3.0 under the option RU2, but the reported coefficients are the μ_k s. This implies that parameters in regression tables should be interpreted in the following way:

$\mu_k > 1$ means that regions within a nest are perceived as more *similar* than regions outside the nest

$\mu_k < 1$ means that regions within a nest are perceived as more *dissimilar* than regions outside the nest and suggests that the nesting structure is not appropriate

$\mu_k = 1$ means independence. If this condition occurs for all *k*, NL collapses into CL.

5. Model specification and variable description

The NL model described in the previous section is implemented using a linear specification of the profit function. From equation (4)

$$\pi_{ij} = W_{i,k} + Y_{i,j|k} + \varepsilon_{ij} = \delta\ Z_{ik} + \beta\ X_{ij} + \varepsilon_{ij},$$

where Z is a vector of country characteristics, and X is a vector of regional characteristics, which eventually vary across firms. In both vectors, variables are lagged one year with respect

to the dependent variable, which takes value 1 if a given subsidiary *i* was created in region j and zero otherwise.

Following the arguments developed in Section 2, the explanatory variables in vectors X and Z may be grouped into five categories: market, agglomeration economies, local labor market, European and national policy (see Table 2).

- Table 2 about here -

(1) Market. Following Friedman et al. (1992), we measure the regional market with two variables: lnY_j, the log of GVA in that region, which proxies for the actual market size, and lnY_j', the log of a distance weighted sum of GVA of all other regions, which captures market potential. For a given region *j*, we calculate $lnY_j' = ln\Sigma_k(Y_k /d_{jk})$, where d_{jk} is the Euclidean distance[10] from the major cities in region *j* and region *k*.[11] A large market is expected to increase profit that a multinational firm can extract from a region.

(2) Agglomeration economies. We use different measures of agglomeration to capture the three different types of effects: overall agglomeration, foreign firms agglomeration and MNE experience. Overall agglomeration economies are approximated by the log of the number of manufacturing plants in the same industry *(s)* in each region *(j)*, while the role of foreign firms agglomeration in affecting the location choice of multinational firms is captured by the log of the number of foreign-owned firms within region *j* and sector *s*. Agglomeration forces have been found by virtually any recent study on foreign firms location choices. We allow also for a spatial lag in both measures of agglomeration using the (log of the) sum of all (or only foreign) firms in sector s in regions different from j, weighted by the inverse Euclidean distances. These

[10] The distance matrix has been obtained from ArcView 3.2 and Spatial Analyst, using layers of the administrative boundaries of the EU and population of European major cites.

[11] Head and Mayer (2002) have proposed an alternative measure of market potential based on Krugman (1992) model. In particular, they claim that the market potential variable must be discounted based on bilateral trade impediments and adjusted to take into account the location of competitors. Empirically, they find that market potential does matter for regional location choice of Japanese firms in the European Union. However, they compare the effect of this new market potential variable with the one utilized in this paper, and did not find significant differences.

variables are expected to capture any congestion effect, which will discourage location in highly agglomerated regions and favour establishment in regions nearby. The role of MNE experience is captured by the log of the number of firms in region *j* controlled by the same parent of firm *i*. Consistently with studies showing that MNE experience, by reducing uncertainty, increase the likelihood of commitment intensive operations (such as the creation new subsidiaries) (Castellani and Zanfei, 2003), we expect a positive sign on this variable.

(3) Local labor market. In measuring observable factor prices, we focus on wages. Wage is measured by the (log of the) ratio between the labor costs and the number of employees at the regional level. High wages would tend to discourage FDI inflows; however, it is also generally acknowledged that high wages could indicate a high level of human capital and skilled workers. Generally speaking, this double effect justifies the non-significance of the coefficient of the wage variable found in many empirical studies on FDI location choice.

We also include the log of tax wedge on labour, measured at the national level, since in Europe there is no room for diversified fiscal treatments within countries. This variable has been borrowed from Martinez-Mongay (2000). Following Layard, Nickell and Jackman (1991, page 209), the total wage wedge "is the gap between the real labour costs of the firm, on the one hand, and the real post tax consumption wage of the worker, on the other". The tax wedge on labour measured by Martinez-Mongay (2000) is the difference between the gross wage deflated by the producer's price (real producer wage) and the gross wage net of social security contributions and personal income taxes on labour income deflated by the consumer's prices (the real consumer wage). In line with De Santis, Mercuri and Vicarelli (2003) who find that FDI inflows in the European Union are more influenced by the total fiscal wedge on labour than by the corporate tax rate, we expect that the higher is the tax wedge on employment, the lower is the attractiveness of a region.

Finally, among labor market variables, we include the log of the regional unemployment rate (percentage of labour force defined as unemployed at the regional level). As in the case of the wage variable, no clear cut expectations can be formulated about the sign of unemployment

coefficient. On the one hand, a high unemployment rate could increase the attractiveness of a region by increasing the size of the job applicant pool; on the other hand, foreign firms may interpret a high unemployment rate as a result of rigidities on the labor market.

(4) National policy. We include the log of the national corporate tax rate (corporate income tax revenues in national currency divided by nominal GDP in national currency), borrowed by Gropp and Kostial (2000), and the log of a regional stock index of infrastructure developed by Confindustria for the 1985. Both variables are under (almost) complete control of nation states and can be expected to affect the profitability of regions. One might expect that a higher corporate tax rate discourages investors, while better infrastructure should increase the attractiveness of a region. However, empirical evidence on the impact of the tax rate on inward FDI and foreign firms location choices is mixed (see Devereux and Griffith (2002, 2003) and Benassy-Querè et al. (2000) for recent reviews). In fact, a number of issues arise when estimating the effect of tax regimes on international investments. First, the correct measurement of the effective corporate tax rate is not trivial given available data; second tax schemes differ across countries (i.e. full credit vs exemption schemes); third, firms might "accept higher taxes if they are associated with better infrastructures or public services" (Benassy-Querè et al. (2000) p. 7), therefore tax differences could not matter for location decisions, if they simply balance differences in public goods; fourth, agglomeration forces make tax competition too costly because they can be counteracted only by very large differences in tax rates.

In recent years, many EU countries have adopted specific policy measures for attracting FDIs, such as financial incentives to foreign firms and local development agencies which implement specific activities to attract multinational firms (Piscitello, 1997). At this stage we are unable to control for such national policies specific for foreign firms.

(5) European policy. While most individual countries have introduced specific incentives targeted to multinational firms, the EU has no specific policy instrument 'dedicated' to the attraction of foreign investments, and foreign firms benefit from 'generic' public incentives, such as those co-financed by the European Union through the Structural and the Cohesion

Funds. The amount of resources mobilized by the EU regional policies in the period 1989-99 contributed about 6.5% of annual Community GDP. As a reference point, one may consider that the Marshall Plan aids, granted in the period 1948-51 for the post-war reconstruction in Europe, was equivalent to 1% of US GDP per year. Structural Funds have different Objectives: Objective 1 is the most important one and accounted for about two-thirds of total Structural Funds allocated over the 1989-99 period. It is aimed at boosting the development of laggard regions (that is regions with a per capita GDP lower than the 75% of the EU average). Cohesion Funds are instead distributed to those countries (Ireland, Portugal, Spain and Greece) with a per capita GDP lower than the 90% of the European average (see Rodriguez-Pose and Fratesi, 2004, for a recent discussion of EU regional policies).

The effect of European policy is captured by two variables: a dummy variable set to 1 when the region receives Objective 1 Structural Funds; and a dummy variable set to 1 if the country receives Cohesion Funds (namely, Spain, Ireland and Portugal; Greece is missing in our data set).

6. Regression results

In section 2 we described the regional distribution of foreign subsidiaries established by multinational firms in Europe over the nineties and we noticed three things. First, larger and richer regional markets account for the higher number of investments, but once controlled for market size and potential, some (even though not all) laggard regions in the EU Periphery, which were eligible for structural funds in the Objective 1, attracted a considerable number of multinationals. This suggests that in order to test whether EU policies have played a role in attracting FDIs one needs to control for other sources of attractiveness. Second, subsidiaries of EU MNEs appear to establish new subsidiaries in Southern regions more than average, while non EU MNEs are apparently more focused on Anglo-Saxon regions, indicating that some specificities in investment orientations may also depend on the area of origin of MNEs. Third, once controlled for market potential, there seems to exist extensive groups of regions belonging to different countries which exhibit quite similar attractiveness, suggesting that MNEs do not

seem to consider national borders as particularly relevant in taking their localisation decisions. A remarkable exception is represented by Italy, wherein the setting up of new foreign subsidiaries has been particularly low, over the examined period, with apparently no equivalent in other areas of Europe.

In this Section we will pursue these issues further, by estimating a nested logit model which allows both to address the question of whether national boundaries are perceived as relevant in location decisions of multinational firms and to examine the impact of various determinants of location. In Section 6.1 we will focus on the first question, while in Section 6.2 we will consider the determinants of location, and in Section 6.3 we will compare the cases of EU and US MNEs.

6.1 Choosing the nesting structure. Do national boundaries matter?

As we anticipated in Section 4, the nested logit model improves on the standard conditional logit by allowing different degrees of substitutability among regions. In particular, regions which yield a similar profit can be grouped into common nests, improving the quality of estimation. In this perspective, the choice of the nesting structure is crucial. As we noted above, an appropriate nesting structure requires that $\mu_k>1$ for all the K nests, suggesting that errors (i.e. the stochastic component of profits) for the various regions within a nest are positively correlated, or in other words, that regions within a nest are perceived as similar by investing firms. Countries are the natural nests. Cultural specificities, barriers to trade and to the movement of people should make regions belonging to the same country more similar than regions from different nation states. Consistently with this view, Head and Meyer (2000) show that markets within the EU are still significantly fragmented due to the consumers' home bias. However, one may argue that within the EU such differences have been declining over time, as a result of the increasing economic and political integration.

In table 3 we report the μ parameters for various nesting structures. First notice that the hypothesis that all regions within Europe are close substitutes, i.e. a test of the CL against the NL, is rejected from a Likelihood Ratio (LR) test in all specifications. Therefore, some nesting

is required. In columns (1), (5) and (9) we test the conjecture that regions are similar within countries and we soundly reject it. In fact, μ parameters are above 1 only for Italy (and for Spain when attention is limited to EU MNEs (column 6))[12]. In other words, a country effect characterizes Italian regions. One may venture saying that, although differences do exist in industrial structures of regions within Italy, a relatively advanced region like Emilia Romagna is perceived by US MNEs as more similar to Italy's Mezzogiorno than to Baden-Wurttenberg, while the latter is considered more similar to Ile de France than to the Berlin region. This result provides some more robust explanation to the fact that almost all Italian regions attract a remarkably lower number of investors than other EU regions. Furthermore, this evidence seems to suggest that, apart from the case of Italy, multinational firms tend to consider the EU as a geo-economic space, not as a sum of independent countries[13]. Then, combining this result with Head and Mayer (2000), who find that the EU market is still fragmented due to the persistence of a home country bias in consumers' preferences, one could venture saying that European integration is far more advanced in firms' perceptions and location decisions than in consumers' preferences.

Having said that national borders do not (generally) affect location decisions of MNEs, one needs to find the appropriate aggregation of regions. As noted by Louviere et al. (2000) many nesting structures are plausible and it is difficult to assess to what extent one is better than the other in behavioral/statistical terms. It is worth stressing that it is beyond the purpose of this paper to single out a one best nesting structure. We rather need to test and see whether some aggregations of regions which appear to make sense from a socio-economic point of view are also characterized by a degree of internal similarity (in terms of profits firms can extract from

[12] Notice that IV parameters are fixed to 1 in the cases of Ireland, Sweden and Portugal since these nests contain only one region. They are the so-called degenerate nests.

[13] Mayer and Mucchielli (1999) find that in the case of Japanese investors national borders seem to matter. We believe that the different results reached in this paper are due to the fact that we consider investors from many countries and in particular we include EU and US MNEs. Results for Japanese MNEs in our sample are consistent with Mayer and Mucchielli (1999) but, given the relatively low number of observations, estimates are not robust and are not shown.

localizing their activities) that is higher than in the case of national aggregates; so that we can get consistent estimates of the various location determinants. In this perspective, we choose to follow two distinct directions in aggregating regions and stop when a satisfying result is reached. First, we aggregated *countries* with similar geo-economic characteristics. Second, we aggregated *regions* according to a Core/Periphery model. Within the first line of analysis we started by creating two broad nests, which group together regions belonging to Northern countries (UK, Ireland, Sweden, France and Germany) and to Southern ones (Italy, Portugal and Spain). See columns 2, 6 and 10 for a test on this nesting structure. This structure seems appropriate for Southern regions but not for the Northern group, so we split this group into one for Anglo-Saxon (UK and Ireland) and one for Continental countries (France, Germany and Sweden). This nesting structure seems appropriate both for the whole sample of investors and for EU and US MNEs since all μ parameters are well above 1 (Column (3), (7) and (11)). In other words, we support the view that multinational firms consider Iberic and Italian regions closer substitutes with each other than with German, French or UK regions. Similarly, French regions are perceived as more similar to German ones, but different from UK regions.

As far as the second direction for the search of the appropriate nesting is concerned, results support a Core/Periphery model as well. In fact, regions eligible for Objective 1 funds are more closely substitute for each others, and are different from non-Objective 1 regions.

Then, we have found at least two appropriate nesting structures (among many possible alternatives), but in the following analysis of the determinants of MNEs location choices we will rely on the Anglo-Continent-South because it allows to capture the effect of EU policy (which we proxy with a dummy for regions eligible for Objective 1 funds). Let us just stress once more that the main goal of this section was not to identify the best nesting structure. Rather we aimed at assessing if we could reject a structure based on national boundaries or, in other words, if we could exclude that country borders play a key role in the choice of the regions where MNEs set up their European operations. Indeed, results suggest that such country effect is relevant only for the case of Italy.

6.2 Determinants of the location of foreign firms in EU regions

In Section 2 we showed that, controlling for market size and market potential, some regions eligible for Objective 1 funds attracted a considerable number of foreign subsidiaries. Results in Table 4 shed further light on this aspect, using the "nesting structure" selected in the previous section (i.e. Anglo-Continent-South) and controlling for a number of exogenous sources of heterogeneity. Columns (1) and (2) show that controlling only for demand and policy, Objective 1 regions are not more attractive than other regions. However, when controlling for other determinants of the location choice, such as agglomeration and labor market conditions, the effect of Objective 1 turns substantially positive (Columns 3 and 4)[14]. We interpret this result as evidence that EU policies have contributed to mitigating centripetal agglomeration forces and have attracted multinationals towards peripheral regions. Furthermore, it is worth recalling that in Section 6.1 we supported the view that a nesting structure based on the eligibility for Objective 1 was not rejected. In other words, firms perceive regions within the administrative boundaries defined by EU policy for structural funds more similar than regions within national boundaries.

As regards other policy variables, one notices that Cohesion funds have possibly made some countries significantly more attractive than others, while infrastructures turn out non significant. However, this is not very surprising, given the strong correlation of this latter variable with market size and agglomeration. In fact, if we do not control for market size in column (2), infrastructure would turn positive. The corporate tax rate does not seem to have a

[14] It is worth mentioning that this result is robust to a number of sensitivity tests. First, we ran a regression using the total amount of structural funds allocated over the 1989-1993 period (Columns (5), which turns out positive and significant. Noticeably, funds allocated to Objective 1 regions have an even higher impact on the attractiveness of regions (Column (6)). However, the use of continuous variables instead of the dummy (Objective 1 regions) to test the impact of EU policy, is not costless. Indeed, due to the lack of data, we had to drop investments in Eastern Germany from regressions in columns 5 and 6 . Second, we dropped investments in Portugal, which (as reported by Table 1) might be overrepresented in our sample and inflate the effect of the Objective 1 dummy. Third, we considered Scotland as non eligible for Objective 1 funds, since only a limited proportion of the region is indeed eligible (The Highlands). Results are not affected by these changes and are available from the authors upon request.

strong impact in discouraging foreign investments. On the contrary, it bears a positive and significant effect. This result supports the view that high tax rates might not discourage foreign investors whenever governments compensate the higher cost with some public good (Devereux and Griffith (2002, 2003) and Benassy-Querè et al. (2000)) as it might happen in Cohesion countries. Caution is needed when interpreting this result, given that we are not able to control for incentives specific to foreign firms, which some countries put into practice in the nineties. Nevertheless, one may want to notice that if we drop the cohesion dummy in column (2), the sign of the corporate tax rate turns negative and significant. This is consistent with the fact that a number of Regions within Cohesion countries (like Portugal and Catalunia) having relatively high corporate tax rates attract about the same amount of subsidiaries (as a share of market potential) as Ireland, having a much lower corporate tax rate (10% as compared to 35-40% in Iberic countries). Conversely, in non-Cohesion countries, high tax regions in Germany attract more subsidiaries than UK regions (characterized by a relatively low tax rate). However, in the richest specification, dropping the cohesion dummy does not change the sign and magnitude of the corporate tax rate, which remain positive and significant.

As concerns other control variables, our tests confirm that demand and agglomeration economies increase the attractiveness of regions, but other results also emerge from the introduction of our proxy of firm-specific agglomeration economies (i.e. MNE experience). In fact, we find that the profit that a MNE receives from a given region is highly responsive to the number of subsidiaries of the same parent. In other words, experience of a given context increases firms' ability of extracting profit from that region and determines a persistency to locate in the same regions. This has important policy implications. While agglomeration economies usually create problems to policy makers because of threshold levels needed to induce virtuous cycles, and thus require substantial investments for attracting a considerable number of firms, targeted incentives to specific firms might induce them to get rooted in a given context and increase the likelihood of further investments of the same MNE. Eventually, this might attract other firms and create the basis for an agglomerating mechanism.

6.3 US versus EU MNEs

In Section 2 we noticed that EU and non EU MNEs seem to follow different location patterns. In Table 5 we investigate this issue further, singling out the role of the most important component of non-EU foreign investors, i.e. US multinationals, and we estimate our richest specification for the two groups of MNEs. Most variables keep their sign and magnitude but two significant differences emerge. First, corporate tax rate is positive and significant for EU MNEs, while it is non-significant for US MNEs. This is consistent with the view that US firms are more sensitive to corporate tax rates, probably because the actual tax differential is on average higher than for EU MNEs, which tend to pay relatively higher taxes in their home countries[15]. Second, labor market conditions have a remarkably different impact on the attractiveness of regions in the case of US MNEs as opposed to EU MNEs. In fact, from Table 5 one notices that a high tax wedge on employment discourages investment from US MNEs significantly, while high wages have the opposite effect. This might suggest that US firms look for skilled workers and are willing to pay them higher wages, but are not willing to grant government high taxes on employed labor. Conversely, EU MNEs place more emphasis on unemployment, consistently with the idea that intra-EU investments are part of a strategy of reorganization of international activities where the local availability of cheap labor plays a role. One may argue that this can have to do with the different characteristics of US and EU investors. In particular, investments in high-tech sectors are far more frequent for the former. Affiliates in high-tech industries account for 34% of total US affiliates in our sample, while in the case of EU MNEs the share drops to 22%. Regressions on sub-samples based on the characteristics of the industries[16] where affiliates are created confirm that the impact of wages is positive and significant only in high-tech industries. However, neither in low nor in stable-tech industries wages have a negative and significant impact on location choices.

[15] In the light of the discussion above, the fact the impact of Cohesion seems not relevant for US firms can be consistent with this difference.

[16] We classify every affiliates as high-tech, stable-tech and low-tech, converting the 4 digit-SIC code of each firm, using a correspondence table provided by Hall and Vopel (1997).

7. Concluding remarks

This paper analyzed the determinants of location choices of multinational firms in European regions. Most of previous studies focused on location decisions within single countries, often analyzing location at a rather geographically disaggregated level, but making the hypothesis that firms choose regions within and not across countries. In other words, firms are usually assumed to choose countries first and then decide in which region within that country they locate their activities. The process of European integration is making this perspective rather narrow, since regions can be expected to compete to attract FDIs with other regions both within and across national boundaries. This study provides empirical support to the view that country boundaries do not matter and that EU policy contributed to attract considerable investments in Peripheral regions, counteracting agglomerative forces which tend to concentrate activities in Core regions. In fact, on the one hand, we find that multinational firms consider regions across countries as closer substitutes than regions within national boundaries. This suggests that when taking location decisions, multinational firms perceive the EU as a relatively (albeit not completely) integrated area, rather than a collection of independent countries. However, Italy turns out as a special case. In fact, US MNEs perceive a strong country effect when locating in Italian regions, suggesting that US firms take their location decision on a presumption that investments in Italian regions would yield systematically lower profits than investment in regions from other countries sharing similar observable characteristics. Quoting a recent article appeared in a US newspaper ("Italian Puzzle: The Land That Doesn't Seem To Fit", *The New York Times*, August 20, 2003)*:* "Italy has occupied an odd place in Europe, to potent to be ignored, but too peculiar to be embraced". Institutional characteristics which are largely unobservable at least in a reliable way, when comparing countries and regions, such as political instability, inefficiencies in public administration, market regulation, have certainly played a role. However, this country effect is not as strong when considering the sub-sample of EU multinationals. In this perspective, one may think that, apart from greater cultural similarities, EU integration, increasing mobility of

people and trade in goods and services across European countries, have contributed increasing information flows and knowledge thus reducing such a presumption of peculiarity of Italy at least in the case of EU MNEs, as opposed to US ones.

We also find that regions eligible for Objective 1 Structural Funds and regions belonging to Cohesion countries are particularly attractive for foreign multinationals. This supports the view that EU regional policy, creating more favourable conditions for investments in Peripheral regions through funding (among others) training, infrastructure and R&D activities, have succeeded in counteracting agglomerative forces which tend to concentrate activities in Core regions. However, further work is required along these lines. First, one would like to control for more direct measures of EU policies, such as the actual amount of funds transferred to the various regions for different activities, e.g. training, infrastructures and R&D. Second, careful measurement of national and regional policies specifically targeted to foreign investments is required, in order to assess the differential impact of EU versus national and regional policies correctly. Third, further investigation should be devoted to assess whether the EU Structural and Cohesion Funds have eventually been distorting the efficient allocation of multinational activity in Europe.

Finally, we find important differences among investors. In particular, US and EU MNEs are attracted by very different labour market conditions. While both groups of firms are not attracted by low wages, US firms seem to place high value on highly skilled workers and are thus willing to pay higher wages (but are strongly discouraged by taxes on labour), EU MNEs are attracted towards regions with relatively higher unemployment rates. This might suggest that US MNEs carry out higher value added activities in the EU.

Table 1 – Newly established subsidiaries and inward FDI flows in selected EU countries over the nineties

	Subsidiaries established in * 1991-1999				Inward FDI Flows 1990-2000 **	
	EU MNEs	Non-EU MNEs	Total	Total (%)	%	Absolute values

		Total	*US MNEs*	*JPN MNEs*				
France	598	269	*143*	*26*	867	15.0%	18.1%	263,873
Germany	965	655	*361*	*39*	1620	28.1%	21.8%	318,414
Ireland	42	35	*26*	*5*	77	1.3%	4.3%	62,274
Italy	202	93	*53*	*12*	295	5.1%	3.6%	52,875
Portugal	151	27	*13*	*5*	178	3.1%	1.7%	25,227
Spain	368	116	*68*	*19*	484	8.4%	9.8%	143,831
Sweden	96	56	*19*	*2*	152	2.6%	10.5%	152,753
Uk	973	1115	*760*	*108*	2088	36.2%	30.2%	441,315
Total	3395	2366	1443	216	5761	100.0%	100%	1,460,560

Source: * Authors' elaborations on Who Owns Whom
** UNCTAD (http://stats.unctad.org/fdi)

Table 2 - Variable List and Description

	Variables	***Description***	***Source***	***Type***
Demand	Market Size	Log of Value Added in region j at t-1	Eurostat	Region
	Market Potential	Log of the sum of value added in all regions r≠j weighted by the inverse euclidean distance between the major cities in r and j at t-1	Eurostat	Region
Agglomeration Economies	Overall agglomeration	Log of the number of establishments in region j (and sector s) at t-1. Also spatial lags are considered	Elios	Region-Sector
	Foreign-firms agglomeration	Log of the cumulative number of foreign-owned firms within region j (and sector s) at t-1. Also spatial lags are considered	Elios	Region-Sector
	MNE Experience	Log of the number of firms in region j controlled by the same parent of firm n at t-1	Elios	Firm-Region
Local labor market	Wages	Log of (labor cost / number of employees) at t-1	Eurostat	Region
	Unemployment Rate	Log of Unemployment rate at t-1	Eurostat	Region
	Tax wedge on employment	Log of (sum of social contributions, income taxes and consumption duties over total employment) at t-1	Martinez-Mongay C. (2000)	Country
EU-policy	Objective 1 region	1 if the region is within Obj.1, 0 otherwise		Region
	Cohesion country	1 if the country receives Cohesion Fund, 0 otherwise		Country
National policy	Public Infrastructure	Index of infrastructure stock in region j at 1985	Confidustria	Region
	Corporate tax rate	Log of Corporate tax rate at t-1	Gropp R. and Kostial K. (2000)	Country

Table 3 – Location determinants of FDI in Europe. Nested Logit Regressions. Choosing the nesting structure

	1 All	**2** All	**3** All	**4** All	**5** EU MNEs	**6** EU MNEs	**7** EU MNEs	**8** EU MNEs	**9** US MNEs	**10** US MNEs	**11** US MNEs	**12** US MNEs
IV parameters (μ_k)												
UK	.874**				.887**				.956**			
France	.818**				.790**				1.008**			
Germany	.795**				.792**				.860**			
Italy	1.082**				1.035**				1.369**			
Spain	.997**				1.028**				.989**			
Ireland	1.000				1.000				1.000			
Portugal	1.000				1.000				1.000			
Sweden	1.000				1.000				1.000			
North (UK-Ire-Fra-Ger-Swe)		.854**				.950**				.841**		
South (Italy-Portugal-Spain)		1.079**				1.216**				1.067**		
Anglo (UK-Ireland)			1.173**				1.272**				1.176**	
Continent (Fra-Ger-Swe)			1.020**				1.032**				1.111**	
South (Italy-Portugal-Spain)			1.386**				1.393**				1.583**	
Objective 1				1.753**				1.863**				1.547**
Non Objective 1				1.482**				1.549**				1.366**
Number of observations	294,794	294,794	294,794	294,794	164,664	164,664	164,664	164,664	79,365	79,365	79,365	79,365
Number of firms	5,761	5,761	5,761	5,761	3,395	3,395	3,395	3,395	1,443	1,443	1,443	1,443
Pseudo R^2	.263	.240	.203	.246	.245	.225	.202	.234	.315	.285	.221	.286
Log-likelihood	-18293.68	-18306.16	-18303.55	-18362.51	-10908.08	-10917.17	-10906.12	-10934.63	-4361.59	-4366.33	-4367.29	-4379.67
Log-likelihood (CL)	-18382.68	-18382.68	-18382.68	-18411.52	-10959.11	-10959.11	-10959.11	-10976.88	-4383.06	-4383.06	-4383.06	-4388.83
LR test: CL vs. NL	178.00**	153.04**	158.26**	98.02**	102.06**	83.88**	105.98**	84.5**	42.94**	33.46**	31.54**	18.32**

Note: The dependent variable is equal to 1 if firm *i* is set in region *j* and zero for all regions different from *j*. Regressions have been run using the specification of column (4) in Table 4, except (4), (8) and (12) where the dummy Objective 1 have been dropped..

Asterisks denote confidence levels: * p < .10 and ** p < .05.

Table 4 – Location determinants of FDI in Europe. Nested Logit Regressions . All foreign investors

Variable	1	2	3	4	5	6
Market Size	.759**	.759**	.089**	.132**	.191**	.175**
	(.043)	(.043)	(.033)	(.033)	(.035)	(.035)
Market Potential	.198**	.111**	.427**	.330**	-004	.061
	(.039)	(.041)	(.122)	(.120)	(.129)	(.130)
Objective 1 Regions	.049*	.026	.496**	.356**		
	(.028)	(.038)	(.062)	(.062)		
EU Structural Funds 1989-1993					.029**	.026**
					(.010)	(.011)
EU Structural Funds in Obj 1 Regions						.026**
						(.010)
Cohesion Funds Countries	.576**	.697**	.764**	.417**	.441**	.471**
	(.054)	(.059)	(.820)	(.086)	(.089)	(.010)
Public infrastructures		-.019	.033	-.682	.033	.075
		(.036)	(.058)	(.633)	(.071)	(.073)
Corporate tax rate		.379**	.723**	.532**	.330**	.443**
		(.704)	(.089)	(.096)	(.098)	(.108)
Overall Agglomeration			.443**	.385**	.338**	.368**
			(.045)	(.043)	(.045)	(.045)
Foreign-firms agglomeration			.347**	.328**	.344**	.324**
			(.043)	(.042)	(.045)	(.045)
MNE Experience			1.304**	1.237**	1.284**	1.275**
			(.048)	(.046)	(.049)	(.048)
Spatial Lag of Overall Agglomeration			.349*	-.321	-.506**	-.463**
			(.209)	(.230)	(.239)	(.238)
Spatial Lag of Foreign-firms Aggl.			-.747	.498**	.803**	.734**
			(.236)	(.244)	(.259)	(.258)
Wages				.084	-.002	.042
				(.070)	(.074)	(.075)
Unemployment rate				.085**	-.077	-.042
				(.037)	(.048)	(.049)
Tax wedge on employment				-1.360**	-1.199**	-1.147**
				(.190)	(.196)	(.196)
IV parameters (μ_k)						
Anglo	1.135**	1.066**	1.043**	1.173**	1.132**	1.133**
Continent	1.541**	1.511**	1.027**	1.020**	1.030**	1.039**
South	2.680**	2.846**	1.307**	1.386**	1.318**	1.134**
Number of observations	294,794	294,794	294,794	294,794	257,006	257,006
Number of firms	5,761	5,761	5,761	5,761	5,509	5,509
Pseudo R^2	.130	.131	.201	.203	.207	.207
Log-likelihood	-19976.50	-19953.14	-1832.01	-18303.55	-16916.68	-16912.64

Note: The dependent variable is equal to 1 if firm *i* is set in region *j* and zero for all regions different from *j*.
Standard Errors in parenthesis. Asterisks denote confidence levels: * p < .10 and ** p < .05.

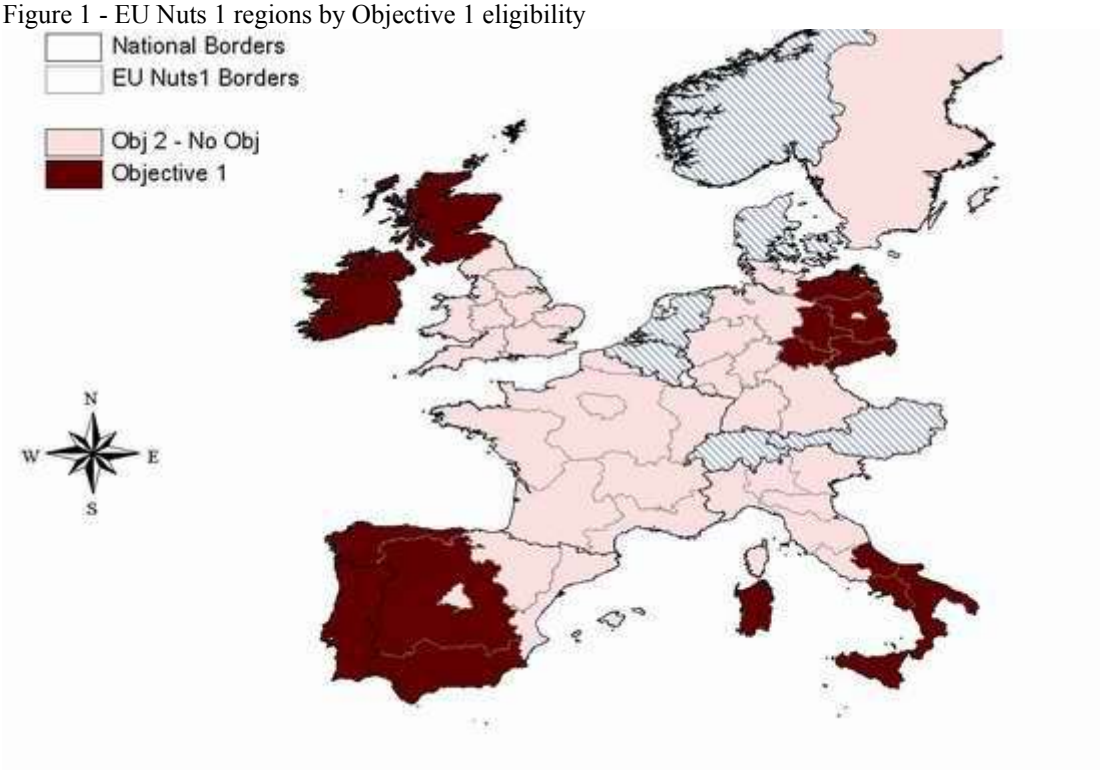
Table 5 – Location determinants of FDI in Europe. Nested Logit Regressions. by country of origin and technological intensity

Variable	EU MNEs	US MNEs	HIGH TECH	STABLE TECH	LOW TECH
Market Size	.126**	.174**	.318**	.162**	.085*
	(.041)	(.067)	(.081)	(.053)	(.051)
Market Potential	.261*	.302	.606**	.188	.078
	(.151)	(.241)	(.268)	(.229)	(.164)

Objective 1 Regions	.335**	.373**	.364**	.407**	.076
	(.078)	(.127)	(.121)	(.106)	(.098)
Cohesion Funds Countries	.649**	.197	.221	.600**	.272**
	(.109)	(.195)	(.167)	(.149)	(.141)
Public infrastructures	-.724	-.006	.102	-.165	-.111
	(.080)	(.120)	(.110)	(.107)	(.106)
Corporate tax rate	.680**	.228	.151	.748**	.543**
	(.119)	(.215)	(.174)	(.167)	(.173)
Overall Agglomeration	.372**	.368**	.198**	.355**	.382**
	(.055)	(.090)	(.101)	(.077)	(.061)
Foreign-firms agglomeration	.308**	.254**	.365**	.354**	.259**
	(.052)	(.084)	(.102)	(.072)	(.069)
MNE Experience	1.125**	1.184**	.971**	1.408**	1.261**
	(.560)	(.112)	(.074)	(.083)	(.090)
Spatial Lag of Overall Agglomeration	.112	-.066	-.486	-.179	-.222
	(.292)	(.461)	(.667)	(.377)	(.343)
Spatial Lag of Foreign-firms	.338	.236	-.954	.870**	.467
agglomeration	(.311)	(.478)	(.706)	(.428)	(.349)
Wages	-.076	.494**	.324**	-.105	.041
	(.089)	(.146)	(.131)	(.113)	(.120)
Unemployment rate	.081*	.052	.019	.061	.123**
	(.045)	(.085)	(.074)	(.061)	(.612)
Tax wedge on employment	-.620**	-2.167**	-1.983**	-1.293**	-.948**
	(.240)	(.391)	(.385)	(.321)	(.319)
IV parameters (μ_k)					
Anglo	1.272**	1.176**	1.156**	1.047**	1.431**
Continent	1.032**	1.111**	1.108**	.095**	1.206**
South	1.393**	1.583**	1.672**	1.174**	1.728**
Number of observations	164,664	79,365	80,496	137,282	77,016
Number of firms	3,395	1,443	1,557	2,710	1,494
Pseudo R^2	.202	.221	.228	.181	.231
Log-likelihood	-10906.12	-4367.29	-4770.74	-8888,78	-4554.67

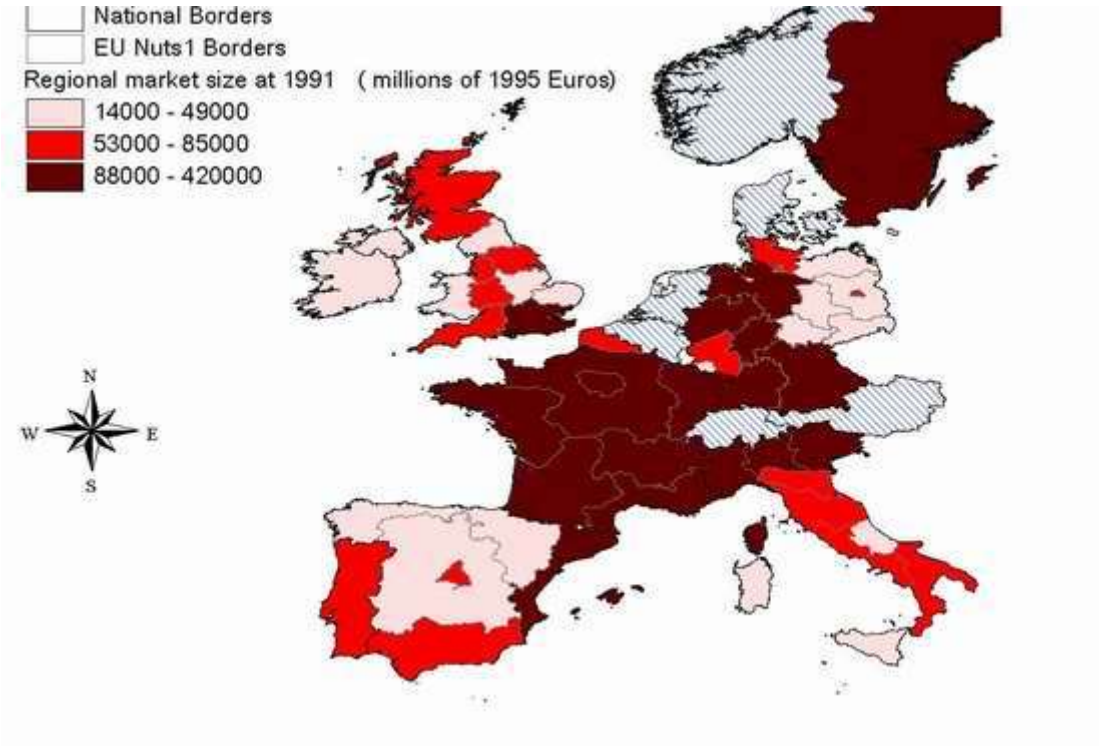
Note: The dependent variable is equal to 1 if firm *i* is set in region *j* and zero for all regions different from *j*.
Standard errors in parenthesis. *denotes *t*-statistics at the 90% confidence level; **, at 95%

Figure 1 - EU Nuts 1 regions by Objective 1 eligibility



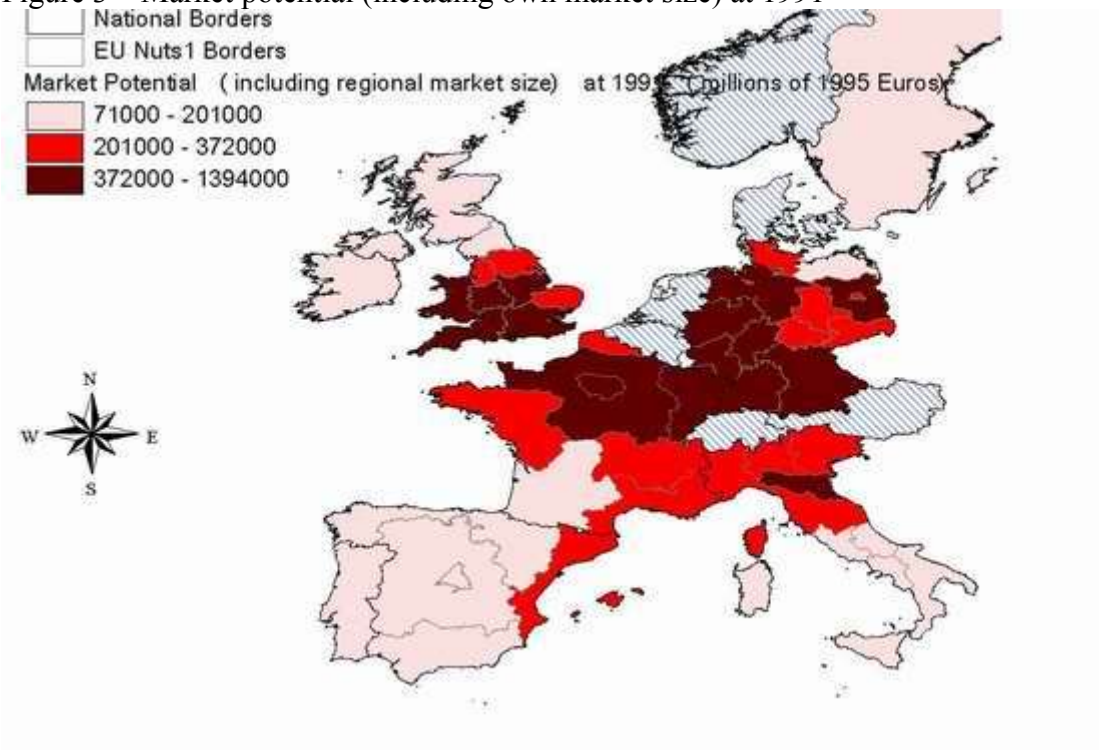
Source: Elaborations on Elios (University of Urbino)

Figure 2 – Market size (regional GVA) at 1991



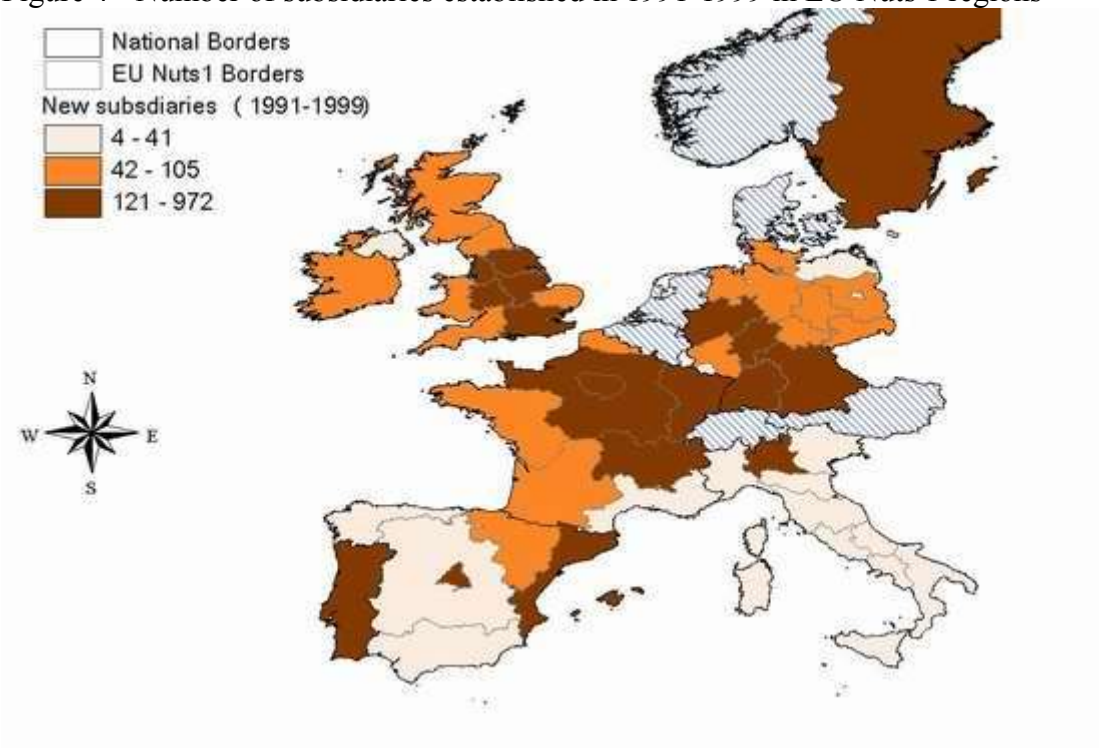
Source: Elaborations on Elios (University of Urbino)

Figure 3 – Market potential (including own market size) at 1991



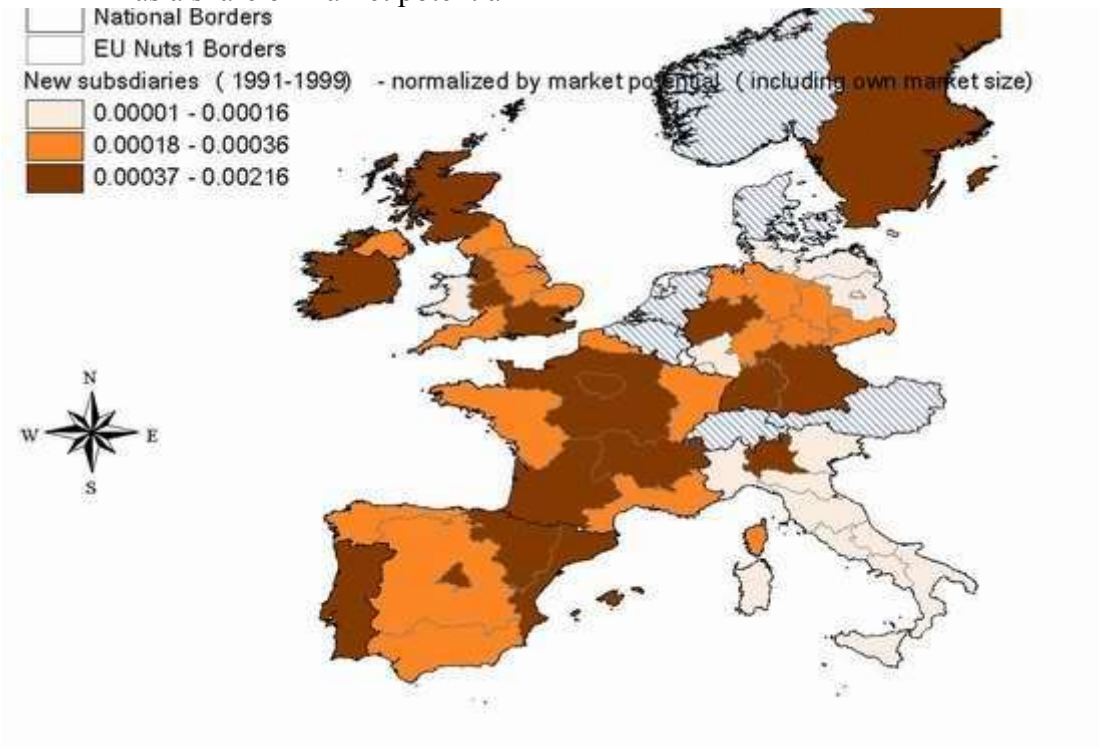
Source: Elaborations on Elios (University of Urbino)

Figure 4 - Number of subsidiaries established in 1991-1999 in EU Nuts 1 regions



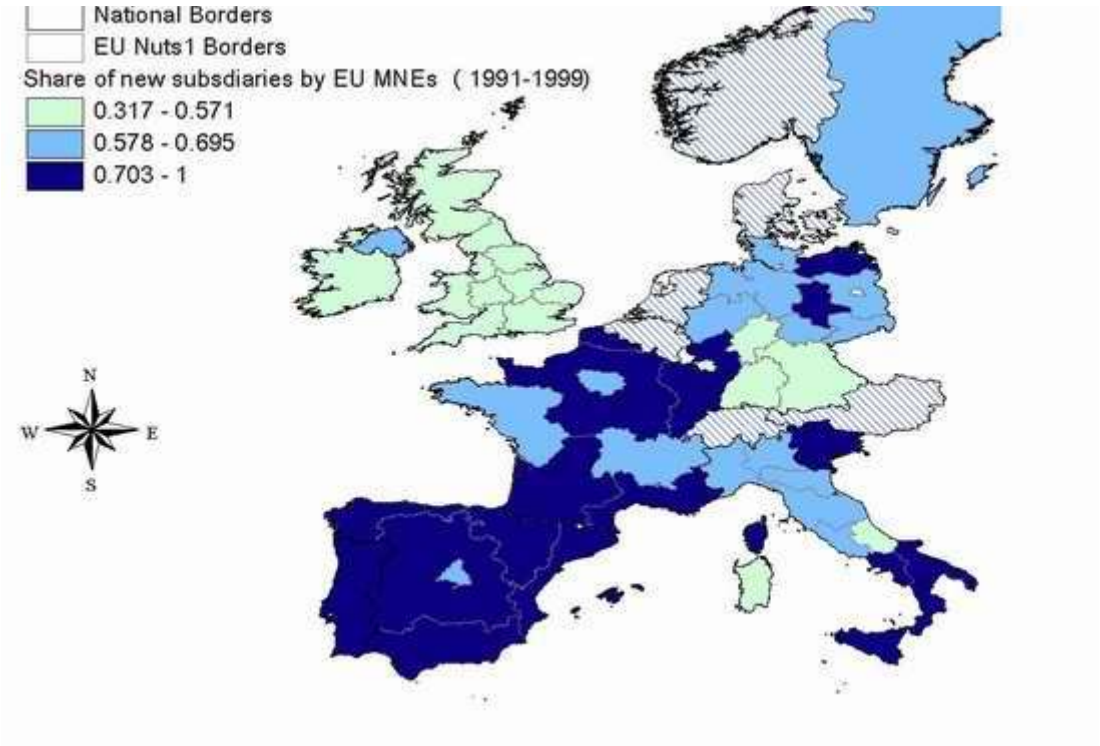
Source: Elaborations on Elios (University of Urbino)

Figure 5 - Number of foreign subsidiaries established in EU Nuts 1 regions (1991-1999) as a share of market potential



Source: Elaborations on Elios (University of Urbino)

Figure 6 - Share of subsidiaries established by EU MNEs in EU Nuts 1 regions (1991-1999)



Source: Elaborations on Elios (University of Urbino)

Acknowledgments
This paper is part of a research project on *"The impact of technological innovation and globalization on the performances of the Italian and European economy"* (Contract n. 2001133591_001) funded by the Italian Ministry of University and Scientific Research (MIUR). The authors are grateful to Claudio Cozza and Elvio Ciccardini for excellent research assistantship. A previous version of this paper was presented at the Western Economic Association International (WEAI) Conference in Denver, European Trade Study Group (ETSG) Meeting in Madrid, European Network on Industrial Policy (EUNIP) Conference in Porto, L'Industria Annual conference in Parma and at a seminar at DELTA in Paris. We wish to thank all the participants to those meetings, as well as Nigel Diffield, Holger Gorg and Andres Rodriguez-Pose for helpful comments. Usual disclaimers apply.

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