

Mayer, Thierry

Article

Where do foreign firms locate in France and why?

EIB Papers

Provided in Cooperation with:

European Investment Bank (EIB), Luxembourg

Suggested Citation: Mayer, Thierry (2004) : Where do foreign firms locate in France and why?, EIB Papers, ISSN 0257-7755, European Investment Bank (EIB), Luxembourg, Vol. 9, Iss. 2, pp. 38-61

This Version is available at:

<https://hdl.handle.net/10419/44836>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

ABSTRACT

This paper studies the determinants of individual location choices of manufacturing production units by foreign affiliates. It concentrates on the specific case of FDI location in France over the period from 1985 to 1995 and evaluates, in particular, how regional policies in favour of French regions by both national and EU authorities compare to other determinants of the location choice. It is shown that foreign investors are, to a large extent, not sensitive to public investment incentives, and are primarily driven by conventional forces such as the market potential, labour costs and agglomeration effects in the region considered for investment. Proximity to the home country of the investor also has a robust positive effect on location choice.

Thierry Mayer is Professor of Economics at the Université de Paris Sud, scientific advisor at CEPII, and research affiliate at CERAS and CEPR (tmayer@univ-paris1.fr). The paper benefited from comments by Ari Kokko, Jozef Konings and other conference participants.

Where do foreign firms locate in France and why?

1. Introduction

There has recently been an important renewal of academic interest in the impact of regional policies. This surge of interest was at first theoretical and followed the renewal of the analysis of the causes and dynamics of agglomeration patterns in the field of the “New Economic Geography”. In light of models predicting endogenous, self-reinforcing, and possibly catastrophic clustering behaviour by firms in the manufacturing industry, economists reorganised their understanding of regional policies aimed at promoting spatial equity. After questioning both their overall welfare impact (in particular, possibly adverse effects of spatial equity on efficiency and growth) and the validity of the instruments used (with measures like investment in transport infrastructure possibly exacerbating spatial inequity), economists have now a richer view of the issues related to regional policy in a world characterised by imperfect competition, capital mobility and – despite ongoing integration – persistent frictions in the trade of goods and services (see Baldwin *et al.* 2003 for a good overview).

Some empirical work was conducted on the effects of regional policy. Two recent studies have expressed doubts about the achievements of regional policies implemented in Europe. Boldrin and Canova (2001) reach rather negative results, failing to find any impact of EU structural funds on regional growth. Midelfart and Overman (2002) evaluate the impact of national and EU policies, and find no effect of national policies. Regarding EU policies, the impact of structural funds is estimated to be positive, but has mostly the effect of changing the location pattern of research and development (R&D)-intensive industries, driving them to regions with low endowments of skilled labour and, therefore, initial comparative disadvantage in those industries. Martin (1998) finds that the level of public infrastructure in regions does not promote regional convergence within a country, but might have a small impact on cross-country convergence. This is bad news for the impact of regional policies because financing such public infrastructure is one of their main objectives. The only type of public infrastructure that seems to help convergence at both the national and regional levels is the development of telecommunication networks. This is instructive and seems to confirm recent theoretical conclusions that facilitating the exchange of information with peripheral regions might be a better idea than concentrating the efforts on transport infrastructure. It is, however, fair to recognise (as often done in this kind of empirical work) that estimating a precise and separate effect of regional policies on complex phenomena like regional growth and the spatial distribution of manufacturing industry is a difficult task, raising numerous methodological issues and probably leaving not much chance to detect the effect of policies in the data.

The approach taken in this paper, i.e. studying the locational pattern of foreign direct investment (FDI), is less vulnerable to some of these methodological problems. This is, first, because foreign investors mostly make their choice with no “history” in the country and the production sites of transnational corporations (TNCs) are more footloose than local industries, the latter presumably reacting with more inertia to changes in economic conditions or public interventions, such as investment subsidies. Second, looking at



Thierry Mayer

the impact of regional policies on location choices means looking directly at the mechanism through which the policy measure is supposed to achieve its ultimate goal, i.e. promoting growth and economic convergence by attracting new firms to a depressed area. Third, investment by TNCs is becoming an increasingly important part of overall investment, and capital investments are increasingly mobile. This makes regional growth more dependent on FDI, and FDI, in turn, more sensitive to financial incentives such as differences in corporate tax rates and investment subsidies.

The empirical literature on the link between the choice of location by foreign direct investors and public policies shows mixed results.

The empirical literature on the choice of FDI location and public policies shows mixed results, depending on the public policy and the geographical zone investigated. One of the seemingly consistent findings of the literature is the significant negative impact of high corporate taxation on location choices. Mooij and Ederveen (2001) survey the literature, covering both FDI flows and stocks, and find that a one-percentage point rise in the corporate taxation rate reduces, on average, the amount of inward FDI by about 5 percent. The impact of subsidies granted through regional policies has also been studied. Ferrer (1998), for instance, finds that European structural funds have very little and sometimes even a negative impact on location choices of French TNCs in Europe. From an economic policy perspective, the economic significance and statistical robustness of these results are important. In terms of robustness, it is particularly important to model correctly the location decision of firms in order not to infer an impact of taxes or regional policies from a mis-specified model. The empirical work thus needs to be grounded in theory. In terms of economic significance, one has to compare the impact of those policies to other determinants such as demand, production costs, and agglomeration effects. Devereux and Griffith (1998) and Head *et al.* (1999) underline that agglomeration forces are important determinants of the location choices of transnational corporations and that policy-related incentives need to be very large to overcome those agglomeration effects. Investigating the case of Italy, Roberto (2004) brings out this point very clearly:

“...a small improvement in the public infrastructure stock does not affect the regional distribution of FDIs. Only a very strong leap forward in Southern infrastructures might allow a significant reallocation of foreign capital towards Southern regions. This finding is very important, since each year the actual expenditure for public works systematically falls short of the planned figure.”

This paper concentrates on the specific case of FDI location in France and evaluates how regional policies allocated to French regions by both national and EU authorities compare to other determinants of the location choice. It is shown that foreign investors are, to a large extent, not sensitive to investment incentives stemming from public policy, and are primarily driven by conventional forces such as the market potential, labour costs and agglomeration effects.

The remainder of the paper is organised as follows: Section 2 describes the overall pattern of FDI in France, in terms of the total stock received and its industry distribution and regional allocation. Section 3 is the main part of the paper, discussing the theoretical determinants of location choice, the data used for the empirical analysis, and the empirical results. Section 4 concludes.

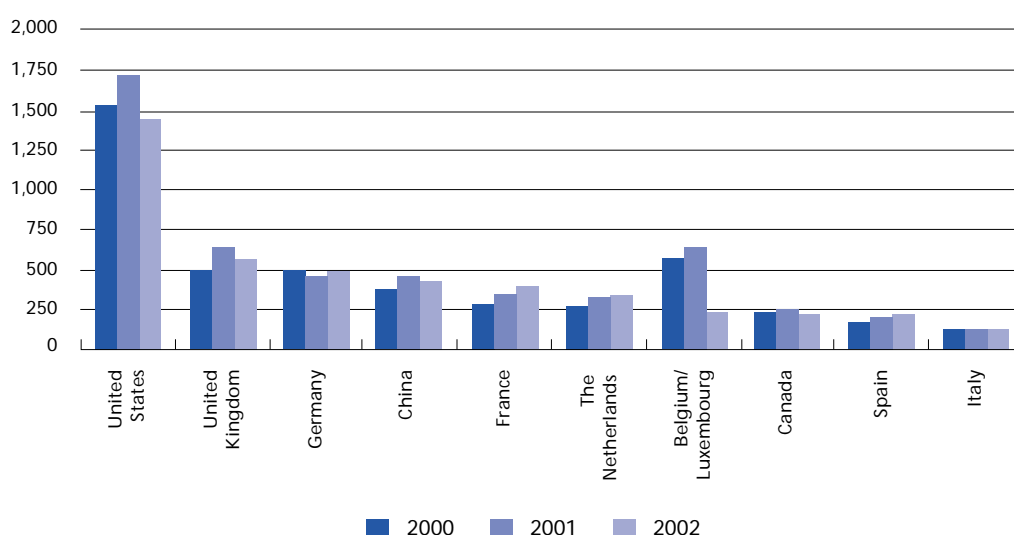
2. Key features of inward FDI in France

2.1 The importance of France as a host country

France is a major recipient of FDI worldwide. Banque de France (2004) estimates for 2002 suggest an inward FDI stock of EUR 383 billion, which is equivalent to 25 percent of GDP (at market prices, the same stock is estimated at EUR 522 billion or 34 percent of GDP). This puts France fifth in the ranking of total inward stocks for 2002 – behind the United States, the United Kingdom, Germany and China (see Figure 1).

France is a major recipient of FDI worldwide.

Figure 1. Inward FDI stock, in EUR billion



Source: Banque de France (2004).

Using *World Investment Report* data (UNCTAD 2003), Table 1 shows the importance of France as a recipient of FDI over a longer time period. Contrary to frequently expressed fears, there does not seem to be an overall fall in the attractiveness of France as an FDI destination.

Table 1. Inward FDI stock by region, 1980-2002

Host region/country	1980	1985	1990	1995	2000	2002
	(in billions of US dollar)					
World	699	978	1,954	3,002	6,147	7,123
Developed countries	392	571	1,400	2,041	3,988	4,595
EU countries	217	268	749	1,136	2,241	2,624
France	26	37	87	191	260	401
	(in percent)					
France as a share of world	3.7	3.8	4.5	6.4	4.2	5.6
France as a share of developed countries	6.6	6.5	6.2	9.4	6.5	8.7
France as a share of EU countries	12.0	13.8	11.6	16.8	11.6	15.3

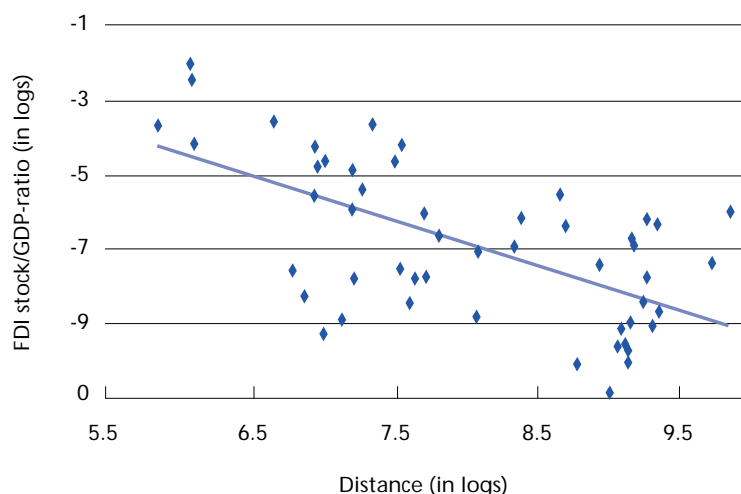
Source: UNCTAD (2003).

Investors from the eurozone account for the majority of the inward FDI stock in France.

The share of world inward FDI attracted by France has in fact increased quite importantly over the last decades, despite a temporary fall between 1995 and 2000. The share of France in inward FDI of EU countries has also increased markedly over the period. Again, the drop in market share towards the end of the 1990s has reversed since 2000.

Regarding the origin of foreign direct investors in France, Banque de France (2003) estimates that investors from the eurozone account for the majority of the inward FDI stock (56 percent in 2001). EU-15 countries from outside the eurozone represent about 18 percent and other European countries 6¹/₂ percent. Investors from the Netherlands, United States, United Kingdom, Germany and Belgium hold more than two-thirds of the inward FDI stock. The large shares of FDI from Belgium and the Netherlands have to be qualified, however, as they reflect the country of immediate origin. This means that an investment by a Dutch affiliate of an American firm is attributed to the Netherlands, not to the United States.¹

Figure 2. Bilateral FDI stock-to-GDP ratio in France and distance to all origin countries (2000)



Notes: The vertical axis measures the ratio of inward FDI stock to GDP (expressed in logs); the horizontal axis measures distance from France (also in logs); each point represents one country that is a source of FDI in France; the line is a fitted regression line (coefficient = -1.17; R² = 0.372).

Sources: World Bank, OECD and CEPII (Paris).

Bearing in mind such problems with bilateral FDI data, we shall briefly discuss what determines the amount of a country's foreign direct investment in France. It has been shown in the empirical literature (see, for example, Wei 2000; Stein and Daude 2001) that

¹ In the data used in the econometric work of this paper, the country of origin is the one where the final owner of the firm locates. Using this data, FDI flows to France in 1985-95 by country of origin were as follows: United States 21¹/₂ percent, Germany 16¹/₂ percent, the Netherlands, Italy, the United Kingdom and Switzerland each about 10-11 percent, Belgium 6¹/₂ percent, and Japan some 2¹/₂ percent.

bilateral FDI is well described by a simple gravity equation, linking the stock of bilateral FDI to the GDP of the two countries concerned and the simplest measure of bilateral transaction costs: distance. Applying this simple framework to OECD data on bilateral FDI stocks in 2000, World Bank GDP data and CEPII (Paris) data on bilateral distances, it turns out that distance and GDP explain almost half the variance in bilateral FDI stocks. Bilateral distance has a surprisingly strong influence on FDI stocks, very much in line with its influence on trade flows (see Disdier and Head 2003) for a quantitative assessment of the impact of distance on trade flows). Figure 2 illustrates the importance of distance for bilateral FDI in France.

2.2 Sector composition of inward FDI

Concerning the composition of inward FDI in France by sector, we observe that investments concentrate in the services sector, particularly in financial services. This is in line with other developed countries. More specifically, in 2001, financial holdings, banking, real estate and distribution services accounted for two-thirds of France's inward FDI stock. The most striking recent evolution in terms of sectoral composition is the rapid rise in the share of FDI in financial holdings (from 26 percent of the overall stock in 1993 to 35 percent in 2001) accompanied by a symmetric fall in the share of manufacturing (34 percent in 1993 and 20 percent of the inward FDI stock in 2001). Table 2 provides more information on how manufacturing FDI breaks down by sector. We can see that chemicals were the main destination for manufacturing FDI in 2001, followed by the food industries, editing and publishing, and the car industry. The remainder of this paper will focus on the location choices of foreign direct investors in France in manufacturing industries. By way of introducing the topic, we present next some descriptive statistics on the location of FDI in France. The data that will be used to describe location patterns in France will also be used in the econometric work of section 3.

As in other advanced economies, in France, the bulk of FDI is in services sectors.

Table 2. Inward FDI stock in the manufacturing sector of France

	1993		2001	
	EUR billion	Share (in %)	EUR billion	Share (in %)
Total	41.2	100.0	64.4	100.0
Chemicals	9.4	22.9	14.6	22.6
Food processing	6.4	15.5	6.3	9.7
Wood, editing and publishing	2.8	6.8	5.3	8.3
Cars	3.5	8.4	4.0	6.2
Machinery	2.3	5.5	3.8	5.9
Radio, TV and communication	1.1	2.7	3.7	5.7
Metal	1.8	4.3	3.6	5.5
Oil refineries	4.1	9.9	3.4	5.2
Rubber and plastic	1.1	2.8	2.1	3.3
Other transport	0.9	2.1	2.0	3.1
Office machinery	1.2	3.0	1.2	1.8
Textile and apparel	0.9	2.1	0.7	1.1

Note: Numbers do not add up because of unreported miscellaneous industries.

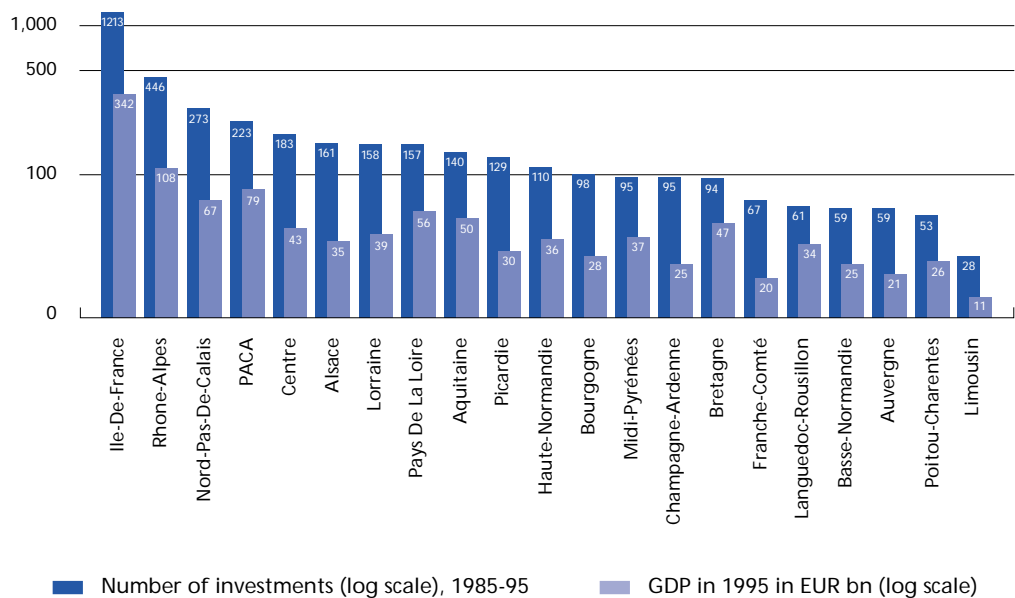
Source: Banque de France (2003).

2.3 Location of inward FDI

Regional market size and home-country distance strongly influence the geographical pattern of FDI in France.

Figure 3 shows the number of FDI investment received by each French region together with the GDP of the region.² While local market size clearly matters for the location of FDI in France, other determinants are important as well. One of them is the distance from the country of origin to the destination region in France – a link we have already seen more generally in Figure 2. To illustrate the point, Figure 4 shows the importance of distance for the location of German FDI in France. It shows a clear negative relationship between the GDP-weighted number of German FDI investments in each French region and the distance to Germany. It is reasonable to hypothesise that the existence of similarities in culture, language, tastes, and distribution networks – to name a few – between regions of a country, on the one hand, and bordering countries on the other hand raises the attractiveness of those regions for investors from these countries. This intuition seems, however, only relevant for very proximate countries. Indeed, while proximity to Switzerland, for instance, might be an advantage for a French region for attracting Swiss investors, this seems most implausible in the case of, say, American investors and French most western regions. The econometric work that follows will confirm that proximity of a region to the home country of the foreign investor is an important determinant of location choice of foreign investors.

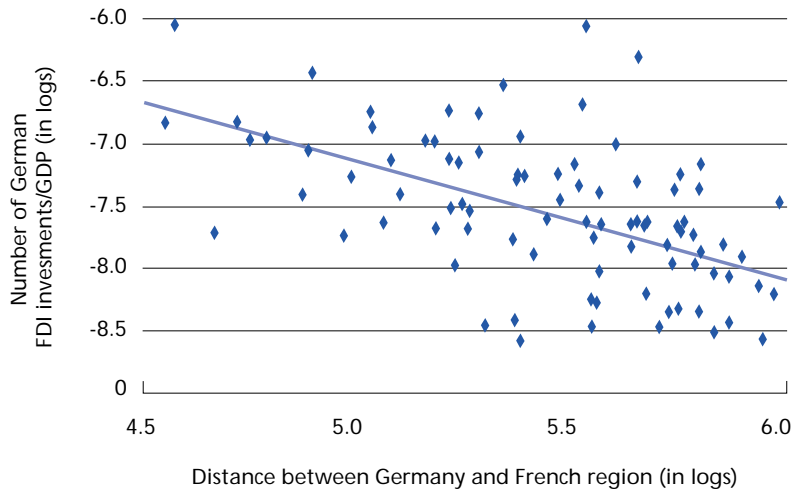
Figure 3. Number of FDI investments in France by region and economic size of regions



Source: French Ministry of Finance.

² We use the NUTS 2 geographical detail level here in order to ease presentation; NUTS 3 level will be used in the econometric analysis.

Figure 4. GDP-weighted number of German FDI investments in French regions vs. distance to Germany



Notes: The line is a fitted regression line (coefficient = -0.96; $R^2 = 0.336$).
Sources: French Ministry of Finance.

3. Determinants of location choice of foreign investors in France

The key question to investigate in this section is: what determines the location choice of a transnational corporation investing in France? To guide and structure the analysis, we will first consider what economic theory suggests with regard to this choice and how to model it empirically. We will then discuss the data used for the empirical analysis before, finally, presenting the empirical results.

3.1 The theory

The determinants of the location choice that economic theory suggests can be broadly grouped in four categories: (1) the demand for the TNC's output in or close to alternative possible locations, (2) the production costs, (3) the intensity of competition, and (4) the public policies designed to influence the choice of location, in particular regional policies. Obviously, the cost of trade between locations will crucially affect the importance of most of these determinants.

Consider first demand: in a perfectly integrated economy with no trade cost, choosing a region rather than another has no effect on the level of demand faced by the TNC. This is because distance and borders, more generally – space, do not matter for trade flows. In these circumstances, alternative locations do not offer different characteristics in terms of demand and, thus, demand does not influence the location choice. At the other extreme, if trade costs are very high, demand is a decisive factor, determining the choice between isolated, quasi-autarkic locations. In practice, trade costs lie somewhere between these extremes, and modelling the influence of demand on the choice of location needs to account for spatial issues that may make a difference between demand in remote locations and demand in highly integrated locations. This is known as the “market potential approach”, initiated by geographers (Harris 1954), rediscovered recently and worked out more formally in theoretical and empirical work by economic geographers (notably Krugman 1992, Hanson 1998, Fujita *et al.* 1999).

Economic theory suggests four key determinants of location choice in a given country: demand, production costs, degree of competition, and investment incentives.

The reasoning is very similar for the intensity of competition faced in each alternative location for a TNC affiliate. In the absence of trade costs, space is meaningless: each firm faces the same level of competition in all locations, and the number of competitors in anyone location is irrelevant for the location choice. With positive trade costs, competition in alternative locations matters. All other things being equal, this means that firms will try to avoid locations with a large number of competitors. This tendency to avoid proximity to competitors has been recognised for a long time in location theory (see Fujita and Thisse 2002 for an overview) and is often called the “market crowding effect”. There is new, overwhelming empirical evidence that space, and distance in particular, still matters a lot in trade flows even in countries as integrated as the United States or France (see, for instance, Wolf 2000 and Combes *et al.* 2003). It is therefore crucial to model demand and competition forces in a correct way, using appropriate market potential and market crowding concepts.

In core regions, positive agglomeration effects mitigate the adverse impact of high labour costs.

Turning to production cost as a determinant of location choice, it is obvious that labour costs are crucial in this respect. The model developed in this paper will control for the cost of labour and other cost factors considered in the literature. For instance, an increasingly popular hypothesis is that TNC affiliates benefit from technological spillovers when locating near other affiliates in the same industry. If such spillovers exist, they can be expected to raise the attractiveness of locations where the number of firms in the same industry is important. A case in point is when proximity to competitors reduces the cost of research and development (R&D) due to the positive knowledge spillovers from neighbouring firms. It is worth noting again that such forces can be at work only if space matters because proximity to knowledge producers is valuable only if knowledge is hard to acquire over space. Distance-related frictions to knowledge transfers have been documented empirically in the literature using notably the location of patents’ citation: Jaffe *et al.* (1993) and Peri (2004) showed that such frictions are large. Knowledge spillovers will therefore push firms to cluster in the same locations. This incentive will counterbalance the aforementioned market crowding effect through which proximity intensifies competition and therefore reduces profits. An additional feature of the market crowding effect and knowledge spillovers is that their intensity might depend upon the nationality of the surrounding competitors. For instance, competition might be tougher between TNCs from the same country due to higher substitutability of the varieties produced. We investigate this possibility in the econometric analysis.

The final set of variables influencing the location choice comprises a plethora of public policies. Indeed, regional policies can take the form of direct production subsidies for targeted regions, as is the case in France with the *Prime d’Aménagement du Territoire* (see below for a description). EU regional policy usually does not take the form of direct subsidies, but indirect subsidies to investors can have a similar effect on the choice of location. In fact, a large share of structural funds is used to finance public transport and communication infrastructure in peripheral areas, which might lead to a reduction in transport and production costs, thus influencing the location choice of foreign investors.

We can now fix ideas more formally. The expected profit of a TNC from locating in region r will be a function of the market potential of that region (mp_r), the number of indigenous and foreign firms in that region and surrounding ones (n_r), and cost components (c_r), consisting of labour costs, in particular, and subsidies granted under

regional policies. Market potential is expected to have a positive impact on profits and, thus, the probability that a specific location will be chosen, while high cost will have a negative influence on that probability. The influence of the number of firms is more complicated and is the result of the aforementioned trade-off between agglomeration and dispersion forces. Papers dealing more formally with theoretical determinants have shown that those factors enter the profit function in a log linear way (see, for instance, Head and Mayer 2004).

Of course, the set of determinants just outlined is not exhaustive and it seems difficult to capture accurately all cost-related variables, for instance. Fortunately, an easy way to deal with this problem, first proposed by Head *et al.* (1995), is to use fixed effects (α_r) for each alternative region r in the location choice set. This ensures that all time-invariant characteristics of a region that make it attractive but are unobserved are nevertheless controlled for (for instance, the difference in skill composition of the labour force and the price of other inputs such as land). All in all, the expected profit of a TNC affiliate a in location r can be described as:

$$(1) \quad \pi_r(a) = \alpha_r + \beta_1 \ln mp_r(a) + \beta_2 \ln_r(a) + \beta_3 \ln c_r(a)$$

The core of the empirical analysis presented below will estimate the influence of proxies for each of the right-hand side variables, using the individual firm location choice decision to estimate the relevant coefficients in equation 1 with logit regressions (see Box 1 for a brief explanation of the logit model). But before discussing the results of these regressions and the data used, some basic exploratory analysis should be helpful.

Equation (1) gives the respective profitability of each French region for a prospective foreign investor in France. This expression is a function of the share of firms in each location. With free entry, the location choices of firms will result in an equalisation of profits over all locations, and the equilibrium share of firms is therefore implicitly defined by setting equation (1) to an equal level (possibly zero) for all locations. The empirical literature then usually invokes the important Helpman and Krugman (1985) simplifications by assuming that there are no technological spillovers, the absence of public policy, and equal production costs. This leads to a very simple linear relationship between the share of firms in a given location (the numbers of firms in region r being denoted by n_r) and its share of demand, which is often approximated by the share of regional GDP in total GDP (GDP of region r being denoted Y_r):

$$(2) \quad \frac{n_r}{\sum_r n_r} = \lambda + \delta \frac{Y_r}{\sum_r Y_r}, \quad \lambda < 0 \text{ and } \delta > 1$$

To illustrate, with only two regions, the underlying theoretical framework predicts that regions of equal size receive equal shares of firms, but that an increase in the share of regional demand in total demand generates a more than proportional increase in the share of firms ($\delta > 1$). We will start our empirical analysis by regressions of this type for all FDI investors in France. This type of simple analysis, however, relies on very restrictive assumptions that make it impossible to estimate more interesting location choice parameters at the individual level. Therefore, we also consider more complex models.

Box 1. Modelling FDI location choice

The basic model

We assume that firms maximise a profit function subject to uncertainty when choosing a location. The profit function consists of a deterministic component and a random component. Equation (1) synthesises the deterministic part, i.e. the attributes influencing the profitability of an affiliate in a particular location. The random component consists of maximisation errors, unobserved characteristics of choices, measurement errors, and unobserved “tastes” of investors for particular locations. The underlying level of profits expected to accrue to an affiliate in each possible region (the variable at the left-hand side of equation (1)) is not observed; what is observed is the actual location choice of each firm for its affiliate and the characteristics of alternative regions. Among a set R ($R = 1, \dots, n$) of possible location sites, location r offers a profit $\Pi_r(a)$ to affiliate a according to observable components of the profit function (described at the right-hand side of equation (1)) and an unobservable error term $\varepsilon_r(a)$:

$$(B1) \quad \Pi_r(a) = \pi_r(a) + \varepsilon_r(a).$$

It is assumed that an investor will choose location r if it yields higher profits than any other possible choice. The probability that affiliate a will be located in region r is thus:

$$P_r(a) = \text{Prob}(\Pi_r(a) > \Pi_j(a) \quad \forall j \neq r).$$

This probability of choosing location r was shown by McFadden (1984) to take the following form under a type I extreme value distribution of the error term:

$$(B2) \quad P_r(a) = \frac{e^{\pi_r(a)}}{\sum_{i \in R} e^{\pi_i(a)}} = \exp [\pi_r(a) - IV_R(a)]$$

where $IV_R(a) = \ln \sum_{i \in R} e^{\pi_i(a)}$ is termed the “inclusive value” for the entire set of regions R . McFadden calls equation (B2) the conditional logit model. The coefficients of the variables on the right-hand side of equation (1), i.e. the equation for $\pi_r(a)$, are estimated by maximising the log-likelihood function associated with equation (B2).

Interpretation of coefficients

There are two ways of interpreting the coefficients in a conditional logit model. First, it is straightforward to show that the estimated coefficients in a conditional logit model closely relate to the elasticity of the probability of a given location being chosen with respect to the considered variable. When all variables are taken in logs, as is the case here, the elasticity of the probability

of choosing region j is $E_j = \frac{\partial \ln P_j}{\partial \ln X_j} = \beta (1 - P_j)$, with β the coefficients obtained on the

explanatory variables X . Hence, $\beta = \frac{E_j}{1 - P_j}$. On average, the probability of choosing location

j is $1/n$. When the number of locations in the choice set is large, each coefficient in β is thus a slight overestimate of the average “direct” elasticity. The elasticity interpretation of those coefficients

is useful because one can compare the effects of, say, a 10-percent rise in each of the variables on the probability of location choice. However, this method does not tell us whether a 10-percent rise occurs frequently for each of the variables in the sample under consideration. It is therefore also instructive to gauge the impact of a one-standard-deviation change in the average of each variable in X . Consider a hypothetical region that would have the average level of variable X in the sample. Suppose further that we want to assess the impact of a one-standard-deviation rise in this variable. To keep matters simple, suppose that the increase in X comes from a redistribution of that variable across locations such that the inclusive values IV remain constant. Then, denoting \bar{P}_j and \bar{P}'_j the respective initial and post-reallocation probabilities of choosing region j , we obtain:

$$\frac{\bar{P}'_j}{\bar{P}_j} = \exp(\beta[\ln(\text{mean}(X_j) + \text{stdev}(X_j)) - \ln(\text{mean}(X_j))]) = [1 + cv(X_j)]^\beta,$$

where $cv(X_j) = \text{stdev}(X_j)/\text{mean}(X_j)$ is the coefficient of variation of variable X , which can be easily calculated.

Nested model

An important feature of the conditional logit model apparent in equation (B2) is the independence of irrelevant alternatives (IIA), which implies that the probability of choosing one location relative to the probability of choosing another is independent of the characteristics of a third location. To put it differently, locations in one group should not be more substitutable with or without the inclusion of locations in another group. This is most likely not to be verified in samples with a large number of small alternative locations as in our sample. McFadden has provided a solution to this issue with the nested logit model, which separates choices in different sets within which IIA is supposed to hold. The researcher has to first define those sets, and then estimate the model taking into account the nested nature of the choice tree. A natural concern in our case is whether substitutability is not largely determined by an upper level choice between the Paris region (including Paris and its surrounding regions) and the rest of the country. More formally, let R now denote the set of N locations in France excluding Paris. Note $\pi_R(a)$ the part of the profit function that does not vary across regions inside R , and $\pi_r(a)$ the part of the profit function which may vary across the $r \in R$ regions. The probability that affiliate a chooses region r is equal to the probability that a chooses not to be in the Paris region times the conditional probability that a chooses r (given that a chooses among regions in R); it can now be written as:

$$(B3) P_r(a) = P_{r|R}(a)P_R(a) = \frac{e^{\pi_r(a)/\lambda}}{e^{IV_R(a)}} \frac{e^{\pi_R(a)+\lambda IV_R(a)}}{\sum_{R=1}^N e^{\pi_R(a)+\lambda IV_R(a)}} \exp\left[\frac{\pi_r(a)}{\lambda} + \pi_R(a) - (1-\lambda)IV_r(a) - IV^*(a)\right],$$

with $IV^*(a) = \ln \sum_{R=1}^N e^{\pi_R(a)+\lambda IV_R}$. Parameter λ measures the degree of independence in

unobserved profitability among the alternatives in each nest. Its estimate should be between 0 and 1, with a value of one yielding full independence in the error terms associated with regions of each nest and, in this case, a collapse of the nested logit model to the simple conditional logit model (B2). For more details on this type of econometric modelling see Train (2003).

3.2 The data

To study location choices of TNCs investing in France, this paper essentially uses the same data as Crozet *et al.* (2004). Box 2 sets out key features of the database. Suffice it to note here that our final sample contains 3,902 (partly) foreign-owned affiliates in 92 regions of France and more than 200 manufacturing industries. In what follows, we describe data concerning the variables that enter the right-hand side of equation (1).

Box 2. Data on foreign-owned affiliates in France

Our database contains information on the location choice of foreign-owned affiliates in all French regions, the nationality of shareholders of the affiliate, date of investment, and type of industry. In fact, it is even possible to know the city where the affiliate is located, but it is very difficult to get data for explanatory variables at this level of detail. In addition, the number of alternative locations in the logit model would then cause computational problems. Even with modern computing power, logit estimation at the regional level is not trivial once location-specific fixed effects are included. The sample used for the logit regressions hence includes only 92 regions. The main source of information comes from *the Direction du Trésor*, a division of the French Ministry of Finance. The 1996 version of the database is used. The sample is restricted to investments that took place from 1985 to 1995, mainly because of data limitations concerning the right-hand side variables of equation (1). Moreover, the sample is restricted to manufacturing firms excluding food industries, again because of lack of data on the explanatory variables for this industry. For each firm, the database reports the nationality of shareholders and the share of capital owned. Those shares are summed by country of origin, and only the firms for which investors of a single foreign country hold more than 10 percent of capital are kept in the sample. The firm is then fully attributed to the first country of ownership in terms of nationality of investors. At this stage, only the location of the French headquarters of the firm is known. This is an important issue because many headquarters are in Paris or its immediate neighbouring regions, whereas the actual production takes place in one or several establishments owned by the firm but located in another part of France. Using the official identification number of the firm, it is however possible to search for the producing units belonging to each foreign-owned firm and obtain the precise regions where they are located. This procedure uses a different database made available by the French Ministry of Industry. The final database incorporates all producing units owned by foreign-owned firms. To focus on greenfield investment, which have presumably different location determinants than mergers and acquisitions, we restrict the sample to producing units that were set up during or following the year the FDI was recorded. A producing unit is assumed to exist as from the first year the Ministry of Industry reports its activity. The final sample contains 3,902 greenfield affiliates in 92 regions of France and more than 200 manufacturing industries.

To start with demand and production cost, we use the following proxy for the market potential of region r :

$$(3) \quad mp_r = GDP_r + \sum_{s \neq r} \left[\frac{GDP_s}{d_{rs}} \right],$$

where d_{rs} is the distance between region r and region s . The source of the regional GDP data is REGIO, the Eurostat regional database. This variable is, of course, only a proxy for the real demand perceived by firms. Another important simplification is that it omits

foreign demand, thus reflecting the implicit assumption that FDI in France is mostly market seeking rather than export oriented. This assumption seems reasonable for a large proportion of the industries in the sample, and the results seem to confirm this intuition. The proxy for production costs is the average annual wage per worker at the region and 4-digit industry level. This is calculated using data on producing units operating in each region, dividing the overall wage bill of the industry in the region by the total number of workers. This is again admittedly an imprecise proxy for overall production costs faced by foreign investors in each location. Nevertheless, the econometric work includes estimations of models with fixed effects for each region. Those fixed effects will capture the attractiveness of each location to the average investor, therefore accounting for all characteristics with little variance over time, such as the average skill level of the local labour force or the price of land. The omitted production costs variables will therefore be at least partly captured by those fixed effects. The same argument holds for omitted elements of perceived demand. The expected sign of the coefficient of the market potential variable is positive while that of the production cost variable is negative.

Regarding the clustering of firms in a region and, thus, the possible impact of competition and knowledge spillovers on the choice of location, we follow Head *et al.* (1995). Specifically, we calculate the number of firms belonging to the same industry – but not owned by the same parent company – and located in each region a year before the considered investment. As noted above, there are good reasons to believe that the underlying theoretical determinants of the location choice (competition and spillovers) vary according to the nationality of the firms involved in the calculation of those variables. From the perspective of a TNC choosing a location for its affiliate, three groups of firms can be distinguished: (i) firms in the region that are owned by foreign direct investors from the same home country as the said TNC, (ii) firms in the region that are owned by foreign direct investors from countries other than the country of the said TNC, and (iii) firms in the region that are owned by French investors. There will therefore be three counts of firm variables representing n_r in equation (1): n_r^h , n_r^o , and n_r^f . But to properly account for competition and possible knowledge spillovers, we have to do more than simply counting the number of firms in a particular region. We also need to account for the number of firms in other regions and the distance between these regions and the region that the TNC considers a possible location. In addition, we need to model that competition forces and the scope for spillovers fall with distance. All in all, the following functional form for n_r^h , n_r^o , and n_r^f is chosen:

The degree to which competition and spillovers affect the location choice of a foreign firm is likely to depend on the nationality of other firms in a possible location.

$$n_r^h = \text{number of firms in region } r \text{ owned by foreign investors from the same home country} + \sum_{S \neq r} \text{number of firms in region } s \text{ owned by foreign investors from the same home country}/d_{rs}$$

$$n_r^o = \text{number of firms in region } r \text{ owned by foreign investors not from the same home country} + \sum_{S \neq r} \text{number of firms in region } s \text{ owned by foreign investors not from the same home country}/d_{rs}$$

$$n_r^f = \text{number of firms in region } r \text{ owned by French investors} + \sum_{S \neq r} \text{number of firms in region } s \text{ owned by French investors}/d_{rs}$$

For each of those variables, the sign and magnitude of the coefficient depends on the relative strengths of the competition effect and knowledge spillovers.

Regional policy has been high on the political agenda in France for a long time. The econometric analysis presented here accounts for national and EU support for lagging regions.

This finally takes us to the discussion of regional policies. There are two types of regional policy instruments used in the empirical analysis that follows. First, the subsidies given by the national government and, second, the funds granted by the European Commission for economically less developed regions (structural funds). Regional policy has been ranking high on the political agenda in France for a long time, and several instruments have been used with the objective of promoting the redistribution of economic activity in favour of lagging regions in general and diverting activity from the region around Paris in particular. The main instrument of regional policy used by the French government is called the *Prime d'Aménagement du Territoire* (PAT) and mostly consists of labour related grants for creating or maintaining jobs in lagging regions, which are home to about one-third of the French population. Both French and foreign investments are eligible for these grants. In practice, roughly half the annual funding goes to foreign investors. To be eligible, investors must, at present, create at least 15 jobs and invest at least EUR 2.3 million. The top subsidy rate on the initial investment is 23 percent for large firms and 33 percent for small and medium-sized enterprises, with a ceiling of EUR 8 million and EUR 11 million, respectively. It should be noted that state aid is subject to EU competition rules, and investment subsidies are in general forbidden unless they aim at promoting regional development. The scope for investment subsidies in the context of regional development policies has been streamlined over time, notably in 1998 when both the spatial coverage and subsidy rate of the PAT was reduced. Nevertheless, PAT remains an important instrument directly aiming at attracting productive investment, FDI in particular, to less developed regions. The amount of PAT received by all companies in a region, in the year the investment took place, is introduced in the estimated equation. The data comes from annual reports of DATAR,³ the official body in charge of regional policy in France.

Some French regions are also eligible for structural funds of the European Commission. This policy involves grants – sometimes used directly to attract FDI, but most of the time more generally granted in the context of larger projects intended to improve economic conditions, with an expected indirect effect on attractiveness of grant-receiving regions. Structural funds are used, in particular, to improve or create ambitious transport infrastructure. In the period considered in this paper, structural funds were available for three objectives. Objective 1 aimed at promoting the development and structural adjustment in lagging regions (defined as those with a GDP per capita below 75 percent of the EU average). No French region considered in this paper was an Objective-1 region given that we have not included Corsica or overseas regions. Objective 2 (OBJ2) aimed at promoting the conversion of areas affected by industrial decline. Objective 5 (more precisely OBJ5B) aimed at promoting the development of rural areas. There were numerous French regions receiving grants under the latter two objectives, but the two main beneficiaries were Nord-Pas-de-Calais and Lorraine. In the empirical analysis, we also take into account funds provided under “Community Initiatives” (HOBJ). The corresponding variables are the grants given to each region, labelled OBJ2, OBJ5B, and HOBJ, respectively, in the econometric analysis and subsequent tables. All three variables

³ *Délégation à l'aménagement du territoire et à l'action régionale.*

are expected to have a positive impact on location choice. Interestingly enough, the data published by the European Commission are rather scarce. Data on grants by Objective and region in France are available for 1989, 1990-91, and 1994-95. It is important to bear in mind that these years include the period 1989-1991 when FDI in France was at its peak.⁴ Overall, the number of observations is sufficiently high to enable reliable estimations.⁵

3.3 The empirical evidence

We start with an empirical analysis of equation (2), which – to recall – simply looks at the possible impact of the market size of a region (right-hand side of the equation) on the relative number of foreign affiliates in a region. More precisely, the share of foreign affiliates in a region in the total number of foreign firms in all regions is regressed on the share of regional GDP; all this is done on the basis of 1995 data. Most “new trade theory” models suggest a relationship between the share of foreign affiliates and the share of regional GDP that can be pictured as a kinked curve with two flat parts at both ends. This means that if regional GDP is below a certain threshold, the region is too small in terms of regional demand to attract any foreign affiliates. Conversely, if the regional market size (relative to the national market) exceeds an upper bound, this region attracts all foreign affiliates. For regional market shares that fall between the two bounds, any increase in the regional market share is expected to concur with a gradual increase in the share of foreign affiliates, and *vice versa*.

The kinked curve with flat parts at each end corresponds to a censoring of the data. If the industry classification is sufficiently detailed and the number of alternative locations is sufficiently high, there will be a large number of observations with no affiliate despite positive demand in the region. As a consequence, ordinary-least-square (OLS) regression would yield downward biased estimates of the slope parameter. By contrast, a Tobit regression accounts for the fact that there will be no affiliates in some regions and yields unbiased estimates. Our Tobit regression estimate for δ in equation (2) is 2.5, with a standard error of 0.11. Therefore, the coefficient showing the effect of market size on the share of foreign affiliates in the total number of firms in a region has the expected sign and is highly significant.⁶ Hence, in line with theoretical reasoning, we find a strong relationship between market size and the number of foreign affiliates.

The Tobit regression shows the importance of one specific determinant of location choice, namely market size. Its appeal stems from the simplicity of the approach. However, the simplifying assumptions underlying this regression are an important drawback. Therefore, we now turn to a more complex model that takes into account more factors. Moreover, we will use information at firm level instead of aggregates at regional level.

The empirical analysis supports a priori reasoning: regional market size and the number of foreign firms in a region are positively correlated.

4 More specifically, the number of investment decisions was 247 in 1985 (i.e. the first year considered here), peaked at 533 in 1989, and amounted to 408 in 1995 (i.e. the last year included in our sample).

5 It should be added that for all EU regional subsidies, data are only available at the NUTS-2 level, while regions are defined at the NUTS-3 finer spatial level of aggregation. This means that the variable used to report structural funds in region r also shows structural funds of neighbouring regions. Unfortunately there is no way of correcting this measurement error.

6 The results are based on a sample of 7,452 observations, covering 81 different manufacturing industries in France. R^2 of the regression is 0.26.

The models that we now apply – they have been explained in detail in Box 1 – are logit regressions that measure the impact of the determinants of location choice of foreign investors in France; these determinants have been introduced in section 3.2. We start with Table 3, which presents results for the conditional logit regression, whereas the results for the nested logit regression will be discussed later in this section.

Table 3. Conditional logit regression estimates of location model

Model specification	1	2	3	4	5	6
Market potential	0.35***	0.44***	0.46***	2.83***	2.84***	0.62
Wage	-0.43***	-0.24**	-0.58***	-0.16	-0.16	-0.38***
Distance	-0.75***	-0.71***	-0.64***	-0.78***	-0.78***	-0.69***
Number of home country firms (n_r^h)	0.22***	0.23***	0.12	0.27***	0.27***	0.20**
Number of other foreign firms (n_r^o)	0.35***	0.34***	0.41***	0.47***	0.47***	0.53***
Number of French firms (n_r^f)	0.89***	0.89***	0.88***	1.03***	1.03***	1.01***
PAT		0.03***			0.00	
Objective-2 funds (OBJ2)			0.00			0.00
Objective-5b funds (OBJ5B)			0.01			0.00
Community initiatives' funds (HOBJ)			0.02**			0.00
Number of observations	3,902	3,902	2,044	3,902	3,902	2,044
Fixed effects for regions (NUTS3 level)	No	No	No	Yes	Yes	Yes
Pseudo R-sq	0.16	0.17	0.17	0.19	0.19	0.19

Notes: (i) all explanatory variables are in logs; (ii) *** (**) [*] indicates that the coefficient is significant at the 1% (5%) [10%] confidence level; (iii) columns (1) to (3) do not include fixed effects for each region, while the other columns do; (iv) columns (3) and (6) exclude investments in years for which EU funds data are missing (1985-88 and 1992-93).

The empirical results point to a negative impact of wage costs and home-country distance on the regional location choice of foreign direct investors in France...

The conditional logit results shown in Table 3 reveal that all coefficients on market potential (row 1) and costs determinants (row 2) have the expected signs. The estimations in column 1 yield a significantly positive influence of market potential, a significantly negative influence of wages, and a significantly negative impact of distance to the home country on the choice of a TNC to locate in a particular region. As stated in Box 1, the coefficients are very close approximations to elasticities of the probability of choosing a location with respect to a change in the underlying explanatory variable. For instance, the parameter estimate of -0.43 corresponding to the wage variable (expressed in logs) in column 1 means that a 10 percent increase in the wage of a region reduces the probability of the region being chosen by around 4 percent.

Moving on to the number of competitors (rows 3 to 6), Table 3 presents for virtually all cases large positive and highly significant coefficients for each of the three variables. This means that, on average, centripetal forces dominate centrifugal forces, and this finding can be interpreted as revealing the importance of spillovers both between foreign affiliates and between foreign affiliates and local firms. It is noteworthy that the agglomeration effect revealed by the size of the coefficients is much higher for French firms than for foreign firms, and this is true irrespective of whether foreign firms are from the same or another country as the TNC considering the location choice. The sign and

magnitude of the coefficient on each of those variables is the result of a trade off between competition strengthening (which in itself has a negative influence) and knowledge spillovers resulting from spatial proximity. The results thus suggest that competition faced by a foreign investor in France is more intense with other foreign firms than with French firms. Another explanation is that the benefits from clustering taking the form of informal communication or inter-firm mobility of skilled workers are substantially larger between foreign-owned and French firms than among foreign-owned firms. The strong attraction of locations with a high concentration of French firms in the industry can also result from informational externalities. If, as is likely, French firms are better informed than foreign companies on the “true” comparative attractiveness of French regions, their choice of location conveys more information than the choice of foreign firms to the prospective investor. As a consequence, foreign investors should try to replicate French firms’ choices rather than those made by other TNCs, which might not have any better information than a TNC in the process of deciding where to locate in France. But there is a counter-argument to this observation if the characteristics that make a location attractive deteriorate over time. If a location becomes less attractive relative to other regions, it is quite likely that installed firms will not move immediately because of the sunk cost they have incurred in setting up production facilities and because of other sources of rigidity, such as migration costs of the workers currently employed. The spatial distribution of French firms will reflect this inertia. More generally, the location of French firms is more influenced by past regional characteristics than the location of foreign firms, simply because the latter have chosen their location more recently.

... and they also suggest that foreign investors are attracted by the presence of other firms in the location, with the presence of French firms being more important than the presence of other foreign firms.

Turning to the impact of regional policies (columns 2 and 3 in Table 3), a key feature of the results is the low value and weak significance of the regional policy variables. Only PAT and Community Initiatives funding are statistically significant, but the coefficients of these policy variables are considerably lower than the coefficients on non-policy related variables. For instance, the coefficient on PAT in column 2 indicates that it requires a doubling of the support for a region to increase by 3 percent the probability of being chosen by TNCs. For comparison, the same increase in the probability would result from a 10-percent rise in the number of foreign firms. These results cast considerable doubt on the scope for regional policy to actually change the location patterns of FDI. However, to be more complete, one has to take into account the respective variance of all variables, because it is possible that, in the sample, a doubling of PAT support is more frequent than a 10-percent rise in the number of foreign firms in a location. As described in Box 1, it is natural to ask how a one-standard-deviation increase of an explanatory variable would increase the probability of a region being chosen.

The answer to this question is shown in the last column of Table 4, which also gives summary statistics and repeats (from columns 2 and 3, respectively, of Table 3) estimated coefficients for each variable. The last column clearly shows that the overwhelming determinant of location choice of foreign firms in France is the location of existing French firms. Market potential is also an important motivation for choosing a region, as well as distance to the home country. The location of competitors from the same home country has a relatively small influence given the very small variance in the number of home country firms. Although wages and regional policies are significant statistically, they have only a marginal impact on the choice of location.

Table 4. Summary statistics and impact of a one-standard-deviation increase in explanatory variables on the probability of choosing a particular location

Variable (in logs)	Summary statistics				Change in probability (in %)
	Mean value	Std. deviation	Coefficient of variation	Estimated coefficient	
Market potential	13,713	14,603	1.13	0.44	39
Wage	125	34	0.07	-0.24	-2
Distance	948	1,141	1.45	-0.71	-47
Number of other foreign firms	1.6	1.6	1.03	0.34	27
Number of home country firms	1.1	0.4	0.13	0.23	3
Number of French firms	5.8	17.4	9.10	0.89	683
PAT	32,335	50,272	2.42	0.03	4
Objective 2 funds (OBJ2)	6,698	9,738	2.11	0.00	0
Objective 5 funds (OBJ5B)	3,596	4,580	1.62	0.01	1
Community initiatives funds (HOBJ)	1,719	2,934	2.91	0.02	3

Notes: The column "Estimated coefficient" shows the figures from column 2 of Table 3, except for EU regional support variables, which are taken from column 3 of Table 3.

The empirical results provide no evidence for an important effect of regional policies on the location choice of foreign direct investors in France ...

Regarding the regional policy variables, the main finding so far is that both the underlying regression coefficients and the increase in the probability of a region being chosen as a result of a one-standard-deviation increase in the regional policy variables are small. But is it possible that reverse causality explains this result? The reasoning could be as follows: economically depressed regions receive funding because they fail to attract economic activity in general and FDI in particular. If the regional policies are triggered by a lack of FDI in a region, the econometric analysis could even find a negative relationship between FDI and regional support. While this concern is important in cross-section analyses, it is still true that – all other things being equal – an increase in PAT and EU structural funds is expected to attract foreign investors. With our panel data, which includes both cross-section and time-series data, we can control for time-invariant unobserved characteristics of each region by including fixed effects. All characteristics that do not evolve over time, or evolve only slowly, like the skill composition of the labour force and GDP per capita, are then controlled for. For all remaining variables in the estimation, the coefficients therefore mainly show the impact of a change in these variables over time.⁷ Columns 4 to 6 in Table 3 show these fixed-effects estimates. The main point to learn here is that the regional policy variables remain economically and statistically insignificant and, hence, for our sample, the reverse causality argument is unlikely to explain the result that a rise in grants given to a poor region in France does not attract foreign investors.

⁷ This is true provided that these variables actually change sufficiently over time.

But there remains another reason why the results developed so far may fail to show an impact of regional policies: if investors consider, for a variety of reasons, the Ile-de-France (Paris) region a particularly attractive location (as Figure 3 suggests), the simple conditional logit estimates shown in Tables 3 and 4 could be biased.⁸ To address this problem, we conduct nested logit regression analyses. The nested logit regression analysis divides the location choice in two steps: an upper-level choice, where the Paris region is distinguished from the rest of France, and a lower-level choice, where the choice of regions inside each nest (i.e. all regions except the Paris region) is considered. In essence, nested logit estimates show the influence of each explanatory variable inside a tree structure, where the first choice is the Paris region vs. the rest of France and the second choice is between regions outside the Paris region. As set out in Box 1, making this distinction is important if there are reasons to believe that the probability of choosing one region (rather than another) depends on the classification of nests. The role of the Paris region in the economic and political geography of France makes such a distinction particularly relevant. Indeed, Paris is the richest French region and is therefore systematically excluded from all regional policy funding (except for special recent European programmes for some suburban cities surrounding Paris). The fact that subsidies do not succeed in luring FDI away from the Paris region does not necessarily mean that regional policies completely fail in meeting their objectives. Most important, they might be effective in directing FDI towards the poorest areas within the non-Paris group of regions. But are they?

... even when econometrically accounting for the particular attraction of the Paris region as a possible destination of foreign direct investment.

Table 5. Nested logit regression estimates of the location model

Model specification	1	2	3	4
Market potential	0.31***	0.31***	1.79**	1.76**
Wage	-0.01	-0.01	-0.07	-0.07
Distance	-0.61***	-0.61***	-0.74***	-0.74***
Number of home country firms (n_r^h)	0.15*	0.15*	0.21***	0.21***
Number of other foreign firms (n_r^o)	0.48***	0.48***	0.52***	0.52***
Number of French firms (n_r^f)	1.20***	1.20***	1.25***	1.25***
PAT		0.00		-0.01
Number of observations	235,580	235,580	235,580	235,580
Fixed effects for regions (NUTS3 level)	No	No	Yes	Yes
Pseudo R-sq	0.16	0.16	0.17	0.17

Notes: (i) all explanatory variables are in logs; (ii) *** (**) [*] indicates that the coefficient is significant at the 1% (5%) [10%] confidence level; (iii) columns (1) and (2) do not include fixed effects for each region, while the other columns do; (iv) the number of observations is determined by the number of options to choose from (*départements*) and the number of affiliates that choose. In the sample, there are 3,902 affiliates that can choose among 92 *départements*. Out of those 3,902 affiliates, 1,213 chose to locate in one of the 8 *Ile-de-France départements* (yielding 9,704 observations) and 2,689 chose to locate in the 84 remaining *départements* in France (yielding 225,876 observations).

⁸ In the terminology of the model described in Box 1: the assumption of independence of irrelevant alternatives (IIA) does not hold.

The results of the nested logit regressions summarised in Table 5 leave considerable doubt. Columns 2 and 4 include PAT, i.e. the national regional policy variable.⁹ PAT is not a significant determinant of location choice when considering the nest of regions comprising the whole of France, except for the Paris region. Furthermore, compared to the conditional logit regression, wages completely lose statistical significance. This underlines that wage differences are only relevant for the investors when comparing Paris with the rest of France. This is very intuitive given the wide wage gap between the two nests. Moreover, agglomeration variables (n_r^h , n_r^o , n_r^f) and market size dominate the location choice inside each nest, and these findings are robust to the inclusion of fixed effects (column 4 in Table 5).

The lack of empirical evidence for a positive effect of regional support on the location choice of foreign direct investors is disappointing from a regional policy viewpoint.

To summarise our empirical findings, we note that regional support – whether from the European Commission or the French government – does not seem to have an impact on where foreign direct investors invest in France. These results are particularly disappointing from the perspective of PAT support because it has the sole objective of attracting firms to economically less developed regions. EU structural funds, by contrast, pursue broader and more long-term regional development objectives. To account for the long-term aspect of structural funds, one can try to assess the influence of past regional policy on present location choices. Over an extended period of time, structural funds might improve the attractiveness of a targeted region and investors might eventually be enticed to locate in this region. Given this possibility, we have also estimated the impact of the cumulated funds received by French regions in 1989-91 on the location choices by TNCs in 1992-95. The results (not reported here) are strikingly similar to those discussed above. The regression coefficients on structural funds are almost never significant, and when they are, they enter with a negative sign.

4. Conclusion

France is highly successful in attracting inward FDI. Relatively little is known about what determines the distribution of FDI across different French regions. Do the investments cluster in specific regions? Is the Paris region as dominant in FDI attraction as it is in other economic activities? Does proximity to a foreign country make a region more attractive for FDI from that country? Are regional policies effective in influencing the location of production units within France?

Reflecting these questions, this paper has analysed the factors that determine where foreign investors in France locate and why. Most important, the paper has tried to assess the impact of French and European regional policies on the location of greenfield investments of transnational corporations in France. One of our main empirical findings suggests rather disappointing conclusions from the viewpoint of regional policies: national and EU support, including regional investment grants, does not influence the location choice of TNCs. By contrast, economies of agglomeration seem to be very important, and

⁹ Table 5 reports only the results for the French regional policy variable, i.e. PAT, for which data are available for all years and which showed the highest (although weak) influence on location choice in Tables 3 and 4. Results with European funds, not reported here, are very similar.

we observe, in particular, that foreign investors have a very strong tendency to follow the location choices of French firms in the same industry.

Obviously, our empirical findings are influenced by the availability and quality of the underlying data. At present, it still seems difficult to obtain information on public grants over a large number of years and for a reasonable number of regions defined at a sufficiently detailed geographical level. And then, the findings for France may not necessarily apply to other countries. Overall, there is thus scope for fruitful research in the years to come.

References

- Baldwin, R., Forslid, R., Martin, P., Ottaviano, G. and Robert-Nicoud, F. (2003). *Public policies and economic geography*. Princeton University Press, Princeton, USA.
- Banque de France (2003). "Le stock des investissements directs étrangers en France au 31 décembre 2001", *Bulletin de la Banque de France* No. 115.
- Banque de France (2004). "Flux et stocks d'investissements directs, comparaisons internationales". Preliminary estimates from *Bulletin de la Banque de France* (forthcoming).
- Boldrin, M. and Canova, F. (2001). "Inequality and convergence in Europe's regions: reconsidering European regional policies." *Economic Policy Review*, (32), pp. 205–253.
- Combes, P.P., Lafourcade, M. and Mayer, T. (2003). "Can business and social network explain the border puzzle?". CEPR Discussion Paper No. 3750.
- Crozet M., Mayer, T. and Mucchielli, J.-L. (2004). "How do firms agglomerate? A study of FDI in France". *Regional Science and Urban Economics*, (34:1). pp 27-54
- Devereux, M. and Griffith, R. (1998). "Taxes and the location of production: evidence from a panel of US multinationals". *Journal of Public Economic*, (68:3), pp. 335-367.
- Disdier, A.-C. and Head, K. (2003). "Exaggerated reports of the death of distance: lessons from a meta-analysis". University of British Columbia mimeo.
- Ferrer, C. (1998). "Patterns and determinants of location decisions by French multinationals in European regions", in Mucchielli, J.-L. (ed.), *Multinational location strategy: economics, geography, management and policy*, JAI Press, Greenwich, Connecticut, USA.
- Fujita, M., Krugman, P. and Venables, A. (1999). *The spatial economy: cities, regions, and international trade*, MIT Press, Cambridge, UK.
- Fujita, M., and Thisse, J.-F. (2002). *Economics of agglomeration; cities, industrial location and regional growth*, Cambridge University Press, Cambridge, UK.
- Hanson, G. (1998). "Market potential, increasing returns, and geographic concentration". NBER Working Paper No. 6429.
- Harris, C. (1954). "The market as a factor in the localization of industry in the United States". *Annals of the Association of American Geographers*, (64), pp. 315–348.
- Head, K. and Mayer, T. (2004). "The empirics of agglomeration and trade." *Handbook of Regional and Urban Economics*, (4). Forthcoming.
- Head, K., Ries, J. and Swenson, D. (1995). "Agglomeration benefits and location choice: evidence from Japanese manufacturing investment in the United States". *Journal of International Economics*, (38), pp. 223-247.
- Head K., Ries, J. and Swenson, D. (1999). "Attracting foreign manufacturing: investment promotion and agglomeration". *Regional Science and Urban Economics*, (29), pp. 197-218.
- Helpman, E. and Krugman, P. (1985). *Market structure and foreign trade*, MIT Press, Cambridge, UK.
- Jaffe, A.B., Trajtenberg, M., Henderson, R. (1993). "Geographic localization of knowledge spillovers as evidenced by patent citations". *Quarterly Journal of Economics*, (108:3), pp. 577-598.

- Krugman, P. (1992). "A dynamic spatial model". NBER Working Paper No. 4219.
- McFadden, D. (1984). "Econometric analysis of qualitative response models". *Handbook of Econometrics* (2).
- Martin P. (1998). "Can regional policies affect growth and geography in Europe?". *World Economy*, (21:6), pp. 757-774.
- Midelfart, K-H. and Overman, H. (2002). "Delocation and European integration: is structural spending justified?" *Economic Policy Review*, (35), pp.321-359.
- Mooij, R.A. and Ederveen, S. (2001). "Taxation and foreign direct investment. A synthesis of empirical research". CPB Discussion Paper No. 003.
- Peri, G. (2004). "Determinants of knowledge flows and their effects on innovation" mimeo UC Davis.
- Roberto B. (2004). "Acquisition versus greenfield investment: the location of foreign manufacturers in Italy". *Regional Science and Urban Economics*, (34:1), pp 2-25.
- Stein, E. and Daude, C. (2001) "Institutions, integration and the location of foreign direct investment". Inter-American Development Bank mimeo.
- Train, K. (2003). *Discrete choice methods with simulation*, Cambridge University Press, Cambridge, UK.
- UNCTAD (2003). *World Investment Report*, United Nations, Geneva, Switzerland.
- Wei, S-J. (2000). "How taxing is corruption on international investors ?" *Review of Economics and Statistics*, (82:1), pp. 1-11.
- Wolf, H.C. (2000). "Intranational home bias in trade". *Review of Economics and Statistics*, (82:4), pp. 555-563.