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Agglomeration Effects and the Location of Foreign Direct Investment – Evidence from French First-time Movers

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Vivien Procher

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Evidence from French First-time Movers

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Universität Duisburg-Essen, Department of Economics
Universitätsstraße 12, 45117 Essen, Germany

Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI)
Hohenzollernstr. 1/3, 45128 Essen, Germany

Editors:

Prof. Dr. Thomas K. Bauer
RUB, Department of Economics
Empirical Economics
Phone: +49 (0) 234/3 22 83 41, e-mail: thomas.bauer@rub.de

Prof. Dr. Wolfgang Leininger
Technische Universität Dortmund, Department of Economic and Social Sciences
Economics – Microeconomics
Phone: +49 (0) 231 /7 55-32 97, email: W.Leininger@wiso.uni-dortmund.de

Prof. Dr. Volker Clausen
University of Duisburg-Essen, Department of Economics
International Economics
Phone: +49 (0) 201/1 83-36 55, e-mail: vclausen@vwl.uni-due.de

Prof. Dr. Christoph M. Schmidt
RWI
Phone: +49 (0) 201/81 49-227, e-mail: christoph.schmidt@rwi-essen.de

Editorial Office:

Joachim Schmidt
RWI, Phone: +49 (0) 201/81 49-292, e-mail: joachim.schmidt@rwi-essen.de

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Vivien Procher*

Agglomeration Effects and the Location of Foreign Direct Investment – Evidence from French First-time Movers

Abstract
This paper analyzes the location choice determinants of French first-time investments in Europe, North America and North Africa. Firm locations are examined on two geographical scales, the national and regional level. The final sample comprises 307 location decisions in 27 countries and across 45 regions. Both, location- and firm-specific variables are used for analysing the investment strategy of French firms. The results show that higher market demand and cultural proximity to France increase the likelihood of a particular location to be chosen, whereas higher labour cost and a larger distance between a foreign location and the headquarters deter FDI investments. Manufacturing and older companies are more likely to establish their first subsidiary in Eastern Europe. Furthermore, this study examines the extent to which French investors choose foreign locations that already host a significant number of French firms. The results obtained from regressions with various absolute and relative agglomeration measures suggest that French investors are rather attracted by firm cluster in general, or by the unobserved factors that led to the agglomeration in the first place, than by any nation-specific firm cluster.

JEL Classification: F21, F23, D21, R30

Keywords: Foreign direct investment, location choices, agglomeration, small- and medium-sized enterprises

March 2009

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* RGS Econ and RWI. – The author is grateful to Dirk Engel and Christoph M. Schmidt for their support and valuable comments. – All correspondence to Vivien Procher, Ruhr Graduate School in Economics, c/o RWI, Hohenzollernstr. 1-3, 45128 Essen, Germany, e-mail: vivien.procher@rwi-essen.de.

1. Introduction

With some 81%, Western European countries were the major recipients of French foreign direct investment (FDI) in 2003, followed by North America with approximately 15% (UNCTAD 2005). In contrast, emerging economies in Central and Eastern Europe (CEE) only received 3% of French FDI despite the on-going Eastern enlargement of the European Union. Hence, the French case not only illustrates that the globalization of production processes is associated with a concentration of FDI in particular countries and regions from the perspective of FDI recipients. From the perspective of the firms engaging in FDI, it also seems to be the case that they sort into emerging clusters abroad according to nationalities – French firms tend to go where other French firms have located before, and the same seems to hold for other nations.

Recent economic research on regional science and location choices might be able to provide rational explanations for these phenomena. In particular, the New Economic Geography (NEG) literature (Krugman 1991 and Fujita et al. 1999) tries to explain spatial clusters of economic activity by the interplay between companies' trade cost and scale economies. Meanwhile, agglomeration effects have received attention in many economic areas and their importance as determinants for FDI location choices has been widely acknowledged. In empirical applications, their exact interpretation remains difficult, however, as agglomeration effects are comprised of location-specific factors (e.g. market demand) and industry-specific factors (e.g. input-output linkages). Both factors are often correlated and may even reinforce each other over time so that they become empirically even harder to disentangle. The empirical analysis of agglomeration effects is complicated further by the importance of additional factors which are not captured by standard economic factors such as regional per capita income or the regional infrastructure. Specifically, the nationality of firms accumulating in a regional cluster may play an important role. Several empirical studies (e.g. Crozet et al. 2004) have shown that a certain home-country effect exists as investors with the same nationality tend to choose the same locations.

This paper contributes to the existing empirical location choice literature in several ways. First, a particular focus in this paper is placed on agglomeration effects and the extent to which they entail spill-over effects from French company clusters and other unobservable regional factors, respectively. Second, the analysis is restricted to those French firms that invest abroad for the first time. In contrast, the majority of previous empirical studies deals with FDI decisions of multinational enterprises (e.g. Mayer et al. 2007, Barrios et al. 2006 and

Basile et al. 2008). They need to consider networking effects between multiple foreign subsidiaries in order to correctly analyse location choice determinants. The establishment of a new foreign subsidiary can change the organizational and, in particular, the sales and production structure of existing foreign subsidiaries. Unfortunately, these interdependencies are, however, often neglected. By concentrating on first-time movers the influence of foreign networking effects are minimized. Moreover, only a limited number of empirical papers have explicitly addressed first-time investors. Navaretti and Castellani (2004) and Navaretti et al. (2006) examine first-time outward investments of French and Italian firms. They focus, however, rather on the effects of outward investments on the home performance than on the actual location choice of these firms.

Third, apart from location-specific factors a limited number of company-specific characteristics are included in the estimations. The role of company characteristics in the internationalization literature is more centred on the questions of *who* is going abroad and *how* (e.g. Greenfield vs. joint venture) instead of *where* companies are going to locate abroad. Nevertheless, company factors like size, age or the industry affiliation can influence the location choice. For example, young, small and hence often risk-averse companies might be more inclined to invest in host countries similar to their home country. Finally, the geographical scope of the FDI locations includes countries in Europe, North America and North Africa, thereby covering 85% of all FDI location choices by French first-time movers in 2004. This allows for the first time to compare location decisions across countries and continents that are most attractive from the perspective of a French investor.

The rest of this paper is organized as follows. Section 2 provides an overview on the related literature and presents the empirical model. The data and variables are described in Section 3. Section 4 presents the empirical results. Section 5 concludes.

2. Related Literature and Empirical Approach

In recent decades, location choice theories have mainly dealt with the existence of agglomeration economies, in their attempt to explain why economic activity is often distributed unevenly. According to the traditional Ricardian trade theory industrial clusters are a direct result of the specialization that arises due to endowment differences between countries (comparative advantages). The new trade theory breaks with some assumptions of

this traditional trade theory and introduces increasing returns to scale, trade cost, preferences for variety and imperfect competition (Krugman 1980). Most specifically, firm locations are endogenous. Profit-maximizing firms that face transportation cost are assumed to choose locations that enable them to serve many costumers directly. Yet, firms also prefer larger markets in order to reduce trade cost which in turn can lead to spatial agglomeration. In addition, the New Economic Geography (NEG) initiated by Krugman (1991) stresses the role of backward linkages like industrial input-output relations where the final product of one firm is an intermediate input of another firm in the same sector. Market demand becomes endogenous so that "agglomeration can form through a process of circular causation" (Head and Mayer 2004: 2612).

The growing availability of firm-level data has facilitated the rapid expansion of the empirical literature on firm location choices in recent years. Empirical contributions can differ to a large extent, depending on whether the studies focus on inward or outward FDI flows, developed or developing countries, national or sub-national locations. The majority of papers analyses inward FDI flows and its spatial distribution within in a developed country. For instance, Crozet et al. (2004) study the location determinants of FDI in France. They find that investors with the same nationality tend to co-locate and that firms prefer locations close to their home-market. Similar agglomeration patterns are found for Japanese investments in the US (Head et al. 1995) and Europe (Mayer and Mucchielli 1998). Numerous other studies have analyzed the location determinants of FDI within a particular country in Western Europe, including Italy (Basile, 2004), Portugal (Guimaraes et al., 2000), Ireland (Barrios et al., 2006) and the UK (Devereux et al., 2007).

In contrast, the location of FDI in Central and Eastern Europe (CEE) has only recently received more research attention. Since the early 1990s the CEE countries have attracted an increasing amount of FDI. The collapse of the Soviet Union started a genuine political and economic restructuring process. With the prospective EU enlargement this transition process has intensified further. Undoubtedly, the accession of ten transition countries in 2004 has marked a new period for foreign investments in the CEE.[1] Pusterla and Resmini (2007) estimate the determinants of the location of foreign manufacturing plants in Bulgaria, Hungary, Poland and Romania between 1995 and 2001. They find that already prospective EU membership has a positive effect on the site selection process. In addition, they confirm the importance of agglomeration forces and interestingly, the effect is stronger for foreign

[1] On May 1, 2004, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia joined the European Union. Bulgaria and Romania joined the EU on January 1, 2007.

than for domestic company clusters. Other country-specific studies include Hungary (Békés 2005) and Romania (Hilber and Voicu 2007).

Taking the outward perspective, Mucchielle and Puech (2003) analyse location choices of French multinationals in Western Europe. They use a French agglomeration variable and obtain a positive and significant coefficient. They conclude that French firms preferably follow other French firms. While the clustering of firms could also result in dispersion forces due to diseconomies of scale like scarce resources and higher prices, empirically agglomeration economies seem to dominate dispersion forces on the national and regional level. The most interesting paper from a French perspective is the one by Disdier and Mayer (2004) who compare FDI location choices of French manufacturing firms in thirteen West and six East European countries between 1980 and 1999. They show that agglomeration economies are stronger in West European than in CEE countries, although the East-West divide appears to be decreasing over the study period. Other traditional explanatory variables like market size and institutional quality have a positive effect on French investors whereas labour cost and exchange rate volatility exhibit a negative effect.

Empirical Model

Different econometric estimation methods can be used to model location choices. One of the most frequently used methods in this literature is the conditional logit (CL) model proposed by McFadden (1974). In the CL model only regressors that vary over the alternatives (here, locations) are used to predict the outcome that is chosen. A multinomial logit (MNL) model is used instead if the regressors, like company characteristics, do not vary over the alternatives. Both models can be combined in a so-called mixed logit model. The dependent variable in the mixed logit model is a binary variable that takes the value of one if a subsidiary has been established in a particular location and a value of zero otherwise. Under the assumption of Independence of Irrelevant Alternatives (IIA), which states that the probability ratio of two locations is independent of any other third location, the probability of choosing a particular location is given in the mixed logit model by

$$p_{ij} = \frac{e^{\beta X_{ij} + \gamma_j W_i}}{\sum_{l=1}^{m} e^{\beta X_{il} + \gamma_l W_i}}, \qquad j = 1, \ldots, \mathrm{m},$$

where X_{ij} includes location-specific variables like GDP per head and GDP growth and W_i includes firm-specific variables like turnover and age of the company. This model will be implemented as a conditional logit model by interacting company characteristics with four choice-specific dummy variables.[2]

3. Data and Variables

The firm-level data used in this paper is taken from AMADEUS (Analyse Major Databases from European Sources), a pan-European corporate database containing information on financial accounts, ownership structure and affiliated companies. The database compiles company accounts filed under legal obligations in European countries. The AMADEUS database release 88, 113 and 136 are used to determine the subsidiary status in the year 2000, 2002 and 2004, respectively.[3] In the context of this paper French first-time investors are defined as French firms reporting foreign subsidiaries in 2004 but not in 2002 and 2000.[4] Only French companies with a single, first-time FDI in 2004 are selected so that potential network effects and interdependencies between multiple foreign affiliates can be neglected.

The final sample consists of 307 French first-time investors with subsidiaries across 45 regions in 27 countries in Europe, North Africa and North America.[5] The complete postal address for European subsidiaries is usually available in AMADEUS, however outside Europe locational information is limited to the country code. Consequently, the location analysis for the worldwide sample is restricted to the country level (NUTS 0) whereas the European sub-sample also allows to estimate the effect of regional (NUTS 1) characteristics.[6]

Figure 1 provides a detailed overview of the spatial distribution of French first-time investments in Europe in 2004. Capital regions and large cities like London, Barcelona, Madrid, Lisbon, Warsaw, Luxembourg and the Rhein-Ruhr area are major recipients of French investments. In Italy, it is not Rome but Milan, the major city in the industrial North

[2] Instead of interacting the firm-specific variables with all 27 countries or 45 regions, only four regional dummies (Western Europe, Eastern Europe, North America and Maghreb) are created for the interaction.
[3] Changes in the subsidiary structure are not explicitly cited in the AMADEUS database, they can only retrieved indirectly by comparing the subsidiaries listed in the database at different points in time via the various data releases.
[4] First-time investors are not necessarily firms that have never invested abroad before but within the time period covered by the database (2000-2004) those firms have become engaged in FDI for the first time.
[5] In this paper North Africa includes the Maghreb countries Morocco, Algeria and Tunisia.
[6] The NUTS (Nomenclature of Territorial Units for Statistics) classification is the standard geographic code for the regional sub-division of a country. Up to 5 statisical levels exist. The NUTS 0 level corresponds to the country (e.g. Germany), the NUTS 1 level corresponds to the top regional subdivision (e.g. the 16 Bundesländer/federal states in Germany) and the NUTS 2 level is a further regional subdivision (e.g the 39 Regierungsbezirke/administrative regions in Germany).

that attracts most French FDI. Moreover, it is apparent that French first-time investors prefer regions that have a common border with France. In those regions French is often an official or major language e.g. in the Swiss cantons Vaud, Vallais, Neuchâtel and Geneva or in the German regions Saarland and Baden.

Figure 1. Location choices of French first-time movers in 2004 (NUTS 3 level)

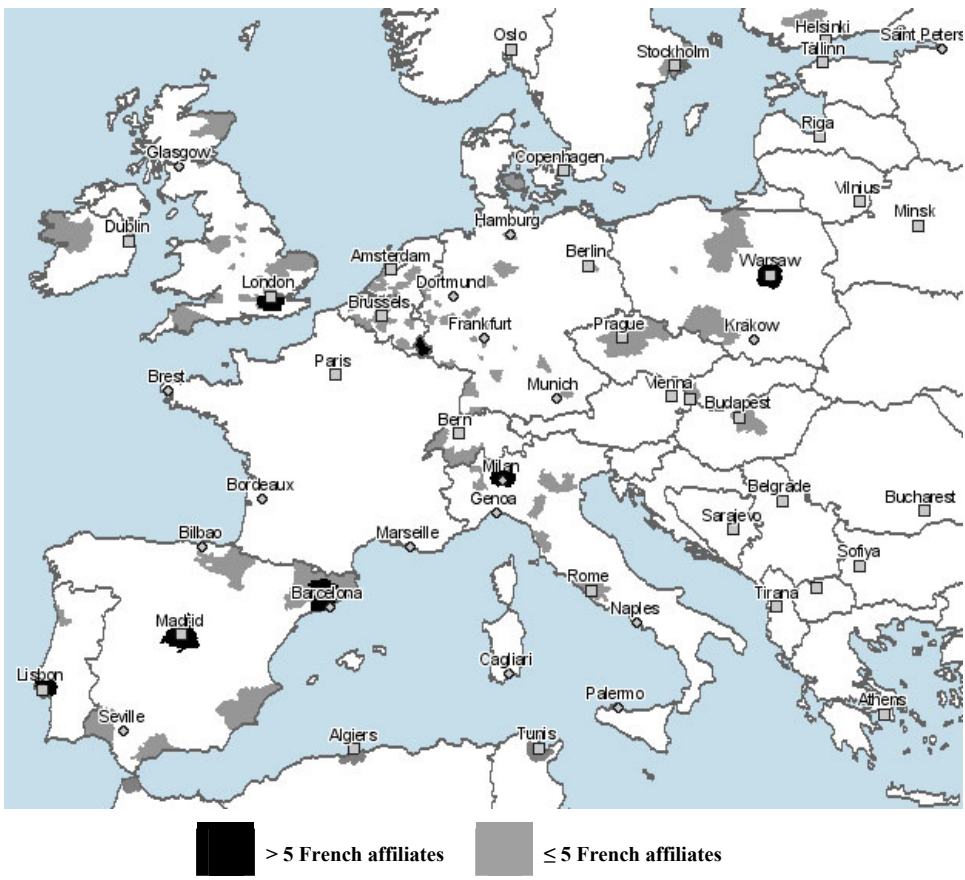

Table 1 provides a general overview of the geographical breakdown of French FDI in 2004. The majority (64%) of all French first-time movers establishes their foreign subsidiary in Europe whereas only 41% of all existing foreign establishments are situated in Europe. This pattern could imply that first-time movers start with European locations before settling in other regions of the world. Moreover, a mere 6% to 8% of all first-time investors choose a location in Central and Eastern Europe, North America or North Africa, whereas the total number of existing foreign establishments of French firms in those regions accounts for 10%

to 12%. Apart from the number of establishments, the distribution of French FDI flows (in terms of market value) confirms that Western Europe remains the major recipient of French FDI flows with 81% in 2004.[7] In contrast, French investment flows to CEE and North Africa only make up 3% and 1%, respectively.

Table 1: Geographical breakdown of French FDI in 2004 (in %)

	New establishments of first movers	Existing establishments	FDI flows
Western Europe	64	41	81
Central and Eastern Europe	6	11	3
North America	8	12	15
North Africa / Africa	7	10	1
Other regions	15	26	1
Total	*100*	*100*	*100*

Source: AMADEUS for "New establishments of first movers" and UNCTAD (2005) for "Existing establishments" and "FDI flows".

The main data source used for country and regional economic indicators is EUROSTAT, a database provided by the Statistical Office of the European Communities. The regional level applied in this paper corresponds to the NUTS 1 level which, for example, in Germany corresponds to the 16 federal states (Bundesländer). A more detailed regional analysis is not possible, as NUTS 2 level figures for some new EU member states are not available yet. Missing figures on non-EU member countries are mainly taken from the CIA World Factbook and the World Bank, and in some cases they are supplemented by the author's own estimations.[8] The reference year for all indicators is 2003. Table 2 provides the summary statistics of the location-specific and firm-specific explanatory variables used in the empirical estimations. A complete description of the variables is given in Table 5 in the Appendix.

Market demand is a fundamental location determinant for foreign investors, as it captures the market potential of the host country or region. The absolute market size is represented by the *average population*. *GDP per head* is included to proxy for important market features like consumers' purchasing power, labour productivity or institutional quality. In addition, *GDP growth* gives valuable information on the sustainability of the economic performance. Labour market conditions, most prominently, *labour cost*, measured as the average hourly labour cost in the manufacturing and service industry, might have two countervailing effects. On the one

[7] The actual FDI flows of the French first-time movers are not available in the AMADEUS database.
[8] For countries like Morocco, Algeria and Tunisia detailed information on the Effective Average Tax Rate (EATR) are not available. The author has approximated these figures by comparable countries for which data is available.

hand, high wages are negatively related to a firm's profitability and might thus have a negative impact on location choice. Among others, Bartik (1985) and Coughlin et al. (1991) find that higher wages deter FDI in the United States. On the other hand, higher labour cost might reflect the existence of a highly skilled work force, thereby exhibiting a positive effect on location choice. The paper by Mayer and Mucchielli (1998), in which they examine Japanese investments in Europe, is one of the few that reports a positive coefficient.[9] The average hourly labour cost in this paper is €17.0 with a large standard deviation of €11.6.

Table 2: Summary statistics

Variable	Mean	Standard Dev.
Location-specific characteristics		
ln(average population)	9.419	1.391
ln(GDP per head)	9.751	0.657
GDP growth	2.271	2.244
Labour cost	17.009	11.581
Tax (EATR)	24.859	6.781
Culture	0.222	0.416
Travel time by truck	1869.9	1149.7
Western Europe	0.556	0.497
Eastern Europe	0.259	0.438
North America	0.074	0.262
Maghreb	0.111	0.314
Firm-specific characteristics		
Turnover*Western Europe	19547.1	93156.8
Turnover*Eastern Europe	9122.0	64381.2
Turnover*North America	2606.3	34659.1
Turnover*Maghreb	3909.4	42388.5
L_productivity*Western Europe	438.40	3192.11
L_productivity*Eastern Europe	204.59	2191.57
L_productivity*North America	58.45	1175.08
L_productivity*Maghreb	87.68	1438.29
Age*Western Europe	13.74	20.63
Age*Eastern Europe	6.41	15.67
Age*North Amercia	1.83	8.86
Age*Maghreb	2.75	10.74
Manufacturing*Western Europe	0.168	0.374
Manufacturing*Eastern Europe	0.079	0.269
Manufacturing*North America	0.022	0.148
Manufacturing*Maghreb	0.034	0.180
South*Western Europe	0.029	0.168
South*Eastern Europe	0.014	0.115
South*North America	0.004	0.062
South*Maghreb	0.006	0.076
Agglomeration variables		
Absolute French agglomeration	2.629	2.828
Relative FR/DE agglomeration	2.094	3.179
Relative FR/IT agglomeration	1.577	1.508

[9] This positive relationship could be explained by the fact that Japanese FDI is driven by the high-technology manufacturing and service industries which prefer to settle in the leading economic regions.

The tax burden at the location of the affiliate constitutes a potential determinant for firms' investment decisions. The "European Tax Survey 2004" reports that more than 50% of the large enterprises are influenced by taxation in their locational choice.[10] Ederveen and De Mooij (2003) show in their meta-analysis that the mean semi-elasticity of FDI wit respect to corporate tax rates is -3.3, suggesting that a 1 percentage point increase in the host country corporate tax rate reduces FDI in that country by 3.3 percent. However, due to large variations in the study design, the 95% confidence interval includes semi-elasticities between -22.8 and +13.2. In 53% of all studies the tax coefficient is insignificant. Moreover, Bellak et al. (2007) show that taxes and infrastructure are two interrelated public policy areas, as taxes are used to finance the information, communication and transport infrastructure which in turn is highly valued by potential investors. In fact, they demonstrate that the tax rate elasticity of FDI is a decreasing function of infrastructure endowment.

The corporate tax rate used in this paper is the *effective average tax rate* (EATR) provided by Devereux et al. (2002) and the ZEW (2005). Devereux et al. (2002) argue that conditional on the choice of location, the size of the investment depends on the effective marginal tax rate (EMTR). However, the location decision, being a discrete choice, depends on the level of post-tax economic rent that can be earned at each location. Therefore, they propose a new tax measure, the EATR, which is equal to a weighted average of an EMTR and an adjusted statutory tax rate. The EATR takes into account the difference between the pre- and post tax return on a typical investment on which the firms are allowed to earn an economic rent. Devereux and Griffith (1998) analyse location choices of US firms in Europe and show that the choice of location is significantly affected by the EATR, but not by the EMTR.[11]

The distance between the headquarters and the foreign subsidiary is taken into account via two distance measures. First, the *culture* variable accounts for the cultural similarity between France and the host country or region, measured by whether French is an official or major language. Transaction cost and the risk associated with FDI are often assumed to be lower in regions with high cultural proximity. Former colonial linkages still tend to translate into higher trade flows (Rauch 1999). Moreover, former French colonies like Morocco, Algeria and Tunisia have mostly kept the French education and legal system. In addition, the Saarland is by far the most francophone region within Germany, having at times being part of France.

[10] The influence varies with respect to the type of subsidiary i.e. only 34.4% are influenced by taxation, when locating a R&D facility, compared to 57.7% for a production plant.

[11] Devereux et al. (2002) compare the investment decision to the labour supply decision "where it is well known that the impact of tax on an individual's incentive to participate in the labour market is through the average tax rate, while the number of hours worked is affected by the marginal tax rate" (p.3).

Second, the actual geographical distance between the mother company and the subsidiary is approximated by the *travel time by truck* between the NUTS 3 regions which host the headquarters and the subsidiary, respectively. The latter distance measure is used as a proxy for trade cost. The average travel time by truck amounts to approximately 31 hours (1869.9 minutes). Finally, the four location-specific dummies *Western Europe*, *Eastern Europe*, *North America* and *Maghreb* are created in order to capture any transnational elements and preferences not taken up by the national variables. Western Europe constitutes the omitted base group in the regressions.

The importance of firm characteristics in the investment decision has often been acknowledged but they have been mostly ignored in empirical papers. In order to measure how company characteristics affect the likelihood of choosing a particular location, firm-specific variables are interacted with the four choice-specific transnational dummies. Company covariates used in this exercise include *turnover*, *labour productivity*[12] and *age* of the company. Companies which establish a subsidiary in Western Europe are on average larger, older and more productive than companies which establish subsidiaries elsewhere. A *manufacturing* dummy is included to detect any industry-specific FDI patterns.[13] Finally, the location of the mother company in a large country like France can itself be a decisive determinant for FDI locations. France maintains a close relationship with the Maghreb states, reflected by the movement of people from both sides of the Mediterranean, the common language, dense cultural exchange, the French development assistance and strong economic relations. Around 900 000 Algerians and 800 000 Moroccans are living in France, with the biggest communities being situated in Paris and the south of France (INSEE 2005). Therefore, a *south* dummy is used as a proxy for trade and social networks of Mediterranean immigrants.

Two types of agglomeration variables are used to measure agglomeration effects. The *absolute French agglomeration* is included to capture the general tendency of French firms to cluster with other French firms in specific countries or in specific regions within a country. The absolute agglomeration variable should primarily take up unobservable regional effects. In contrast, two *relative agglomeration* measures are intended to take up the French-specific element of agglomeration forces as they measure the French agglomeration relative to the German (and Italian) agglomeration. The relative agglomeration measures identify regions

[12] Total factor productivity (TFP) is usually preferred to labour productivity in the internationalization literature, but TFP could only be calculated for a small number of companies in the sample.

[13] The sample size does not allow for a more detailed industry differentiation. Moreover, the industry code of the mother *and* the subsidiary are needed to analyze industry-specific FDI location patterns in more detail. Unfortunately, this cannot be done in this paper as the industry classification of the subsidiary is often missing.

which seem to be more attractive for French investors than for investors from Germany or Italy.

4. Estimation Results

Country Level

The estimation results from the conditional logit regressions for the country determinants of location choice are displayed in Table 3. Columns (1) and (2) provide the results for the worldwide set of location choices (307 firms) while in columns (3) and (4) the estimations are restricted to 251 firms deciding to establish subsidiaries in European countries. The first column in Table 3 reports the baseline specification without any agglomeration measures. Market demand, measured by the population size, GDP per head and GDP growth, has a positive impact on the location strategy of French first-time investors, a finding that matches with existing comparable papers (e.g. Woodward 1992; Crozet et al. 2004; Mucchielli and Puech 2003). In contrast, labour cost exhibit a negative effect on location choice. Similar results have also been obtained by Coughlin et al. (1991), Ford and Strange (1999) and Jianping (1999).

The EATR is not found to display a significant impact on location choice. This result is confirmed when using the nominal corporate tax rate instead of the EATR (not reported here). Most papers that analyze the role of taxation as determinant of FDI find a negative tax rate elasticity (Ederveen and De Mooij 2003; Bellak and Leibrecht 2008). When checking for the robustness of the tax results, it should be noted that highly developed countries often have a higher EATR than less developed countries as depicted by the high correlation of 0.68 between GDP per head and the EATR. Omitting GDP per head (or GDP growth) from the estimation leads to a negative but insignificant tax rate coefficient. In addition, overall results do not change significantly when the tax rate is being omitted from the regression.

Both distance measures are significant at the one per cent level and demonstrate that increasing distance tends to deter FDI. Cultural proximity has positive impact on the location choice whereas the travel time by truck and hence transport cost impact negatively. Overall, French first-time investors are less likely to choose a location in the new EU members states as indicated by the negative coefficient for the Eastern Europe dummy. In comparison to locations in Western Europe, the omitted base group, firms are more likely to set up their first foreign affiliate in North America and less likely in North Africa, albeit both coefficients are not significant at the conventional levels.

Table 3: Influence of country characteristics on the location choice of French firms

	WORLDWIDE				EUROPE			
Conditional logit model	(1)		(2)		(3)		(4)	
Location-specific characteristics								
ln(average population)	0.541***	(5.14)	0.158	(0.86)	0.773***	(5.23)	0.495*	(1.84)
ln(GDP per head)	0.876*	(1.79)	0.312	(0.46)	1.901***	(2.62)	1.266	(1.31)
GDP growth	0.148**	(2.38)	0.0232	(0.28)	0.131**	(2.00)	0.0416	(0.44)
Labour cost	-0.0686***	(-3.84)	-0.0667***	(-3.30)	-0.0877***	(-4.24)	-0.0577*	(-1.71)
Tax (EATR)	0.00157	(0.07)	-0.0202	(-0.74)	-0.0184	(-0.71)	-0.0304	(-1.04)
Culture	0.739**	(2.56)	0.621*	(1.89)	1.123***	(3.22)	0.501	(0.94)
Travel time by truck	-0.000855***	(-4.55)	-0.000853***	(-3.54)	-0.000683***	(-2.90)	-0.000899***	(-3.06)
Eastern Europe	-2.445***	(-4.07)	-1.931***	(-2.70)	-1.983***	(-3.14)	-0.999	(-1.02)
North America	1.321	(1.50)	2.190*	(1.86)				
Maghreb	-0.644	(-0.78)	-1.135	(-1.15)				
Firm-specific characteristics								
Turnover*Eastern Europe	-0.00000141	(-0.41)	-0.00000180	(-0.50)	-0.00000169	(-0.44)	-0.00000228	(-0.57)
Turnover*North America	0.00000125	(1.13)	0.00000101	(0.92)				
Turnover*Maghreb	-0.000000228	(-0.11)	-0.000000509	(-0.24)				
L_productivity*Eastern Europe	-0.00101	(-0.92)	-0.000992	(-0.89)	-0.00120	(-1.03)	-0.00124	(-1.01)
L_productivity*North America	0.0000198	(0.62)	0.0000169	(0.53)				
L_productivity*Maghreb	-0.000636	(-0.93)	-0.000473	(-0.76)				
Age*Eastern Europe	0.0172**	(2.30)	0.0173**	(2.24)	0.0149**	(2.07)	0.0139*	(1.91)
Age*North America	-0.00488	(-0.41)	-0.00340	(-0.29)				
Age*Maghreb	0.00678	(0.76)	0.00820	(0.94)				
Manufacturing*Eastern Europe	1.917***	(4.12)	2.170***	(4.52)	1.900***	(4.07)	2.166***	(4.48)
Manufacturing*North America	0.603	(1.30)	0.838*	(1.76)				
Manufacturing*Maghreb	1.127***	(2.73)	1.379***	(3.21)				
South*Eastern Europe	0.124	(0.11)	0.000928	(0.00)	0.136	(0.12)	-0.0441	(-0.04)
South*North America	0.288	(0.27)	0.236	(0.21)				
South*Maghreb	1.550**	(2.49)	1.392**	(2.10)				
Agglomeration variables								
Absolute French agglomeration			0.186***	(3.29)			0.119*	(1.70)
Relative FR/DE agglomeration			0.111	(1.31)			0.425	(1.48)
Relative FR/IT agglomeration			-0.239**	(-2.35)			-0.357**	(-2.31)
N	8289		6425		5522		4020	

Notes: Reported are the coefficients from a conditional logit regression. The dependent variable is the chosen country. "WORLDWIDE" includes countries from Europe, North America and North Africa. The region of Western Europe consitutes the base group for the interactions with company characteristics. The number of observations (N) correpsonds to the number of firms × number of potential locations. The t-statistics are given in parentheses with * p<0.10, ** p<0.05, *** p<0.01.

In the conditional logit model firm-specific variables cannot be taken into account as they do not vary across the alternatives. To overcome this problem, company characteristics are interacted with the transnational dummies for Eastern Europe, North American and the Maghreb states. The results show that turnover does not affect the location choice in any of the regions, indicating that the actual company size is of minor importance for location choice. Labour productivity is a key determinant for the decision of French firms to internationalize (Engel and Procher 2008), yet, the location choice seems to be unaffected.

Even though the negative effect of the Eastern Europe dummy indicates that locations in CEE countries are generally less attractive, older companies are more likely to establish affiliates in those countries. Manufacturing companies prefer to locate in Eastern Europe and the Maghreb states. Finally, French firms situated in the South of France are more likely to choose a location in North Africa than firms headquartering in other French regions. The latter finding emphasizes the strong business and trade linkages between Mediterranean regions.

In column (2) one absolute and two relative measures of agglomeration are added to the basic specification. Absolute French agglomeration has a positive and significant effect on the location choice. This result, however, cannot not be interpreted as a French-specific effect, because in an alternative specification absolute German agglomeration leads to similar results.[14] Therefore, investors are rather attracted by firm clusters in general, or by the unobserved factors that led to these clusters in the first place, than by nation-specific firm clusters. Moreover, it is noteworthy that some indicators like the market demand variables become insignificant through the inclusion of the agglomeration variables. This in turn indicates that the agglomeration variables are indeed picking up some of the observable and unobservable country effects. Severe multicollinearity can be excluded due to the relatively low correlation between agglomeration and other country-specific variables.

The two relative agglomeration measures are included in order to detect any French-specific bias in the location choices of French first-time investors. The coefficient for the relative French/German agglomeration is positive but not significant at the 10% level whereas the coefficient for the relative French/Italian agglomeration is negative and significant at the 5% level. These results suggest that a univocal French-specific effect does not exist with respect to the country choice. Moreover, the results are confirmed in various alternative regressions where the agglomeration variables are included individually or pair-wise instead of the group-wise inclusion (i.e. all three agglomeration variables in one regression).

The main methodological hurdle in this model is the IIA assumption. The IIA property is violated in some cases, e.g. if important investment countries are left out. To overcome this problem a number of models with relaxed IIA assumption are available, including the nested logit. However, in the case of French first movers a nested logit model yields no robust estimation results as the number of observations in some regional nest is probably too small.[15] The results from the conditional logit model might constitute a good approximation after all because according to Train (2003) the violation of the IIA assumption might be less of a

[14] Results are available on request.
[15] Results are available on request.

concern if the primary interest resides in average preferences rather than predictions on the odds ratios due to varying choice characteristics.

The analysis in columns (3) and (4) is restricted to the European sub-sample in order to account of the fact that results for the worldwide comparison might be skewed through the inclusion of countries from North Africa and North America. In general, however, the findings for Europe are consistent with the findings for the location choice patterns on a worldwide basis.

Regional Level

It is often argued that firm locations should be analysed at several spatial scales in order to grasp complex investment strategies. Location characteristics can have varying effects on different geographical levels. For example, 11% of all French first movers go to Germany, making it after the UK the most preferred country for outward investments. However, with the exception of Berlin, no subsidiary is situated in the Eastern federal states of Germany (see Figure 1). This indicates that regional differences influence location patterns.

Table 4 presents the results for the European subsidiaries on the regional NUTS 1 level. The results for the base line specification are reported in column (1). All three market demand variables have a positive and significant effect. In particular, the positive coefficient for regional GDP growth indicates that regional long-term economic growth increases the probability of locating a subsidiary in a particular region. Here some analogy to the French location choices in Germany as depicted in Figure 1 is discernible because many Eastern German states exhibit relatively low growth rates while Southern states like Baden-Württemberg or Bavaria are consistently among the fastest growing. Analogous to the country-level findings, higher regional labour costs are more likely to deter FDI of French first-time movers.

Both distance measures confirm the results found on the country level. On the one hand, cultural proximity increases the probability of a particular region to be chosen. On the other hand, the larger the travel time between the headquarters and a potential host region, the less likely it is chosen. The dummy for Eastern Europe indicates that companies generally prefer locations in Western Europe. However, in terms of firm size and labour productivity one cannot discriminate between firms investing in Western or Eastern Europe. Older companies and manufacturing companies are more likely to choose a location in Eastern Europe.

Interestingly, the qualitative results on the regional level follow closely the findings on the country level. Neither location nor company variables exhibit countervailing effects on the two geographical levels. Therefore, these findings suggest that, at least for the macroeconomic indicators used in this exercise, the actual spatial scale selected for analysing location choices might be less important than often thought.

Table 4: Influence of regional characteristics on European location choice of French firms

	European regions			
Conditional logit model	(1)		(2)	
Location-specific characteristics				
ln(average population)	0.796***	(6.03)	0.742***	(2.82)
ln(GDP per head)	1.538***	(4.79)	0.425	(0.73)
GDP growth	0.104**	(2.14)	-0.0977	(-1.45)
Labour cost	-0.0609***	(-3.57)	-0.0761***	(-3.70)
Culture	1.465***	(4.72)	2.629***	(4.25)
Travel time by truck	-0.000728***	(-3.26)	-0.000608**	(-2.37)
Eastern Europe	-1.556**	(-2.33)	-2.160***	(-2.79)
Firm-specific characteristics				
Turnover*Eastern Europe	-0.00000185	(-0.48)	-0.00000218	(-0.53)
Labour productivity*Eastern Europe	-0.000831	(-0.68)	-0.000623	(-0.53)
Age*Eastern Europe	0.0183**	(2.37)	0.00894	(1.05)
Manufacturing*Eastern Europe	2.288***	(4.15)	2.650***	(4.35)
Agglomeration variables				
Absolute French agglomeration			0.140***	(3.56)
Relative FR/DE agglomeration			-0.191*	(-1.76)
Relative FR/IT agglomeration			-0.0716	(-0.58)
N	10845		6048	

Notes: Reported are the coefficients from a conditional logit regression. The dependent variable is the chosen region. The region of Western Europe consitutes the base group for interactions with company characteristics. The number of observations (N) correpsonds to the number of firms × number of potential locations. The t-statistics are given in parentheses with * p<0.10, ** p<0.05, *** p<0.01.

The agglomeration measures are added to the estimation in column (2). Absolute French agglomeration has a positive and significant effect on the location choice. This result, however, is not restricted to French firm clusters as it can be shown in an alternative specification that absolute German agglomeration yields similar results.[16] These findings

[16] Results are available on request.

suggest that high firm density constitutes a good measure for the overall attractiveness of a location for potential investors. Hence, as absolute agglomeration can be regarded as a poor measure for detecting nation-specific effects, two relative agglomeration variables are additionally included. Both relative measures exhibit a negative effect indicating that French first-time investors are less likely to choose a region with a relative high share of existing French firms compared to German or Italian firms. Despite an insignificant relative French-Italian agglomeration coefficient, robustness checks (i.e. alternative specifications with varying combinations of agglomeration measures) have shown that both relative measures are usually negative and significant. These results suggest that regional investment patterns might be slowly changing. French first-time investors in 2004 are not necessarily choosing the same locations as French investors in previous years.

5. Conclusion

In this paper the foreign location choices of French first-time investors in Europe, North America and North Africa are analysed. The results for the macroeconomic location variables are consistent with the existing empirical literature. Overall, no fundamental differences are discernible when comparing the results of the country and regional level. Location- and firm-specific characteristics exhibit a similar effect on both geographical scales. A higher market demand increases the probability of a particular country or region to be chosen whereas higher labour cost and a larger distance decrease the attractiveness of a location. Cultural proximity to France is a decisive location determinant for French investors.

Apart from location factors individual firm characteristics can also influence the investment decision. The results show that the new EU member states in Eastern Europe are preferred locations of French manufacturing companies. Moreover, firms headquartering in the South of France exhibit a higher probability of establishing their first subsidiary in Northern Africa (Maghreb) which in turn reflects the strong investment and trade linkages between Mediterranean regions. The existence of agglomeration effects are confirmed for French first-time investors. The results show that investors are indeed attracted to locations with a large agglomeration of firms. Contrary to the current literature, however, the actual nationality of firms within a given cluster is not found to play a major role for the location choice. Moreover, specific spill-over effects from French clusters seem to be rather limited.

One important direction for further research concerns the step-wise internationalisation process of firms. The location choice of first-time investors only allows to examine the initial

investment decision. Hence, a better understanding of the investment strategy of multinational enterprises could be obtained by investigating their international network and, in particular, the sequential establishment of foreign affiliates. In addition, more emphasis should be placed on the shareholder (upstream) and corporate (downstream) structure when analysing location choices. Control patterns have become more complex through direct and indirect investment linkages, so that it is more difficult to identify the ultimate controlling owner(s) of a company. Moreover, the establishment of special purpose entities (SPEs), like holding companies or cash-pooling trusts, have transformed the corporate structure by separating financial transactions from real investment flows. Thus, the increasing complexity of international companies makes it necessary to establish a more sophisticated model of FDI activity.

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Abbreviations

AMADEUS: Analyse Major Databases from European Sources
CEE: Central and Eastern Europe
CL: Conditional logit
EATR: Effective average tax rate
FDI: Foreign direct investment
GDP: Gross domestic product
IIA: Independence of Irrelevant Alternatives
MNL: Multinomial logit
NEG: New Economic Geography
NUTS: Nomenclature of Territorial Units for Statistics
UNCTAD: United Nations Conference on Trade and Development
ZEW: Zentrum für Europäische Wirtschaftsforschung

Appendix

Table 5: List of explanatory variables

Variable	Description	Level	Data source
Location-specific characteristics			
ln (average population)	Average population (in 1000 inhabitants and in logs)	NUTS 0 & 1	Eurostat
ln (GDP per head)	GDP per head in Purchasing Power Parities per inhabitant (in logs)	NUTS 0 & 1	Eurostat
GDP growth	Real GDP growth rate, % change on previous year	NUTS 0 & 1	Eurostat
Labour cost	Average labour cost per employee in fulltime units per hour for NACE 10-74	NUTS 0 & 1	EU Labour Force Survey 2004
Tax (EATR)	Effective average tax rate	NUTS 0	Devereux et al. (2002), ZEW (2005)
Culture	Dummy = 1 if French is official or major business language (countries: LU, BE, CH, MA, DZ, TN)	NUTS 0 & 1	Author's calculations
Travel time by truck	Shortest distance between NUTS 3 regions via motorway and national roads, measured as travel time (in minutes) by truck	NUTS 3	Schürmann (2001) & author's calculations
Western Europe	Dummy = 1 if location is in Western Europe	NUTS 0	AMADEUS
Eastern Europe	Dummy = 1 if location is in Eastern Europe	NUTS 0	AMADEUS
North America	Dummy = 1 if location is in North America	NUTS 0	AMADEUS
Maghreb	Dummy = 1 if location is in Morocco, Tunisia or Algeria	NUTS 0	AMADEUS
Firm-specific characteristics			
Turnover	Operating revenue	Company	AMADEUS
Labour productivity	Turnover / employees	Company	AMADEUS
Age	Age of the company (in years)	Company	AMADEUS
Manufacturing	Dummy = 1 if firm is in manufacturing (NACE 15-37)	Company	AMADEUS
South	Dummy = 1 if home location of the firm is in the south of France	Company	AMADEUS
Agglomeration variables			
Absolute French agglomeration	Number of French establishments in a given country or region / total number of French establishments worldwide	NUTS 0 & 1	AMADEUS & author's calculations
Relative FR/DE *or* FR/IT agglomeration	Number of French establishments in a given country or region / number of German (*or* Italian) establishments in a given country or region	NUTS 0 & 1	AMADEUS & author's calculations