Chapter 7
Regional Attractiveness and Its Determinants

7.1 Regional Attractiveness and FDI Determinants

As discussed in the previous chapter, high-quality and efficient territorial capital assets, together with high regional attractiveness, are the elements on which regional competitiveness is based. Territorial attractiveness therefore matters for regional growth, and this applies to all regions, regardless of their exposure to globalization processes. The continuous inflows of competitive and innovative economic factors, and mainly entrepreneurship and financial capital, not only from other regions of the same country but also from outside the country's borders, make the difference in explaining regional growth differentials.

These considerations introduce the specific focus of this chapter: empirical analysis of the factors responsible for the uneven distribution of FDI across EU regions, which is an indirect way to understand whether and why regional attractiveness differs so markedly among EU regions.

Theoretical thinking on the determinants of foreign direct investments has been developed from different conceptual approaches and disciplines. Initially, the emphasis was on the preconditions necessary for foreign investments to be undertaken, rather than on the factors able to attract them. Within this framework, a firm became multinational in order to exploit three kinds of advantages, summarized in the acronym of the well-known OLI (Owernship, Location, and Internationalization) paradigm (Dunning 2001). This states that to become multinationals, firms must possess *ownership advantages* – such as a superior technology, specific know-how, and managerial competences – which provide inward investors with essential advantages over local firms, and then *internalization advantages*, which make the establishment of a production plant abroad the first-best strategy to serve foreign markets, because it allows the internalization of not only trade costs but also externalities from firm-specific assets.[1] *Locational advantages*, instead, are all the benefits accruing to the firm from its decision to operate in a particular host location (Dunning 2009; Cantwell 2009).

[1]See Markusen 1995, for a critical and exhaustive survey on the main literature on ownership and internalization advantages.

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The identification of location advantages has been the specific subject of subsequent advances in international economics since the OLI paradigm. Generally speaking, the theory has identified two broad groups of factors able to attract FDI, and whose importance cannot be assessed without considering the motivations at the basis of the decision to invest abroad (Markusen 1984; Helpman 1984; Shatz and Venables 2000): (1) the cost and the quality of production factors, as well as the endowments of natural and technological resources; and (2) access to, and the size of, the final markets, both local and potential. Vertical FDI, which is characterized by the spatial fragmentation of the production chain, positively responds to factors included in the first group, while horizontal FDI, which implies the duplication of production plants in different markets far from the home one, is more sensitive to market characteristics.[2]

Besides demand- and supply-side characteristics, other factors, related to both the home and the host countries as well as to their bilateral relationships, have been identified by the empirical literature as potential determinants of FDI. We refer to the economic fundamentals and the quality of the institutions (Bénassy-Quéré et al. 2007), agglomeration forces as proxies for human capital and infrastructure endowments (Braunerhjelm and Svensson 1996), and tax and other incentives to FDI (Wheeler and Mody 1992). Needless to say, their importance varies according to FDI motivations, although the empirical literature is rather inconclusive on this issue (Blonigen 2005; Barba Navaretti and Venables 2004).

The purpose of this chapter is not simply to investigate which regional socio-economic characteristics are able to attract FDI; it is also and mainly to examine whether the relationship between FDI flows and such factors varies across regions. The aim is also to explain the causes of such differences. One possible explanation is that globalization has different impacts across regions because of their specialization and degree of connectivity with the rest of the world, as highlighted in Chap. 4. If more open regions are able to attract substantial inflows of extra-European FDI, they may also be competitive in attracting intra-European FDI flows. Another explanation may be linked to the country effect on regional growth rates described in Chap. 6, which may also affect regional attractiveness, making regions more or less attractive for foreign firms.

In order to test these hypotheses, we consider total and intra-European newly created foreign firms in the EU during the 2005–2007 period.[3] Our results show that, even after controlling for traditional determinants of FDI, regional attractiveness

[2]Resource and strategic seeking FDI is usually considered a particular form of vertical FDI, since it is attracted by specific resources (i.e., natural and/or technological) that are abundant, and therefore, cheap, in the foreign location. More recently, Helpman 2006 has pointed out that this classification has become less useful in practice because of the increased complexity of MNEs sourcing strategies. Very often MNEs invest in low-cost countries to create export platforms from which to serve other countries around the world. This kind of investment cannot be considered either horizontal or vertical. See Ekholm et al. 2007, on export platform FDI.

[3]Since we are working with flows of FDI rather than stocks, by using a three-year period instead of a single one we are able to control for potential factors that may affect FDI flows in specific years.

differs across the EU. However, globalization does not seem to be either the correct or the only explanation for this diversity, given that regional attractiveness varies not only across global, regional, and local players, but also within each group of regions, as indicated by Fig. 7.1, which compares the distribution of foreign firms across and within the EU regions classified with respect to their degrees of openness towards the rest of the world.

The most likely cause of differences across regions in terms of FDI attraction capacity is the country effect and its impact on regional performance, which can be disentangled into a within- and between-country effect. Regions perform differently both within and across countries, and this may reflect differences in their potential attractiveness, as indicated by Fig. 7.2, which shows that the geographical distribution of foreign firms varies not only across but also between countries.

Therefore, in order to understand the geographical distribution of foreign firms in Europe and the mechanism that drives their location decision process, we need to consider not only sector and firm specificities, as suggested by the theory, but also geographically specific effects able to affect regional attractiveness. We argue that the lack of a clear geographical dimension is responsible not only for the inconclusiveness of the empirical evidence on the main factors driving foreign firms' location decisions but also for the ineffectiveness of most FDI promotion policies.

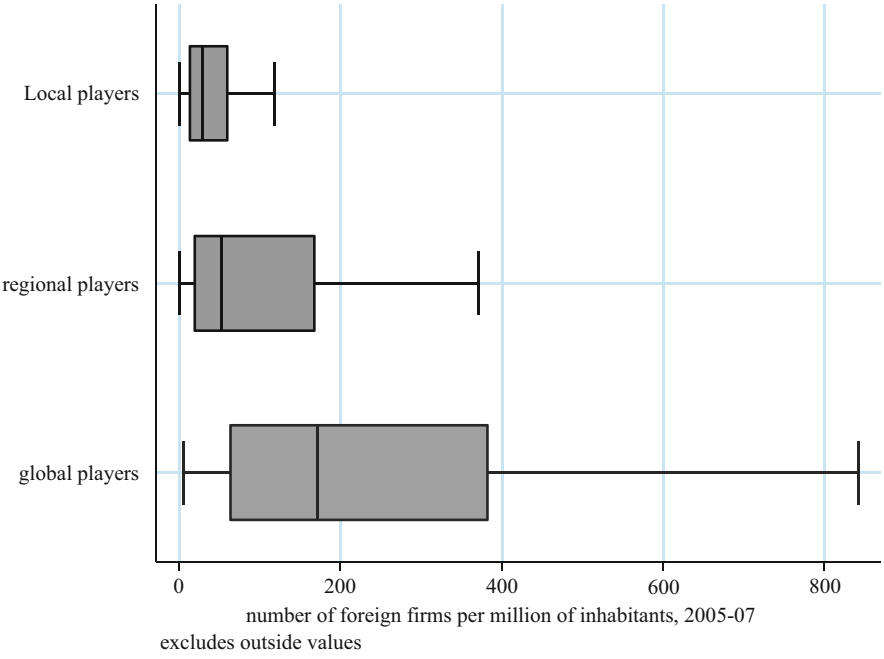

Fig. 7.1 The spatial distribution of FDI within and across types of regions, 2005–2007
Source: authors' calculations on FDIRegio database

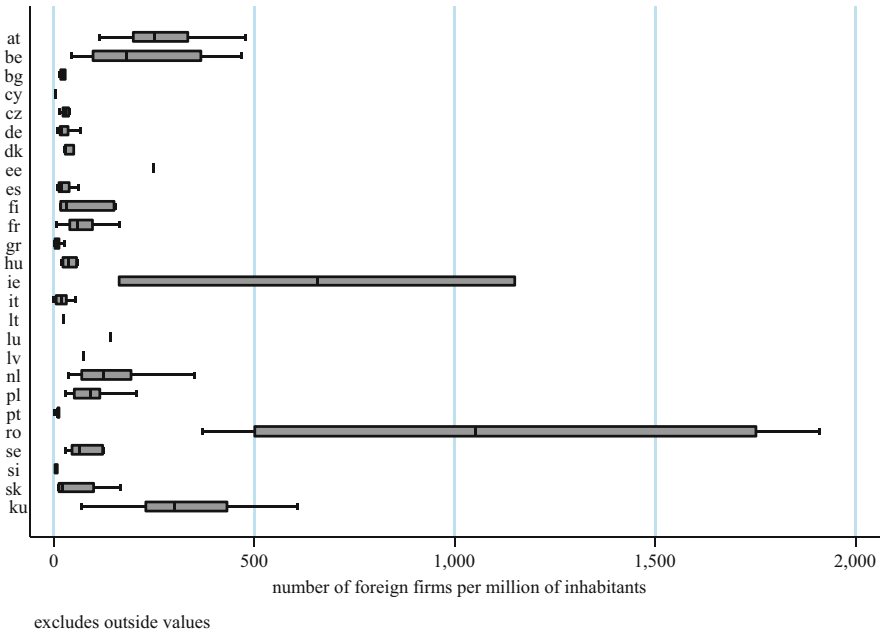

Fig. 7.2 The spatial distribution of FDI within and across countries in the EU, 2005–2007
Source: authors' calculations on FDIRegio database

7.2 Factors Affecting Regional Attractiveness

7.2.1 The Traditional Factors

In order to analyze factors at the base of FDI regions' attractiveness, we started with the following simple model, which relates FDI flows – measured as the number of newly established foreign firms in region *r* per million inhabitants in the 2005–2007 period – to various regions' characteristics able to affect FDI flows, at least from a theoretical point of view:

$$\frac{FDI_r}{POP_r} = \alpha_0 + \beta_1 FDI_r + \beta_2 LABCOST_r + \beta_3 MKTPOT_r + \beta_4 MAN_{ir} + \beta_5 SER_r + \beta_6 HUMCAP_{kr} + \alpha_1 D_{RO} + \alpha_2 D_{PL} + \varepsilon_r \quad (7.1)$$

Regional determinants of FDI are the market potential (*MKTPOT*), costs (*LABCOST*) and skills (*HUMCAP*) of the labor force, the region's industrial specialization

in manufacturing (*MAN*) and business services (*SER*), and previous inflows of FDI (*FDI*).[4]

The composition of the set of the explanatory variables reflected different motivations for FDI. In particular, foreign firms pursuing market-seeking strategies will be driven by market access. Needless to say, the reference market was not that of the region where foreign firms locate, but the potential market (Head and Mayer 2004), i.e., the entire market that foreign firms can serve from that location. In order to control for transportation costs, we measured market potential as the sum of each region's GVA normalized by the inverse of the distance between the region where foreign firms locate and all other EU regions. We expected to find a positive relation between FDI flows and market potential.

Conversely, foreign firms delocalizing abroad for efficiency reasons were expected to pay closer attention to labor costs, the quality of the labor force, and industrial relations. High labor costs may discourage FDI, although high productivity levels and workforce qualification and skills may compensate for this effect. Unlike previous related studies, we did not proxy the quality of the human capital with education variables, but instead with functional variables. In particular, we included in (7.1) regional endowments of command and control functions – proxied by corporate managers and scientists and professionals, medium-level functions (proxied by SME managers) and low-level functions, such as clerical workers and machine and plant operators. We believe that functions reflect human capital competencies and foreign firms' needs better than educational levels. In particular, scientific and technological expertise may attract foreign firms wanting to exploit know-how-related assets in foreign locations in order to sustain or improve their international competitiveness (Ethier and Markusen 1996). Advanced regions are generally best placed to offer these kinds of advantages and are thus more likely to attract strategic-asset seeking FDI than laggard regions. Finally, high geographical concentrations of manufacturing and/or service activities can also attract efficiency-seeking FDI, since they signal to potential entrants the availability of supporting industries and services, as well as good potential links with local suppliers and buyers. We measured the geographical concentration of industries in absolute terms by computing the shares of three manufacturing branches (low-, medium-, and high-tech sectors) and business services on regions' total employment.[5]

Finally, we expected to find that an existing concentration of foreign firms facilitates the gathering of information via business relationships and signals to potential entrants the quality of the business environment. Therefore, the larger the number of foreign firms in a given location, the less likely is the risk (and the cost) for a new foreign firm deciding to locate there.

[4]All the explanatory variables are lagged by one period in order to minimize possible endogeneity problems. Lags may vary according to data availability. See Table 7.9 in the Annex to this chapter for more detailed definitions of the variables included in (7.1) and the data sources.

[5]See Table 7.10 in the Annex for definitions of the manufacturing and service branches included in (7.1).

Besides the error term, (7.1) also includes two dummy variables, one for Romanian regions and the other for Polish regions. These variables capture potential biases due to the characteristics of our sample.[6]

In estimating (7.1) we started with traditional OLS techniques and then controlled for spatial dependence in foreign firm location patterns (Blonigen et al. 2007; Resmini and Casi 2010). As suggested by spatial diagnostics, the latter does exist and can be controlled for using a spatial error model. The novelty of our analysis, however, consists in its explicit consideration of different forms of spatial heterogeneity, as discussed in Sect. 7.3.

7.2.2 Empirical Results

According to the results of the regression analysis, which are shown in Table 7.1, the attractiveness of EU regions relies on several factors, most of which, not surprisingly, have been already highlighted by previous similar studies.

On looking at the spatial error model only (column 2 of Table 7.1), we find that agglomeration among FDI seems to play an important role in foreign firms' location choices. The larger the number of foreign firms which have set up production plants in the previous period, the larger the number of new foreign firms that a region is able to attract. Labor costs are not significant, and they enter the regression with a positive sign, indicating that regional attractiveness relies on high productivity rather than on cheap labor. As expected, market access is also marginally significant, given that all foreign firms can serve the entire EU market regardless of the region in which they are located. This may also indicate that transportation costs are not important for foreign firms delocalizing activities in the EU. As far as regional specialization is concerned, location externalities arise in low-tech manufacturing sectors and in business services, while regions specialized in high-tech manufacturing sectors do not seem to be attractive, since competition effects are stronger than localization externalities, as indicated by the negative and significant sign of the corresponding variables. What turns out to be indeed crucial in attracting FDI is the human capital endowment. This holds true for all its specifications except SME managers. We interpret this result as signaling that MNEs and local industrial networks, which in most EU countries consist of a large number of small- and medium-sized enterprises, are two separate spheres that do not collaborate but instead compete against each other for local production factors and local demand.

[6]As discussed in Chap. 2, Poland and Romania attract a large number of foreign firms but a low amount of foreign investments. These trends are not necessarily in contradiction with each other, but may simply indicate that Poland and Romania are favored locations for small multinational firms. Since, however, we had no information on foreign firms' size, we preferred to control for this fact in order to avoid potential distortions due to sample biases.

Table 7.1 The traditional factors

	OLS			Spatial error model			Spatial error model (EU15)		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.40	0.06	***	0.42	0.04	***	0.45	0.05	***
Labor costs	0.06	0.04		0.06	0.05		0.84	0.34	**
Market potential	0.08	0.05		0.08	0.05	*	0.05	0.05	
Manuf. (LT)	4.58	2.41	*	4.46	2.11	**	5.19	2.34	**
Manuf. (MT)	−0.77	1.66		−0.81	1.35		−2.44	1.55	
Manuf. (HT)	−5.37	2.85	*	−6.93	3.28	*	−12.58	4.02	***
Business services	2.84	1.57	*	2.68	1.29	**	0.96	1.55	
Corp. managers	25.23	1.62	***	25.33	2.25	***	23.71	2.49	***
SME managers	−8.02	4.32	**	−7.85	2.96	***	−8.90	3.81	**
Professionals	4.30	1.86	**	4.88	1.80	***	3.09	2.22	
White collars	4.63	2.13	**	4.38	2.52	*	4.49	2.80	
Blue collars	11.91	2.48	***	11.16	2.12	***	12.49	2.73	***
n. of obs.		260			260			197	
λ					0.92	***		0.93	***
R-square	0.82								
Moran's I	13.94	***							
Spatial error									
LM	41.40	***							
Robust LM	43.47	***							
Spatial lag									
LM	1.66								
Robust LM	3.74								
Wald test of $\lambda = 0$				141.43	***		158.53	***	
LM test of $\lambda = 0$				41.40	***		44.99	***	
Log likelihood				−244.41			−178.84		

All variables are in log form; therefore coefficients can be interpreted as elasticities. The constant term as well as dummies for Romania and Poland – which are significant in all specifications – has been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

Overall, these results indicate that MNEs investing in Europe look mainly to European regions well endowed with human capital, and they are willing to pay a higher cost to access those specific skills.

Most of these results seem to be driven by the EU15 regions, as indicated by the coefficients reported in column 3 of Table 7.1.[7] To be noted is that, for EU15, regions' productivity becomes a significant factor of attraction for foreign firms, while market potential matters only for Eastern European regions, given their peripheral position with respect to the EU core market. Not surprisingly, competition effects in high-tech manufacturing sectors are stronger than the average effect, while the regional endowments in intermediate functions, such as clerical workers and professionals do not represent potential attractiveness factors for EU15 regions, which, instead, become more competitive as endowments in command and control

[7](7.1) could not be estimated for Eastern European regions because of the lack of degrees of freedom.

functions and machine and plant operators increase. These results are in line with recent trends in globalization whereby foreign firms delocalize not only production activities but also high value added functions (OECD 2007).

7.3 The Role of Globalization and the Country Effect

7.3.1 Spatial Heterogeneity

Although informative, the model just analyzed suggests that differences in the attractiveness of regions are entirely due to the availability at local level of the factors able to attract FDI. Moreover, it presumes that model parameters are constant across space, and thus that European regions are homogeneous. In other words, the model does not account for spatial heterogeneity. This hypothesis, however, is rather unrealistic because regions may differ in several respects, such as morphology, institutional system, culture, language, and so on. These differences may concern regions belonging to different countries, but they may also arise within the same country, altering the explanatory power of the previously identified determinants of FDI.

In order to control for spatial heterogeneity, and thus understand the role played by globalization on regional attractiveness, we applied the same methodology used in Chap. 6 to assess the role of globalization on regional growth. Therefore, we first included in (7.1) a dummy that accounted for globalization stance, and then interacted it with the other explanatory variables in order to test whether the estimated coefficients varied across types of regions.[8] This strategy allows assessment of first whether global regions are, *ceteris paribus*, more attractive than other kinds of regions, and then whether globalization is able to affect factors of attractiveness of foreign firms. The model estimated was therefore as follows:

$$\begin{aligned}\frac{FDI_r}{POP_r} &= \alpha_0 + \beta_1 FDI_r + \beta_2 LABCOST_r + \beta_3 MKTPOT_r + \beta_4 MAN_{ir} + \beta_5 SER_r \\ &+ \beta_6 HUMCAP_{kr} + \alpha_1 D_{RO} + \alpha_2 D_{PL} + \alpha_3 GLO \\ &+ \beta_7 \left[GLO^* \sum_{n=1}^{6} X_n \right] + \varepsilon_r \end{aligned} \tag{7.2}$$

[8]Since the globalization index includes, among other things, also extra-European FDI, the latter was excluded from FDI variables in order to avoid multicollinearity.

where *GLO* is a categorical variable equal to one if region *r* is a global player and zero otherwise, and X_n is the vector of the six explanatory variables which can affect FDI inflows, as discussed when explaining (7.1).[9]

The second source of spatial heterogeneity that should be considered relates to regional performances, which are different not only across EU regions, but also among countries and within global, regional, and local players, as discussed in Chap. 6. In particular, country dynamics not only have a strong impact on the dynamics of regions regardless of their attitude towards globalization, as we showed in Chap. 6, but they have also been proven to exert positive effects on FDI flows, at least at country level (Billington 1999; Culem 1988).

Given these considerations, we maintain that the relationship between FDI flows and GDP growth rates may be affected by two distinct phenomena: (1) the relative position of each region within the country to which it belongs and (2) the relative position within Europe of the country to which each region belongs. This implies that laggard regions in well-performing countries may attract more (less) FDI than well-performing regions in laggard countries and/or vice versa.

In order to test these hypotheses, we constructed two dummy variables. The first, which we call *national champion* (*NATCH*), equaled one when region *r*'s growth rate was above the national mean and zero otherwise. The second, called *European champion* (*EUCH*), equaled one when region *r* belonged to a country whose growth rate was above the EU mean and zero otherwise. By including these dummies in (7.1) and interacting them with regional factors of FDI attraction, we were able to assess whether and to what extent being a leading region within a country or belonging to a leading country in the EU gives regions additional advantages in attracting FDI. The first effect captures the within-country advantage while the latter accounts for a between-country advantage in terms of FDI.

When the within-country effect was tested, the regression equation became as follows:

$$\begin{aligned}\frac{FDI_r}{POP_r} = {} & \alpha_0 + \beta_1 FDI_r + \beta_2 LABCOST_r + \beta_3 MKTPOT_r + \beta_4 MAN_{ir} + \beta_5 SER_r \\ & + \beta_6 HUMCAP_{kr} + \alpha_1 D_{RO} + \alpha_2 D_{PL} + \alpha_3 NATCH \\ & + \beta_7 \left[NATCH^* \sum_{n=1}^{6} X_n \right] + \varepsilon_r \end{aligned} \tag{7.3}$$

In order to test the between-country effect, the *NATCH* dummy variable was substituted with the *EUCH* dummy variable, all else equal.

[9]Since we did not have enough degrees of freedom we re-estimated (7.2) twice, with a dummy for regional and local players, respectively.

7.3.2 Global Vs. Non-Global Regions

In this section, we enquire whether and to what extent the regional stance towards the global economy matters in terms of FDI. We first test for the presence of fixed effects due to a region's attitude towards globalization. As the first three columns of Table 7.2 show, the answer to this research question is that global regions attract, on average, more foreign firms than regional and local players. Therefore, being an open region with a high degree of connectedness with the world economy represents, *ceteris paribus*, a further advantage in the FDI attraction game.

In order to check whether the attitude towards globalization is also able to magnify the impact of the traditional FDI attraction factors, we interacted the global dummy with the other explanatory variables, as shown in (7.2). Interestingly, we found that spatial heterogeneity does exist and that it affects the performance of global regions, as the last two columns of Table 7.2 show.[10]

However, we also found that globalization exerts an impact on only two broad factors: the absolute specialization in business services, and the concentration of skilled labor force and, in particular, of professionals and scientists, and, somewhat surprisingly, plant and machine assemblers, all else equal.

We may therefore conclude that qualitative changes brought about in a region's economic structure by globalization are able, *ceteris paribus*, to improve that region's attractiveness in terms of FDI flows. However, the impact of globalization is rather limited. We consequently cannot say that globalization is the main cause of the uneven distribution of FDI across EU regions. Better results are obtained when considering the between- and within-country effects.

7.3.3 Region Vs. Country Dynamics

When discussing potential reasons for differences in regional attractiveness, we argued that regional performance and, consequently, the capacity to attract FDI may be conditioned by country specificities that can work either within or between countries. In order to test the within-country effect, we estimated (7.3), always controlling for spatial dependence. The results are set out in Table 7.3.

Although regions performing better than the national average are, *ceteris paribus*, more attractive than other regions, as indicated by the positive sign of the dummy variable, this effect is rather weak and it is unable to affect the relationship between FDI flows and location advantages, with the exception of market potential. This result indicates that MNEs are, as expected, interested in the EU market and not in segmented national markets. Hence, regions with good accessibility to EU

[10]The coefficients reported in the last column are differential slope coefficients, indicating the extent to which the slope coefficients of the explanatory variables in global regions differ from those of regional and local players considered as a whole.

Table 7.2 The impact of globalization

	Model with fixed effects but constant parameters within each group of regions									Spatial heterogeneity: the impact of globalization (7.2)					
	Global players			Regional players			Local players			Other regions (average effect)			Global regions (marginal effects)		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.41	0.04	***	0.41	0.04	***	0.42	0.04	***	0.39	0.04	***	−0.06	0.10	
Labor costs	0.07	0.05		0.06	0.05		0.06	0.05		0.10	0.05	*	−0.10	0.22	
Market potential	0.05	0.05		0.08	0.05		0.08	0.05		0.02	0.07		0.02	0.10	
Manufacturing (LT)	3.97	2.10	*	4.02	2.14	*	4.62	2.13	**	3.17	2.11		−7.16	7.51	
Manufacturing (MT)	−0.58	1.34		−0.32	1.42		−1.05	1.41		−0.03	1.47		−1.14	3.60	
Manufacturing (HT)	−7.31	3.24	**	−7.01	3.27	**	−6.96	3.28	**	−5.93	3.39	*	−2.92	8.07	
Business services	1.43	1.37		2.52	1.30	*	2.55	1.30	*	−0.71	1.53		5.81	3.25	***
Corp. managers	25.72	2.23	***	25.77	2.28	***	25.14	2.27	***	28.08	2.53	***	−4.36	3.74	
SME managers	−8.11	2.92	***	−7.46	2.97	**	−8.12	2.99	***	−9.52	3.12	***	6.30	7.29	
Professionals	4.07	2.80	**	4.68	1.80	***	4.86	1.80	***	1.78	1.94		6.39	3.38	*
White collars	4.51	2.49	*	4.48	2.51	*	4.35	2.52	*	7.10	2.86	**	−7.03	5.52	
Blue collars	10.84	2.10	***	11.10	2.11	***	11.14	2.12	***	9.44	2.18	***	11.35	6.67	*
Global player	0.32	0.13	**												
Regional player				−0.10	0.09										
Local player							−0.06	0.10							
n. of obs.	260			260			260			260					
λ	0.92	0.08	***	0.92	0.08	***	0.92	0.08	***	0.92	0.08	***			
Wald test for $\lambda = 0$	138.69	***		144.97	***		138.57	***		124.25	***				
LM test of $\lambda = 0$	41.02	***		42.29	***		40.49	***		35.56		***			
Log likelihood	−241.27			−243.74			−244.24			−228.58					

Spatial error models. All variables are in log forms, therefore coefficients can be interpreted as elasticities. The constant term as well as dummies for Romania and Poland has been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

Table 7.3 Spatial heterogeneity: the within-country effect

	Other regions (average effects)			National champions (marginal effects)		
	Coeff.	St. Err.	Sig.	Coeff	St. Err.	Sig.
FDI flows ($t-1$)	0.39	0.05	***	0.10	0.06	
Labor costs	0.08	0.06		−0.05	0.08	
Market potential	0.18	0.06	***	−0.18	0.09	**
Manufacturing (LT)	4.56	2.76	*	−3.70	4.09	
Manufacturing (MT)	1.12	1.87		−3.63	2.56	
Manufacturing (HT)	−9.92	4.98	**	6.05	5.99	
Business services	4.15	1.73	**	−3.94	2.46	
Hum. Cap. – Corp. managers	26.72	4.77	***	−1.36	5.24	
Hum. Cap. – SME managers	−9.16	3.44	***	6.79	4.89	
Hum. Cap. – Professionals	3.77	2.45		−1.14	2.88	
Hum. Cap. – White collars	1.43	3.09		4.69	3.77	
Hum. Cap. – Blue collars	12.53	2.66	***	−3.18	3.81	
Constant	−2.94	0.92	***			
National champion dummy	1.86	1.07	*			
n. of obs.	260					
λ	0.91	0.09	***			
Wald test for $\lambda = 0$	109.93	***				
LM test of $\lambda = 0$	28.39	***				
Log likelihood	−231.64					

Spatial error model. All variables are in log forms, therefore coefficients can be interpreted as elasticities. The dummies for Romania and Poland regions have been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

core markets are definitely more attractive than regions with a good market potential from a national point of view.

In conclusion, these results suggest that inequalities in the distribution of foreign firms across regions are not explained by within-country differences: performances above the respective national averages, on the one hand, do not help regions to attract, *ceteris paribus*, more investments than other regions and, on the other hand, do not magnify the impact that location advantages exert on FDI flows.

By contrast, the between-country effect is not only more significant but also able to alter the relationship between FDI flows and location advantages, as shown in Table 7.4.

In particular, we found that regions belonging to a well-performing country in the EU are *ceteris paribus* more attractive than other regions, as indicated by the positive and significant coefficient of the corresponding dummy variable (Table 7.4 column 1). Also, the importance of each location advantage seems to differ between the two groups of regions. In particular, the country's growth potential positively affects location externalities in medium- and high-tech manufacturing sectors, as well as in business services, and negatively affects the importance of already-established foreign firms, labor productivity, and regions' endowments of medium- and low-level functions. This implies that if local industrial systems are to generate positive externalities, they must be part of a highly dynamic national system, while

Table 7.4 Spatial heterogeneity: the between-country effect

	Other regions (average effects)			European champions (marginal effects)		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.49	0.05	***	−0.16	0.08	**
Labor costs	1.33	0.38	***	−1.23	0.39	***
Market potential	0.17	0.08	**	−0.01	0.10	
Manufacturing (LT)	3.79	3.02		−2.04	4.02	
Manufacturing (MT)	−4.63	1.83	**	6.46	2.56	**
Manufacturing (HT)	−13.40	4.75	***	12.23	6.21	**
Business services	−1.71	2.29		6.91	2.76	**
Hum. Cap. – Corp. managers	25.30	4.67	***	−5.17	5.43	
Hum. Cap. – SME managers	6.35	5.19		−21.09	6.37	***
Hum. Cap. – Professionals	−1.96	2.87		4.49	4.30	
Hum. Cap. – White collars	9.01	3.54	**	−11.59	4.87	**
Hum. Cap. – Blue collars	15.05	3.30	***	−11.57	4.45	***
Constant	−15.11	3.90	***			
EU champion dummy	14.03	3.98	***			
n. of obs.	260					
λ	0.85	0.15	***			
Wald test for $\lambda = 0$	31.42	***				
LM test of $\lambda = 0$	7.72	***				
Log likelihood	−214.07					

Spatial error model. All variables are in log form, therefore coefficients can be interpreted as elasticities. The dummies for Romania and Poland regions have been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively.

the other location advantages partially lose their capacity to attract foreign firms, especially in the case of regions not belonging to national competitive systems.

It is also worth noting that regional endowments of command and control functions are totally independent from the country's performance, while medium- and low-level functions, such as blue and white collars, become less relevant when the between-country effect is accounted for. The opposite occurs for labor costs, which however, remain less relevant than productivity.[11]

7.3.4 Sector and Firm Heterogeneity

According to the theoretical literature on FDI, the attractiveness of a location does not depend on its specific advantages alone, but also on firm' and sector specificities, if they exist (Barba Navaretti and Venables 2004). In what follows, we report analysis performed to determine whether and to what extent these specificities affect the results obtained thus far. In particular, we wanted to know whether the

[11]This effect is due to new member states, because the estimated coefficient of the labour cost variable was not significant when (7.3) was estimated for EU15 countries only.

within- and between-country effects are constant across manufacturing and service sectors and between intra- and extra-EU foreign investors.

At sectoral level, we found that, on average, the attractiveness of regions is only marginally affected by the within-country effect, which is however less significant in manufacturing than in service sectors, while the between-country effect turns local disadvantages into positive externalities and vice versa, although the latter effect occurs in only a rather limited number of cases.

In particular, we found that the between-country effect makes sectoral externalities, both in manufacturing and business service sectors, emerge and positively affect FDI flows, as well as heightening the role of labor costs as a disadvantage for foreign firms. In other words, the attractiveness of regions belonging to well-performing countries depends less on labor productivity as an attractiveness factor than in other regions, given that, on average, it is likely that productivity and the labor force have better standards and skills in those regions than in regions belonging to laggard countries, regardless of their relative performance within the country.

Besides these regularities, foreign manufacturing and service firms respond to different locational advantages, which explain the motivations behind their internationalization strategies. Generally speaking, foreign manufacturing firms pursue efficiency-seeking strategies, because they are sensitive to labor costs, agglomeration externalities in medium-high tech manufacturing sectors and in business services, and regions' endowments of plant and machine assemblers, as indicated by Table 7.5. The importance of these factors varies across regions: the attractiveness of regions belonging to advanced countries stems mainly from low labor costs and agglomeration externalities, while other regions' competitiveness depends on labor productivity and low-skilled labor. Overall, these results suggest that regions belonging to laggard countries mainly attract foreign firms operating in traditional labor-intensive manufacturing sectors, while regions belonging to dynamic national systems attract foreign firms operating in the higher stages of the production chain.

By contrast, foreign firms providing services are, not surprisingly, market oriented, as indicated by the positive and significant estimated coefficient of the market potential variable (see Table 7.6). In this regard, we found that, although several services are not tradable, the European market is more important than the national ones, as indicated by the negative signs assumed by these variables when the within- and the between-country effects are accounted for. Another interesting finding is that, *ceteris paribus*, regions outperforming their own country are better able than other regions to attract more foreign firms operating in services. However, this potential advantage seems to be offset by the fact that the traditional determinants of FDI become less significant than the average effects. Thus, in service sectors, regions undergoing a counter-cyclical trend seem to be penalized in the FDI attraction game.

Conversely, the between-country effect is always positive, thereby magnifying the importance of traditional FDI determinants. In particular, we found that it magnifies regional specialization in high value added activities, such as manufacturing high-tech sectors and business services, and in the related high-level

Table 7.5 The country effect: manufacturing sectors

	Within-country effect						Between-country effect					
	Other regions (average effects on all regions)			National champions (marginal effects)			Other regions (average effects on all regions)			EU champions (marginal effects)		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.31	0.05	***	0.02	0.06		0.33	0.05	***	−0.08	0.07	
Labor costs	0.07	0.06		−0.01	0.08		0.92	0.36	**	−0.81	0.36	**
Market potential	−0.00	0.06		−0.03	0.08		0.10	0.07		−0.06	0.09	
Manufacturing (LT)	3.92	2.63		−3.31	3.90		3.42	2.80		−4.50	3.72	
Manufacturing (MT)	2.20	1.79		−3.48	2.44		−4.75	1.70	***	8.57	2.37	***
Manufacturing (HT)	−4.58	4.75		3.37	5.72		−7.47	4.39	*	8.67	5.75	
Business services	3.51	1.65	**	−4.25	2.35	*	−4.55	2.12	**	8.63	2.56	***
Corp. managers	22.21	4.56	***	1.43	5.00		19.46	4.33	***	1.24	5.03	
SME managers	−6.64	3.29	**	1.52	4.67		1.76	4.81		−13.54	5.91	**
Professionals	2.19	2.33		−1.93	2.75		−0.65	2.65		0.05	3.98	
White collars	5.27	2.95	*	2.78	3.60		17.09	3.28	***	−21.82	4.51	***
Blue collars	13.36	2.54	***	0.04	3.64		19.21	3.06	***	−13.55	4.12	***
Country effect	1.39	1.02					10.08	3.68	***			
n. of obs.	260						260					
λ	0.89	0.10	***				0.85	0.15	***			
Wald test for $\lambda = 0$	75.93	***					30.13	***				
LM test of $\lambda = 0$	18.63	***					5.99	**				
Log likelihood	−219.43						−194.12					

Spatial error model. All variables are in log form, therefore coefficients can be interpreted as elasticities. The dummies for Romania and Poland regions have been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

Table 7.6 The country effect: service sectors

	Within-country effect						Between-country effect					
	Other regions			National champions			Other regions			EU champions		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.54	0.06	***	0.08	0.08		0.64	0.06	***	−0.24	0.09	**
Labor costs	0.51	0.08		−0.09	0.10		1.10	0.46	**	−1.02	0.47	**
Market potential	0.22	0.08	***	−0.20	0.10	*	0.24	0.09	**	−0.07	0.12	
Manuf. (LT)	4.27	3.21		−5.33	4.75		3.26	3.62		−2.21	4.81	
Manuf. (MT)	1.44	2.17		−5.13	2.98	*	−4.61	2.20	**	5.94	3.07	**
Manuf. (HT)	−10.93	5.79	*	4.81	6.97		−6.14	5.69	***	13.97	7.48	**
Business services	5.27	2.01	***	−5.29	2.86	**	−1.11	2.74		6.96	3.31	**
Corp. managers	30.52	5.54	***	−4.31	6.09		32.98	5.60	***	−13.00	6.50	**
SME managers	−6.62	4.01	*	4.16	5.68		4.66	6.22		−18.77	7.65	**
Professionals	4.37	2.84		−3.87	3.35		−6.26	3.43	*	9.53	5.15	*
White collars	−1.13	3.59		8.49	4.38	**	6.85	4.24		−6.21	5.83	
Blue collars	12.01	3.09	***	−7.20	4.43		10.23	3.96	**	−8.67	5.34	
Country effect	3.67	1.24	***				11.31	4.77	**			
n. of obs.	260						260					
λ	0.90	0.10	***				0.80	0.19	***			
Wald test for $\lambda = 0$	85.95	***					17.43	***				
LM test of $\lambda = 0$	22.70	***					4.81	**				
Log likelihood	−270.68						−261.13					

Spatial error model. All variables are in log forms, therefore coefficients can be interpreted as elasticities. The dummies for Romania and Poland regions have been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

functions, such as professionals and scientists, while reducing the explanatory power of agglomeration among foreign firms, labor productivity, and command and control functions, whose positive effects can be indirectly captured by the dummy signaling regions belonging to well-performing countries, that is, countries with higher productivity, higher quality of human capital, and a more friendly business environment than other countries and regions.

When intra- and extra-EU FDI are distinguished, the previous results do not change dramatically, especially as far as intra-EU foreign firms are concerned. The latter, in fact, behave as indicated by the general model, and as suggested by the estimation results reported in Table 7.7, which are quite similar to those previously discussed for the entire sample (see Tables 7.3 and 7.4).

Extra-EU foreign firms, instead, seem to exhibit different location patterns.[12] Several striking features are should be noted. Firstly, extra-EU foreign firms' location patterns are affected by spatial dependence only within the country, as indicated by the λ coefficient, which is not significant when the between-country effect is accounted for (Table 7.8).

Secondly, both the within- and between-country effects are less important than in the sample as a whole. This implies that the attractiveness of regions depends more on traditional FDI determinants than on spatial differences at work either within or between countries. In particular, the between-country effect heightens the importance of labor costs and externalities in medium-high tech manufacturing sectors, while it reduces the importance of low-level functions.

Thirdly, the results fully confirm the importance of good accessibility to EU-wide markets as a factor in attracting extra-EU foreign firms, which prefer to locate in regions where other foreign firms are already operating, and which are well-endowed with high-level functions. These locational advantages do not seem to be affected by spatial heterogeneity.

7.4 Conclusions

The analysis in this chapter has yielded a number of important findings, which are now summarized.

Firstly, we have found that regional attractiveness can be improved by strengthening various economic factors, which include market accessibility, labor costs, agglomeration externalities, and the labor force's expertise and competences.

Secondly, we have seen that these factors of attractiveness are not of equal importance. Rather, their capacity to attract FDI must be assessed together with firm and sector specificities. In particular, foreign manufacturing firms, in that they are motivated by efficiency reasons, do not respond to improvements in market

[12]In this regard, it should be borne in mind that extra-EU FDI represents only one third of our sample. See Chap. 5 for a description of extra-EU FDI trends.

Table 7.7 The country effect: intra-EU FDI

	Within-country effect						Between-country effect					
	Other regions			National champions			Other regions			EU champions		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.40	0.05	***	0.10	0.07		0.49	0.06	***	−0.16	0.08	**
Labor costs	0.07	0.07		−0.05	0.09		1.22	0.40	***	−1.12	0.40	***
Market potential	0.18	0.07	***	−0.17	0.09	*	0.19	0.08	**	−0.36	0.10	
Manuf. (LT)	5.10	2.86	*	−3.36	4.23		4.48	3.12		−2.10	4.14	
Manuf. (MT)	0.47	1.93		−3.40	2.65		−5.45	1.89	***	7.13	2.64	***
Manuf. (HT)	−12.04	5.16	**	7.04	6.21		−16.33	4.90	***	15.92	6.40	**
Business services	3.51	1.79	**	−4.04	2.55		−3.11	2.36		8.08	2.84	***
Corp. managers	24.73	4.94	***	−2.76	5.43		24.11	4.82	***	−7.63	5.60	
SME managers	5.27	3.91		6.71	5.07		5.12	5.35		−19.04	6.57	***
Professionals	4.42	2.54	*	−1.54	2.99		−1.82	2.96		4.56	4.43	
White collars	2.20	3.21		5.27	3.91		10.75	3.66	***	−13.28	5.02	***
Blue collars	13.07	2.75	***	−3.34	3.95		15.39	3.41	***	−12.13	4.59	***
Country effect	1.92	1.10	*				12.79	4.10	***			
n. of obs.	260						260					
λ	0.92	0.08	***				0.86	0.14	***			
Wald test for $\lambda = 0$	141.78	***					40.36	***				
Lagrange multiplier test of $\lambda = 0$	34.95	***					9.29	***				
Log likelihood	−241.11						−222.09					

Spatial error model. All variables are in log forms, therefore coefficients can be interpreted as elasticities. The dummies for Romania and Poland regions have been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

Table 7.8 The country effect: extra-EU FDI

	Within-country effect						Between-country effect					
	Other regions			National champions			Other regions			EU champions		
	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.	Coeff.	St. Err.	Sig.
FDI flows ($t-1$)	0.27	0.05	***	0.04	0.06		0.26	0.05	***	0.02	0.08	
Labor costs	0.05	0.06		0.02	0.08		1.06	0.39	***	−0.99	0.40	**
Market potential	0.24	0.06	***	−0.17	0.09	**	0.19	0.08	**	−0.03	0.10	
Manuf. (LT)	2.10	2.70		2.12	4.00		−4.09	3.10		0.88	4.11	
Manuf. (MT)	1.76	1.82		−3.79	2.49		−2.68	1.87		5.00	2.63	*
Manuf. (HT)	2.15	4.82		−1.24	5.87		1.10	4.83		0.03	6.31	
Business services	2.34	1.68		0.55	2.41		1.61	2.34		1.12	2.82	
Corp. managers	26.68	4.66	***	6.54	5.03		29.61	4.74	***	−0.98	5.50	
SME managers	−6.88	3.34	**	1.98	4.78		3.37	5.38		−14.06	6.62	**
Professionals	1.85	2.38		−0.09	2.81		−3.13	2.90		6.15	4.38	
White collars	−0.24	2.97		0.26	3.70		2.27	3.54		−1.55	4.93	
Blue collars	6.75	2.59	***	1.04	3.72		9.67	3.38	***	−7.66	4.55	*
Country effect	0.16	1.04					10.61	4.10	**			
n. of obs.	260						260					
λ	0.66	0.33	**				0.45	0.49				
Wald test for $\lambda = 0$	4.09		**				0.87					
LM test of $\lambda = 0$	1.39						0.33					
Log likelihood	−223.83						−219.84					

Spatial error model. All variables are in log forms, therefore coefficients can be interpreted as elasticities. The constant term as well as dummies for Romania and Poland regions has been omitted. Robust standard errors. ***, **, * implies significance at 10, 5, and 1%, respectively

accessibility but rather to increases in labor productivity (or decreases in labor costs) and agglomeration externalities. Foreign firms providing services are instead more sensitive to market access and high-level functions, two important signals of well-developed local markets. Origin from within or outside Europe does not seem to be associated with substantial differences in location patterns.

These results explain why we found in Chap. 5 that FDI in manufacturing concentrates in Eastern European regions, and why we observed a strong concentration of foreign firms producing services in the capital regions. However, they do not help in understanding why regions with the same labor costs or with the same access to the EU core market have different levels of attractiveness. In order to answer this question, it is necessary to consider another important dimension, one often neglected by previous similar studies, i.e., spatial diversity.

Spatial heterogeneity may assume different forms, in that it is more a conceptual problem than a technical one. Given the aims of this book, we explored two forms of regional diversity: the attitude towards globalization and the role played by national specificities.

Global players are, *ceteris paribus*, more attractive than regional and local players. Their increased capacity to attract FDI is linked, on the one hand, to their greater international openness and specialization in open sectors, and on the other, to the fact that globalization has increased the explanatory power of three factors of attractiveness: specialization in business services, the endowments of professionals and scientists, and the skills of blue collars. The first two effects are direct consequences of the qualitative changes brought about by globalization in the economic structure of EU regions and countries; while the last effect is indubitably driven by Eastern European global players, which are particularly attractive for foreign manufacturers operating in low-tech, labor-intensive sectors.

Although interesting and new,[13] these results do not completely explain the geographical distribution of FDI in Europe. We have found that global regions are, on average, more attractive than regional and local players; but we have not been able to explain the uneven distribution of FDI within each type of region. In an attempt to do so, we have argued that regional attractiveness does not depend entirely on locational advantages, but may be enhanced or diminished by a country's performance. We have modeled two different country effects: the within-country effect, which refers to the relative performance of a region within the country to which it belongs; and the between-country effect, which instead concerns the relative performance in Europe of the country to which a region belongs. We have obtained the following interesting results:

[13]Previous studies have concentrated mainly on the impact of economic integration through Preferential Trade Agreements (PTAs) on FDI flows, rather than on globalization. See, among many others, Blomstrom et al. 1998; Ethier 1998; Levy-Yeyati et al. 2002; Balasubramanyam et al. 2002; and, as regards the EU, Egger and Pfaffermayr 2004; Resmini 2003; Liebscher et al. 2007 and Barrell and Pain 1999.

- The within-country effect is only marginally significant. This implies that regions that outperform within their own country are not, *ceteris paribus*, more attractive than other regions.
- Despite its low level of significance, the within-country effect points up the importance of accessibility to the EU market, and not to national fragmented markets.
- The between-country effect is instead highly significant and affects several traditional FDI determinants. In particular, we have found that it magnifies agglomeration externalities, makes labor costs relevant in location decisions, and reduces the importance of low-level functions as attractive to foreign firms.
- The country effect is not constant over sectors. In the service sector, it magnifies the importance of agglomeration externalities in medium-/high-tech economic activities and related high-level functions, such as professionals and scientists, while it reduces the capacity to attract FDI inflows through self-cumulative processes.

These results have interesting policy implications. Firstly, they suggest that what makes regions more attractive is not their own absolute performance, but instead that of the country to which they belong. This explains why South-Western regions attract so few foreign firms compared, for example, with Eastern regions: the former perform, in absolute terms, better than the latter, but they are penalized in the FDI attraction game by the performance of their own countries, whose growth trends have been poorer than those of new Eastern-Europe member states.

Secondly, the competition to attract FDI does not occur among regions belonging to the same country, but among regions belonging to different countries; and, in particular, between regions belonging to dynamic national systems and regions belonging to nondynamic ones. Attractiveness factors differ between these two groups of regions and they consequently attract different kinds of FDI. In particular, FDI inflows into regions belonging to less dynamic national systems seem to be more attractive for foreign firms producing in low-value added activities (both services and manufacturing), while regions belonging to well-performing national systems attract high value added FDI. The contribution of these kinds of FDI to local growth and development may be different.

The foregoing considerations imply that if a region's attractiveness is to be improved, it is necessary to act first at national level, and then at regional level, and not vice versa, given that national champions are not, *ceteris paribus*, more attractive than other regions. This implies that FDI promotion policies cannot be implemented at either national or regional level, but should be the result of coordination efforts between the two levels of governance.

These interesting results, together with those obtained in Chaps. 5 and 6, provide profound insights into the impact of globalization on regional growth, attractiveness, and competitiveness. As mentioned in the introductory chapter to the book, however, the interest in globalization's spatial impact does not only lie in interpretation of past experience. The capacity to interpret what will happen in the future is of paramount importance, because the main challenges facing the European regions are embedded in alternative future globalization patterns driven by

several factors: how and when the world economic crisis will end; how it affects geo-political games; how the complex interactions among large global players will develop; how international competitiveness will be achieved by advanced and emerging economies; and which different intervention policies will be put in place by the European Commission.

A prospective analysis will raise awareness about the likely territorial effects generated by different (alternative and rather extreme) visions of the future states of the socioeconomic system. How these visions are built (Chaps. 8 and 9) and the results of the simulation exercises (Chap. 10) are the subjects of the next and last part of the book.

Annex 7.1 Regional Database

Table 7.9 Variable description and data sources

Variables	Definition	Source of raw data
GDP growth	Percentage change in real regional GDP (2004).	Eurostat
Labor cost	Average annual labor cost: salaries and wages in 2004 (excluding apprentices and trainees).	Eurostat
Market Accessibility	Weighted average of GDP of all European regions *j* other than *i*. The weights are the reciprocal of the time distances between the respective capitals. Reference year: 2004.	Eurostat and DGRegio
FDI/Lag_FDI	Number of new foreign firms per million inhabitants. Reference period: 2005–2007 for the dependent variable and 2001–2003 for the independent variable.	Eurostat and FDIRegio
Low Tech	Specialization Index. Share of regional value added generated by sectors with low technological intensity on total value added generated by the region. Reference year: 2004	Eurostat
Medium Tech	Specialization Index. Share of regional value added generated by sectors with medium technological intensity on total value added generated by the region. Reference year: 2004.	Eurostat
High Tech	Specialization Index. Share of regional value added generated by sectors with high technological intensity on total value added generated by the region. Reference year: 2004.	Eurostat
Business Services	Specialization Index. Share of regional value added generated by business services sectors on total value added generated by the region. Reference year: 2004. Source: Eurostat	
Corporate Managers	ISCO-88/12 employment share on total regional employment (3-year average, 2002–2004). Data provided by DGRegio.	
SME Managers	ISCO-88/13 employment share on total regional employment (3-year average, 2002–2004).	DGRegio

(*continued*)

Table 7.9 (continued)

Variables	Definition	Source of raw data
Professionals and Scientists	ISCO-88/2 employment share on total regional employment (3-year average, 2002–2004).	DGRegio
Clerical workers (White Collars)	ISCO-88/4 employment share on total regional employment (3-year average, 2002–2004).	DGRegio
Skilled Workers (Blue Collars)	ISCO-88/8 employment share on total regional employment (3-year average, 2002–2004).	DGRegio

Table 7.10 Classification of economic sectors by technology intensity

Nace code	Economic activity
AB	Agriculture, hunting, and forestry + fishing
C	Mining and quarrying
DA	Manufacture of food products, beverages, and tobacco
DBDC	Manufacture of textiles, clothing, and leather
DD	Manufacture of wood and wooden furniture
DE	Manufacture of paper, publishing, printing
DFDG	Chemical industry
DH	Manufacture of rubber and plastic
DI	Manufacture of nonmetal products
DJ	Manufacture of metal and metal-based products
DK	Manufacture of machinery and equipment
DL	Manufacture of electrical and electronic equipment, precision instruments
DM	Manufacture of automobile and other transport equipment
DN	Other manufacturing
E	Electricity, gas, and water supply
F	Construction
G	Wholesale and retail trade
H	Hotels and restaurants
I	Transport, storage, and communication
J	Financial intermediation
K	Real estate, renting, and business activities
L	Public administration and defense, compulsory social security
M	Education
N	Health and social work
OP	Other personal services

Low-Tech (LT): manufacture of food products, beverages, and tobacco; textiles, clothing, and leather; wood and wooden furniture; paper, publishing, printing; other manufacturing
Medium-Low Tech (MLT): rubber and plastic; other nonmetal products; metals and metal-based products
Medium-High Tech (MHT): chemicals; machinery and equipment; automobile and other transport equipment
High Tech (HT): electrical and electronic equipment, precision instruments
Business services: real estate, renting and business activities; financial intermediation; transport, storage, and communication