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Analysis of inward Greenfield Foreign Direct Investments in the German Federal States

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I. Abstract

The aim of this dissertation is to investigate the location of greenfield foreign direct investments in the federal states of the German Federal Republic during the time period 2007-2015. The research exhibited substantial differences among the federal states of the once Western and Eastern Germany and using the conditional logit model introduced by McFadden (1971) under the Independence of Irrelevant Alternatives (IIA) hypothesis, the results have shown that greenfield investors prefer to invest in regions with a great market potential, presence of higher educated population, good transportation infrastructure and high population density. Additionally, also network effects as general agglomeration activities and presence of companies from the same country of origin and technical or Marshall externalities are significant in attracting greenfield investments. Meanwhile, Jacobs externalities seem to deter in general the attractiveness of a federal state, while the results presented some ambiguous findings about the regional demand and federal taxes. Still, after a sectoral analysis, resulted that Bundesländern with high population density attract more greenfield investments in the headquarters, R&D and sales sectors while a high sectoral diversification is not attractive for greenfield investments in the logistics sector. In conclusion, the country of origin of an investment affects the location decision choice of greenfield investments, since countries that are not part of Europe as the United States, China and partly the United Kingdom tend to locate their firms in federal states with already existing firms from the same source country and France, the Netherlands and especially Switzerland locate their investments in the neighbour federal states, in order to decrease the information asymmetry when entering a foreign market. Meanwhile, Dutch investors tend to locate their greenfield projects in federal states where other Dutch firms are already present.

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1. Introduction

Multinational enterprises (MNE) undertake Foreign Direct Investments (FDI) to create, acquire or expand a foreign subsidiary in a certain location outside its country of residence. In general, MNEs are larger and sometimes more productive than national firms when size is measured in terms of the number of employees, turnover and value added (Barba Navaretti, Barry and Venables, 2004). Because of this fact, the general public and policymakers around the world have mixed feelings about MNEs: they see them either as welcome bearers of foreign wealth and knowledge or as unwelcome threats to national wealth and identity (Barba Navaretti, Barry and Venables, 2003).

In the present research, the focus was pointed on the analysis on how regional differences between the sixteen federal states (Bundesländer) corresponding to the NUTS I (*Nomenclature des Unités Territoriales Statistiques*) regions of the European Union (EU), part of the Federal Republic of Germany, are determinant of the attraction of greenfield FDI in various industry sectors. In this case, particular attention was posed on the regional characteristics that attract or deter investments by various MNEs in the German federal states. In the dissertation it was also important to underline the fact that despite the German reunification (Deutsche Wiedervereinigung) occurred nearly thirty years ago, precisely on the 3rd October 1990 (Evans, 1998), there are still notable economic differences between the eleven Western German regions (Baden-Württemberg, Bayern, Berlin, Bremen, Hamburg, Hessen, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Schleswig-Holstein) formerly part of the Federal Republic of Germany (FDR) and the five Eastern German regions (Mecklenburg-Vorpommern, Brandeburg, Sachsen, Sachsen-Anhalt and Thüringen), formerly part of the German Democratic Republic (GDR). In the report two different sets of data were used. A smaller amount of data was retrieved from the period ranging from year 2003 to year 2006 and a broader set of data from the period from year 2007 to year 2015 was used to create the model for

evaluating the influence of the regional characteristics of the German federal states on the investing decision of MNEs.

1.1 Literature and previous studies

The research concentrates on the study of the location decision of foreign greenfield investments in the German federal states. The novelty of this research lies in the fact that the majority of the research papers as Spies, (2009) for the German case, Barrios, Görg, and Strobl, (2006) for Ireland, Cheng and Kwan, (2000) for China, Deichmann, Karidis and Sayek, (2003) for Turkey and Kornecki and Ekanayake, (2012) for the United States, have all concentrated the research on the regional attractivity for general Foreign Direct Investment inflow in the respective countries, but they did not focus on the location determinants of foreign investors, when evaluating the attractiveness of the particular case of the German regions, for greenfield investments. Spies, (2009), "Network and border effects: Where do foreign multinationals locate in Germany?", research paper, gave interesting insights on the determinants of attraction of FDI in general in the sixteen German federal states, for the time period 1997-2005. The results of the paper highlighted that natural industry clusters, presence of a common border and market access play a crucial role in the location decision of foreign investors. The research paper from Spies, (2009) was used as a pattern on how to proceed to structure the argument. Still, the dissertation is in itself unique since it is evaluating the federal states during the 2007-2015 period and is concentrating only on the study of greenfield investments that have been performed in the Bundesländer during this specific period. Additionally, to make the analysis more complete, the general agglomeration variable that was present in the Spies, (2009) research, was divided in five different variables, with the scope to better comprehend the agglomeration behaviour which from the literature results to be crucial in the investing decision of foreign investors.

The other research papers have shown similar results for what concerns the characteristics that a geographic area must have in order to be interesting for inward foreign investments. The research paper from Basile, (2004), "Acquisition versus greenfield investment: the location of foreign manufacturers in Italy," assessed the determinants for the attraction of inward greenfield investments in Italy and it was interesting to realize that similarly as in Italy, where there are significant differences in the attractiveness in terms of foreign direct investments between the northern and southern regions of the Italian peninsula, meaningful differences exist also between the Western and the Eastern parts of Germany with the Western federal states receiving more greenfield foreign investments, similarly to the case of the northern Italian regions.

1.2 Nature of FDI

As definition, the term FDI states for an expenditure in a foreign country where usually as trash hold level, the foreign investor owns at least 10 percent of the ordinary shares, undertaken with the objective of establishing a "lasting interest" in the country, a long-term relationship and significant influence on the management of the firm (Barba Navaretti, Barry and Venables, 2004). FDI flows include equity capital, reinvested earnings and other direct investment capital.

From the modern literature a crucial point in understanding how the mechanism of foreign direct investment works, is to comprehend the reasoning behind why investors commence these investments schemes. According to Dunning (1983), there are three purposes of FDI.

Market seeking FDI

The main intention of market-seeking FDI, which is also called horizontal FDI, is to operate in regional and local markets and is linked with the reproduction of business facilities in the host economy. Since the reason for horizontal FDI is to better serve a local market by local production, market size and market growth of the host economy are the main drivers. The impediments to access local markets such as tariffs and transport costs also encourage this type of FDI (Kinoshita and Campos, 2003).

Resource or asset seeking FDI

Resource or asset seeking firms invest abroad when their goal is to obtain resources that otherwise are more expensive or not available in the home market. Assets such as raw materials, natural resources, low cost input factors such as energy and cheap labour force play a key role in this FDI category. Resources may be natural resources, raw materials, or low-cost inputs such as labour. Especially in the manufacturing sector, when multinationals directly invest in order to export, factor cost considerations become important. In contrast to horizontal FDI, vertical or export-oriented FDI involves a relocation of parts of the production chain to the host country. Availability of low-cost labour is one prime driver for export-oriented FDI. Furthermore, FDI in resource sector such as oil and natural gas is attracted to the countries with abundant natural endowments (Kinoshita and Campos, 2003).

Efficiency seeking FDI

Efficiency seeking investments are made when firms gain from the common governance of geographically dispersed activities in the presence of economies of scale and scope (Kinoshita and Campos, 2003). In this case MNEs benefit from different factor endowments, cultures, institutional arrangements, economic systems and policies, and market structures by concentrating production in a limited number of locations to supply multiple markets (Dunning, 1993).

In the modern economy we can observe out two different approaches on how a multinational enterprise can invest in a certain foreign country. These two major categories of FDI investments called namely, Mergers and Acquisition (M&A) and greenfield Investments (GI) who differ between each other by the decision of how the MNE decides to expand its operations in the foreign market. By opting for a Merger and Acquisition, the foreign firm acquires an existing asset of a local firm or opts to merge with the local firm. From that moment on the multinational enterprise will be able to serve the foreign market by using the already existing facilities that were once property of the local firm. In the case that is studied in this research, the greenfield investment, the MNE decides to invest in a new physical plant and productive asset in the foreign market (case of the market seeking behaviour or horizontal FDI). From UNCTAD, worldwide, the majority of FDI takes place through M&A activity rather than through greenfield investments.

1.3 Theoretical effects of MNEs on the local economy

Multinational enterprises are usually considered different from national firms operating in the same country. Normally they are larger and have enhanced bargaining power when it comes to policy making and bargaining power in the market place, these facts are well observable in the particular case of smaller developing countries. In addition, they are global players who can circumvent national regulations and policies more easily than national firms can do. They are footloose, able to move activities between their plants at relatively low cost, removing benefits as rapidly as they deliver them (Barba Navaretti, Barry and Venables, 2004) and because of these reasons distrust against them is legitimate. But in contrast MNEs often bring private technologies, financial resources and

know-how. They are experienced in gaining return from contemporary economic opportunities and improving national wealth by eroding market monopoly from local firms with an increased competition in the market place, and they often offer better employment conditions compared with national firms. A particular aspect on which MNEs are able to leverage on is the fact that since they have production plants and offices in different parts of the globe, it is relatively easier for them to move activities across borders and because of this reason, they are more elastic when variations regarding labour cost and output demand alterations occur in the host country, mainly due to different hiring and firing outlays of the work force. The benefit of this behaviour is that the labour market becomes more competitive, diminishing the bargaining power of trade unions, meanwhile the total welfare is reduced because of an increase in mistrust and unpredictability.

1.4 Germany in the world economy

Germany is the fourth largest economy in the world, behind only to the United States, China and Japan, with Italy ranked number 8, with a gross domestic product referred to year 2017 of 3,263 billion euros with services accounting for 69.3%, industry 30.1% and agriculture 0.6% (International Monetary Fund, 2018), increased by 2.2% compared to year 2016 and expected to grow to up to 4,470 billion euros by year 2022 (Statista, 2018). Germany is ranked number 3 worldwide for both exports and imports behind to the United States and China, exporting a total value of 1,279 billion euro with the United States accounting for 8.8%, France 8.2%, China 6.8%, Netherlands 6.7%, UK 6.6% and Italy 5.1% and importing a total of 1,035 billion euro, accounting for a net export surplus of

244 billion euro with Netherlands 13.8%, China 7%, France 6.6%, Belgium 5.9%, Italy 5.4% and Poland 5.4% (Bozoyan, 2018). The ten most exported goods categories in year 2016 were: automotive 19%, machinery 14%, chemical goods 9%, IT-hardware, electronics, optical goods 8%, electrical goods 6%, pharmaceuticals 6%, other vehicles 5%, food and feed 4%, metals 4% and rubber and plastic 4%. Meanwhile, in the same year the ten most imported goods categories were: automotive 11%, IT-hardware, electronics, optical goods 11%, machinery 8%, chemical goods 8%, electrical goods 6% metals 5%, pharmaceuticals 5%, oil and natural gas 5%, food and feed 5% and other vehicles 4% (Bozoyan, 2018). Germany is the largest economy among the 28 EU-countries, it constitutes 21% of the total European GDP and it contributes for 16% of the total European Union citizens. 67% of all German export goods are exported in European economies, of which 58% goes to the 28 EU member states. German companies operating in the manufacturing sector account for 10% of the total manufacturing companies working in the manufacturing sector and generate 28% of the total EU turnover in the industry sector. Exports are driven by Germany's backbone of highly innovative small and medium-sized enterprises (SMEs), the renowned *Mittelstand*. They constitute 99.6% of all companies, employing around 60% of the German workforce. Many of these SMEs are hidden champions-world market leaders in their respective niche segments (Bozoyan, 2018). The biggest German companies by sales in year 2017 are: Volkswagen Group 230.7 billion euro, Daimler AG 164.3 billion euro, Allianz 126.1 billion euro, BMW Group 98.7 billion euro and Siemens 83.1 billion euro (Fortune, 2017). Due to its geographic strategic location and to factors of quality and reliability of the transportation networks (rail, roads, sea and inland river ways) and also including a dense distribution of national and international airports, Germany is considered to have the best infrastructure in the world from the World Bank logistics performance index 2016. Germany has substantially invested in the development of advanced technologies and innovations. It is the biggest research spender country in Europe with total research and development expenditures in year 2015 of nearly 89 million euro. Since year 2009 research and development national expenditures have constantly increased at 4.7%

compound annual growth rate with industry significantly increasing its research and development expenditures and being considered as one of the most important areas for the future dynamic development of the national economy.

Figure 1.1. R&D expenditure by federal state and equivalent
European country (Eurostat, 2016)

Germany is significantly investing in fast developing technologies and has a 23% share of total full-time researches working in Europe in year 2015, with France second with 15%, United Kingdom 14%, Italy 9% and Spain 7%. Still, in year 2015 Germany has invested nearly 89 billion euro in research and development which is close to the combined national R&D expenditures of France 49 billion euro and United Kingdom 40 billion euro. Italy and Spain followed with 21 and 13 billion euro reciprocally (Eurostat, 2017). Figure 1.1. illustrates how single federal states have similar R&D expenditures as other European countries, with Bayern having a comparable expenditure as Spain, Portugal and Greece, meanwhile Baden-Württemberg has a comparable level of R&D expenditure as Italy.

As challenges for the future, Germany will have to manage three crucial facts: Low wage growth and inflation, ageing society and budget surplus and balanced savings and investments.

1.5 General facts regarding FDI in Germany

As overview, foreign subsidiaries of MNEs in manufacturing employ one person every five in Europe and one every seven in the US; they sell one euro in every four of manufactured goods in Europe and one dollar in every five in the US (OECD, 2001). More specifically, Germany is one of the most important FDI inflow destinations worldwide and was ranked number eight in terms of FDI inflow stocks in 2016 and ninth for openness to FDI inflows (OECD, 2017). Despite the fact, that roughly 28,000 enterprises, which accounts for no more than 1% of all business activities in Germany, has headquarters in overseas countries, the foreign investments amounted to 731 billion EURO and accounted for 23.7% of the total German GDP (UNCTAD, 2017). In addition,

it is also important to mention that the value added in foreign controlled enterprises in Germany amounted to 20,05% and MNEs employed 3.1 million people, which is 10.84% of the German workforce (Eurostat, 2018). From Table 1.1 it is possible to notice that more than 75% of all inward FDI stock was invested by only eleven foreign countries meanwhile from Table 1.2 it is possible to observe in which sectors foreign enterprises are investing the most.

Investing countries	Share of total investments in %
United States	21.18
Switzerland	12.26
Netherlands	6.32
Spain	5.86
UK	5.31
Denmark	5.18
France	5.15
China	4.49
Austria	4.16
Australia	3.34
Italy	2.63

Main invested sectors	Share in %
Professional, Scientific and Technical Services	40.5
Financial and insurance activities	35.7
Real estate	6.0
Information and Communication	5.3
Manufacturing Sector	5.1
Wholesale and retail trade, maintenance	5.0

Table 1.1. Major countries investing in Germany (OECD, 2016)

Table 1.2. Main sectors receiving FDI in Germany (OECD, 2016)

In addition to the strategic position in Central Europe, from surveys resulted that foreign investors in the German area appreciate five factors over the other competing countries: skilled workers force, supply chain networks, research and development, infrastructure and reliable political/legal framework (Bozoyan, 2018). In the further chapters is assessed which federal states are better endowed with these factors and consequently, they benefit from a greater FDI inflow in the region.

2. Data collection

The data used in the analysis were retrieved from the Eurostat database, the Destatis Statistiche Bundesamt database and the OECD dataset. Thanks to these sources it was possible to retrieve various macro-economic data regarding all the sixteen German Federal States. These data as the regional GDP, infrastructure development, federal taxes, unemployment etc. were used to assess and to differentiate the sixteen federal states that present notable differences among them. Still, for assessing FDI microdata regarding the single foreign enterprises investing in greenfield projects in Germany, particular access to the fDi Intelligence database had to be gained in order to conduct a deeper and more complete analysis of the argument. These information allowed to segment each single greenfield investment by its source country, the destination state, the year of the investment, the name of the parent company, the name of the investing company, the amount of euros invested and the industry sector and industry activity in which the greenfield investment was operating. From the fDi Intelligence database it was possible to retrieve 7,511 observations of foreign companies investing in Germany specifying the federal state in which they invested. Still, in a certain number of observations, the information regarding the state in which the company invested was missing. Additionally, all the foreign investments were classified as: new (greenfield investments), expansion or co-location projects. For the purpose of this research, only greenfield investments were taken in account. The reason for that is that the intention of the research was to appraise the behaviour of establishing a completely new business and not to investigate the further development of the new businesses in the German federal states. As a consequence, the final utile number of greenfield investments was 6,685. All the previously collected data from the Statistiche Bundesamt database, the OECD dataset and from the fDi Intelligence are from the period ranging from year 2007 till tear 2015. Additionally, from a second set of data from the period from year 2003 to year 2006 retrieved from the fDi Intelligence database, was possible to observe 1,226 investing projects in the German country, where

after applying the same procedure of not taking in account the investments where the location of the investments was not specified and also by not considering the expansion or co-location investments projects, the final number of observed greenfield investments during the specified period was 947. This has resulted in a high number of foreign investing companies, that combined with the federal states characteristics allowed a modest amount of data to elaborate.

3. Regional differences driving greenfield investments

The first step in the analysis of the impact of the intensity of FDI in a certain federal state of the Federal Republic of Germany was to investigate if there is a positive correlation between the FDI in the federal state and the Gross Domestic Product (GDP) generated in the federal state. From Table 3.1 representing the regional per capita GDP and from Table 3.2 representing the regional GDP of all the sixteen federal states relative to year 2015 it is possible to note, that the Eastern federal states that were part of the former German Democratic Republic have a substantially lower GDP per capita and are also subject to less greenfield investments compared with the federal states of the former Federal Republic of Germany (FDR). The dilemma that resulted from this analysis is to understand the direction of the causality. It means to determine whether is it the wealth of a region that attracts FDI or are FDI inflows that bring capital inflow and consequent wealth in a certain region? From the substantial differences of the recent history of the two categories of federal states it is reasonable to state that richer Bundesländer as are the Western German states are because of their characteristic, more appropriate to attract foreign investments. In the dissertation, other factors were inserted to address the attractiveness of a federal state, not by only evaluating if it is a former state of the Federal Republic of Germany or of the German Democratic Republic which would make the dissertation not valuable for a researcher's and policy-maker's point of view.

Still, a point that does not have to be neglected is the ethical point where "policymakers face a dilemma in which democracy and legal rights seem to be mutually incompatible with fostering foreign employment" (Paniagua and Sapena, 2014). Thus, an additional question mark has to be posed on the right balance of national and regional policymakers when trying to attract FDI in order to stimulate the local economy.

Rank	States	GDP per capita (EUR€)
1	Hamburg	61,100
2	Bremen	46,900
3	Bayern	43,100
4	Hessen	42,900
5	Baden-Württemberg	42,800
6	Nordrhein-Westfalen	36,700
7	Berlin	35,600
8	Saarland	35,000
9	Rheinland-Pfalz	33,700
10	Niedersachsen	32,700
11	Schleswig-Holstein	30,600
12	Sachsen	28,000
13	Thüringen	27,300
14	Brandenburg	26,900
15	Sachsen-Anhalt	25,900
16	Mecklenburg-Vorpommern	25,100

Table 3.1 GDP per capita and total GDP of German federal states in 2015 (Eurostat, 2016)

Rank	States	GDP (billion EUR€)	Share of total GDP (%)
1	Nordrhein-Westfalen	645.59	21.3
2	Bayern	549.19	18.1
3	Baden-Württemberg	460.68	15.2
4	Hessen	263.44	8.7
5	Niedersachsen	258.53	8.5
6	Rheinland-Pfalz	131.95	4.4
7	Berlin	124.16	4.1
8	Sachsen	112.65	3.7
9	Hamburg	109.27	3.6
10	Schleswig-Holstein	85.61	2.8
11	Brandenburg	65.29	2.2
12	Thüringen	56.81	1.9
13	Sachsen-Anhalt	56.21	1.9
14	Mecklenburg-Vorpommern	39.86	1.3
15	Saarland	35.02	1.2
16	Bremen	31.59	1

Table 3.2 GDP of German federal states in 2015 (Eurostat, 2016)

Rank	States	Number of greenfield FDI	Share of total investments (%)
1	Nordrhein-Westfalen	1316	22.33
2	Baden-Württemberg	1312	22.26
3	Bayern	853	14.47
4	Hessen	818	13.88
5	Berlin	611	10.37
6	Hamburg	342	5.80
7	Niedersachsen	135	2.29
8	Sachsen	128	2.17
9	Brandenburg	76	1.29
10	Bremen	68	1.15
11	Rheinland-Pfalz	47	0.80
12	Sachsen-Anhalt	45	0.76
13	Schleswig-Holstein	43	0.73
14	Thüringen	38	0.64
15	Saarland	36	0.61
16	Mecklenburg-Vorpommern	26	0.44

Table 3.3 Number of greenfield FDI in the German federal states 2007-2015 (fDi Intelligence, 2018)

Figure 3.1. Geographical distribution of GDP per capita in the German federal states in EUR€ 2015 (Eurostat, 2016)

Figure 3.2 Geographical distribution of the GDP in the German federal states in billion EUR€ in 2015 (Eurostat, 2016)

Figure 3.3 Geographical distribution by number of greenfield FDI
German federal states 2007-2015 (fDi Intelligence, 2018)

From the previous figures it is easy to notice how the Western federal states receive more foreign investments for greenfield projects compared with the less rich Eastern states. Furthermore, retrieved from the fDi Intelligence database, from year 2007 till year 2015 the number of the foreign greenfield investments in the states of Nordrhein-Westfalen, Baden-Württemberg and Bayern amounted to 59.1% of all the greenfield investment projects in the German country and if also considering the federal states of Hessen, Berlin and Hamburg the number increases to 89.1% of the total number of greenfield foreign investments that took place in the German Federal Republic.

In addition, these two categories of states also differ in the industrial sectors that MNEs invest. From the fDi Intelligence database information regarding the industry activity of the greenfield investment can be retrieved and each greenfield investment was defined in one of the eighteen industry activities: 1) Business services, 2) Costumer contact centre, 3) Design development and testing, 4) Education and training, 5) Extraction, 6) Headquarters, 7) ICT and internet infrastructure, 8) Logistic distribution and Transportation, 9) Maintenance and servicing, 10) Construction, 11) Electricity, 12) Manufacturing, 13) Recycling, 14) Research and Development, 15) Retail, 16) Sales marketing and support, 17) Technical support centre and 18) Shared services centre. These categories were used to create 7 other classes of particular interest in the research: I) Business services, II) Manufacturing, III) Headquarters, IV) Research and Development (composed by the activities of Research and Development and Design development and testing), V) Logistics, VI) Sales (composed by the activities of Customer contact centre, Retail, Sales marketing and support) and another category called VII) Other, that includes the remaining activities (Education and training, Extraction, ICT and internet infrastructure, Maintenance and servicing, Construction, Electricity, Recycling, Technical support centre and Shared services centre).

	Business services	Manufact uring	Headquart ers	Research and Develop ment	Logistics	Sales	Other
Baden-Württemberg	14,71%	3,96%	3,13%	3,43%	3,35%	68,60%	2,82%
Bayern	22,98%	2,81%	4,81%	5,16%	3,63%	54,63%	5,98%
Berlin	23,24%	2,45%	6,87%	3,93%	1,31%	54,83%	7,36%
Brandenburg	9,21%	31,58%	1,32%	3,95%	6,58%	26,32%	21,05%
Bremen	14,71%	2,94%	5,88%	5,88%	2,94%	64,71%	2,94%
Hamburg	25,73%	1,46%	4,09%	1,75%	4,39%	57,60%	4,97%
Hessen	24,33%	2,57%	6,11%	3,30%	4,03%	48,04%	11,61%
Mecklenburg-Vorpommern	0,00%	38,46%	0,00%	7,69%	11,54%	7,69%	34,62%
Niedersachsen	14,81%	11,11%	2,22%	11,85%	8,15%	42,96%	8,89%
Nordrhein-Westfalen	13,76%	3,80%	6,39%	3,73%	5,17%	63,73%	3,42%
Rheinland-Pfalz	0,00%	10,64%	2,13%	14,89%	19,15%	46,81%	6,38%
Saarland	5,56%	11,11%	11,11%	11,11%	16,67%	38,89%	5,56%
Sachsen	10,16%	25,00%	2,34%	9,38%	7,03%	32,81%	13,28%
Sachsen-Anhalt	2,22%	57,78%	4,44%	2,22%	6,67%	11,11%	15,56%
Schleswig-Holstein	6,98%	6,98%	4,65%	4,65%	20,93%	44,19%	11,63%
Thüringen	10,26%	41,03%	0,00%	2,56%	20,51%	20,51%	5,13%
TOTAL	1059	304	292	247	264	3363	365

Table 3.4 Sectoral composition of greenfield investments in the German Federal Republic during the period 2007-2015 (fDi Intelligence, 2018)

As previously stated, from Table 3.4 it is possible to notice that difference between the federal states of the former Western Germany, the Federal Republic of Germany (FDR) and the federal states of the former Eastern Germany, the German Democratic Republic (GDR), which are highlighted in the table. The main difference results to be the fact that former Western German Bundesländer, attract a different category of greenfield investments, particularly in the sales and business services sectors, meanwhile former Eastern German Bundesländer attract foreign greenfield investments largely in the

manufacturing sector, where the federal state of Sachsen could be interpreted as an exception since lower levels of greenfield investments are reported in the manufacturing sector and higher investment are recorded in the sales and business services macro-categories.

Further consideration in the dissertation was posed on the origin of the greenfield investments. Table 3.5 indicates the ten countries that invest more in greenfield projects in the German federal sates, with the United States, Switzerland, United Kingdom and China that top the list with more than 48% of the total share. In addition, from Table 3.6 it is possible to have an overview of the greenfield investments segmented by macro-category in which the ten most important foreign countries are investing in Germany and interestingly, all the countries are investing the most in greenfield projects from the sales macro-category.

Source country	Number of GI	Share
United States	1222	20.74%
Switzerland	640	10.86%
UK	513	8.71%
China	455	7.72%
France	387	6.57%
Netherlands	286	4.85%
Japan	267	4.53%
Austria	197	3.34%
Spain	183	3.11%
Italy	162	2.75%

Table 3.5 Major countries investing in greenfield projects in Germany during the period 2007-2015 (fDi Intelligence, 2018)

Note: GI stands for Greenfield Investment.

Comparing Table 3.5 with Table 1.1 it is interesting to notice that United Kingdom, China and France are in proportion investing in more greenfield investments than in general investments and Switzerland, the Netherlands and Spain are underperforming when it comes to the number of greenfield investments over the number of general investments in Germany.

	Business Services	Manufacturing	Headquarters	Research and Development	Logistics	Sales	Other
Unites States	16.12%	3.93%	6.63%	6.96%	4.66%	53.36%	8.35%
Switzerland	22.66%	6.88%	1.41%	2.50%	3.28%	60.78%	2.50%
UK	3743%	2.14%	2.14%	2.73%	4.87%	44.83%	5.85%
China	7.25%	4.18%	5.05%	9.45%	3.52%	69.23%	1.32%
France	19.90%	5.68%	1.81%	2.33%	6.46%	54.52%	9.30%
Netherlands	1993%	5.24%	2.80%	3.15%	7.69%	55.94%	5.24%
Japan	6.74%	7.87%	5.99%	8.24%	2.62%	62.17%	6.37%
Austria	23.86%	8.63%	2.03%	2.54%	4.57%	55.84%	2.54%
Spain	16.39%	3.28%	1.09%	0.55%	3.28%	61.20%	14.21%
Italy	7.41%	6.79%	1.23%	0.62%	2.47%	78.40%	3.09%

Table 3.6 Share of greenfield investments by industry category from the ten most investing countries during the period 2007-2015 (fDi Intelligence, 2018)

And assessing the location decision of the 6 most investing countries, by disaggregating the previous data by the destination federal state, the location preference of the foreign companies from a certain source country can be well described in Figure 3.4 reporting

the destination of the investments from the Unites States, Switzerland, United Kingdom, China, France and the Netherlands in the German federal states.
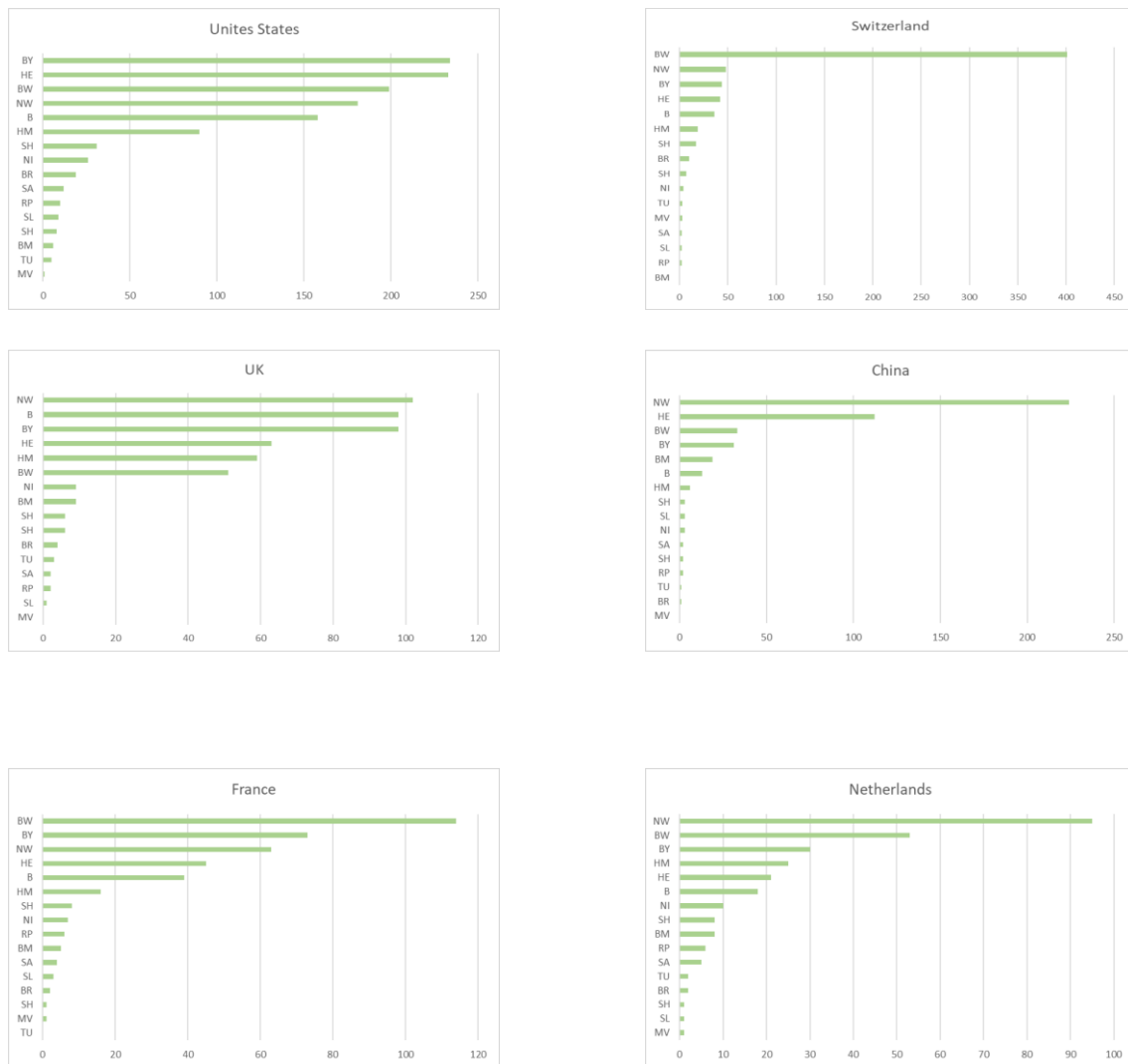

Figure 3.4 Total number of greenfield investments by the six most important investing countries (fDi Intelligence, 2018)

Note: to indicate the shortened names of the German Bundesländer codes were used to replace the original names: BW: Baden-Württemberg; BY: Bayern; B: Berlin; BR: Brandenburg, BM: Bremen, HM: Hamburg, HE: Hessen, MV: Mecklenburg-Vorpommern, NI: Niedersachsen, NW: Nordrhein-Westfalen, RP: Rheinland-Pfalz, SL: Saarland, SH: Sachsen, SA: Sachsen-Anhalt, SH: Schleswig-Holstein, TU: Thüringen.

What it is interesting to observe from Figure 3.4 is that France, the Netherlands and in an extraordinary amount Switzerland are investing in border federal states as are Nordrhein-Westfalen for the Netherlands and Baden-Württemberg for Switzerland and France.

4. Assessing the reasons of diversified FDI concentration

In the analysis of understanding which factors are significant in attracting FDI in the German Bundesländer some insights have been taken from the existing literature where various authors discussed which factors have the biggest impact in attracting FDI in the relative countries. In the modern economy the main goal of multinational enterprises is to maximize their profit when expanding their business in another country or region. According to the intention, multinationals evaluate which location offers the highest expected profitability and in turn the profitability of an investment is affected by regional specific characteristics combined with the motivation of the investment. Because of these facts there are differences regarding the attractiveness for FDI of the Bundesländers and these variances can be explained by state specific characteristics. The report evaluates how, relative to each federal state, measures linked with the regional demand, R&D expenditures, number of scientists, quantity of higher educated population, quality of the transport infrastructure, federal taxes, labour cost etc. are significant when assessing the intensity of FDI in the German federal states.

4.1 Regression variables

Regional demand

Using the regional GDP of the federal state in the regression model it is possible to assess the size of the regional local market which is an expression of the demand in the region. Since foreign firms are attracted by large and wealthy markets, this variable will be used in the regression model and is considered as an indicator of

firms investing in the regions having a market seeking behaviour. The coefficient is expected to have a positive sign, since large and wealthy markets are expected to attract more FDI.

Growth of the market size

Likewise to the previous case, MNEs invest in areas where the market is expected to grow in the future, since a growing market is linked with more room for an increased expected profit. As a measure of market growth, the year-to-year percentage GDP increase has been taken as independent variable. For this regressor the expected value of the coefficient is positive, since a growing local economy is expected to receive more foreign investments that display a market seeking behaviour.

Market potential

Foreign companies invest in greenfield projects not only for serving the Bundesländer in which they are located but the investment has also the purpose of serving the other federal states regional market. A company will select the market in which to operate also considering the size and the distance from the other markets. Since the sales of an MNE are not limited to a state's boundaries, an access index is a better measure of a Bundesländer market potential He (2003). In our model a variable indicating the market potential of the federal state i ($MARK_i$) was added in order to access the regional characteristic.

$$MARK_i = \sum_{i \neq k} \left(\frac{GDP_k}{D_{ik}}\right) \qquad (1)$$

Where GDP_k is the GDP of the Federal state k and D_{ik} is the shortest distance on a highway, connecting the capital cities of Federal state i and the capital city of the Federal state k. The expected sign of this coefficient is positive since, MNE are attracted to locate their businesses in locations that can take advantage of large and close markets.

Common border

As shown from the literature, border effects are very influential in the investing decision of foreign companies, since companies from neighbour countries tend to invest in regions close to the border as it presents a lower information asymmetry compared with investing in the same country but in regions that could be more distant and less familiar. Due to this aspect a dummy regressor was added to the model in order to assess the importance that a shared common border has in the location decision of greenfield investments. From Figure 4.1 it possible to observe which Bundesländer have a border shared with other foreign countries. The expected sign of the coefficient is positive since companies from neighbour countries should invest more in bordering regions in order to decrease information asymmetries when investing in a foreign country.

Figure 4.1 Map of the German federal states and neighbour countries
(MyGermanCity.com, 2018)

Higher educated population

Cheap labour is hardly related with the quality of the work force. A better educated labour force can master and embrace a new technology faster, resulting in a reduced cost for investing firms when training local labour force. Furthermore, from Spies (2009) in terms of policies, federal states can differentiate their governance on the administration of education. States are competing for the best education system and differences among performances are not negligible. Considering this fact, an additional regressor was inserted in the analysis measuring the percentage of students enrolled in tertiary education, compared with all the students in the region. The coefficient is expected to have a positive sign since a great availability of cheaper and higher educated population will attract foreign investor in the region. Since data for the period 2013-2015 were missing, using a linear regression model the forecasted values for the missing data period were inserted in the model.

Concentration of researchers

In the dissertation an additional variable linked with the concentration of researchers in a certain region was added in the regression model. The measure aims to evaluate if a higher concentration of researchers is relevant for the investing decision of foreign firms. This factor could be of particular interest for firms that are efficiency seeking and try to utilize the existing local endowment. The expected sign of the coefficient should be positive since a greater number of scientists is expected to engage more FDI in the federal state. Similarly to the labour cost case, data regarding the percentage of R&D personnel over the total employment in the federal state were missing for the years 2008, 2010, 2012 and 2014. In this case for avoiding the issue of missing data in the dataset, the problem was circumvented by using an interpolation procedure for estimating the value of the missing data.

Regional R&D expenditures

By inserting in the regression model, a variable linked to the R&D expenses by federal state, it is possible to assess the importance that investments in new technologies have in the behaviour of firms when expanding their operations in the foreign German region. Since from Zanatta, Strachman, Carvalho, Varrichio, Camillo (2008) evidence, technological development increases firm's productivity and spillovers have a positive external effect on the firm location choice, the coefficient of the variable is expected to have a positive sign. As in the case of the concentration of researchers measures, data for the years 2008, 2010, 2012 and 2014 were not provided in the Eurostat database and still with the intention to avoid missing data inputs in the model, an interpolation procedure using the available information from the years 2007, 2009, 2011, 2013 and 2015

was applied to estimate the values of R&D expenditures during the specific period in the federal state.

Population density

Using this variable in the regression analysis could add an insight in analysing the behaviour of MNEs at sector level. Foreign service companies appealing to enhance sales, could opt to locate their retail and wholesale affiliates in densely populated regions in order to reach a bigger number of potential customers. On the other side, manufacturers could be more attracted by less urbanized areas, where a greater availability of land is more appropriate for production purposes. Because of the mentioned reasons the expected sign of the coefficient is ambiguous, or it will have a different effect when we will consider service firms or manufacturing companies.

Transportation infrastructure

Firms are usually investing in locations with good infrastructure in order to better serve the local market and to better interact with other firms present in the area. In the regression model, the data describing this parameter were composed by the sum of the development of motorways in the region and also the scope of railways present in the region in the area of the federal state. The coefficient is expected to have a positive sign since a better developed infrastructure facilitates the activities of the firms.

Labour cost

A cheap work force will attract more foreign enterprises in the region since lower wages result in a higher potential income for the enterprises, but the fact that cheap labour force is usually linked with skilled and quality work force still should not be neglected. Considering this aspect, the average labour cost per hour per employee has been inserted in the regression analysis. Since higher wages are expected to attract less FDI inflow, the sign of this coefficient is predicted to be negative. For the labour cost data, the only retrievable data were for years 2008, 2012, 2016. For avoiding the problem of not having values for labour cost in the German federal stated during the remaining years, these missing data were retrieved using the interpolation procedure that allowed to have a complete set of data to be used in the model.

Land acquisition cost

In the analysis a variable related to the purchase of land was inserted to assess whether different prices per square meter of building land effect the decision of MNEs in locating their affiliates in urban areas, where land prices are higher, or locating in rural areas, where land prices are by fact lower. The sign of this coefficient is ambiguous since firms could be attracted by areas with higher prices especially because of the proximity to customers and other firms, or they would locate their operations in areas with a lower land price to reduce the cost of entry in the foreign market. Data for the period 2007-2009 were not possible to retrieve from the Destatis Statistiche Bundesamt database and for avoiding the issue of missing data in the model, using a regression model with the existing data from the 2010-2015 period, an approximation of the data was calculated.

Federal taxation

In the German jurisdiction the single Federal States do not have the right to issue particular acts to regulate FDI since this legislation section is centrally controlled by the Republic of Germany which decides the level of investment regulation for the whole republic. Because of this fact in the dissertation it was not possible to analyse the Bundesländer in a comparable approach as Kinoshita and Campos did when trying to assess the taxation influence in the Eastern European countries. However, the single Federal States are allowed to exercise a federal tax on real estates and on commercial transactions and in that way can influence the decisional behaviour of firms operating under the Federal state taxation laws. Using these data in our regression model, it is possible to analyse the effect that federal taxes have on foreign investment. In this case, the coefficient of the regressor is expected to have a negative sign since a higher taxation level is associated with lower FDI inflows in the region.

Unemployment

As last federal state characteristic taken in the model, the unemployment rate of each single Bundesländer is also considered playing a role in the location decision of multinational enterprises. The effect of unemployment on foreign investment flows could either positively or negatively affect the federal state attractiveness for foreign direct investments. On one hand, a high unemployment rate could be interpreted as a source of potential workforce and consequently, higher unemployment rates in a federal state would positively impact foreign investments in the region. However, a high unemployment rate could increase the company expenses when operating in the region, since it would have to pay unemployment insurance premiums and thus decrease the attractiveness of the federal state.

Because of that, the sign of the coefficient could not be certainly determined. Still, it has to be noted that in a similar research for the United State case by Kornecki and Ekanayake (2012) the unemployment rate had a negative and statistically significant effect on the decisional behaviour of the foreign enterprises investing in one of the states.

In addition to the previously mentioned factors related to the period from year 2007 to year 2015, a further group of key characteristics has been taken in account for a better insight of the German federal states attracting foreign firms in establishing new businesses in the region. The additional factors have all been related to the period 2003-2006, anterior to the one we have considered till now. Adding in the model these five additional factors, the agglomeration effects linked with the behaviour of firms concentrating their activity in the same region was addressed. From the fDi Intelligence database, data evidencing the following aspects have been retrieved.

General agglomeration activity

Agglomeration activities gain importance when the aggregation of economic entities becomes beneficial for the businesses that are located in the same area due to positive externalities. From the German case, it could result that executives from foreign countries may engage in investing in locations with an already established presence of foreign companies. Not having an appropriate familiarity of local laws and settings in the Federal states, could affect the foreign investors decision to invest in regions with already settled overseas MNEs as a signal of a

favourable environment and imitate the decision to decrease information asymmetry. From Kinoshita and Campos (2003), the theory of new economic geography emphasizes backward and forward linkages as a source of agglomeration. Users and suppliers of intermediate inputs cluster near each other because the large market provides greater demand for goods and supply of quality inputs. From Alfaro and Xiaoyang Chen (2014), multinational foreign subsidiaries are significantly more agglomerative than domestic plants in capital-, skilled-labour, and R&D-intensive industries. In addition, technology spillovers can be shared among foreign investors among various industries. General and/or technical information about how to operate efficiently in the host country is usually obtained by direct experiences of investors. This knowledge can be passed onto other foreign firms by informal communication. To benefit from such knowledge spillovers, firms have to locate close to others (Kinoshita and Campos, 2003).

For addressing this effect from the dataset from the period 2003-2006, data regarding the number of greenfield investments in the federal states in the period anterior to year 2007 were added to the model, aiming to estimate if foreign firms are more attracted to settle greenfield investments in states with an already established number of foreign investors. The coefficient is expected to have a positive sign, since from the literature a higher number of foreign investors is expected to attract other offshore companies trying to avoid market uncertainties.

Presence of businesses with the same country of origin

In the study, particular attention was posed on the aspect if foreign firms are attracted to establish a new venture in federal states that present an already existing population of firms from the same country of origin. Proximity to firms

with the same country of origin facilitates learning about how to adapt to local environments and institutions because such knowledge is often culturally and institutionally sensitive. When moving abroad, firms have to transform routines they take for granted in their home environment to fit the host context (Cuervo-Cazurra et al., 2007). Higher entry costs due to asymmetric information disadvantage linked to language barriers, cultural barriers, bureaucratic barriers etc. is decreased by the presence of multinationals with the same country of origin. To describe this phenomenon, from the fDi Intelligence Database information about the country of origin of the single greenfield investment in the particular federal state was obtained, analysing the national composition of foreign greenfield investments per country of origin in the single federal state during the period 2003-2006. As stated in the existing literature, if a federal state during the period 2003-2006 had a vast number of greenfield investments having in common the same country of origin, will lead more enterprises to invest in the same federal state in the subsequent period 2007-2015. Following this pattern, a positive sign of the related coefficient is expected to emerge from the model.

Previous presence of the parent company

In order to decrease the firm's entry cost in a foreign market, in this particular case in a foreign federal state, foreign parent companies could opt for locating greenfield investments in regions where they already have a background in operating in the particular region, consequently avoiding uncertainties linked with the not familiar federal state. For estimating this conduct, from the panel of data for the period 2003-2006, data regarding activities of a parent company performing greenfield investments in the region were assessed and consequently a dummy variable was inserted in the model. The value of the dummy was 1 if the

parent company already invested in greenfield projects in the same Bundesländer during the period 2003-2006 or 0 if the parent company did not investment in greenfield projects during the previously mentioned period. The expected value of the related coefficient could not be certainly determined since an activity of the parent firm in the federal state during the period 2003-2006 could stimulate additional investments in the same federal state due to a decrease in information asymmetry thanks to gained experience of local requirements or could also lead the parent company to select a different federal state if the outcome of operating in the region was not sufficiently rewarding and consequently deter future investments in the area.

Sectorial specialization

Foreign firms can also decide to locate in areas where other existing firms from the same industry sector are already established. This phenomenon, called *Marshallian (1890) or technical externalities* has been extensively analysed by the scientific literature. The Marshallian externalities arise when firms operating mainly in the same industry, locate close to each other in order to facilitate asset sharing between the existing companies, as it could be the supply of input and output necessary goods and services that can be offered by other closed located firms, or they could result from a more advantageous array of the labour force cost and quality but also of primary and intermediate goods. Furthermore, an additional reason for this kind of externalities comes from the shared use of the infrastructures provided in the region as could be highways, pipes, power systems, internet and network connection etc. (Ellison and Glaeser, 1999) as it enables the creation of scale economies affecting the production side and leading to productivity increases. To assess this externality, a regressor was inserted in the

model describing the concentration of greenfield foreign investments in the same industry category in the German federal state that were established during the period 2003-2006.

Sectorial diversification

On the other hand, foreign firms when investing in greenfield projects in foreign countries can also choose to locate their new business in geographical regions where other firms from different industry categories are already operating. This idea of diversity agglomerations which stimulates the creation of new ideas through various and different industrial sector was proposed by Jacobs (1969) and this kind of effects are called *Jacobs externalities or technological externalities*. Compared with the Marshall externalities they are linked with the implicit and localized nature of knowledge and information. In this case agglomeration in a specific place is a rational response adopted by firms to ease the exchange of information and expertise (Paci and Usai, 2000). The presence of a varied industry composition increases the chances for firms to interact, collaborate, imitate, improve and merge already existing ideas, technologies and processes. Jacob's externalities allow companies working in different industrial sectors to pursue an innovation pattern by bringing together knowledge and experience from different industrial sectors. Thus, the presence of greenfield investments from different industrial sectors in the federal state is supposed to further improve knowledge and innovation spillovers and consequently increasing the attractiveness of a certain region. Therefore, the expected effect of Jacobs externalities is to simplify in particular profound product innovation due to the recombination of technologies and knowledge from diverse industrial sectors, leading to completely novel products and technologies. To estimate the effects that Jacobs externalities

have on the location choice of foreign greenfield investments in the German federal states, in the model was inserted a regressor that considers the industry diversification of the greenfield investments that took place in the German federal states during the period 2003-2006.

Further, it has to be mentioned that due to the fact, that thorough innovations and product developments it follows a consequent establishment of new markets and an increase in the employment demand, which differs from productivity gains, the effect of radical innovations and product developments on the characteristics of the region could differ significantly compared with scale effects and process innovation generated by Marshallian externalities.

It is important to notice that in certain cases, spillovers between innovation and production activities occur and this causes that innovation agglomeration depends, including other factors, on the level of the development of the regional production businesses.

In this case it was interesting to observe the different behaviour between the US and the European geographical regions when it comes to productive and technological activities. From the literature it was interesting to observe that from the research papers of Feldman and Audretsch (1999) and Kelly and Hageman (1999) from the US case, there was no evidence that specialization effects affected the localization decision of US enterprises, meanwhile diversity effects influenced the location selection in the US metropolitan areas. This means that in the United States case innovation and development in a certain industry sector is affected by a not negligible geographical concentration and this effect does not depend on the diffusion of manufacturing activities. By contrast, in the Paci and

Usai (2000) research paper, the evidence from the European territory, exhibits a positive correlation between the geographical distribution of technologic and productive activities.
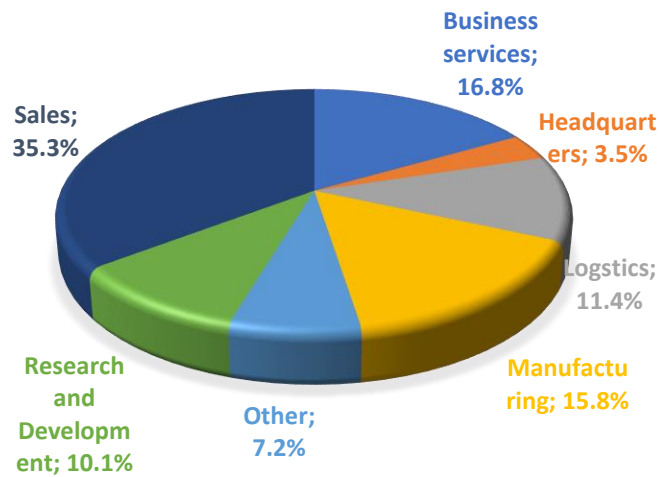

Figure 4.2 Sectoral composition of greenfield investments in the Western German federal states during 2003-2006 (fDi Intelligence, 2018)
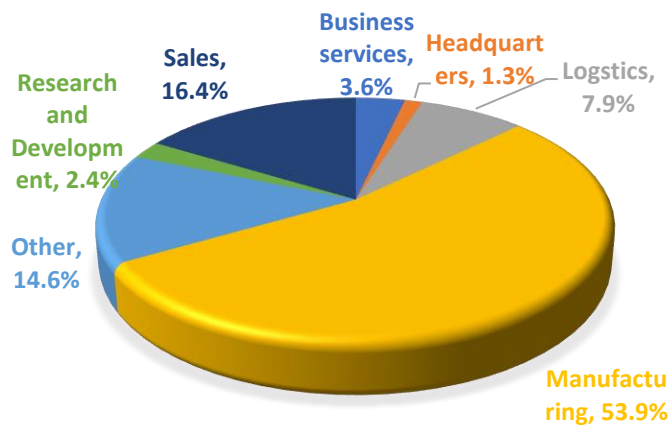

Figure 4.3 Sectoral composition of greenfield investments in the Eastern German federal states during 2003-2006 (fDi Intelligence, 2018)

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From the data represented in Figure 4.2 and Figure 4.3 it is immediate to notice that during the period 2003-2006 the difference between the different sectors of greenfiled investments between the federal states of the once Western Germany, where Sales and Business services account for more than 52% and foreign companies investing in new projects in the federal states of the former Eastern Germany are mainly investing in the Manufacturing sector, with a share of nearly 54%.

4.2 Firm location decision

Foreign companies investing in Germany have a set of sixteen options when deciding about the location of the greenfield investment. Consequently, the company will decide to opt to locate the new business in the Federal state where the potential profits are expected to exceed the potential profits possible in all the other available fifteen Bundesländern, considering that each greenfield investment has an unobservable profit function, dependent on the characteristics of the federal state it locates:

$$
\begin{aligned}
\Pi_{ift}^* = F(\ & \gamma_1 GDP_{ft} + \gamma_2\, \Delta GDP_{ft} + \gamma_3\, MPOT_{ft} + \ \gamma_4\, BORD_f \\
& + \gamma_5\, UNIV_{ft} + \gamma_6\, RES_{ft} + \gamma_7\, R\&D_{ft} \\
& + \ \gamma_8\, DENS_{ft} + \gamma_9\, INFR_{ft} + \gamma_{10}\, \omega_{ft} \\
& + \gamma_{11}\, LAND_{ft} + \gamma_{12}\, ETAX_{ft} + \ \gamma_{13}\, BTAX_{ft} \\
& + \ \gamma_{14}\, UNE_{ft} + \ \gamma_{15}\, AGL_{ft} + \gamma_{16}\, ORIG_{if} \\
& + \gamma_{17}\, PAR_{if} + \ \gamma_{18}\, SPEC_{if} + \gamma_{19}\, DIV_{if})
\end{aligned}
\tag{2}
$$

In the equation, Π^*_{ift} is the unobservable profit of the company i in the federal state f at year t (f= 1,2,3,…,16 and t=1,2,3,…,9), GDP_{ft} is the GDP in the federal state f in year t, ΔGDP_{ft} represents the growth or decline of the GDP in the federal state f in year t, $MPOT_{ft}$ is the market potential of federal state f in year t, $BORD_f$ is the dummy variable linked with the shared border of federal state f and the source country of the greenfield investment, $UNIV_{ft}$ is the measure of university graduates in federal state f in year t, RES_{ft} is the regressor for the researchers in federal state f in year t, $R\&D_{ft}$ is the investment in research and development in federal state f in year t, $DENS_{ft}$ is the population density in federal state f in year t, $INFR_{ft}$ is a measure indicating the level of infrastructure development in federal state f in year t, ω_{ft} is the unit labour cost in federal state f in year t, $LAND_{ft}$ is the average cost of building land in federal state f in year t, $ETAX_{ft}$ and $BTAX_{ft}$ are the level of real estate tax and business tax in federal state f in year t, UNE_{ft} is the level of unemployment in the federal state f in year t, AGL_f indicates the agglomeration of foreign greenfield investments in federal state f during the period 2003-2006, $ORIG_{if}$ indicates the concentration of companies from the same country as company i investing in greenfield projects in Federal state f during the period 2003-2006, PAR_{if} is a dummy variable indicating if the parent company of company i already invested in federal state f in greenfield projects during the period 2003-2006, $SPEC_{if}$ indicates the proportion of businesses established during the period 2003-2006 that are operating in the same industry sector as firm i in federal state f and DIV_{if} indicates the proportion of business established during the period 2003-2006 that are operating in the same industry sector as firm i in the federal state f.

Subsequently, we can compress equation (2) and get a shortened form, equation (3),

$$\Pi^*_{ift} = F(\alpha_{ft}, w_{ft}, \rho_{ft}) \qquad (3)$$

where α_{ft} is the vector of Bundesländer-specific factors, w_{ft} is the vector of Bundesländer-specific factor prices and ρ_{ft} is the measure of the antecedent Bundesländer characteristics.

4.3 Model construction and specification

From the fDi Intelligence it is not possible to assess profits that each new established firm has in each federal state, but data regarding the location decision and characteristics about the Bundesländer are retrievable.

In order to assess the effects that the Bundesländer characteristics have on the location decision of foreign enterprises, in the dissertation the McFadden's (1974) Conditional logit model was used.

The model assumes that each individual company *i* operates under the principle of utility maximization, in our case of profit maximization, where the profit function is always composed of a deterministic component and of a random component.

$$\Pi_{if}^{*} = V_{if} + \varepsilon_{if} \qquad (4)$$

Where the deterministic component V_{if} is often defined to be an additive function of the attributes, and the random component ε_{if} represents the influence from the unobserved attributes on the choice behaviour, and the interpersonal and intrapersonal heterogeneity in utilities (Train, 2009), is independent across *i* and *f* and follows an extreme value type 1 distribution.

Introducing the vector x_{if} of attributes of company i in federal state f, the systematic utility is:

$$V_{if} = x_{if}^T \beta \tag{5}$$

where the coefficient vector β is the same for all the alternatives. As a result of this assumption, the expectation that the company i chooses the federal state f instead of another federal state is:

$$P_{f|i} = P_i = \frac{e^{x_{if}^T \beta}}{\sum_{k=1}^f e^{x_{ik}^T \beta}} \tag{6}$$

where $\sum_f P_{f|i} = 1$ for all i and the term β is calculated using the maximum likelihood.

The strong hypothesis that the error term ε_{if} in equation (4) is independent across i and f and follows an extreme value type 1 distribution, is a good way to facilitate the analytical part, but in the same time it imposes the Independence of Irrelevant Alternatives (IIA) limitation on the foreseen probabilities. This property simplifies the model by requiring that the probability of choosing one alternative over the other should be independent of the other alternatives in the choice set. Such a property implies that the same degree of substitution effect among the alternatives or differently, that the ratio of the probabilities of choosing any two alternatives is independent of the attributes or the availability of a third alternative. It also has to be emphasized that this assumption is often treated as impractical and restrictive since it severely restricts the flexibility of the functional form, forcing equal cross-elasticities of the probabilities of choosing various alternatives with respect to an attribute of one alternative (Hausman and Mcfadden, 1990).

Variable	Definition	Source
Size of the market	Regional GDP in federal state i (billion EUR)	Eurostat
Market growth	Yearly variation in percentage of GDP in federal state i	Eurostat
Market potential	Sum of the proportions between GDP of state j at time t and distance between the capitals of state i and j (million EUR/km)	Eurostat and Google maps
Border	Dummy=1 if the federal state i has a common border with the source country of the considered greenfield investment	Google maps
Educated population	Percentage of third level students over the whole population at the federal level	Eurostat
Researchers	Researcher's percentage over total employment	Eurostat
R&D expenditure	Capita R&D expenditure in federal state i (billion EUR)	Eurostat
Population density	Inhabitants per km^2	Eurostat
Transportation infrastructure	Sum of kilometres of motorways and railways in the federal state i (km)	Eurostat

Labour cost	Unit labour cost (EUR/h)	Destatis Statistiches Bundesamt
Land cost	Cost per m^2 of building land (EUR/ m$^{2)}$)	Destatis Statistiches Bundesamt
Real estate tax	Real estate tax in percentage	Destatis Statistiches Bundesamt
Business tax	Business tax in percentage	Destatis Statistiches Bundesamt
Unemployment	Percentage of unemployment over the total working population	Destatis Statistiches Bundesamt
Previous FDI investments	Number of greenfield projects in the federal state *i* during 2003-2006 period	fDi Intelligence
Country of origin	Proportion between the number of greenfield investments by a country over the whole number of greenfield investments in federal state *i*	fDi Intelligence
Parent company activity	Dummy=1 if the parent company performed investments in federal state *i* during the 2003-2006 period	fDi Intelligence
Sectorial specialization	Ratio between the number of companies operating in the same industry category of the considered greenfield investment and the total number of companies	fDi Intelligence

present in federal state *i* during the
2003-2006 period

Sectorial diversification	Ratio between of companies operating in a different industry category as the considered greenfield investment and the total number of companies present in federal state *i* during the 2003-2006 period	fDi Intelligence

Table 4.1 List of model variables

5. Results

In the following chapter are presented the results of the conditional logit estimations of the location choice of the greenfield investments in the German Bundesländern.

In the first section, the results on the entire sample are discussed. In the second section, the same model will be used to assess the differences between the six macro-categories (Business services, Manufacturing, Headquarters; Research and Development, Logistics and Sales) that were introduced in chapter 3 and consequently to evaluate the different behaviour of firms investing in greenfield projects in various sectors. In the final section, the model will be used to assess the decisional behaviour of the six countries that are investing the most in greenfield projects in the Germany (United States, Switzerland, United Kingdom, China, France and the Netherlands). In the Appendix the results have been also calculated for Italy as point of comparison. All the values have been calculated using the software Stata and are presented in the tables present in this chapter.

5.1 Estimation for the whole population

Table 1. presents the ultimate results of the conditional logit assessing the importance of each regressor. From column (1) additional control variables as: Higher educated population (Educated population), Researchers concentration, Land acquisition cost (Land cost) and all the other variables related to the period 2003-2006 as: General agglomeration, Presence of companies from the same home country (Same country), Previous investments from the parent company (Same parent company), Sectorial specialization (Specialization) and Sectorial diversification (Diversification) were furtherly added till column (5). The sign and the importance of regional demand, market potential, the border dummy, educated population, R&D investments, population density,

infrastructure development, labour cost, the two types of federal taxes and unemployment remain stable in sign and in significance. Researcher's concentration becomes insignificant, meanwhile land and unemployment become significant and infrastructure development becomes negative but insignificant. Market size growth remains always positive, but it is never significant in the location decision of the greenfield investments. In column (1) the results for the basic equation are presented without taking in account the previously mentioned variables. Market potential, the border dummy, R&D investments and infrastructure have the expected positive sign. Population density and unemployment result to have a positive and significant effect on the decisional behaviour, meanwhile labour cost and the two federal taxes have an opposite influence compared to what it was expected.

In column (2), inserting in the model the variable related to the higher educated population, the results for market potential, the border dummy, educated population, R&D investments, population density, infrastructure, labour cost, the two federal taxes and unemployment remain stable in sign and in significance. Still, the inclusion of higher educated population has increased the coefficient of the two taxes, indicating that investors are willing to spend more in taxes in order to have a bigger supply of higher educated population.

In column (3) and column (4), after adding to the model the land acquisition cost variable in column (3) and the researcher's concentration variable in column (4), there are no bigger differences affecting the model and the newly added variable land acquisition cost results to be positive and significant.

In column (5), the remaining five variables related to the investments during the period 2003-2006 were added. Market potential, the border dummy, higher educated population, concentration of researchers, R&D investments, population density, infrastructure development and unemployment are still positively and significantly influencing the location decision of greenfield investments, meanwhile, property tax and business tax still have a surprising positive sign and are still significant. Regional demand has a statistically important impact and surprisingly it has a negative sign, in contrast to what it has been

expected. Market size growth and land acquisition cost do not seem to play a role in the investing decision of foreign companies. In conclusion, for what concerns the variables related to the period 2003-2006, general agglomeration effects, same country of origin effect, the dummy related to the presence of the parent company in the federal state and sectorial specialization are significant and have a positive sign in attracting greenfield investments in the federal state and the difference in sectors of the companies that are operating in the federal state seems to be significant and affects in a negatively the attractiveness of the German federal states.

Table 5.1 Conditional Logit Estimations

	Dependent variable: choice between Bundesländern
	(1)	(2)	(3)	(4)	(5)
Regional demand	-0.001**	-0.006***	-0.006***	-0.006***	-0.006***
	(0.0007)	(0.001)	(0.001)	(0.001)	(0.001)
Market size growth	0.005	0.003	0.004	0.005	0.008
	(0.01)	(001)	(0.01)	(0.01)	(0.01)
Market potential	0.02***	0.04***	0.04***	0.05***	0.06***
	(0.002)	(0.004)	(0.004)	(0.004)	(0.004)
Border	1.08***	1.11***	1.11***	1.11***	1.08***
	(0.05)	(0.05)	(0.054)	(0.05)	(0.06)
Educated pop.		0.17***	0.17***	0.17***	0.13**
		(0.01)	(0.02)	(0.02)	(0.01)
Researchers concentration				0.13	0.57***
				(0.13)	(0.17)
R&D investments	0.07***	0.09***	0.09***	0.08***	0.05***
	(0.008)	(0.01)	(0.01)	(0.00002)	(0.00002)
Population density	0.0005***	0.0005***	0.0004***	0.0004***	0.0002***
	(0.00005)	(0.00005)	(0.00006)	(0.00006)	(0.00006)
Infrastructure	0.0001***	0.0003***	0.0003***	0.0003***	0.0001***
	(0.00002)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Labour cost	0.28***	0.23***	0.24***	0.23***	0.15 ***
	(0.01)	(0.01)	(0.01)	(0.014)	(0.02)
Land acquisition cost			0.0005**	0.0006**	-0.00008
			(0.0003)	(0.0003)	(0.0004)
Property tax	0.05***	0.08***	0.08***	0.08***	0.08***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Business tax	0.09***	0.13***	0.14***	0.14***	0.13***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Unemployment	19.83***	13.95***	15.75***	15.17***	9.87***
	(1.76)	1.87	(2.06)	(2.14)	(2.21)
Agglomeration					0.008***
					(0.001)
Same country					0.01***
					(0.001)
Same parent company					0.25**
					(0,10)
Specialization					0.39***
					(0.03)
Diversification					-0.0001***
					(0.00003)
Pseudo R²	0.24	0.23	0.25	0.25	0.26
Observations	94,288	94,288	94,288	94,288	94,288

Note: The table represents the results of the estimation of equation (6) and the regressors are based on the Conditional Logit Model. The dependent variable is the exclusive choice of multinational enterprises to locate their greenfield investment in one of the sixteen Bundesländern part of the Federal Republic of Germany. The independent variables are defined in section 4.3 and listed in Table 5.1 Based on the characteristics of column (1), columns (2), (3), (4) and (5) successively introduce higher educated population, land acquisition costs, concentration of researchers and factors from the period 2003-2006 as additional controlling variables. Standard errors are indicated in parentheses with significance level indicated as: ***p<0,01, ** p<0,05 and *p<0,10 level.

Source: Own calculations

5.2 Result stratified by activity

Table 2. presents the results of the conditional logit model divided in the six most important macro-categories: Business services, Manufacturing, Headquarters, Research and Development, Logistics and Sales in which the greenfield investments were divided. A surprising fact is that regional demand affects significantly and negatively the investment decision for greenfield investments in the manufacturing, sales and in a certain amount in the research and development macro-categories. Market size growth affects the location decision positively and significantly only in the business and service's sector. As expected, market potential is positive for all the macro-categories and statistically significant for the majority of them. This aspect, compared with the negative sign of the regional demand variable indicates that foreign companies, when deciding where to locate their greenfield project, they do not consider which Bundesländer has the highest GDP, but their investing decision depends on which federal state is able to serve better the other richer federal states that are closer to the region. The border dummy variable is positively influencing the greenfield investments from all the categories, where only in the headquarter's category it is not significant. The educated population variable is as expected positive and significant for the R&D macro-category and it is surprisingly also significant for greenfield projects in the logistics sectors. By contrast, the presence of higher educated population statistically significantly deters greenfield investments in the sales category but unusually, researcher's concentration effects positively the location decision of greenfield projects in the sales sector and R&D investments have a highly significant role in the location decision for the business services, manufacturing and sales macro-categories. As it was expected population density statistically significantly attracts greenfield investments in the headquarters, research and development and sales sectors meanwhile, infrastructure development is significant and positive for greenfield investments in the headquarters and research and development categories, but it is exhibiting a negative sign for the sales category. Labour cost is negatively and

significantly affecting investments in the business services categories and surprisingly, it is showing a positive and significant effect in attracting greenfield investments in the headquarter's category. Land cost is negatively and statistically significantly affecting only greenfield investments in the logistics sector and not surprisingly, it is positively affecting investments in the business services and sales sectors, since companies operating in these sectors as a direct consequence of the fact that businesses with a higher need to interact with each other tend to converge in metropolitan regions, where consequently land prices are higher. The results for the property tax are ambiguous for the location decision and in some cases, they are also significant. By contrast business taxes are not significant except for the case of the headquarter's category. Higher unemployment levels in the federal do not seem to play a role in any of the macro-categories in the location decision of the greenfield investments.

For what concerns the variables related to the period 2003-2006, previous general agglomeration activities are beneficial for the federal states in attracting greenfield investments in the business services, manufacturing and sales activities. The concentration of companies with the same foreign country of origin positively affects the location decision of investors investing in the business services, headquarters and sales categories, meanwhile, the previous presence in the federal state of the parent company is beneficial in attracting greenfield investments only for the manufacturing and to a certain extent also in the research and development categories. Finally, it is interesting to notice that in the Bundesländern, the presence of a high concentration of companies from the same category is not attractive for greenfield investments in the manufacturing and sales sector, but it still significantly attracts investments in the headquarters, logistics and research and development categories and the presence of companies operating in diversified companies deters greenfield investments in the logistics sector.

Table 5.2 Conditional Logit Estimations by macro-category

	Dependent variable: choice between Bundesländern					
	(1)	(2)	(3)	(4)	(5)	(6)
	Business Services	Manufacturing	Headquarters	R&D	Logistics	Sales
Regional demand	-0.003	-0.02***	-0.002	-0.02*	0.01*	-0.01***
	(0.002)	(0.007)	(0.01)	(0.01)	(0.006)	(0.002)
Market size growth	0.08**	0.02	-0.01	0.007	-0.005	-0.005
	(0.03)	(0.05)	(0.06)	(0.06)	(0.05)	(0.01)
Market potential	0.06***	0.10***	0.04	0.12**	0.01	0.11***
	(0.01)	(0.03)	(0.03)	(0.06)	(0.01)	(0.009)
Border	1.26***	0.86***	0.49	0.63*	0.62***	1.21***
	(0.05)	(0.23)	(0.39)	(0.34)	(0.25)	(0.07)
Educated pop.	-0.04	0.09	0.09	0.23***	0.22**	-0.09***
	(0.58)	(0.06)	(0.09)	(0.07)	(0.09)	(0.02)
Researchers con.	0.43	-0.25	0.60	0.67	-0.63	1.15***
	(0.580)	(0.71)	(0.78)	(0.81)	(0.72)	(0.27)
R&D investments	0.002**	0.29***	-0.11	0.09	0.02	0.13***
	(0.0006)	(0.09)	(0.13)	(0.11)	(0.09)	(0.03)
Population density	-0.00001	0.0003	0.002***	0.001***	0.0004	0.0002**
	(0.0002)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0001)
Infrastructure	-0.0001	-0.0002	0.0005**	0.0005*	-0.0002	-0.0004***
	(0.0001)	(0.0002)	(0.0003)	(0.0002)	(0.0001)	(0.00007)
Labour cost	-0.14**	-0.08	0.38***	0.04	0.01	0.04
	(0.07)	(0.05)	(0.13)	(0.07)	(0.07)	(0.03)
Land cost	0.003***	0.00006	-0.002	-0.001	-0.004**	0.002***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.0006)
Property tax	-0.02	0.16**	0.11	0.14*	0.29***	-0.05**
	(0.04)	(0.07)	(0.08)	(0.07)	(0.07)	(0.02)
Business tax	-0.08	-0.09	0.37**	0.05	-0.05	0.06
	(0.07)	(0.07)	(0.15)	(0.11)	(0.08)	(0.03)
Unemployment	-0.69	12.49	10.94	-6.60	6.77	2.74
	(6.45)	(7.89)	(13.51)	(11.01)	(10.16)	(3.75)
Agglomeration	0.08***	0.21***	-0.25	0.03	-0.18	0.05***
	(0.02)	(0.08)	(0.21)	(0.09)	(0.12)	(0.006)
Same country	0.01***	-0.002	0.02***	0.008	0.003	0.007***
	(0.003)	(0.007)	(0.005)	(0.005)	(0.006)	(0.001)
Parent company	0.14	0.80**	0.41	0.46*	0.26	0.11
	(0.28)	(0.38)	(0.54)	(0.26)	(0.28)	(0.17)
Specialization	-0.22	-0.58***	2.41**	0.31*	0.50**	-1.41***
	(0.42)	(0.19)	(1.17)	(0.17)	(0.24)	(0,35)
Diversification	-0.00002	0.00002	0.0004*	0.00009	-0.0005***	0.00007
	(0.00008)	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.00004)
Pseudo R2	0.30	0.12	0.29	0.19	0.19	0.31
Observations	16,944	4,864	4,672	3,952	4,224	53,776

Note: The table represents the results of the estimation of equation (6) and the regressors are based on the Conditional Logit Model. The dependent variable is the exclusive choice of multinational enterprises to locate their greenfield investment in one of the sixteen Bundesländern part of the Federal Republic of Germany. The independent variables are defined in section 4.3 and listed in Table 5.2 The dependent variables are related to the six previously defined macro-categories: Business Services, Manufacturing, Headquarters, Research and Development (R&D), Logistics and Sales. Standard errors are indicated in parentheses with significance level indicated as: ***p<0,01, ** p<0,05 and *p<0,10 level.

Source: Own calculations

5.3 Result stratified for origin country

Table 3. presents the results of the conditional logit model for the six countries: United States, Switzerland, United Kingdom, China, France and the Netherlands, that have invested the most in greenfield projects during the period 2007-2015. In addition, as point of comparison, results for Italy which is ranked 10th for the number of greenfield investments performed in Germany during the same period are presented in the Appendix, in Table A.1.

From Table 3. at the individual source country level, regional GDP has a statistically significant and negative impact on the location decision of United States', United Kingdom's, Chinese's and to a certain amount for the Netherlands greenfield projects, but still, the statistically significant and positive market potential regressor indicates that investors from these two countries tend to locate their greenfield investments not in the federal states that have the highest GDP but in the federal sates which are better located to serve the closer richer regions. Investors from Switzerland and France substantially differ from the previous two, since they seem to not be affected by the demand and the market potential of the federal state. As expected, the border dummy variable has a positive and statistically significant impact on the investing decision on the three bordering countries as are Switzerland, France and the Netherlands. A federal state endowment of higher educated population attracts greenfield investments from France and in a certain statistical tenure also investors from China. Meanwhile, high regional R&D spending is effective to attract in the federal state greenfield investments from the United States, United Kingdom, China and still statistically significantly from Switzerland, but a high presence of researchers results to be deterring for greenfield investments from China. When it comes to population density, investors coming from Switzerland, United Kingdom and the Netherlands prefer to locate their new businesses in less populated German federal states. Also in this case, the regressor linked with the infrastructure development is ambiguously negative and still significant for investments

from the United States and Switzerland, but positive and significant for investors from the Netherlands. Meanwhile, regions with high labour cost are not attractive for greenfield investments from the United States, but investors from China and to a certain amount France and the Netherlands are attracted from regions with high labour costs. This phenomenon could be linked to the fact that Chinese investors are not attracted to regions with a low endowment of less skilled and consequently cheaper workforce, since it is already abundant in their home country, but they are establishing their greenfield businesses in federal states with skilled and consequently costlier workforce. Surprisingly, all the investors, except from France have invested in greenfield projects in federal states with higher land costs. Investors from United Kingdom do not invest in federal states with high property taxes but contrary, high business taxes in a Bundesländer except for the Netherlands do not seem to deter investors from investing in greenfield projects in the region, by contrast, they seem to attract investors from France and Switzerland. High levels of unemployment in the region are attractive for Chinese and Dutch investors. In the end, when it comes to the locational decision of foreign investors of greenfield investments considering the industry characteristics of the federal states during the 2003-2006 period, United Kingdom's investors are still to a certain amount deterred to invest in federal states with a high general agglomeration of businesses in the region, while more specifically investors from the Netherlands do not invest in federal states where other Dutch companies tend to operate, where in the meantime, foreign investors from the United States, United Kingdom and China are locating their greenfield projects in regions with a notable presence of firms from the same home country. This behaviour is reasonable, since all the three mentioned countries, compared with the three remaining, are geographically located far away or are isolated from the markets of the German federal states and because of that the entry cost linked with information asymmetry is reduced due to the presence of other already existing firms from the same source country. Interestingly from the same parent company dummy variable, greenfield investments from the United Kingdom are not executed in the same federal state where the parent company was already operating, meanwhile Swiss investors tend to invest in

regions with an already established presence of the parent company. In conclusion, all the investors except locate their greenfield investments in federal states where other firms from the same industry macro-category are already operating, meanwhile Swiss and Dutch investors seem to not locate their new projects in regions where firms from heterogeneous macro-categories are located and operate, differently as the United Kingdom's and Chinese's greenfield investors are doing.

Table 5.3 Conditional Logit Estimations by the 6 most investing countries

	Dependent variable: choice between Bundesländern					
	(1)	(2)	(3)	(4)	(5)	(6)
	US	Switzerland	UK	China	France	Netherlands
Regional demand	-0.01***	0.005	-0.02***	-0.03***	0.009	-0.01*
	(0.002)	(0.005)	(0.005)	(0.01)	(0.01)	(0.007)
Market size growth	0.04*	0.01	0.009	-0.03	-0.03	0.03
	(0.02)	(0.04)	(0.04)	(0.06)	(0.05)	(0.05)
Market potential	0.11***	0.02	0.09***	0.18***	-0.02	0.21***
	(0.011)	(0.02)	(0.01)	(0.06)	(0.05)	(0.05)
Border		1.30***			0.84*	3.84*
		(0.13)			(0.44)	(1.97)
Educated population	0.004	0.06	0.002	0.14*	0.18***	0.01
	(0.04)	(0.06)	(0.06)	(0.07)	(0.06)	(0.10)
Researchers conc.	0.06	0.80	-0.25	-1.38**	1.02	0.64
	(0.41)	(0.72)	(0.63)	(0.68)	(0.77)	(0.73)
R&D investments	0.17***	0.16*	0.27***	0.39***	-0.08	-0.08
	(0.05)	(0.09)	(0.09)	(0.11)	(0.09)	(0.09)
Population density	0.0001	-0.0008**	-0.0005*	-0.00001	0.0001	-0.0008**
	(0.0001)	(0.0003)	(0.0003)	(0.0004)	(0.0002)	(0.0003)
Infrastructure	-0.003**	-0.0004**	-0.0003	0.0001	0.0002*	0.0001
	(0.001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)
Labour cost	-0.11**	-0.001	0.07	0.56***	0.21**	0.16*
	(0.04)	(0.06)	(0.07)	(0.10)	(0.08)	(0.09)
Land acquisition cost	0.001*	0.003*	0.004***	0.004*	-0.0004	0.005***
	(0.0009)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Property tax	-0.02	-0.04	-0.11*	0.15**	-0.007	0.05
	(0.03)	(0.07)	(0.05)	(0.06)	(0.06)	(0.08)
Business tax	0.04	0.25**	0.12	-0.17	0.26***	-0.21*
	(0.05)	(0.01)	(0.08)	(0.12)	(0.08)	(0.12)
Unemployment	-5.98	10.11	2.83	55.88***	-14.78	38.73***
	(4.78)	(9.75)	(8.06)	(13.92)	(11.06)	(12.16)
Agglomeration	0.004	0.003	-0.008*	0.005	0.005	0.002
	(0.002)	(0.006)	(0.004)	(0.005)	(0.005)	(0.006)
Same country	0.05***	-0.18	0.29***	0.95**	-0.34	-0.48***
	(0.006)	(0.13)	(0.06)	(0.44)	(0.20)	(0.16)
Same parent company	0.14	0.77*	-1.27*	0.31	-0.25	-0.11
	(0.23)	(0.43)	(0.70)	(0.74)	(0.51)	(0.49)
Specialization	0.38***	0.39***	0.62***	0.589***	0.43***	0.45***
	(0.06)	(0.10)	(0.11)	(0.12)	(0.11)	(0.12)
Diversification	-0.00006	-0.0002*	0.0002**	0.0009***	-0.0005	-0.0003**
	(0.00007)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
Pseudo R2	0.24	0.47	0.27	0.46	0.28	0.27
Observations	19,552	10,240	8,208	7,280	6,192	4,576

Note: The table represents the results of the estimation of equation (6) and the regressors are based on the Conditional Logit Model. The dependent variable is the exclusive choice of multinational enterprises to locate their greenfield investment in one of the sixteen Bundesländern part of the Federal Republic of Germany. The independent variables are defined in section 4.3 and listed in Table 5.3 The dependent variables are related to the six countries that have invested the most in greenfield investments during the period 2007-2015: United States, Switzerland, United Kingdom, China, France and the Netherlands. Standard errors are indicated in parentheses with significance level indicated as: ***p<0,01, ** p<0,05 and *p<0,10 level.

Source: Own calculations

As conclusion of this analysis, it is interesting to use and compare the findings from Table 3.6 where the greenfield investments from the ten most investing countries were segmented by the macro-category all except United Kingdom are investing more than 50% of the greenfield investments in the sales macro-category. Consequently, the five out of six countries analysed using the conditional logit model, are attracted or deterred by similar characteristics as the general investors in the sales category, meanwhile United Kingdom has a more diverse behaviour due to the comparably higher investments in the business services sector. Still, it has to be taken in account that for the three countries: United States, United Kingdom and China a big influence on the investing behaviour is influenced by the fact that for these countries the border dummy is equal to zero and this fact is reflected in the positive and highly significant importance of the presence of businesses from the same source country.

6. Conclusion

This study has examined and evaluated the main determinants of inward foreign greenfield investments in the German Bundesländern during the period 2007-2015. By determining the profit function for foreign firms that have to choose their investment location between one of the sixteen German federal states and the probability that a firm chooses one federal state over the others allowed to use the conditional logit model to come to the previously indicated results. The market potential of a region, federal taxes, general agglomeration, the presence of other businesses from the same source country and Marshall and Jacobs specialization and diversification externalities resulted as determinant for the attractiveness of a federal state in attracting or deterring foreign greenfield investments. Additionally, as it has been highlighted, there are significant differences among the German federal states, especially between the ones that were once part of Western Germany (Federal Republic of Germany) and Eastern Germany (German Democratic Republic), with the latter attracting less foreign greenfield investments. Additionally, also the sectors in which the investments are performed differ substantially between the two groups of federal sates, with the Western states attracting a more heterogeneous mix of investments especially in sales, business services, research and development and logistics, while the Eastern states depend enormously on the manufacturing sector. Furtherly, the impact of fixed entry costs linked to information asymmetry plays an influential role in the conditional logit model. Foreign investors, when evaluating the location decision are significantly influenced by network effects associated with already existing industry agglomerates, presence of investors from the same country, firms operating in the same sector and especially for the Swiss case the presence of a common border, decreases the information asymmetry and consequently the entry cost in the Bundesländer. Still, exceptions are present, with Dutch investors presenting an opposite behaviour since as it has resulted from the model, they tend to invest in regions with a low presence of other Dutch firms. Finally, when it comes to the

industrial sector analysis it is meaningful to notice that greenfield investments in headquarters, research and development and sales are attracted by regions with a high population density meanwhile investments in the manufacturing sector tend to locate in federal states which are not specialized in a single industry. The findings of this dissertation which whose intention was to concentrate only on greenfield investments presents a certain degree of similarity with the Spies, (2009) research paper, where the market potential, industry clusters and common borders resulted to be the main drivers of the location decision of all the foreign investments coming to Germany, meanwhile ambiguity linked to the effect of taxes and land costs have surprised the author.

I believe that the results of this research are of particular interest not only for the scientific world but are of high value also for future investors investing in greenfield projects in Germany and for the German policy-makers that are accounted for attracting these investors. The evidence of the importance of a strategic position of a federal state, the degree of research and development investments and of the attractiveness of the presence of a well-educated population in the region significantly influence in positively the location decision of the investors. Consequently, these regional Bundesländer's characteristics could be considered from the policy-makers as a powerful tool to leverage on when considering attracting further foreign greenfield investments. Lastly, it has to be highlighted that a critical mass effect in certain federal stats due to different agglomeration effects caused from the presence of already established firms, creating positive network effects, could reduce the expected impact of policies aimed to attract greenfield investments in less attractive German federal states.

Although interesting, this research is limited by the limited availability and completeness of data, in particular for the period 2003-2006. In addition, a bigger limitation to the study was posed by the characteristics of the conditional logit model, since for being able to adopt the model, the limitation of the Independence of Irrelevant Alternatives (IIA) had to be adopted. This assumption allowed to simplify the model to be used, but it has limited the study by considering as all the federal states to be equivalent and completely

substitutable. Because of the mentioned reasons the further development of the study has been left for future research.

Appendix

Table A.1. Conditional Logit Estimations for Italy

	Italy
Regional demand	0.02***
	(0.008)
Market size growth	0.03
	(0.07)
Market potential	-0.03
	(0.03)
Border	
Educated population	-0.17
	(0.11)
Researchers conc.	2.31**
	(1,14)
R&D investments	-0.20
	(0.13)
Population density	-0.001**
	(0.0006)
Infrastructure	-0.001*
	(0.08)
Labour cost	-0.08
	(0.10)
Land acquisition cost	-0.0009
	(0.002)
Property tax	-0.07
	(0.10)
Business tax	-0.01
	(0.15)
Unemployment	-37.50**
	(15.91)
Agglomeration	-0.003
	(0.01)
Same country	0.55***
	(0.19)
Same parent company	0.94
	(0.87)
Specialization	0.78***
	(0.18)
Diversification	-0.0004*
	(0.0002)
Pseudo R2	0.32
Observations	2,592

Note: The table represents the results of the estimation of equation (6) and the regressors are based on the Conditional Logit Model. The dependent variable is the exclusive choice of Italian multinational enterprises to locate their greenfield investment in one of the sixteen Bundesländern part of the Federal Republic of Germany. The independent variables are defined in section X. and listed in Table A.4 Standard errors are indicated in parentheses with significance level indicated as: ***p<0,01, ** p<0,05 and *p<0,10 level.
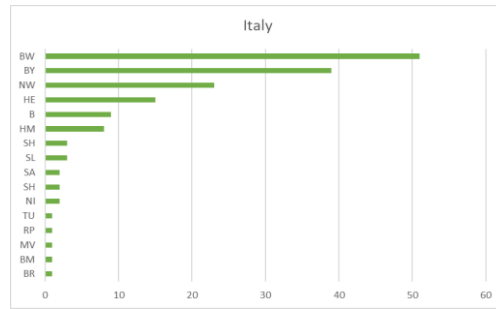
Source: Own calculations

Figure A.1. Number of greenfield investments coming from Italy (fDi Intelligence, 2018)

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