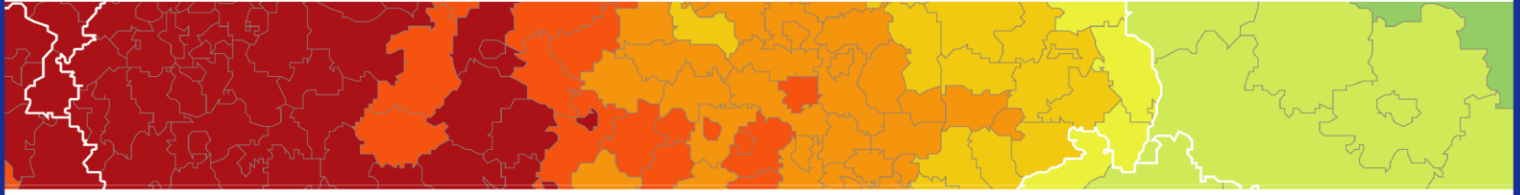


Inspire policy making by territorial evidence



The World in Europe, global FDI flows towards Europe

Drivers of extra-European FDI towards Europe

Applied Research

Scientific Report

March 2018

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The World in Europe,
global FDI flows towards Europe

Drivers of extra-European FDI
towards Europe

Scope and introduction to the study

This report is part of the study, *The World in Europe, global FDI flows towards Europe*. The study casts new light on three topics related to the integration of Europe in the world economy:

1. Extra-European FDI towards Europe
2. Intra-European FDI
3. FDI by European SMEs

Key conclusions and recommendations related to each of these questions can be found in three stand-alone reports. Each report is supported by a number of scientific reports that contain detailed methodological descriptions and results. The insights gained from the study are summarised in a synthesis report that cuts across the three topics.

This scientific report *Drivers of extra-European FDI towards Europe* includes background information and documentation for the conclusions and recommendations brought forward in the main report on extra-European FDI towards Europe.

Overview of the study

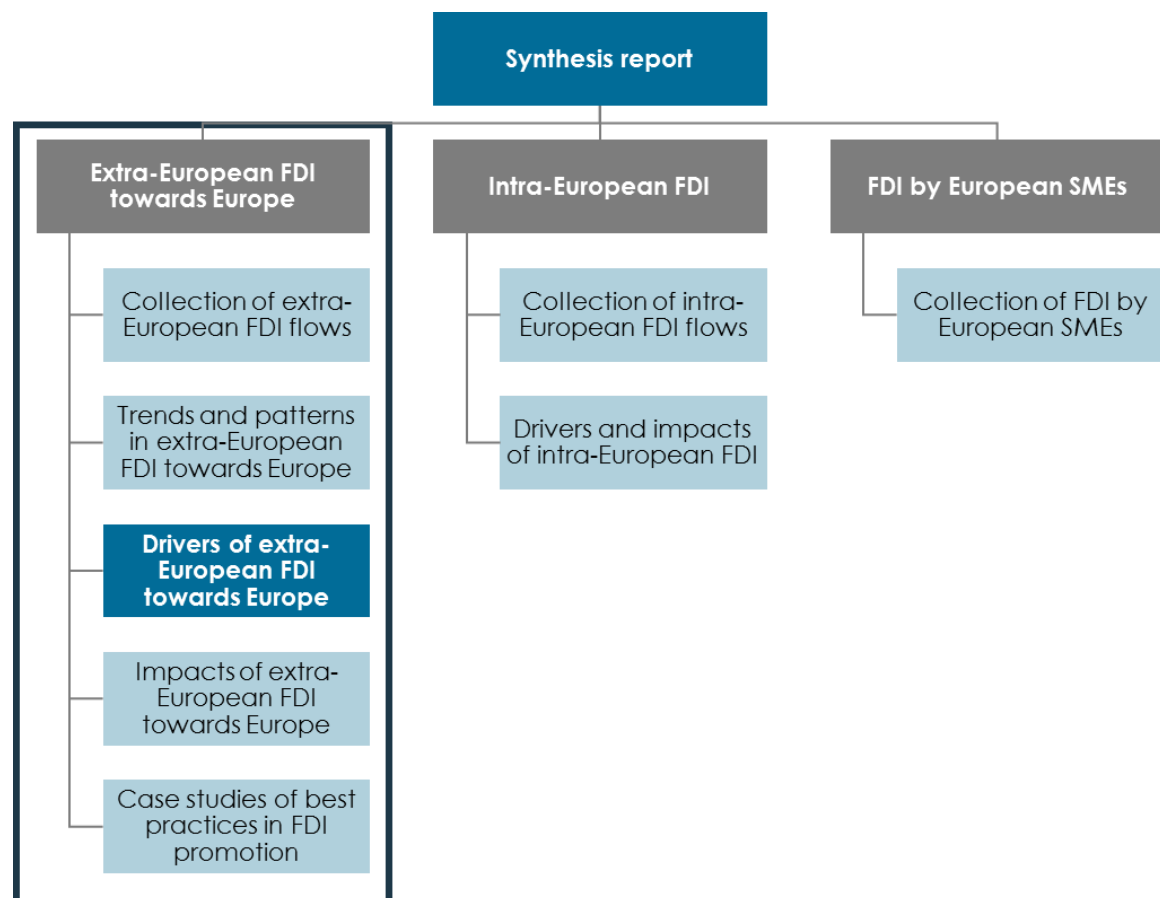


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Abbreviations

BvD	Bureau van Dijk
EC	European Commission
ESPON	European Territorial Observatory Network
EU	European Union
FDI	Foreign Direct Investment
FT database	fDi Markets database offered by the Financial Times
M&A	Mergers and acquisitions
NUTS	Nomenclature of Territorial Units for Statistics

Executive summary

This scientific report analyses drivers of extra-European FDI towards Europe and identifies specific regional factors that have an impact on the FDI location across NUTS3 regions in Europe. The analysis consists of the following three steps.

First, we select potential regional FDI drivers based on the existing literature, with specific focus on studies of regional FDI drivers. *Second*, we construct a tailor-made dataset containing information on:

- The location of non-European owned firms across NUTS3 regions in Europe.
- Data on the selected regional FDI drivers. We include both policy drivers of FDI that can be influenced by policy in the short to medium term (e.g. regional innovation, accessibility and educational attainments) and fundamental drivers that are more difficult for policy makers to influence in the short to medium term (e.g. regional demand factors, agglomeration economies and territorial characteristics).

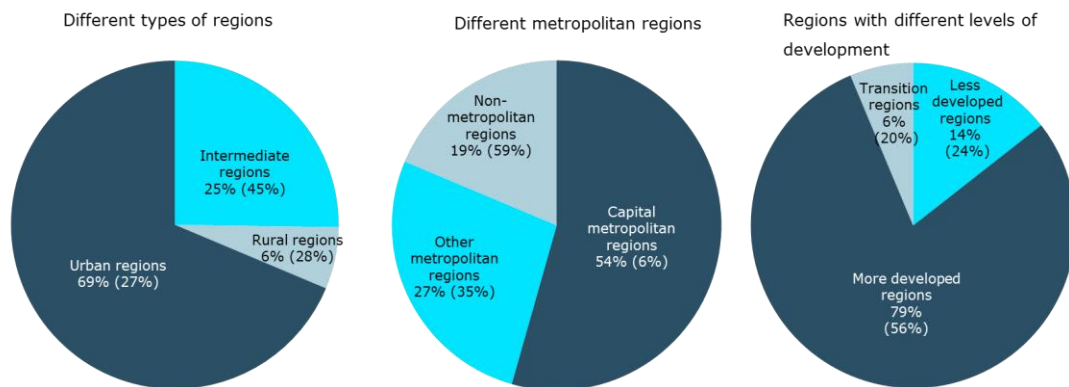
Third, we test the impact of the selected regional FDI drivers on the location of non-European owned firms across European regions, taking into account national factors that are common to all regions within the same country (e.g. the political, legal and regulatory environment, minimum wages and corporate taxes). While the aim has been to include as many regions in as many European countries as possible, it has not been possible to obtain data on regional FDI drivers for all regions in all countries. The data used covers 102,502 non-European owned firms across 1072 NUTS3 regions in 31 European countries (28 EU Member States, Norway, Iceland and Switzerland).

Drivers of FDI across all regions in Europe

A wide range of factors go into the decision process of investing abroad, some of which will be specific to the company and thus difficult to describe in general terms. However, studies across a large number of sectors and countries over time have allowed researchers to provide a knowledge base about common factors can help explain the location pattern of foreign firms. These factors may be determined at the bilateral, national, supra national (e.g. EU) or regional level. The main focus in this report is on the regional drivers of FDI.

FDI is highly concentrated across European territories with non-European owned firms being located mainly in urban regions (69 per cent), capital metropolitan regions (54 per cent) and more developed regions (79 per cent). Urban regions that make up only 27 per cent of all the regions included in the study thus account for a disproportionately high share of non-European owned firms. The opposite is the case for rural regions, which make up 28 per cent of all regions but only host six per cent of all non-European owned firms in Europe.

The distribution of FDI across territorial groups of regions



Note: The figure shows the distribution of non-European owned firms in Europe across different types of regions, different metropolitan regions and regions with different levels of development. The distribution of NUTS3 regions across the different types of regions are shown in brackets.

Source: ESPON FDI (2018) based on data from the Amadeus database

Overall, we find that regions can attract non-European investors by offering:

- Stronger industry clusters.** A number of positive externalities arise when similar firms are located together, and these externalities make individual firms more productive. In areas with strong industry clusters, pools of specialised labour and inputs will often be available, and new ideas and innovation spread across firms. Strong industry clusters are mainly a driver for non-European FDI towards less advanced regions and may, to some extent, compensate for a less attractive local market in these regions.
- Labour abundance.** Firms in some cases establish abroad to secure labour. A high unemployment rate signals to potential investors that there is abundant labour and that workers, at risk of facing unemployment, are likely to exert great effort to keep their job. It should be kept in mind, however, that labour abundance will not always be a driver of FDI if the right skills and competences are not available. Labour abundance is more important in the urban regions, capital metropolitan regions, other metropolitan regions and more developed regions where labour shortages can limit the firms' possibilities for expanding their businesses. A flexible labour market can therefore be one of the tools to attract investments into these regions. Likewise, initiatives to improve the accessibility of urban centres from related rural territories can increase mobility and ensure that the necessary workers are available, and such initiatives could support growth in both territories.
- A higher level of education.** Regions with a high level of education offer good access to human capital, which non-European firms may wish to access in order to improve their productivity. A high level of education is particularly relevant for the more advanced regions.
- Good accessibility.** Regional accessibility reduces the cost of transporting goods to and from the region, and facilitates easier travel to and from the firm's headquarters. Good accessibility is particularly important for market seeking FDI where non-European firms locate in one region to serve other markets in Europe. This FDI driver is particularly important for capital metropolitan regions.

- **A high level of innovation.** When there is a high level of innovative activity in a region, the scope for acquiring new knowledge and hiring R&D workers will be greater. Firms that are establishing themselves abroad in order to access human capital resources will therefore be attracted to regions with a high level of innovation. The impact is quite small, which could be because the level of innovation is relatively high in most regions. In this case, the innovation level will only contribute little to explain regional differences in FDI attractiveness.
- **A high FDI concentration.** Existing FDI projects in a region send a signal of low risk and high profitability to other potential investors, and regions with a large stock of non-European firms will find it easier to attract even more FDI. The presence of non-European firms in the region sends a particularly strong signal to potential investors in less advanced regions. Investment promotion agencies in these regions can thus benefit from making existing foreign firms more visible and use these business cases in their branding of the region.
- **High population density.** A dense regional market means that firms can reach a large number of potential customers within a limited range. This is of particular importance for market seeking firms in the service sector, e.g. wholesale and retail activities. For other firms, a dense regional market will rather indicate high land and rent costs, which will tend to deter FDI.
- **A large regional market.** A large regional market will all else equal offer good business opportunities and the potential for economies of scale. This will be particularly important for market seeking FDI. An attractive regional market is a particularly important driver of FDI into the more advanced regions.
- **Financial incentives.** Financial investment incentives may help attract non-European investments if an investor is deciding between two or more equally attractive locations.

Regions with a more *concentrated industry structure* are less likely to host non-European owned firms. Highly dominant incumbent firms deter FDI in both advanced and less advanced regions. Likewise, *border regions* on average appear to be disadvantaged because barriers to doing business across borders limit the size of the local market. Initiatives to reduce such barriers (e.g. disparities and differences in legal, social and political systems) will help these regions attract more FDI. Looking across different types of regions, we find that the negative impact is driven by urban regions, whereas capital metropolitan regions can in fact benefit from being a border region.

Of the regional FDI drivers, the strength of industry clusters, presence of other foreign firms and low dominance of incumbent firms are particularly important. There are several policy implications from this:

- Initiatives to build strong industry clusters can be a way to ensure sustained regional growth, particularly for less advanced regions. Depending on the characteristics of the specific industry, such initiatives could involve public R&D, collaboration between universities and private companies and education programmes.
- Enforcement of competition policies and equal treatment of foreign and domestic firms will provide a level playing field that reduces the risk of foreign firms to establish a business in the region. This is important in most types of regions.

- The use of financial investment incentives could be a way forward for disadvantaged regions with a low presence of foreign firms to start building up a stock of foreign firms in the region. The strong signalling effect suggests that there are certain rigidities in the way that foreign investors locate, and investor incentives may help break the vicious cycle for some regions. As the use of financial investment incentives are typically only allowed in regions that are economically lagging behind the rest of the EU or other regions within a given country, the use of financial investment incentives may help stimulate convergence among regions in Europe. It should be remembered, however, that this study does not provide information on how much these incentives are actually being used and how effective they are.

The main results are summarised in the figure below.

Summary of findings from the FDI driver analysis across regions

	Regional drivers	Impact	Significant for...
Policy FDI drivers	Strength of industry clusters	+	All regions, but especially important for intermediate and rural regions, other metropolitan regions and less developed regions
	Labour abundance	+	All regions, but especially important for urban regions, capital metropolitan regions, other metropolitan regions and more developed regions
	Tertiary education	+	All regions, but especially important for urban regions, capital metropolitan regions, other metropolitan regions and more developed regions
	Accessibility	+	All regions, but especially important for capital metropolitan regions
	Level of innovation	+	All regions, but the effect is very small
Fundamental FDI drivers	FDI concentration	+	All regions, but especially important for urban and rural regions, non-metropolitan regions, less developed regions
	Population density	+ / -	All regions (positive), but especially important for urban regions (negative) and capital metropolitan regions and transition regions (positive)
	Market size	+	All regions, but especially important for urban regions, other metropolitan regions, more developed regions
	Border region	- / +	All regions, (negative) but especially important for urban regions (negative), capital metropolitan regions (positive) and more developed regions (negative)
	Dominance of incumbent firms	-	All regions, but especially important for urban regions, capital metropolitan regions, non-metropolitan regions and less developed regions

Note: The figure summarises the findings from the FDI driver analysis. The green plus signs indicate that higher values of the regional driver is associated with a higher likelihood of a non-European owned firm being located within the given region, while a red minus sign indicates the opposite.

Source: ESPON FDI (2018) based on the econometric analysis of FDI drivers

Drivers of FDI across sectors, origins of FDI and types of FDI

Looking across regions, we find that 81 per cent of non-European owned firms in Europe are in the service sector, while 9 per cent are in manufacturing. The remaining 10 per cent are either in other sectors or have no information on sector affiliation. We find that industry clusters are particularly important for the location of non-European owned firms in the manufacturing sector. Within the service sector, labour abundance, the level of education, the regional market size and the presence of other non-European owned firms are particularly important for the location of non-European owned firms.

In terms of the origin of investments, we find that the US (20 per cent) and Russia (18 per cent) are the main sources of non-European owned FDI into Europe. With only a few exceptions, we find that FDI from different origins tends to be driven by the same regional factors.

Russian investors are particularly attracted to regions with good accessibility, labour abundance and a high concentration of non-European owned firms. Russian investors do not appear to locate in a region to serve the local market, but rather prefer regions with smaller regional market sizes. These investors seem to locate in regions with good access to labour to a larger extent and they use the location as a platform for exporting to other markets in Europe. Russian investors respond more strongly to signals from other foreign companies about the attractiveness of a particular region.

US investors are particularly attracted to regions with large regional markets. Regional markets with a high dominance of incumbent firms are less attractive to these investors. The motive for US investors to invest in Europe therefore seems to be to serve local markets.

In terms of the type of investment, a larger regional market size and stronger industry clusters increase the likelihood of receiving M&As, while it has not been possible to identify the factors of particular relevance to greenfield investments.

Investment promotion agencies can use the knowledge about different drivers across sectors and origins of investors in their branding campaigns and in targeting their communication to different groups of potential investors. In this context, taking territorial characteristics, drivers and impacts into account will increase benefits from such activities and improve the utilisation of the existing territorial capital.

The main results are summarised in the figure below.

Summary of findings from the FDI driver analysis across sectors, origins of FDI and types of FDI

	Regional drivers	Impact	Significant for...
Policy FDI drivers	Strength of industry clusters	+	All non-European firms, but especially in manufacturing and for M&As
	Labour abundance	+	All non-European firms, but especially in services and for Russian investors
	Tertiary education	+	All non-European firms, but especially in services
	Accessibility	+	All non-European firms, but especially for Russian investors
	Level of innovation	+	All non-European firms, but the effect is very small
Fundamental FDI drivers	FDI concentration	+	All non-European firms, but especially in services and for Russian investors
	Population density	+	All non-European firms, but especially in services
	Market size	+ / -	All non-European firms, but especially in services, for US and other non-Russian investors and for and M&As (positive). Negative in manufacturing and for Russian investors
	Border region	-	All non-European firms, but especially in services, and for Russian investors
	Dominance of incumbent firms	+	All non-European firms, but especially in services and for US investors

Note: The figure summarises the findings from the FDI driver analysis. The green plus signs indicate that higher values of the regional driver is associated with a higher likelihood of a non-European owned firm being located within the given region, while a red minus sign indicates the opposite.

Source: ESPON FDI (2018) based on the econometric analysis of FDI drivers

Caveats and possible directions for further research

The analysis of FDI drivers in Europe is based on regional data from 31 countries (28 EU Member States, Iceland, Norway, Switzerland) as the required data on FDI drivers is not available for the remaining European countries (Turkey, Lichtenstein, the former Yugoslav Republic of Macedonia, Montenegro, Bosnia and Herzegovina, Serbia, Albania and Kosovo). The conclusions drawn cannot be generalised to the excluded group of countries without further analysis.

The analysis examines the location of all non-European owned firms presently located in Europe, and the analysis thus includes both firms that were established several years ago (and have chosen to stay) and more recent establishments. A changing investment climate due to innovation and smart specialisation strategies in Europe may have changed the investment pattern over time. A focused analysis of the location decision of more recent establishments (e.g. within the last three years) could cast some light on this.

Furthermore, the analysis does not cover the location of firms that are indirectly owned by non-European investors, e.g. via a European holding company. These investments are measured as intra-European FDI that have been analysed separately.

While the results suggest that financial investment incentives may help attract FDI to economically lagging regions in Europe and thus stimulate convergence, it is important to underline that this is only an indicative result. The current analysis suggests that regions, where the use of financial investment incentives is allowed under the EU rules on state aid, are more likely to host non-European owned firms than regions where this is not allowed. However, we do not know to what extent such investment incentives are actually used, how these incentives work and how effective they are in stimulating FDI that would not otherwise have taken place. This is therefore an area that should be examined more closely.

Finally, the results show that the location of non-European firms in Europe depends partly on regional characteristics measured at both the NUTS3 and NUTS2 level. This implies that NUTS3 regions can become more attractive as a result of policies enacted at the NUTS2 level. Such regional interdependencies in FDI attraction could be an area for further analysis.

1 Identifying potential drivers of FDI

The purpose of the analysis presented in this scientific report is to examine which regional characteristics can help explain the location pattern of non-European owned firms across European regions.

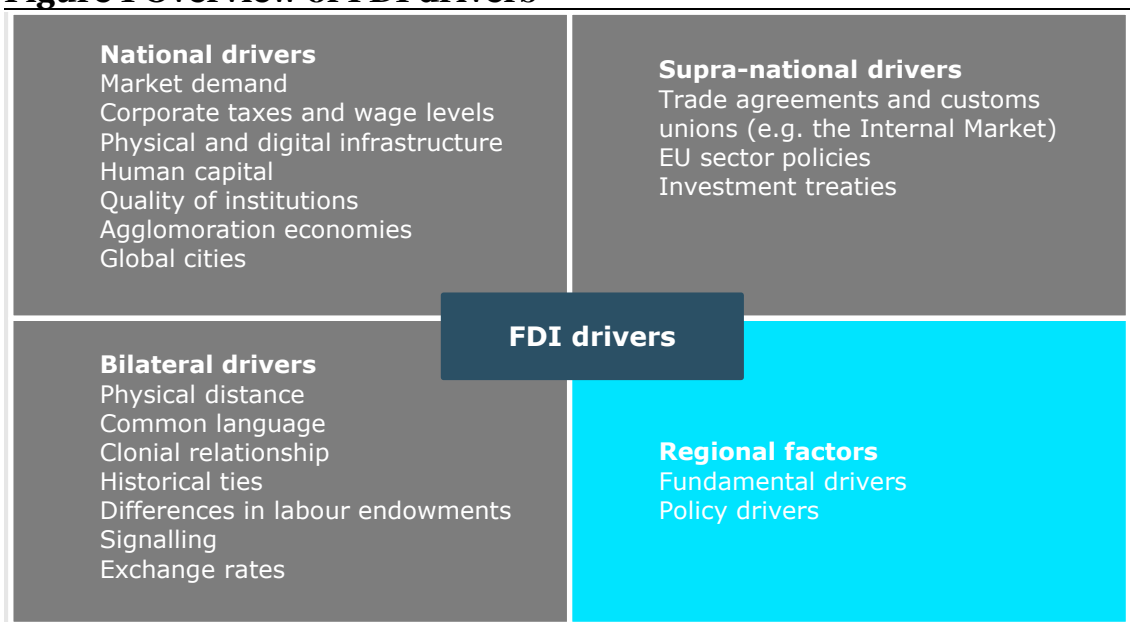
In this chapter, we describe how we have selected the initial set of regional factors that are included in the analysis. Based on findings in the existing literature, we also discuss the expected impacts of each of these on the location choice of foreign investors.

1.1 Overview of FDI drivers

Multinational companies invest abroad to maximise the long term profit and value of the company. Economic theory suggests that if foreign investors expect that they can earn more profit by establishing a foreign affiliate (e.g. instead of exporting) or expanding their business by acquiring an existing foreign company, they will do so. They will make their investment in the location that promises the highest long term profit.

A wide range of factors go into the decision of investing abroad, some of which will be specific to the company and thus difficult to have general expectations about. However, studies across a large number of sectors and countries over time have provided a knowledge base about common factors that have a positive and significant impact on the attraction of FDI and which can help explain the location pattern of foreign firms. These factors may be determined at the national, supra-national (in this context meaning mainly at the EU level), bilateral or regional level, cf. Figure 1.

Figure 1 Overview of FDI drivers



Source: ESPON FDI (2018) based on literature survey

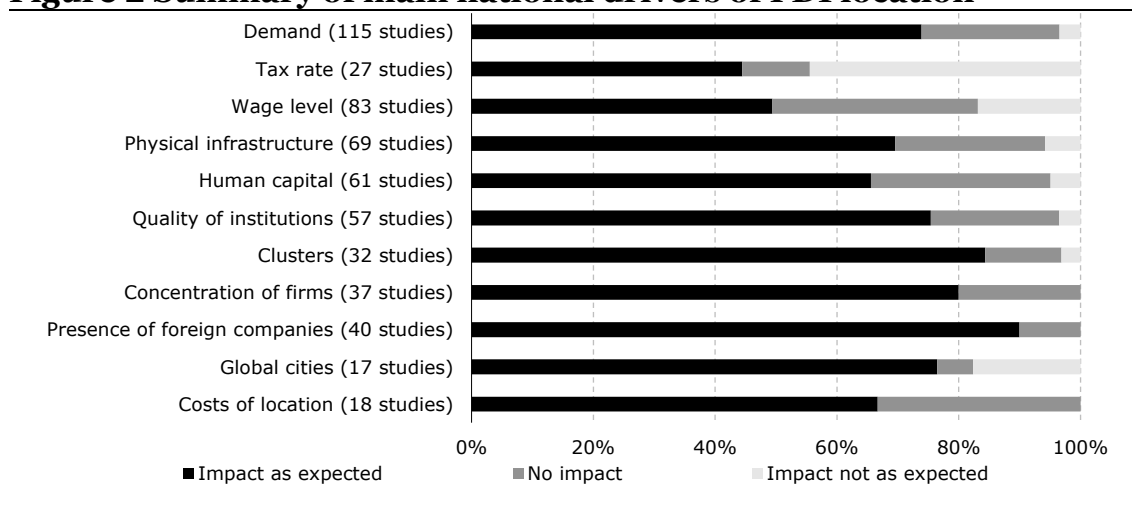
The distinction between the different levels is not always this clear, and some FDI drivers are influenced at several levels. The overall education policies in a country are generally decided at the national level, whereas the availability of a skilled labour force in a specific area can be influenced by regional policies.

While focus in this study is on regional drivers, we briefly comment on other FDI drivers found to be of importance in the literature, and we explain how we deal with these in our empirical analysis.

1.1.1 National drivers

There are several preconditions that are necessary for all regions to attract and maintain FDI. A recent literature survey identifies the determinants of the locational choice of foreign investors across countries that are most often used in the extensive literature on FDI drivers, cf. Figure 2. These factors include both fundamental drivers (e.g. demand, quality of institutions, concentration of firms and global cities) that are difficult for policy makers to influence in the short to medium term as well as policy drivers (e.g. tax rates, wage levels, physical infrastructure, human capital, clusters and cost of location) that can be used more actively in investment promotion activities.

Figure 2 Summary of main national drivers of FDI location



Note: The literature survey covers 154 empirical studies of FDI location. "Impact as expected" means that the impact quantified in the empirical study has the expected sign, "No impact" means that the impact is not significant, and "Impact not as expected" means that the impact had the opposite sign than expected.

Source: ESPON FDI (2018) based on Nielsen, Asmussen & Weatherall (2017)

An attractive national market is an important location factor for many investors, in particular investors seeking to sell their products locally. The size and growth of the national market and the purchasing power of the consumers are therefore among the factors that are most frequently found to influence the location decision of foreign investors.

Cost factors, such as corporate tax rates and wage costs are also frequently pointed to as being of importance for the location of FDI. Lawless et al. (2015), for example, find evidence of lower tax rates being a factor of importance for the location of FDI in Europe, albeit with large variations across sectors, with investments in the financial sector being especially sensitive to taxes.

A country's physical infrastructure integrates the country with the rest of the world and makes the country more attractive for multinationals that seek to optimise their supply chain across different locations or that locate in one country with the purpose of serving markets in nearby countries. The transport and logistics infrastructure is also found to be the third most important location factor for international investors in an investor survey undertaken by E&Y (E&Y, 2015).

Furthermore, access to human capital has been found to be of importance for investors choosing which host country to place their investment in. A highly qualified labour force with innovative competences attracts companies that compete in global markets and which continuously need to improve their competitiveness. A focus on public R&D, including close collaboration between industry and universities can thus help attract investments. In Copenhagen Economics (2016), such ties were for example found to be of particular importance for investments in the chemical and pharmaceutical sectors in Europe.

The quality of a country's public institutions also matters. FDI typically involves large fixed investments (e.g. in buildings, production plants and equipment), and investors are therefore sensitive to any factors that can cause a risk to their investment, such as political instability or an ineffective legal system (Berden et al., 2014). A stable political, regulatory and legal environment reduces the risk of undertaking FDI and has been found by E&Y (2015) to be the most important factor for investors when choosing a location.

Agglomeration economies are also among the factors, which have most frequently been found to attract FDI. Agglomeration economies include industry clusters and concentration of firms as well as the presence of foreign owned firms. Clusters of firms in the same or related industries are often associated with increased productivity, due to a concentration of specialised labour, inputs and perhaps even specialised infrastructure, such as for example pipeline networks. The presence of foreign firms furthermore sends a signal to potential investors about the given host country being a profitable investment location.

The cost of location includes factors such as rents and land costs. This type of cost will be particularly important for greenfield investments where a company sets up a new production facility but the business case for acquiring a company will also depend on cost commitments of the existing company.

The presence of so called global cities (characterised by global interconnectedness, cosmopolitanism and abundance of advanced producer services) also attracts FDI to a given host country as they help foreign investors overcome the costs of establishing a business abroad (Goerzen et al., 2013). Investors therefore sometimes chose between cities – not countries.

In our analysis, we control for such national attraction factors by including country dummies, which control for factors that only vary at the national level. Thus, if foreign investors in general are more attracted to all types of regions in countries with a larger domestic market, with lower corporate tax rates, better infrastructure or educational policies, this will be controlled for via the inclusion of country dummies.

1.1.2 Supra-national drivers

A country's membership of regional trade agreements or a customs union can be an attraction factor for investors as they gain access to larger markets with low trade friction. Within Europe, the Internal Market and the Customs Union are thus significant attraction factors as they allow non-European investors to locate their business in one Member State and serve the rest of the EU from there. Likewise, a high level of investment protection (e.g. guaranteed by investment treaties) will also make a country more attractive.

In some countries, these agreements are negotiated at the national level, but for most countries in Europe such agreements are negotiated at the EU level.¹ We implicitly control for the attractiveness of the EU as a driver of FDI into Europe when we undertake specifications of the analysis in which we include only locations that have access to the Internal Market.

The UK accounts for a sizable share of the Internal Market.² Depending on the final outcome of the negotiations between the EU and the UK, Brexit may therefore reduce the Internal Market as an attraction factor for non-European investors so that less FDI will tend to flow towards Europe. Brexit may also make the UK less attractive as an investment location because trade between the EU and the UK is likely to be less frictionless. The extent to which Brexit will influence the location of future FDI inflows towards Europe and cause reallocations of existing investments between the UK and the EU remains to be seen.

EU sector policies also have an impact on the attractiveness of European countries relative to other countries. This could be EU transport policies that improve accessibility and the interconnectedness of individual countries or EU strategies to improve education levels among European citizens and funds directed to building common research and innovation capacity in Europe.³ Other examples include EU agricultural and energy policies. Likewise, EU cohesion policies provide financial resources for convergence and competitiveness in European regions and thus have an impact on the attractiveness of different locations in Europe.

1.1.3 Bilateral drivers

A common finding in the literature is that bilateral factors, i.e. factors that characterise the relationship between the host (where the investment takes place) and the home country (the origin of the investor), are important FDI determinants.⁴

¹ The Lisbon treaty has also brought investment policy under the sphere of policy developed at EU level. Findings regarding the impact of so-called bilateral investment treaties on FDI are however inconclusive, with several studies finding no significant effect of such treaties on FDI.

² Based on data from Eurostat, the UK accounted for 16 per cent of the combined EU GDP in 2016 <http://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20170410-1>.

³ An example is Europe 2020 – A strategy for smart, sustainable and inclusive growth, which set goals for both R&D investments, early school leavers and the level of tertiary education for the younger generation.

⁴ Based on bilateral data on FDI stocks across OECD countries, Blonigen and Piger (2014) test the robustness of a large number of FDI determinants frequently included in empirical studies of FDI location determinants. They find that physical distance, common language, colonial relationships and the (squared) skill difference between the home and host country are among the most robust FDI determinants.

All else equal, physical distance is typically found to lower FDI, which implies that foreign investors tend to favour locations that are closer to their home country. In contrast, a common language and historical ties are typically found to increase FDI. The absence of a language barrier reduces transaction costs and makes it easier to set up and run a business abroad, and historical ties (e.g. through colonial relationships) may also be associated with large diaspora populations and increase the awareness of the host country among potential investors in the home country.

Differences in skilled labour endowments between the home and host country have also been found to be of importance and are commonly discussed in relation to so-called vertical FDI, where a company sets up an affiliate in a country with a higher share of unskilled labour in order to access low-cost labour. Finally, evidence also shows that the presence of investors from a given origin in a given host location tends to attract even more investors from the same home country, as it signals profitability and puts the region or city on the map. Within Europe, evidence for this is found by e.g. Crozet et al. (2004) who analyse the location pattern of FDI in France and find that investors from some countries, including Japan and the US, are more likely to locate in regions where other investors from their own home country are already located.

There is also evidence suggesting that exchange rate movements can influence FDI patterns by increasing the likelihood of M&As, as a depreciation of the host country's currency, can reduce the cost of acquiring assets in that country for foreign investors (Blönigen, 2005).

In the current analysis, we do not explicitly account for bilateral FDI drivers, but we distinguish between investors from different origins and examine whether the identified regional drivers differ between investments from the main origins of FDI into Europe.

1.2 Selection of regional drivers

We select the set of regional drivers to be included in the econometric model based on insights from existing studies that have examined the FDI location in Europe from a regional perspective. We have surveyed both academic studies published in peer-reviewed journals as well as policy reports. In total, we have identified six studies, which fulfil these criteria and which in combination cover regions in a large number of European countries, cf. Box 1. All studies include analysis of determinants of FDI originating from both within and outside of Europe.

Box 1 Selected econometric studies of regional FDI determinants

- **Gauselmann and Marek (2012):** The study analyses the determinants of the location choice of MNEs across 33 NUTS2 regions in East Germany, the Czech Republic and Poland.
- **Spies (2010):** The study analyses the determinants of the location choices of foreign multinational firms at the level of German federal states.
- **Basile et al. (2008):** The study analyses the determinants of the location choice of multinational enterprises across 50 NUTS1 regions across Germany, France, Italy, Sweden, UK, Spain, Ireland and Portugal.
- **Copenhagen Economics (2007):** The study analyses the determinants of the location choice of foreign investors across 268 NUTS2 regions across the EU27.
- **Barrios et al. (2006):** The study analyses the determinants of the location choice of MNEs across 28 regions in Ireland (Irish counties).
- **Crozet et al. (2004):** The study analyses the determinants of the location choice by foreign investors across 92 NUTS3 regions in France (French départements).

Note: All academic studies listed in the box are published in peer-reviewed journals. Copenhagen Economics (2007) is a policy report and was prepared for DG Regio at the European Commission. In terms of geographical coverage, Copenhagen Economics (2007) is the most comprehensive of the studies and is based on data covering the location of approximately 100,000 foreign firms across NUTS2 regions in the EU27.

Source: ESPON FDI (2018) based on a literature survey

We have listed all regional drivers that have been found to be significantly associated with the location of foreign owned firms in at least one of the studies in Table 1. We have grouped drivers under six headings according to the context in which they are typically discussed: Regional demand, regional territorial characteristics, regional agglomeration economies, regional labour market, regional cost factors and other regional policy factors. Many of the drivers are included in all or several of the six studies. The middle column in Table 1 contains examples of how the individual drivers have typically been measured as the specification varies from study to study.

Table 1 Overview of regional drivers applied in the literature

Regional drivers	Measures typically used	Type of FDI driver	Selected
<i>Regional demand</i>			
Market size	Regional GDP	Fundamental	Yes
Market potential	Regional GDP plus the sum of GDP in other regions, weighted by distance	Fundamental	Yes
Level of development	Regional GDP per capita	Fundamental	No
Population density	Regional population density	Fundamental	Yes
<i>Regional territorial characteristics</i>			
Border regions	Variable indicating whether or not a given region is a border region	Fundamental	Yes
Capital city regions	Variable indicating whether or not a given region is a capital city region	Fundamental	No
Distance	Distance between capital of the investors home country and the main city in a given region	Fundamental	No
<i>Regional agglomeration economies</i>			
FDI concentration	Number of foreign firms in a given region/industry or foreign firms' share of employment in a given region/industry	Fundamental	Yes
Dominance of incumbent firms	Herfindahl index	Fundamental	Yes
Industry clusters	Total number of firms in a given region/industry or the regional share of employment in a given industry	Policy	Yes
<i>Regional labour market</i>			
Education level	Share of the labour force with a tertiary education or secondary school enrolment	Policy	Yes
Labour abundance	Regional unemployment rate	Policy	Yes
<i>Regional cost factors</i>			
Accessibility	Index of infrastructure or accessibility or a specific measure of infrastructure (e.g. traffic in commercial airports)	Policy	Yes
Wage costs	Average regional wages	Policy	No
Land prices	Prices of building land or population density	Policy	No
FDI incentives	European structural funds expenditures or a variable indicating whether the country in which the region is located is eligible for EU cohesion funds	Policy	Yes
Taxes	Regional corporate taxes or real estate taxes	Policy	No
<i>Other regional policy factors</i>			
Level of innovation	Regional number of patent applications or regional R&D expenditures as a share of regional GDP	Policy	Yes
Level of ICT	Regional share of firms with own website	Policy	No

Note: The table contains an overview of regional factors found to be significantly associated with the location decision of foreign investors, in at least one of the six selected studies. The grouping of the regional drivers in the far left column and the categorisation of the drivers into fundamental or policy FDI drivers in the far right column are done by Copenhagen Economics.

Source: ESPON FDI (2018) based on the studies listed in Box 1

The regional drivers found to be of importance in the literature, can be categorised into the following two types of FDI drivers:

- *Fundamental FDI drivers*. Include regional demand factors, regional territorial characteristics and to a large extent also regional agglomeration economies. These types of drivers are often key drivers of FDI but are difficult for policy makers to influence in the short to medium term.
- *Policy FDI drivers*. Include factors related to the regional labour market, industry clusters, regional cost factors and other regional policy factors. These types of drivers can be influenced by policy in the short to medium term.

We have included at least one driver under each heading as these drivers can be highly correlated. When two drives are highly correlated, we have chosen the variable with the best coverage across countries and regions. In particular, we have selected market size (regional GDP) and population density as measures of market attractiveness instead of the level of development (GDP per capita). The reason for this is that the level of development is more highly correlated with other drivers such as the level of innovation and tertiary education, which can make it difficult to identify the effects of the individual drivers. We also have information on market potential, but only for EU28 countries. The results for the EU28 countries do not change when we use the market potential variable rather than regional GDP. As more countries can be included when we use regional GDP, we only employ the market potential variable as a robustness check.

We have not been able to obtain data for regional taxes and the regional level of ICT. In addition, we do not explicitly include capital cities as a determinant, but instead examine determinants of investments into different types of territories, including capital metropolitan regions, cf. Chapter 4. Likewise, we do not include distance and other bilateral FDI drivers but test if the drivers of FDI differ across investors with different origins. Finally, we have left out regional wage costs because this variable is highly correlated with other variables already included in the model (e.g. regional GDP and GDP per capita). Our robustness checks show that leaving out this variable does not change to the impact of the remaining variables.

The expected impacts of the selected regional factors are discussed in turn below and a full list of definitions and sources are provided in Table 2 in Chapter 2.

1.3 The expected impact of the selected regional factors

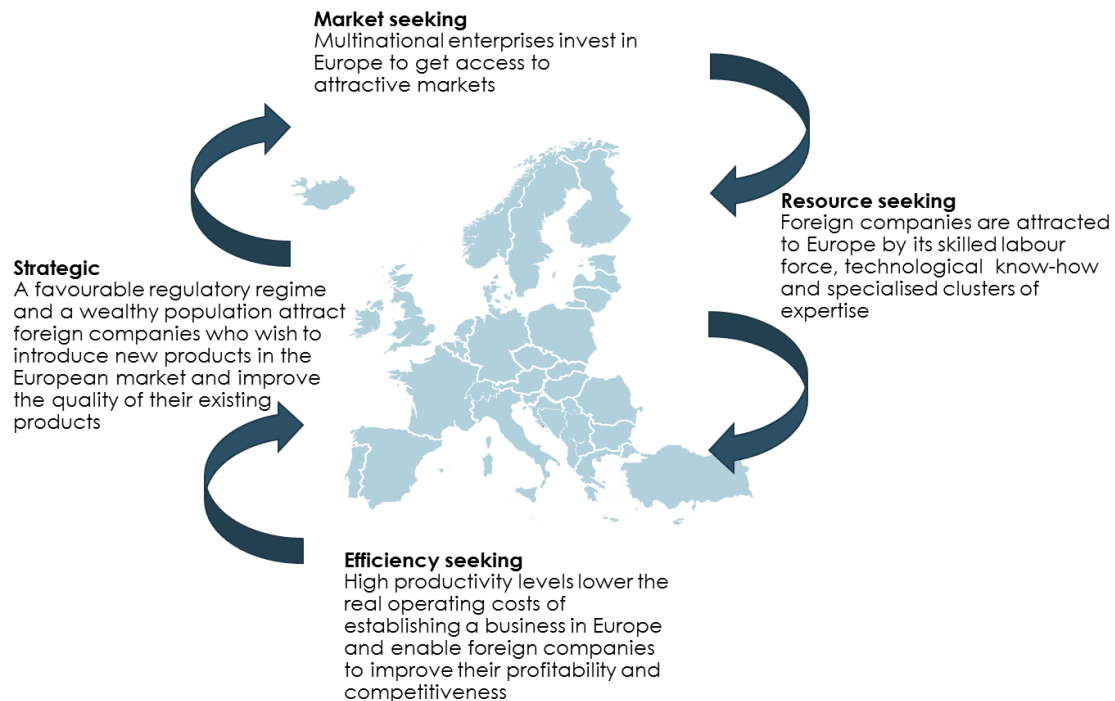
The location of foreign investors will invariably be guided by the firm's motive for engaging in FDI in the first place. In order to form an expectation of how the various regional factors of interest will impact the FDI location of foreign companies, we therefore first consider why firms invest abroad.

In the literature, it is common to distinguish between:

- Market seeking FDI
- Efficiency seeking FDI
- Resource seeking FDI
- FDI motivated by strategic reasons

These four types of FDI are all motivated by different underlying factors and respond to different types of drivers, cf. Figure 3.

Figure 3 Motives for engaging in FDI in Europe



Source: ESPON FDI (2018) based on Copenhagen Economics (2016)

Market seeking FDI

Firms that engage in market seeking FDI do so in order to sell their products in the local or nearby market instead of exporting from their home country. Firms will therefore choose the location that offers the best access to the largest market at the lowest cost of transportation.

The factors which should be particularly relevant for this type of FDI are thus:

- Regional market size or other measures of regional demand (positive)
- Population density (positive/ negative)
- Whether or not a region is a border region (positive/ negative)
- The dominance of incumbent firms (negative)
- Accessibility (positive)

The regional market size (proxied by GDP) is expected to influence the location choice positively as larger markets are more attractive to investors wishing to sell their products locally. Measures of regional demand are consistently found to be among the most important factors explaining the regional location of foreign owned firms across the different studies listed in Box 1.

Similarly, population density can also be an indicator of market attractiveness, especially for services such as e.g. wholesale and retail activities. Population density is found to be positively associated with the location of foreign firms in the service sector in Germany (Spies, 2010).

However, a high population density may also be correlated with high land and rent costs and may thus also be negative. This has for example been found by Basile et al. (2008).

Regions located by a national border tend to be more attractive to foreign investors as they provide easy access to other countries' markets. The importance of border locations has been empirically verified in a number of studies (e.g. Copenhagen Economics, 2007; Spies, 2010). However, a country border may also limit the size of the local market. If consumer tastes are inherently different across the border or if barriers (e.g. language or regulatory differences) make it more costly for firms to sell their goods or services across the border, investors will tend to locate more centrally within the local market. Border regions may therefore be both more and less likely than other regions to attract foreign owned firms.

Highly dominant incumbent firms will all else equal make it more difficult to enter the market and is thus expected to make it less likely that foreign firms will choose to locate in the region.

Regional accessibility is found to influence the location choice positively as the costs of transporting intermediate goods to the region and final goods from the region to nearby markets will be lower. Likewise, good accessibility facilitates easier travel to and from the company's headquarters. The importance of regional accessibility or infrastructure has been empirically verified in a number of studies (e.g. Copenhagen Economics, 2007; Gauselmann et al., 2012).⁵

Efficiency seeking FDI

Firms that engage in efficiency seeking FDI do so in order to improve the profitability of their production by increasing their productivity. Among the factors that will matter especially to this type of FDI are factors such as access to human capital, cost-competitive wages and labour abundance.

The factors that should be of particular relevance for this type of FDI are thus:

- Educational level (positive)
- Labour abundance (positive/negative)
- Industry clusters and agglomeration economies (positive)
- Wage costs (negative)

The regional educational level is a proxy for access to human capital and is expected to influence the location choice positively. This was found to be the case in Copenhagen Economics (2007) for foreign firms locating in regions across the whole of the EU. However, when focusing only on regions in Eastern European EU countries, the regional education level was found to have no importance.

In a later study by Gauselman and Marek (2012) focusing on the location choice by multinational companies across 33 regions in East Germany, the Czech Republic and Poland, the regional

⁵ The importance of accessibility for the location decision of investment was also highlighted in the ATTREG ESPON project.

share of employees with a technical-scientific education was found to affect the location choice positively. Finally, in a study of the determinants of location choices of foreign multinationals across German federal states, Spies (2010) also finds the share of university graduates to be an attraction factor.

To proxy for labour abundance, we use the unemployment rate. As noted by Disdier and Mayer (2004), a high unemployment rate may be positively associated with the location decision of foreign investors as it can signal the availability of a large pool of labour. A high unemployment rate may also raise efforts among a company's employees as it can make it more difficult to find a new job if one gets fired (Head, 1999). A high unemployment rate may, however, also deter FDI as it can be a sign of rigidities and mismatch in the labour market (Disdier and Mayer, 2004).

Empirical findings reflect this ambiguity. Gauselmann and Marek (2012) find a positive association between the regional unemployment rate and the location of foreign owned firms across regions in East Germany, the Czech Republic and Poland. However, regressions undertaken on national subsamples of their data, show a negative impact of the regional unemployment rate in Poland, while the equivalent impact is positive in Eastern German and non-significant in the Czech Republic. In Copenhagen Economics (2007), the regional unemployment rate was found to be negatively associated with the location of foreign firms across regions in the EU as a whole but insignificant across regions in Eastern Europe.

Industry clusters and agglomeration economies have been found to be key factors of attraction in multiple studies (e.g. Copenhagen Economics, 2007; Spies, 2010; Crozet et al., 2004; Basile et al., 2008). The tendency to locate near similar firms is not specific to foreign owned firms but is a general tendency among firms, as evidenced by the existence of many localised industry clusters and broader agglomerations of economic activity. A number of positive externalities arise when similar firms locate together, and these externalities make individual firms more productive. In areas with clusters of similar firms, pools of specialised labour will often be available, and new ideas and innovation may spread across firms, either via direct exchange of knowledge or via labour movements. Specialised inputs may also be more easily available, and the market for the firms' final goods may be larger.

Wage costs are expected to be negatively associated with the location of foreign firms, as suggested by evidence from e.g. Germany (Spies, 2010).

Resource seeking FDI

Firms that engage in resource seeking FDI do so in order to access specific resources that are available in a given location. This can be natural resources such as oil and minerals, but can also be human capital resources, R&D and innovation. A high regional educational level or deep regional industry clusters can therefore also be especially attractive to this type of FDI.

The factors that should be particularly relevant for this type of FDI are thus:

- Educational level (positive)
- Level of innovation (positive)

- Industry clusters (positive)

Regions in which there is a high level of innovative activity are all else equal expected to be more attractive to foreign firms than regions with lower levels of innovation, as the scope for acquiring new knowledge and hiring R&D workers is greater. The importance of regional innovation activities has been empirically verified in a number of studies (e.g. Copenhagen Economics, 2007; Basile et al., 2008; Gauselmann et al., 2012).

FDI motivated by strategic reasons

Firms that engage in FDI for strategic reasons do so because they believe it will benefit them in the long run by sustaining or advancing their global competitiveness. This type of FDI can be driven by very firm-specific motivations. This can for example be the acquisition of a foreign firm in order to strengthen the acquiring firm's global portfolio of physical assets and human competencies, or to weaken those of their competitors (Dunning et al., 2008).

The factors that should be particularly relevant for this type of FDI are therefore more difficult to point to but could include factors such as:

- Level of innovation (positive)
- Educational level (positive)
- The dominance of incumbent firms (negative/positive)

Higher regional innovation and educational levels may thus increase the likelihood of a region being home to innovative firms that are interesting acquisition targets for foreign firms. Local markets with a weak dominance of incumbent firms offer greater opportunities for foreign firms to build up a strong market position in the longer run. A dominant incumbent firm may, however, also be attractive to acquire so this factor can be either positive or negative.

Cross-cutting issues

Regardless of the underlying motive, foreign firms will have less knowledge of locations abroad and will have a tendency to locate in regions where other foreign firms are already located. One reason for this is what is commonly referred to as 'signalling', where existing FDI projects in a region send a signal of profitability to potential investors. The importance of clusters of foreign firms has been empirically verified in a number of studies (e.g. Head et al., 1995; Crozet et al., 2002; Copenhagen Economics, 2007; Basile et al., 2008). As we focus only on FDI from non-European countries, the measure of FDI concentration, included as a measure of the concentration of non-European owned firms, captures signalling effects arising from these non-European investors.

Finally, the availability of financial investment incentives, such as e.g. direct grants or cost sharing schemes can also be of importance to the attractiveness of a particular region. However, such incentives cannot compensate for the lack of market attractiveness, resources or specific strategic assets but may have an impact if an investor is deciding between two or more equally attractive locations. In that situation, it is likely that such incentives can help push investors towards a specific location.

2 Empirical methodology and data

This chapter gives an overview of the data we employ in the empirical analysis and describes the empirical methodology we apply.

2.1 Collection of regional data on the location of non-European owned firms

In order to analyse the regional factors that influence the location pattern of non-European owned firms across Europe, we combine two sets of data:

- Data on the NUTS3 location of more than 102,500 non-European owned firms in Europe. This data is obtained from the Amadeus database owned by Bureau van Dijk. Data is from 2015 and thus reflects the stock of foreign companies that has been accumulated over the years, i.e. the companies that have chosen to invest and stay in a given region.
- Data on the regional attraction factors. This data is obtained from multiple public data bases and the specific measures have been selected based on the literature survey from Chapter 1.

Each of these two sets of data are commented upon below.

2.1.1 Data on the NUTS3 location of foreign owned firms in Europe

We treat a firm as being foreign owned if a single non-European shareholder owns at least 10 per cent of the firm.⁶ Our definition of foreign owned firms includes direct ownership linkages only and does not take into account indirect foreign ownership, e.g. via a domestic holding company. This means that if a US firm owns a French firm, which in turn owns another French firm, only the former French firm is considered foreign owned. For a firm to be considered foreign owned, at least 10 per cent of the firm must thus be directly owned by a non-European owner. Appendix A contains a description of the extensive data cleaning process that was required to undertake the analysis.

2.1.2 Data on the regional drivers

As we identify the location of the non-European owned firms at the NUTS3 level, it would be preferable to have all data on regional characteristics at this level. However, regional data at the NUTS3 level is sparse for many countries. As we are interested in including as many of the ESPON countries as possible, some of the regional data collected is only available at the NUTS2 level, cf. Table 2. This may not be a problem as foreign investors in practice may locate their investments based on a combination of both NUTS3 and NUTS2 characteristics of a region.

As we match data on regional characteristics with data on the location of non-European owned firms, we have collected information on all regional attraction factors from 2015 or the most recent year available. As the initial location decision by a given foreign investor may have been made at any point up to and including 2015, we cannot make a causal connection between the various

⁶ The OECD also employs this threshold in their definition of FDI (<https://www.oecd.org/daf/inv/investment-policy/2487495.pdf>).

regional attraction factors and the choice of location. We can however, get a good picture of which factors help explain the current pattern of the location of non-European owned firms.

Table 2 contains an overview of the definition, coverage and sources for all the regional variables collected, and Box 2 contains a brief explanation of how we measure FDI incentives.

Box 2 Measuring regional FDI incentives

Within the EU, financial and fiscal investment incentives to attract FDI such as e.g. direct grants, cost-sharing schemes, reduced rates or direct provision of land, tax exemptions or reductions given to specific firms are considered a form of state aid. The use of such incentives are therefore governed via a framework of wider laws on state aid. The framework allows for the use of such incentives at varying degrees in two types of regions, stipulated in the two articles of the Treaty on the Functioning of the European Union ("TFEU"):

1. 'a' areas – Article 107(3)(a): NUTS2 regions with a gross domestic product (GDP) per capita in purchasing power standards (PPS) that is equal to or less than 75% of the EU27 average and outermost regions.
2. 'c' areas – Article 107(3)(c):
 - Predefined 'c' areas: Areas fulfilling pre-established conditions that can be designated by Member States without any further justification; this category includes NUTS2 regions that were designated as 'a' areas in the 2011-2013 period and sparsely populated NUTS2 and NUTS3 regions, as well as parts of or areas adjacent to NUTS3 regions, under certain conditions.
 - Non-predefined 'c' areas: Areas that may be designated by a Member State provided that they fulfil certain socio-economic criteria.

Based on information on which specific regions are defined as either 'a' or 'c' regions, we include a binary variable equal to one if the use of investment incentives is permitted and zero if this is not the case (i.e. regions that are neither 'a' nor 'c' regions).

Source: ESPON FDI (2018) based on European Parliament (2017)

Table 2 Regional drivers used in the econometric model

Variable	Definition	Year	Level	Source	Expected impact
Level of innovation	Number of patent applications to the European patent office, per million inhabitants	2012	NUTS2	Eurostat	+
Accessibility	European potential accessibility index for freight*	2011	NUTS3	TRACC (2015)	+
Tertiary education	Percent of 25-64 year olds with a tertiary education	2015	NUTS2	Eurostat	+
Labour abundance	Unemployment rate (per cent)	2015	NUTS3	Amadeus database	+
Investment incentives allowed	Dummy variable equal to one if investment incentives are permitted period 2014-2017 and zero otherwise (see Box 2)	2014	NUTS3	Eurostat	+
Strength of industry clusters	The share of a region's employment in a given sector (2-digit NACE) relative to the country's employment in that sector	2015	NUTS3	Amadeus database +	
Dominance of incumbent firms	Herfindahl index	2015	National	Amadeus database	
Border region	Variable equal to one if the region's population lives within a 25 km buffer zone along a land border**		NUTS3	EC DG Regio	+/-
Market size	GDP (EUR)	2013	NUTS2	Eurostat	+
Population density	The sum of the population in 1 km ² grid cells within a circle of 100 km radius, averaged by NUTS3 regions and weighted by the population of each grid cell located in the region.		NUTS3	EC DG Regio	+/-
FDI concentration	The regional share of a sector's (2-digit NACE) employees employed in foreign owned firms	2015	NUTS3	Amadeus database	+

Note: Industry clusters, FDI concentration and the Herfindahl index are calculated by Copenhagen Economics using data from the Amadeus database, cf. Appendix A for details on how these variables were calculated. * Accessibility is measured using the European potential accessibility index for freight, obtained from TRACC (2015). For each NUTS3 region, the index value is computed as the sum of GDP in all other European regions weighted by the generalised travel cost by multimodal (non-unitised), road, rail, air and/or water to go there. **The typology used to identify border regions covers EU28 countries. Border regions in non-EU countries are therefore identified using a border typology from Eurostat and include both land and maritime border regions.

Source: ESPON FDI (2018) based on the sources listed in the table

2.1.3 The final dataset

In the final dataset, in which we combine the data on the location of non-European owned firms in Europe and the data on regional characteristics, we only include NUTS3 regions for which the NUTS3 code has either remained unchanged since the 2006 NUTS nomenclature or for which any change has been limited to a simple code change. This means that we exclude NUTS3 regions where codes have changed due to boundary shifts or splits/merges of specific NUTS3 codes. This is because:

- The accessibility index is constructed based on the 2006 NUTS nomenclature
- Data on the number of patent applications is based on the NUTS 2010 nomenclature
- The classification of regions allowing the use of investment incentives is based on the 2010 NUTS nomenclature
- The location of foreign firms is identified based on the 2013 NUTS nomenclature

In total, the final dataset covers 1072 NUTS3 regions across 31 European countries (28 EU Member States, Norway, Island, Switzerland), cf. Table 3. The country coverage of the data means that the conclusions drawn cannot be generalised to the accession countries without further analysis.

Table 3 Country coverage of the final data set

Austria	Finland	Luxembourg	Slovakia
Belgium	France	Latvia	
Bulgaria	United Kingdom	Malta	
Switzerland	Greece	Netherlands	
Cyprus	Croatia	Norway	
The Czech Republic	Hungary	Poland	
Germany	Ireland	Portugal	
Denmark	Island	Romania	
Estonia	Italy	Sweden	
Spain	Lithuania	Slovenia	

Note: The table lists the countries included in the final dataset.

Source: ESPON FDI (2018)

2.2 Empirical methodology to identify significant drivers

In order to examine whether the location of non-European owned firms can be explained by the selected regional characteristics, we follow the standard approach in the literature and estimate a discrete choice model, which links the presence of foreign owned firms at the NUTS3 level with a range of regional characteristics.

Specifically, we use a so-called conditional logit model in which we estimate the likelihood of a given foreign firm to locate in a given NUTS3 region given the different regional characteristics and the national characteristics, controlled for via the inclusion of national dummies, cf. Box 3.

As we do not have data on the allowance of investment incentives for all 31 countries, we start by estimating a baseline model, in which we exclude this variable, and which therefore covers all 31 countries listed in Box 3. We then estimate an extended model including investment incentives covering the 26 countries for which this data is available.⁷ As the estimated impacts of the variables included in both specifications change very little across the two specifications, we are confident that the results pertaining to investment incentives we obtain based on the smaller sample covering 26 countries can be generalised to all 31 countries.

Box 3 Conditional logit model used to estimate drivers of FDI

The baseline model we use looks as follows:

$$pr(reg^k = i | X_{ji}) = f(X_{ji} = (Level\ of\ innovation_i, Accessibility_i, Tertiary\ education_i, Labour\ abundance_i, Strength\ of\ industry\ clusters_{ij}, Dominance\ of\ incumbent\ firms_j, Border\ region_i, Market\ size_i, Population\ density_i, Regional\ FDI\ concentration_{ij}))$$

Where the probability that firm k decides to locate in region i in sector j is the dependent variable, and the regional factors are measured using the specific variables listed in Table 2, where GDP (used to proxy for market size) and population density are measured in logs. The model furthermore includes a full set of country dummies.

Source: ESPON FDI (2018) based on literature survey

While the signs of the estimated coefficients derived from the conditional logit model indicate whether higher levels of the explanatory variables increase or decrease the likelihood of a foreign firm to locate in a given region, the magnitudes of the coefficients are not straightforward to interpret.

However, as shown in Head et al. (1995) and applied by e.g. Blonigen et al. (2005) and Stöllinger (2014), one way to facilitate the interpretation of the coefficients is to calculate the average probability elasticities.

The average probability elasticity indicates the change in the probability of a firm being located in a given region, when the value of the respective explanatory factor is increased by 1 per cent. The average probability elasticity is calculated by multiplying the estimated coefficient by $\left(\frac{C-1}{C}\right)$, where C is the number of location choices available (i.e. the number of NUTS3 regions included in the model).

⁷ The countries for which there is no data on wage costs or the allowance of investment incentives are Switzerland, Cyprus, Croatia, Island, Norway.

When we estimate the model across all regions in our dataset, there are 1072 choices (NUTS3 regions) available, and when we estimate the model across capital metropolitan regions only, which is the smallest set of regions on which we estimate the model, the number of choices is 68.

As the number of NUTS3 regions in all specifications of our model is consistently high, $\left(\frac{c-1}{c}\right)$ approximates one. This means that the magnitude of the average probability elasticities will roughly be equal to the estimated coefficients. When interpreting the results, we therefore interpret the coefficients as average probability elasticities. This means that the estimated coefficients can be interpreted as the change in the probability of a firm being located in a given region, when the value of the respective explanatory factor is increased by 1 per cent. However, it should be noted that a one per cent increase in the different types of drivers implies different absolute increases. It may therefore be easier to increase certain drivers by one per cent than others. Summary statistics across all drivers are included in Table B.1 in Appendix B.

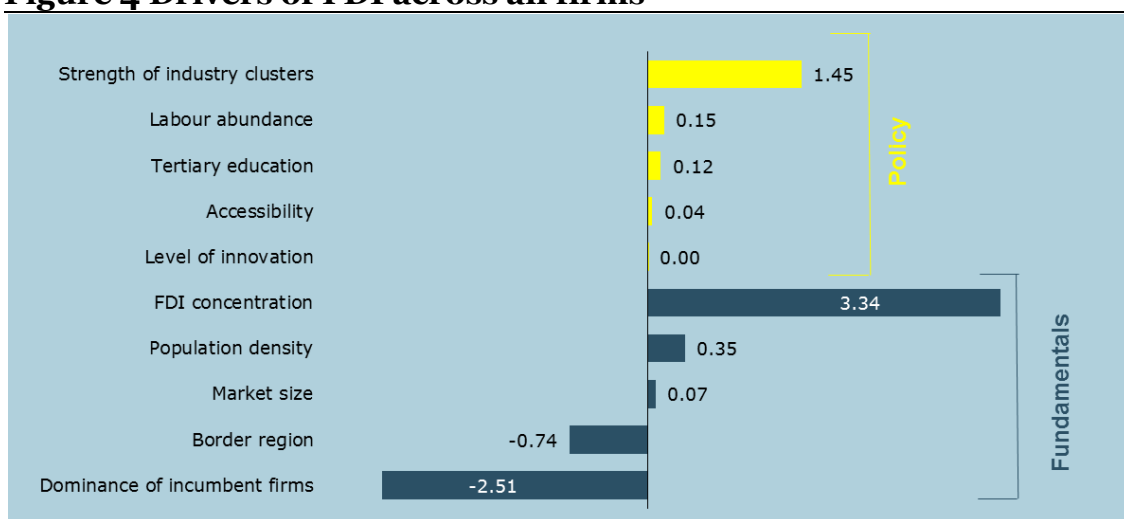
3 Drivers of FDI across European regions

In this chapter, we first present the results of the drivers of FDI across all types of regions, sectors and origins of FDI. As the attraction factors for foreign firms in the manufacturing sector may differ from those in the service sector, we also conduct the analysis separately for each of these two sectors. Finally, we test if the drivers of FDI vary for investors from different origins.

3.1 Drivers of FDI across all regions and sectors

Figure 4 shows the results for the full sample of non-European owned firms (approximately 102,500 firms) across all regions, sectors and origins of FDI.

Figure 4 Drivers of FDI across all firms



Note: The figure shows the results from the regression analysis conducted across all regions in the data. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Column (1) in Table B.1 in Appendix B.

Source: ESPON FDI (2018) based on data described in Chapter 2

The results show that a number of both policy and fundamental drivers make regions more likely to host foreign firms. With respect to policy drivers, we find that regions are more likely to host foreign firms when they have strong industry clusters, a greater labour abundance, have a higher level of education and are more accessible.

Interpreted as average probability elasticities, the results imply that a one per cent increase in the *strength of industry clusters* is associated with a 1.4 per cent increase in the likelihood of a non-European owned firm being located in a given region. The equivalent impacts for the remaining policy drivers are significantly lower and range between 0.15 per cent (labour abundance) to 0.04 per cent (accessibility).

The results also indicate that regions with a higher level of innovation are more likely to host non-European firms. The impact is, however, extremely small and very close to zero, indicating that regional levels of innovation contribute little to explain the location pattern of non-European firms, when we look across all regions, sectors and origins of FDI.⁸

With respect to fundamental FDI drivers, which are harder to influence by policy in the short to medium term, we find that regions are more likely to host non-European owned firms when they have a higher concentration of non-European owned firms (FDI concentration), greater population density and a larger market. A one per cent increase in the in FDI concentration is thus associated with a 3.3 per cent increase in the likelihood of a non-European owned firm being located in a given region, while the equivalent impact is 0.35 per cent for population density and 0.07 per cent for market size.

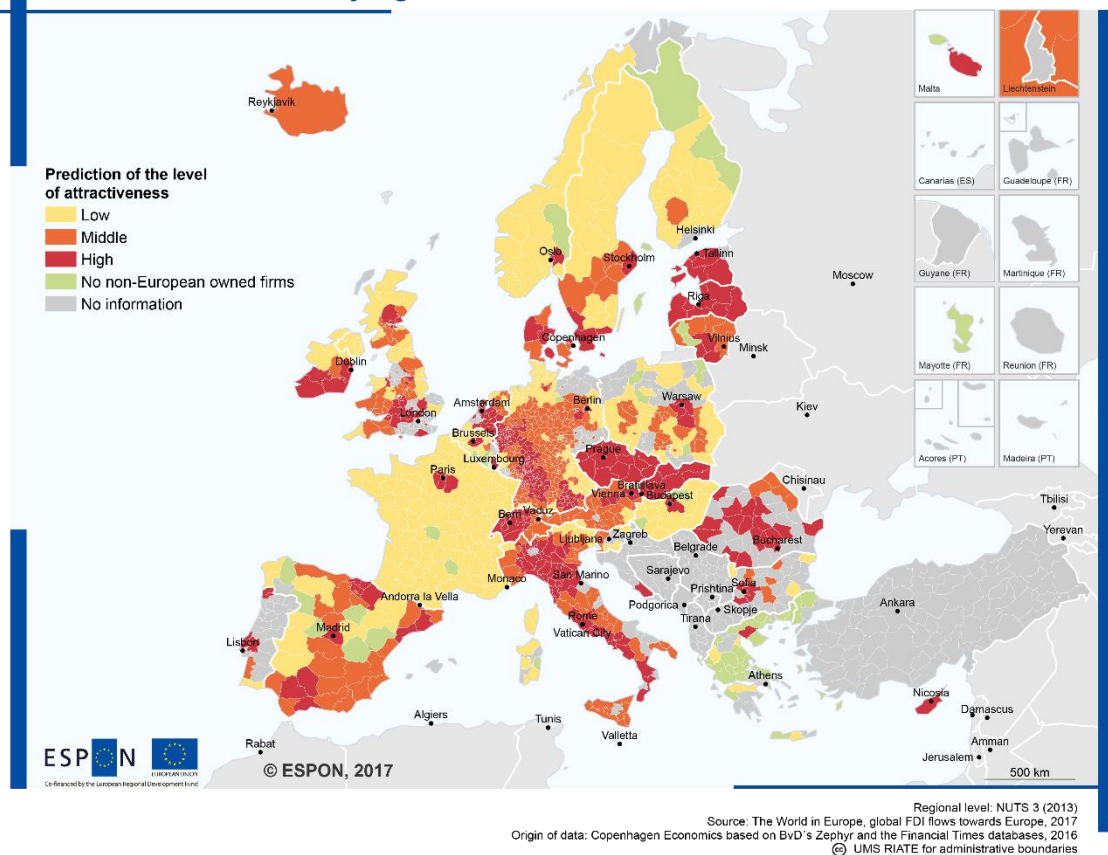
In accordance with expectations, the results furthermore show that a stronger dominance of incumbent firms is associated with a smaller likelihood of hosting non-European owned firms. Furthermore, border regions are less likely to host foreign firms than non-border regions. This may be due to a number of trade barriers such as language or regulatory differences across borders, which de facto reduce the size of the local market.

Based on the model for FDI location used in Figure 4, we can use the data to estimate the predicted attractiveness of all NUTS3 regions included in the data. Based on these predicted values of attractiveness from the model, each region is then divided into one of three categories: 'High', 'Middle' and 'Low', where the category 'High' includes the third most attractive regions, the category 'Low' includes the third least attractive regions and the category 'Middle' includes the remaining regions. The results show that urban regions in which the national capital is located and the neighbouring regions tend to be 'High' attractiveness regions, while more rural regions tend to be less attractive, cf. Map 1.

⁸ The coefficient shown for the level of innovation is rounded off to zero in Figure 4, but is 0.000251. This implies that a one percent increase in the number of regional patent applications (proxy for regional level of innovation) is associated with an increase in the likelihood of FDI by 0.000251 per cent.

Map 1 The predicted attractiveness of European regions for non-European investors

Predicted attractiveness by region in 2015



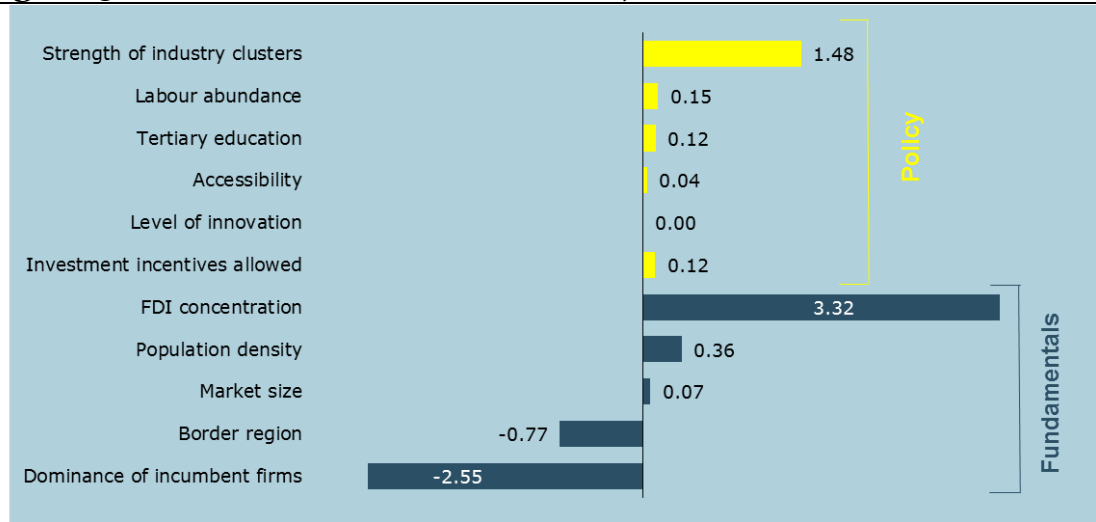
Note: The figure shows the predicted attractiveness of European regions for non-European investors. The predicted attractiveness of individual regions is measured as the predicted values from the drivers analysis displayed in Column (1) in Table B.1 in Appendix B. The category 'High' attractiveness includes the third most attractive regions, and the category 'Low' includes the third least attractive regions. The category 'Middle' includes the remaining regions.

Source: ESPON FDI (2018) based on data described in Chapter 2

Figure 5 shows the results for the extended model that covers the subset of regions in the 26 countries for which we have data on the allowance of investment incentives. The results indicate that regions that allow for the use of investment incentives are more likely to host foreign firms than regions where such incentives are not allowed. As the regions in which investment incentives are allowed are regions that lag behind relative to either the rest of the EU or relative to other regions within the country, these results indicate that the use of investment incentives can help increase the convergence of regions.

The results are, however, only indicative as we do not know to what extent such investment incentives are actually being used in the regions. Also, we do not know if this is an efficient and sustainable way of increasing FDI into these regions, particularly since the impact is relatively small.

Figure 5 Drivers of FDI across all firms, extended model



Note: The figure shows the results from the regression analysis conducted across the subset of all regions. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Column (2) in Table B.2 in Appendix B.

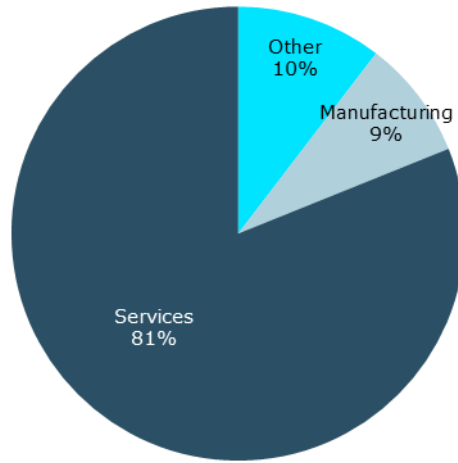
Source: ESPON FDI (2018) based on data described in Chapter 2

The impacts of the remaining drivers change very little across the two samples. We would therefore expect that the results for investment incentives also apply to regions in the remaining six countries, for which there no such data is available. Furthermore, as the inclusion of this variable does not impact the remaining drivers very much, we continue with the full sample and leave out this variable in the rest of the analysis. We do so because we want to ensure that the analysis covers as many European countries as possible.

3.2 Drivers of FDI across sectors

The majority of the non-European owned firms in our data are found in the service sector. Of the more than 102,500 firms included in the analysis, 81 per cent are thus in services while 9 per cent are in manufacturing. The remaining 10 per cent are either in other sectors (e.g. agriculture, water and electricity supply), construction or do not have any information on sector affiliation, cf. Figure 6.

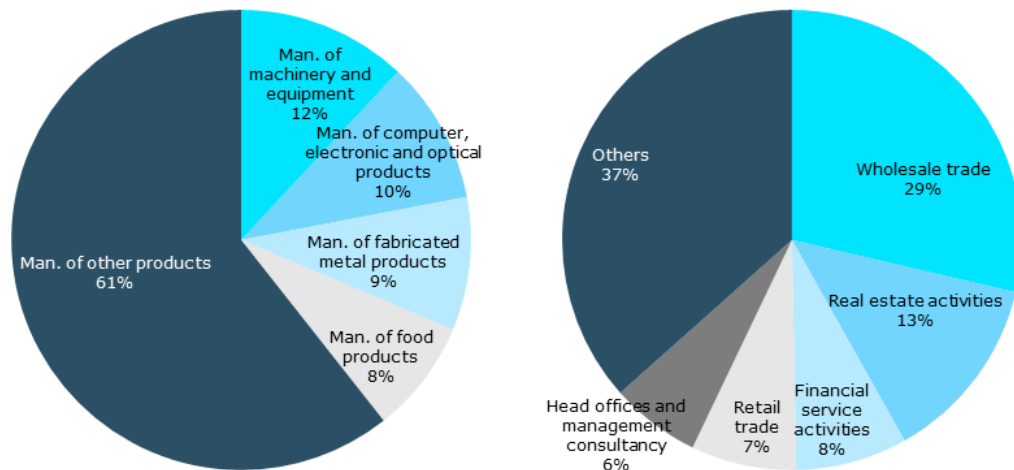
Figure 6 The distribution of non-European owned firms across sectors



Note: The figure shows the distribution of non-European owned firms across the manufacturing and service sectors. The sector affiliation is determined based on the NACE code of the primary activity of the firm, where NACE codes 10-33 are defined as manufacturing, while NACE codes 45-96 are defined as services. The category 'Others' covers the remaining NACE codes as well as firms for which it has not been possible to determine their sector affiliation due to missing NACE codes.

Source: ESPON FDI (2018) based on data from the Amadeus database

Figure 7 The sub-sector distribution of non-European firms in manufacturing and services



Note: The figure shows the distribution of non-European owned firms across subsectors in the manufacturing and service sectors.

Source: ESPON FDI (2018) based on data from the Amadeus database

Within services, the five single largest subsectors are wholesale trade, the real estate sector, financial services, retail trade and head offices, which combined account for 63 per cent of the non-European firms in the service sector, cf. Figure 7. In manufacturing, investments are more dispersed across sectors, with manufacturing of machinery and equipment accounting for the single largest share (12 per cent) of non-European firms in the manufacturing sector.

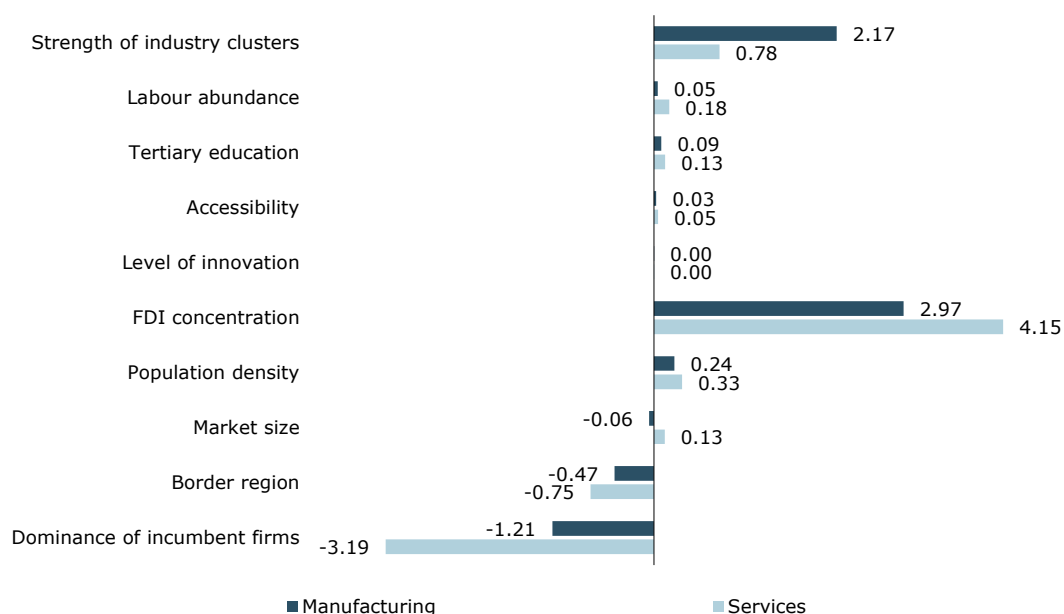
If the motives for undertaking FDI in manufacturing and services differ, FDI drivers are also likely to differ. As services are often less tradable than manufactured products, service investments are more likely to be market seeking investments. The local market may thus be a relative more important driver for investments in services than in manufacturing, where production may be more easily exported to other markets (e.g. within the Internal Market).

Figure 8 contains the results obtained when we allow the FDI drivers to differ for firms in the manufacturing and service sectors, respectively.

While the sign of each of the regional factors is the same as for the full sample in both instances, the magnitude of the coefficients in some cases vary across manufacturing and services.

The results show that foreign investors in the service sector place more emphasis on the availability of labour (labour abundance), the local level of education (tertiary education), the local presence of other foreign owned firms (FDI concentration), population density, the local market size and the dominance of incumbent firms compared to investors in the manufacturing sector.

Figure 8 Drivers of FDI across sectors



Note: The figure shows the results from the regression analysis conducted separately for manufacturing and services. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Columns (2) and (3) in Table B.2 in Appendix B.

Source: ESPON FDI (2018) based on data described in Chapter 2

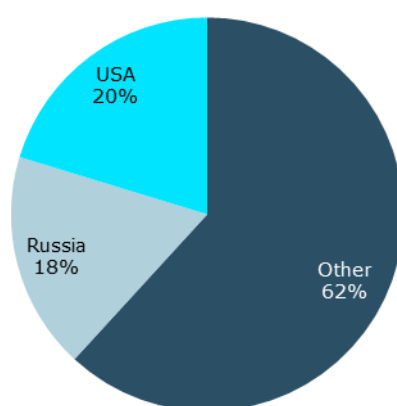
Interpreted as average probability elasticities, the results for example imply that a one per cent increase in the share of the population with a tertiary degree is associated with an increase in the likelihood of a non-European owned firm in the service sector being located in the region by 0.13 per cent compared to 0.09 per cent for foreign firms in the manufacturing sector.

In contrast, industry clusters are particularly important for firms in the manufacturing sector, where the magnitude of the coefficient implies that a one per cent increase in the regional employment share within a 2-digit NACE industry increases the likelihood of FDI by 2.7 per cent, compared to 0.8 per cent in the service sector.

3.3 Drivers of FDI by origin of the investor

The single largest origin of foreign investors is the US. Thus 20 per cent of the more than 102,500 non-European owned firms included in the analysis are US owned. The US is followed closely by Russia, which is the origin of 18 per cent of the non-European companies located in Europe, cf. Figure 9.

Figure 9 The origin of non-European investors in Europe



Note: The figure shows the distribution of the origin of non-European owned investors, based on all non-European owned firms included in the analysis.

Source: ESPON FDI (2018) based on data from the Amadeus database

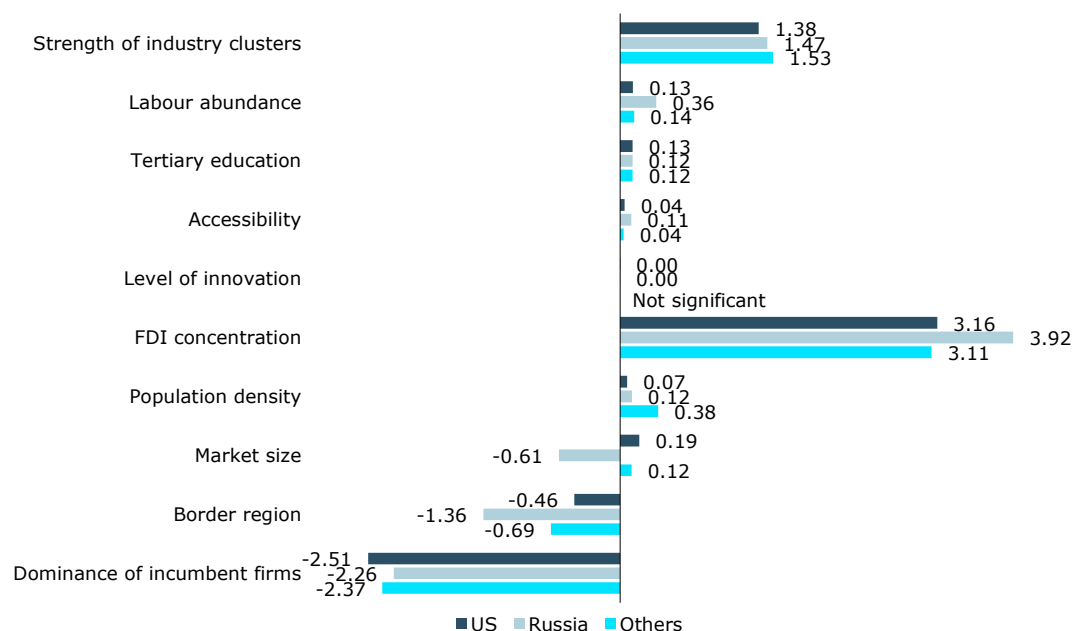
Due to the important role of US and Russian investors, we examine the drivers of FDI from each of these origins separately and group firms from other non-European origins together. The results are displayed in Figure 10.

With a few exceptions, the results do not point to any major differences between the importance of specific drivers across the origins of investors. Market size is an attraction factor for both US and other investors, while this does not seem to be the case for Russian investors. Russian investors also to a larger extent tend to locate in locations where there are other foreign investors and less in border regions. Finally, Russian investors also seem to place more emphasis on labour abundance and accessibility.

Part of the reason for these differences may be differences in the location and composition of Russian and US investments in Europe. Russian firms in Europe are located mainly in Eastern Europe and are relatively concentrated in terms of the sectoral composition, with the top three sectors (wholesale trade, real estate and retail trade) accounting for just over half of all Russian investments in Europe.

In comparison, the majority of US investments are located in Western Europe and are less concentrated across sectors, with the top three sectors (wholesale trade, financial services and activities of head offices and management consultancies) accounting for 35 per cent of US investments in Europe.

Figure 10 Drivers of FDI across origins



Note: The figure shows the results from the regression analysis conducted separately by origin of the investor. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Columns (2) to (4) in Table B.3 in Appendix B.

Source: ESPON FDI (2018) based on data described in Chapter 2

3.4 Drivers of FDI by type of investment

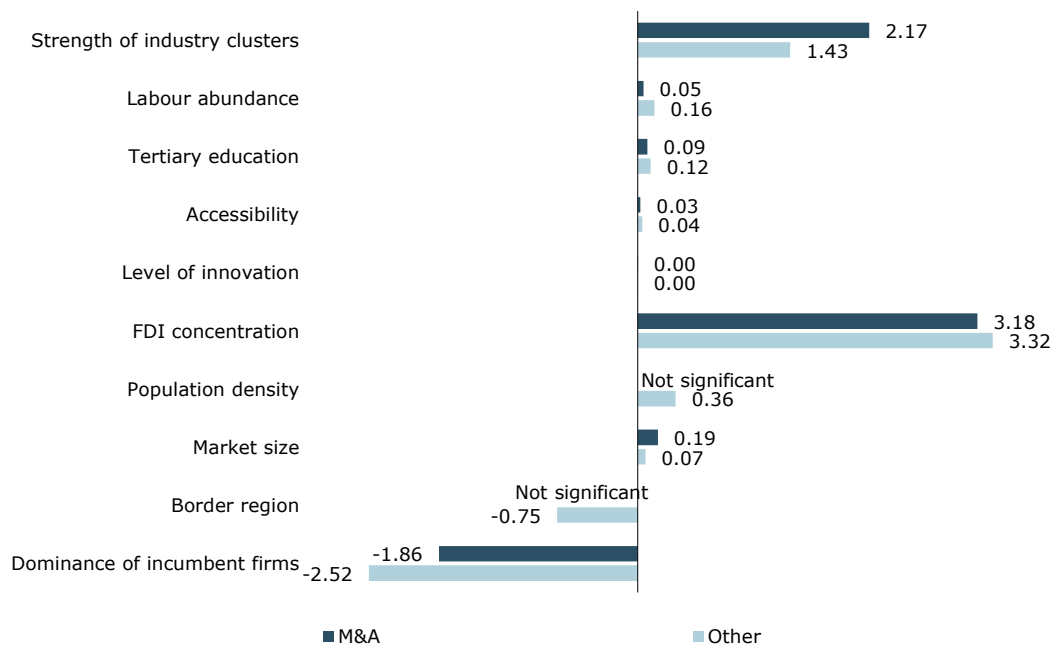
Research done at the country level indicates that drivers of FDI may differ between different types of FDI. Davies et al. (2015) for example find that market size matters more for M&A than for greenfield investments. M&A's are also found to exhibit opportunistic behaviour in so far as they are more sensitive to currency crises in the destination country, which reduce the asset price for the acquirer. Similarly, Davies et al. (2015) find that M&As are relatively more deterred by geographical and cultural barriers and more dependent on institutional quality in the destination country, especially the legal system, which ensures that the contract between the seller and acquirer is fulfilled. In comparison, greenfield investments are found to be driven relatively more by taxes and other cost drivers.

In order to test whether regional drivers differ across different types of FDI, we would ideally like to split our sample of non-European owned firms into M&As and greenfield investments. Via the BvD's Zephyr database, we can identify a small share of firms, which we know for certain that the non-European investors have acquired via M&As (1.5 per cent of the 102,500 non-European owned firms included in the analysis). However, due to a number of data limitations we cannot

identify greenfield investments. The remaining 98.5 per cent of firms may thus be greenfield, reinvestments by foreign owners or M&As which it has not been possible to capture via the Zephyr database.⁹ While we do split the data into M&As and other investments based on the above information, the results should be compared with caution and are no conclusion regarding the drivers of greenfield investments can be made.

The results indicate that M&As are especially sensitive to the strength of industry clusters and market size, cf. Figure 11. This result is supported by Davies et al. (2015) and can be explained by the larger pool of potential target firms being available in larger markets and regions with strong industry clusters. Neither population density nor the border status of a given region matters. M&As also seem to be less sensitive to the dominance of incumbent firms. This may be due to the fact that investors undertaking M&As have less choice of location, in so far as their choice is limited by the location of target firms of interest.

Figure 11 Drivers of FDI for M&A and other types of investment



Note: The figure shows the results from the regression analysis conducted separately by type of investment. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Columns (2) to (3) in Table B.4 in Appendix B.

Source: ESPON FDI (2018) based on data described in Chapter 2 and the Zephyr database

⁹ See Appendix A for a discussion of the data and its limitations.

3.5 Concluding remarks

Summing up across the results presented in this chapter, the analysis shows that regions which have strong industry clusters, a greater labour abundance, higher levels of education, greater accessibility, a higher concentration of non-European owned firms (FDI concentration), greater population density, a larger market and which allow for investment incentives are more likely to host non-European owned firms, while regions with a more concentrated industry structure are less likely to do so.

Industry clusters are found to be especially important in terms of explaining the location of foreign firms in the manufacturing sector, while labour abundance, the level of education, FDI concentration, the regional market size and population density are found to be more important in the service sector.

The results obtained for the firms owned by US, Russian and other non-European investors furthermore show that regions with a larger market size are found to be less likely to host foreign firms from Russia but more likely to host foreign firms from the US and other origins. Furthermore, while FDI concentration, labour abundance and accessibility are found to be significant drivers of investments from all non-European origins, the impact is relatively larger for Russian investments.

Finally, the results obtained by type of investment show that the strength of industry clusters and market size are especially important for M&As.

4 Drivers of FDI in a territorial context

Not all regions have the same potential for attracting FDI. Different types of regions have their own inherent characteristics, and it is therefore likely that the investors' underlying motive for locating in the region will be different for different types of regions.

In this case, we would also expect the sectoral composition and the drivers of FDI to differ between different types of regions. In order to examine whether this is the case, we conduct our analysis across regions with different territorial characteristics. We thus conduct our analysis separately for urban, intermediate and rural regions, as well as across different metropolitan regions and for regions with different levels of development.

By examining FDI drivers across regions with the same territorial characteristics, we ensure that we compare like with like and obtain policy results that can be used to make place-based recommendations.

4.1 Drivers of FDI across urban-rural regions

Urban regions have a larger consumer base than rural regions and are also commonly the type of regions, where universities and other R&D environments are located. FDI in urban regions may therefore be more likely to be market seeking investment or resource seeking investment aimed at gaining access to specific skills or innovation activities. In contrast, investments in rural regions are more likely to be efficiency seeking, where costs factors are especially important.

Box 4 The urban-rural typology applied in the analysis

NUTS3 regions are classified as urban, intermediate or rural using the following three-step approach:

1. Populations in rural areas are identified, where rural areas are all areas outside urban clusters. The latter is defined by clusters of contiguous grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5,000. NUTS3 regions smaller than 500 km² have been combined with one or more of their neighbours.
2. Based on the share of their population in rural areas, NUTS3 regions are classified as follows:
 - *Predominantly rural* if the share of the population living in rural areas is higher than 50 per cent
 - *Intermediate* if the share of the population living in rural areas is between 20 and 50 per cent
 - *Predominantly urban* if the share of the population living in rural areas is below 20 per cent
3. The size of urban centres in the region is considered and a predominantly rural region, which contains an urban centre of more than 200,000 inhabitants making up at least 25 per cent of the regional population, is classified as intermediate. An intermediate region which contains an urban centre of more than 500,000 inhabitants making up at least 25 per cent of the regional population is classified as predominantly urban.

Note: The urban-rural typology is developed by DG Regio in co-operation with DG Agri, Eurostat, the DG Joint Research Centre and the OECD.

Source: <http://ec.europa.eu/eurostat/web/rural-development/methodology>

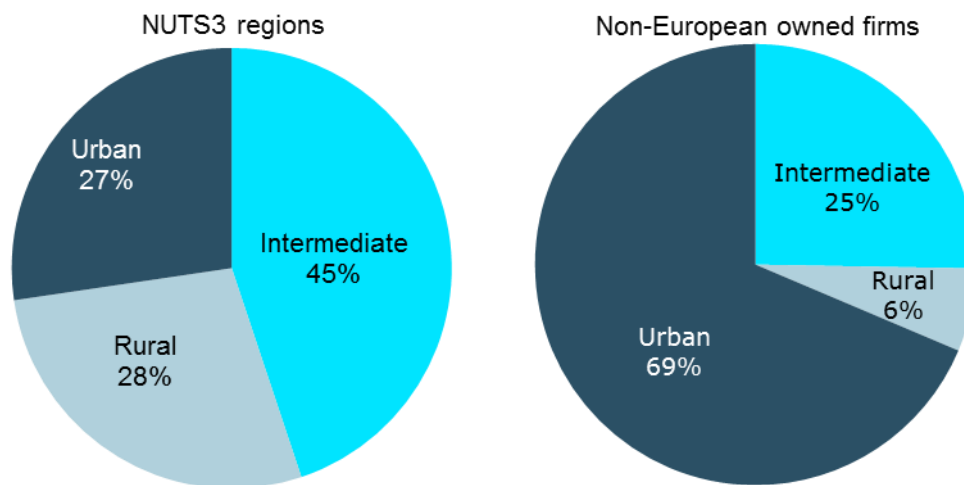
In order to test this, we use the urban-rural typology described in Box 4, and split the full dataset into the following three territorial groups:

- Urban regions
- Intermediate regions
- Rural regions

Based on this typology, 27 per cent of the 1072 NUTS3 regions, for which it has been possible to collect data on regional determinants, are classified as urban, while 45 per cent are classified as intermediate and 28 per cent as rural regions.

Of the 102,500 non-European owned firms included in the analysis close to 70 per cent are located in urban regions, 25 per cent are located in intermediate regions and only 6 per cent in rural regions, cf. Figure 12. Urban regions thus attract a disproportionately high share of FDI. Although 28 per cent of the regions included in the sample are classified as rural, these regions only account for 6 per cent of the total number of non-European owned firms.

Figure 12 FDI across urban-rural regions

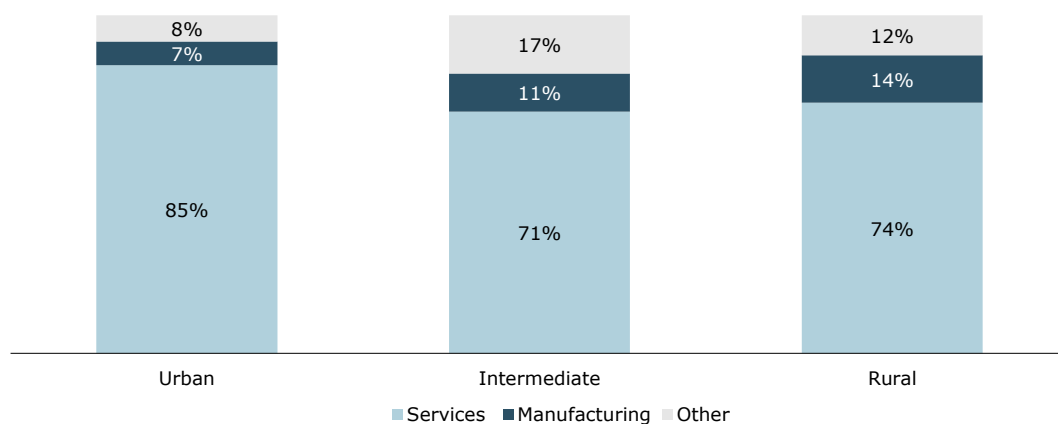


Note: The left figure shows the distribution of the type of NUTS3 regions in the sample, and the right figure shows the location of non-European owned firms across urban, rural and intermediate regions.

Source: ESPON FDI (2018) based on data from the Amadeus database

In terms of the sector distribution, non-European owned firms are concentrated in the service sectors across all three types of regions, but more so in urban regions. Of all foreign firms located in urban region, 85 per cent are thus in the service sector, compared to 74 per cent in rural regions, where manufacturing accounts for a relatively larger share of foreign firms than in urban and intermediate regions, cf. Figure 13.

Figure 13 The sector distribution of non-European owned firms in urban-rural regions



Note: The figure shows the distribution of non-European owned firms in the manufacturing and service sectors across urban-rural regions. The sector affiliation is determined based on the NACE code of the primary activity of the firm, where NACE codes 10-33 are defined as manufacturing, while NACE codes 45-96 are defined as services. The category 'Other' covers remaining NACE codes, as well as firms for which it has not been possible to determine their sector affiliation due to missing NACE codes.

Source: ESPON FDI (2018) based on data from the Amadeus database

The impacts of the different drivers on FDI location in each of the three types of regions point to some interesting differences, cf. Figure 14.

First, industry clusters matter more for attracting FDI to intermediate and rural regions than to urban regions. One explanation is that there are more manufacturing firms located in these regions and that firms in this sector are driven more by clusters than firms in the service sector. Another explanation is that as the population is less dense in the rural and intermediate regions, the market is less attractive and the labour pool smaller. Firms that decide to locate in the rural and intermediate regions are thus more likely to be looking for specialised labour (resource-seeking) or innovations (strategic).

Second, a higher labour supply (measured as high unemployment) is associated with more non-European owned firms in urban regions and intermediate regions, while the impact is negative in rural regions. Thus, while labour supply may indicate a readily available pool of labour in urban and intermediate areas, a higher level of labour supply in rural regions is more likely to reflect poor business opportunities and/or inflexibility or mismatch in the labour market. The impact may likely differ between more and less densely populated rural regions. In more densely populated rural regions, where business opportunities are better, a higher labour supply may possibly be a positive driver. While we have not tested this, we do find that population density in itself is a positive factor driving FDI to rural regions (see below).

Third, the share of the population with a tertiary education seems to be relatively more important for non-European owned firms locating in urban areas. This indicates either that the type of non-European owned firms locating in urban areas are different from the type of non-European owned firms locating in other areas, or that investors in urban regions put more emphasis on this factor.

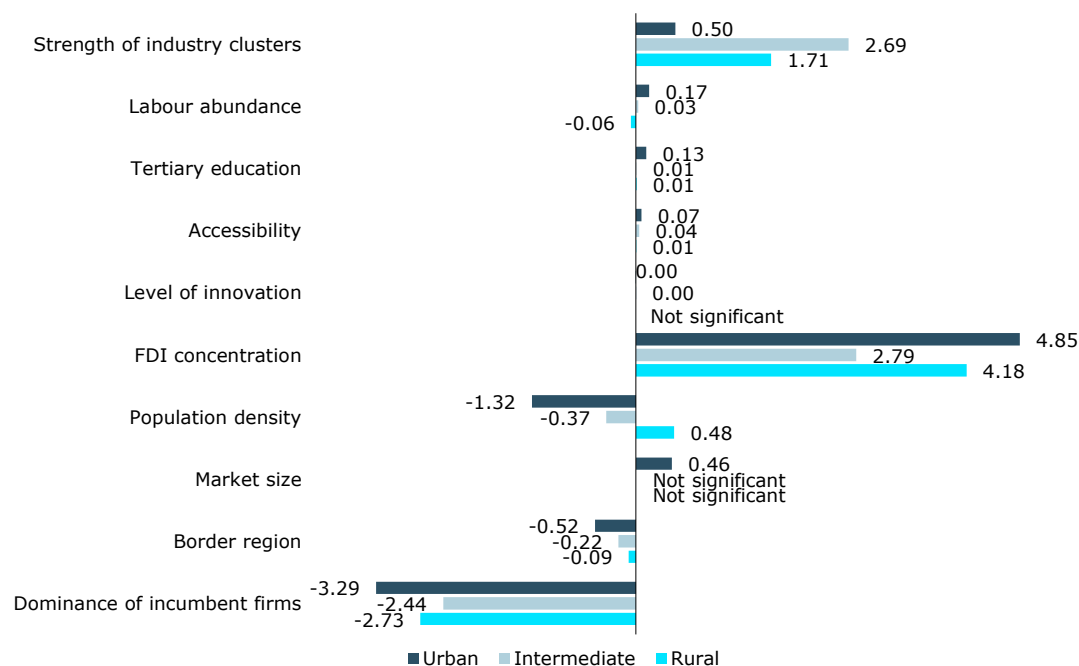
Fourth, FDI concentration is relatively more important in urban and rural regions compared to intermediate regions. While this suggests the importance of the signalling effect, where the presence of foreign firms help brand the region to other potential investors, this is likely to mainly be the case in rural regions. In the case of urban regions, the larger impact found may also partly be a reflection of urban regions simply being more attractive and thus tend to draw in more FDI.

Fifth, population density is found to be negative for urban and intermediate regions, but positive for rural regions. The latter suggests that rural regions with a larger consumer and labour base are more attractive than other rural regions. In urban and intermediate regions, where the population density is higher, a high population density is likely to be associated with congestion and higher rents, which deter FDI.

Sixth, the dominance of incumbent firms is more important in urban regions than in rural and intermediate regions. This factor has a negative impact for attracting FDI. This is most likely due to a higher share of investments in urban regions being market seeking investments as evidenced by market size only being important for attracting FDI to urban regions. Thus, if one of the main reasons non-European owned firms to locate in urban areas is in to sell their products locally, dominant incumbent firms would reduce the market attractiveness.

Finally, while border regions in all types of regions are less likely to host foreign firms, than non-border regions, this is especially so for urban regions. This may again be because foreign firms locate mainly in urban regions to sell their products locally, as this is where the most consumers are. A border can, however, reduce the size of the local market, if consumers on the other side of the border have different preferences or if barriers (e.g. language or regulatory differences) make it more costly for firms to sell their goods or services across the border. For market seeking FDI, urban regions located near a border may therefore be less attractive than other urban regions, where the surrounding local market is larger.

Figure 14 Drivers of FDI across urban-rural regions



Note: The figure shows the results from the regression analysis conducted separately across urban, intermediate and rural regions. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Columns (2) to (4) in Table C.5 in Appendix C.

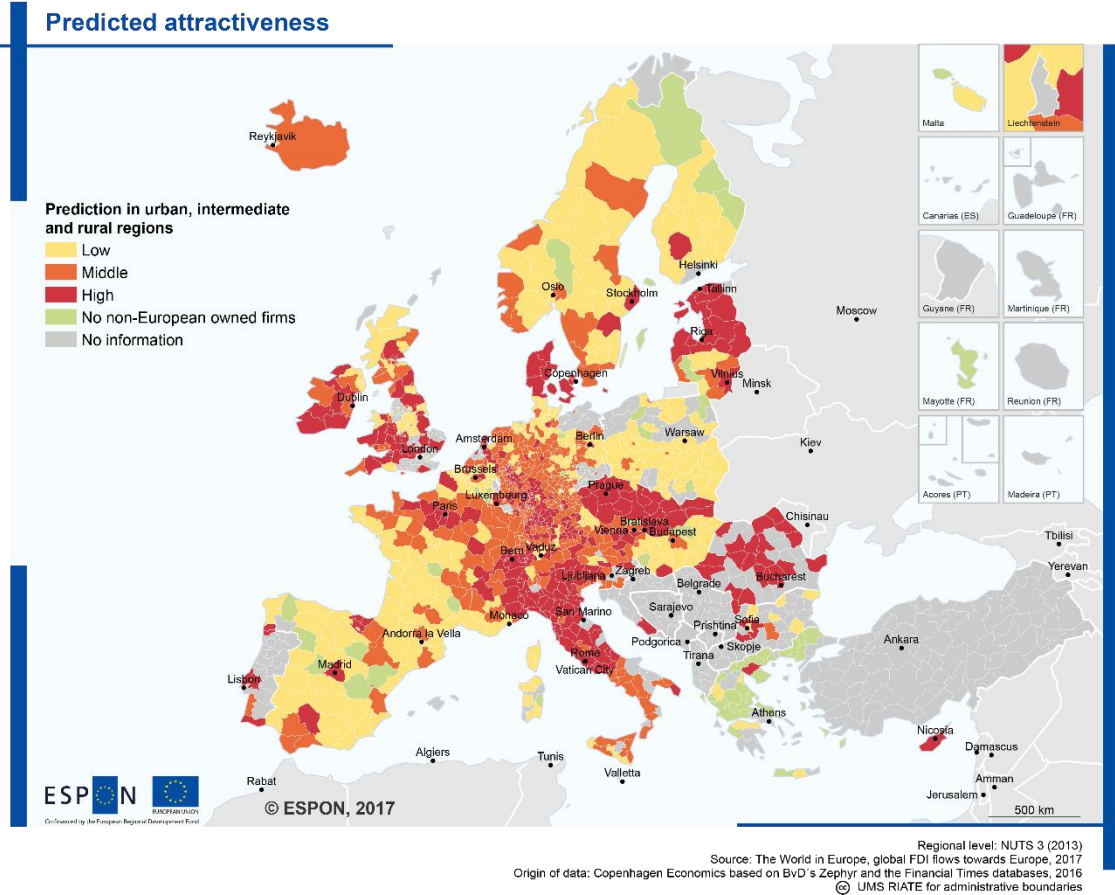
Source: ESPON FDI (2018) based on data described in Chapter 2

The results thus show that while there are some common factors that help explain the location of foreign firms across all regions, some of the factors are especially relevant for the different types of regions. For rural and intermediate regions, industrial clusters are especially relevant. Labour abundance, the educational level, and market size is especially relevant for attracting FDI to urban regions, while the dominance of incumbent firms and population density make especially urban regions less attractive. Furthermore, while border regions in all types of regions are less likely to host foreign firms, than non-border regions, this is especially so for urban regions. Finally, FDI concentration is found to be especially important in urban and rural regions.

As the importance of the various drivers and the potential for attracting FDI differ across the three types of regions, we estimate the attractiveness of individual NUTS3 regions using the models for each type of region. Each NUTS3 region is then classified as 'High', 'Middle' or 'Low', where the category 'High' includes the third most attractive regions *within each type of region*, the category 'Low' includes the third least attractive regions *within each type of region* and the category 'Middle' includes the remaining regions. Each region is thus classified into categories of attractiveness,

based on a comparison with other regions of the same type.¹⁰ The results are displayed in the map in Map 2.

Map 2 The predicted attractiveness of different types of territories for non-European investors



Note: The figure shows the predicted attractiveness of different types of European territories for non-European investors. The predicted attractiveness of individual regions is measured as the predicted values from the drivers analyses displayed in Columns (2) to (4) in Table C.3 in Appendix C. The category 'High' attractiveness includes the third most attractive regions, for each type of region, and the category 'Low' includes the third least attractive regions, for each type of region. The category 'Middle' includes the remaining regions.

Source: ESPON FDI (2018) based on data described in Chapter 2

Peer-to-peer comparisons change the relative attractiveness of regions significantly from the equivalent map shown in Map 1, where the classification of attractiveness was determined relative to all regions, regardless of type. In the case of France, for example, the majority of regions outside of the capital and its surrounding regions are rural or intermediate regions and therefore relatively unattractive when compared to urban regions. However, relative to their peers (other rural and intermediate regions, respectively), a number of regions outside of Paris are now in the 'Middle' group, underlining the importance of comparing like with like.

¹⁰ This means that the attractiveness of a given rural region is compared to other rural regions only, and similarly for intermediate and urban regions.

4.2 Drivers of FDI across metropolitan regions

The literature survey from Chapter 1 indicates that drivers of FDI are also likely to differ between different types of urban regions, especially between capital city regions and other types of urban regions. Copenhagen Economics (2007), for example, found that when controlling for a list of factors, including e.g. educational level and GDP per capita, capital cities attract more FDI than other regions.

The importance of capital cities is also reflected in survey findings. E&Y (2015) thus find that London, Paris and Berlin are the three most attractive cities in Europe to foreign investors and that this is due especially to a strong international business culture.¹¹ Furthermore, capital cities are often more cosmopolitan than other regions, and the cost of doing business may thus be lower and it may be easier to attract international talent. This points to capital cities being special cases that should be looked at separately.

In addition, the drivers of FDI in intermediate and rural regions that are located within commuting distance of urban regions are also likely to differ from their more remote counterparts. Market size and local labour abundance may for example be less important in regions that are within commuting distance from a densely populated urban region, than in regions, which are not. In order to test these hypotheses, we make use of the metropolitan typology also available from Eurostat and divide the regions into:

- Capital metropolitan regions (includes the national capital city)
- Other metropolitan regions
- Non-metropolitan regions

The typology is based on the agglomeration of inhabitants. Specifically, metropolitan regions are defined as a single or a combination of NUTS3 regions, which cover agglomerations of at least 250,000 inhabitants across a city and its commuting zones, cf. Box 5. All regions that are not classified as belonging to either type of metropolitan region are classified as non-metropolitan regions.

Box 5 The metropolitan typology applied in the analysis

Metropolitan regions are NUTS3 regions or a combination of NUTS3 regions, which represent agglomerations of at least 250,000 inhabitants.

These agglomerations were identified using the Urban Audit's Functional Urban Area (FUA).

Each agglomeration is represented by at least one NUTS3 region. If in an adjacent NUTS3 region more than 50 per cent of the population also live within this agglomeration, it is included in the metropolitan region.

Note: A Functional Urban area (FUA) is a city and its commuting zone.

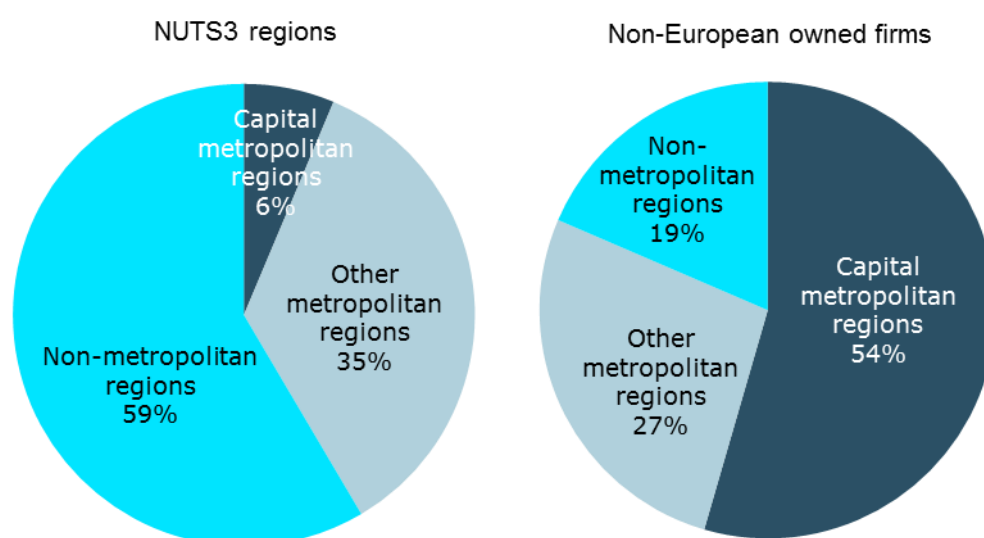
Source: <http://ec.europa.eu/eurostat/web/metropolitan-regions/overview>

¹¹ Based on results from E&Y (2015)'s European attractiveness survey conducted among 808 foreign investors.

As metropolitan regions are based on agglomerations of inhabitants across cities and their commuting zones, it is not the case that all NUTS3 regions belonging to a metropolitan region are also classified as urban regions.¹² The capital metropolitan region of Vienna, for instance, covers the NUTS3 regions of Nordburgenland (rural), Weinviertel (rural), Wiener Umland/Nordteil (urban), Wiener Umland/Südteil (intermediate) and Wien (urban). Similarly, not all urban NUTS3 regions belong to a larger metropolitan region.¹³ This is for example the case for the NUTS3 regions of East Lancashire and Warrington in the UK.

By focusing on metropolitan regions, we therefore do not merely zoom in on urban regions. Rather, we rely on a different grouping of the regions, which distinguishes between urban regions and takes into account that some rural or intermediate regions are relatively close to a large city centre.

Figure 15 FDI across metropolitan regions



Note: The left figure shows the distribution of the type of NUTS3 regions in the sample, and the right figure shows the location of non-European owned investments across different metropolitan regions.

Source: ESPON FDI (2018) based on data from the Amadeus database

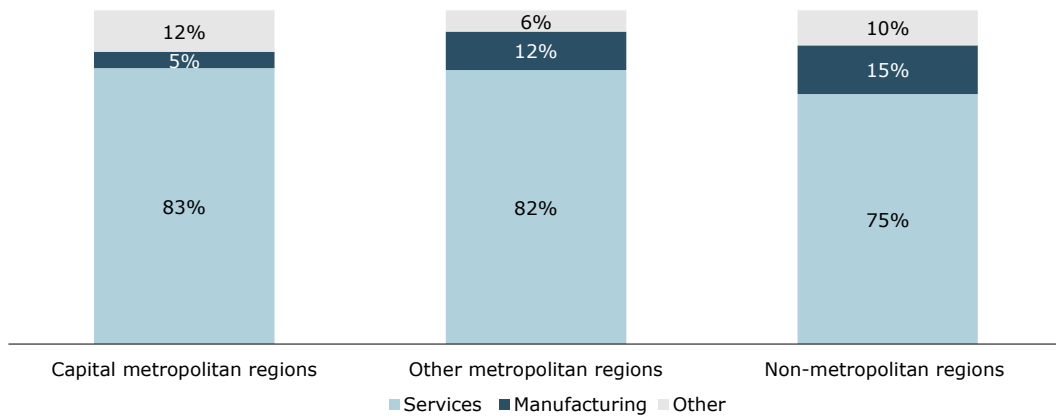
Based on this typology, 6 per cent of the NUTS3 regions in the study belong to a capital metropolitan region while 35 per cent belong to a non-capital metropolitan region. We classify the remaining 59 per cent as being non-metropolitan regions. Of the 102,500 foreign owned firms included in the analysis 54 per cent are located in capital metropolitan regions, 27 per cent in other metropolitan regions 19 per cent in non-metropolitan regions, cf. Figure 15. Capital metropolitan regions thus attract a disproportionately high share of FDI.

¹² 51 per cent of all NUTS3 regions that belong to a capital or other metropolitan region are defined as urban regions, while 42 per cent are defined as intermediate regions and 7 per cent as rural regions.

¹³ 76 per cent of urban NUTS3 regions belong to a capital or other metropolitan region.

In term of the sector distribution, there are also significant differences, with a larger share of foreign firms in the manufacturing sector outside of capital metropolitan regions. In non-metropolitan regions, 15 per cent of the foreign firms are thus in manufacturing, compared to 12 per cent in other-metropolitan regions and 5 per cent in capital metropolitan regions, cf. Figure 16.

Figure 16 The sector distribution of non-European owned firms across metropolitan regions



Note: The figure shows the distribution of non-European owned firms across the manufacturing and service sectors across different types of metropolitan regions. The sector affiliation is determined based on the NACE code of the primary activity of the firm, where NACE codes 10-33 are defined as manufacturing, while NACE codes 45-96 are defined as services. The category 'Other' covers remaining NACE codes, as well as firms for which it has not been possible to determine their sector affiliation due to missing NACE codes.

Source: ESPON FDI (2018) based on data from the Amadeus database

The impacts of the different drivers on FDI location in each of the three types of regions point to some interesting differences, cf. Figure 17.

First, the strength of industry clusters is especially important in other metropolitan regions, but remains an important determinant in both capital metropolitan regions and non-metropolitan regions.

Second, labour abundance is more important in capital metropolitan regions and other metropolitan regions, suggesting that foreign investors locating in these regions place relatively more emphasis on the availability of labour than investors locating in non-metropolitan regions.

Third, tertiary education is positively and significantly associated with the location of foreign firms in both capital metropolitan regions and other metropolitan regions. In contrast, there is a small negative effect of tertiary education in non-metropolitan regions.

Fourth, while accessibility is an attraction factor in all three types of metropolitan regions, the impact is largest in capital metropolitan regions that for example host many headquarters. The analysis shows that 47 per cent of all non-European owned firms undertaking “activities of head offices or management consultancy activities” are located in capital metropolitan regions.¹⁴

Fifth, the results show that while the signalling effect arising from the presence of other foreign firms is important in all three types of metropolitan regions, it is relatively more important in non-metropolitan regions. This is likely to be so because these regions are less well known for many investors.

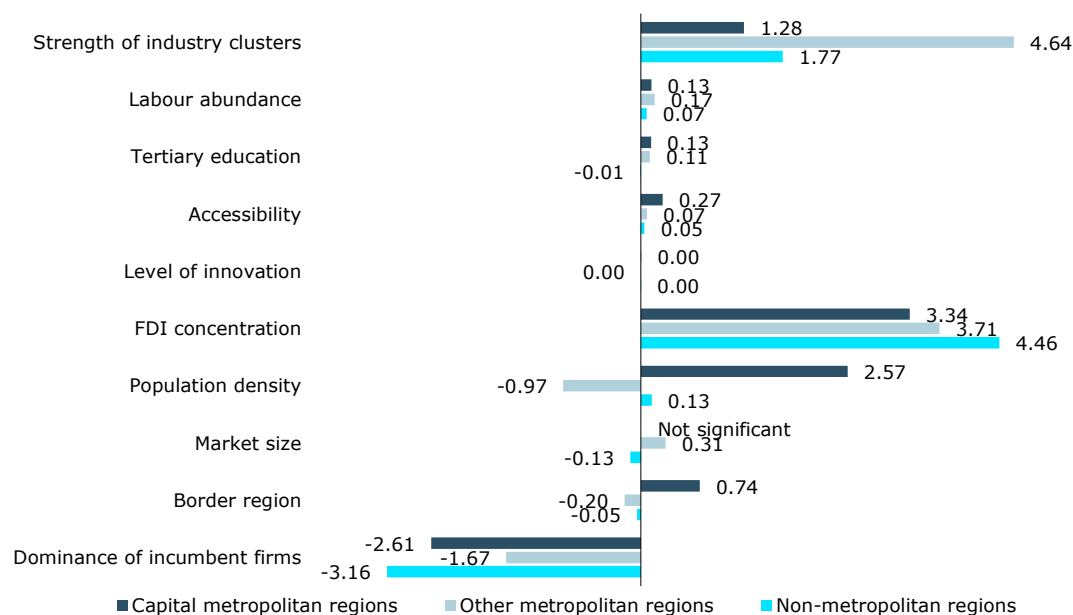
Sixth, a higher population density increases the attractiveness of capital metropolitan regions and non-metropolitan regions, but makes other metropolitan regions less likely to host non-European owned firms. For capital metropolitan regions, where market size is found to be insignificant, a high population density is likely to indicate an attractive market with a larger consumer base. For non-metropolitan regions, where market size (GDP) is negative, the results suggest that regions with a large consumer and labour base are more attractive than other non-metropolitan regions, and that this weigh more than the economic size of the region, which may be driven by a few large firms being located there. Finally, for other metropolitan regions, where market size is positive, population density may be picking up the cost of locating there (e.g. rents) rather than market attractiveness.

Seventh, capital metropolitan regions with a border have a higher likelihood of attracting non-European owned firms. This is in contrast to other metropolitan and non-metropolitan regions, where border regions were found to be less likely to host foreign firms. This also suggests that the negative border effect, found for urban regions above, is driven by non-capital urban regions. In combination with the results regarding population density, the results suggest that foreign firms locate in capital metropolitan regions to gain access to the local as well as surrounding markets, possibly also to secure critical labour.

Finally, the dominance of incumbent firms is found to be especially important in capital metropolitan regions as well as in non-metropolitan regions. In the first case, this is likely because strong incumbent firms reduce the attractiveness of the market for investors seeking to sell their products locally. In the case of non-metropolitan regions, it is more likely due to increased competition for labour or other resources.

¹⁴ Non-European owned firms undertaking “activities of head offices or management consultancy activities” account for 6 per cent of non-European owned firms in the service sector, cf. Chapter 3.

Figure 17 Drivers of FDI across metropolitan regions



Note: The figure shows the results from the regression analysis conducted separately across metropolitan regions. The percentages shown in the figure are the change in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Columns (2) to (4) in Table C.6 in Appendix C.

Source: ESPON FDI (2018) based on data described in Chapter 2

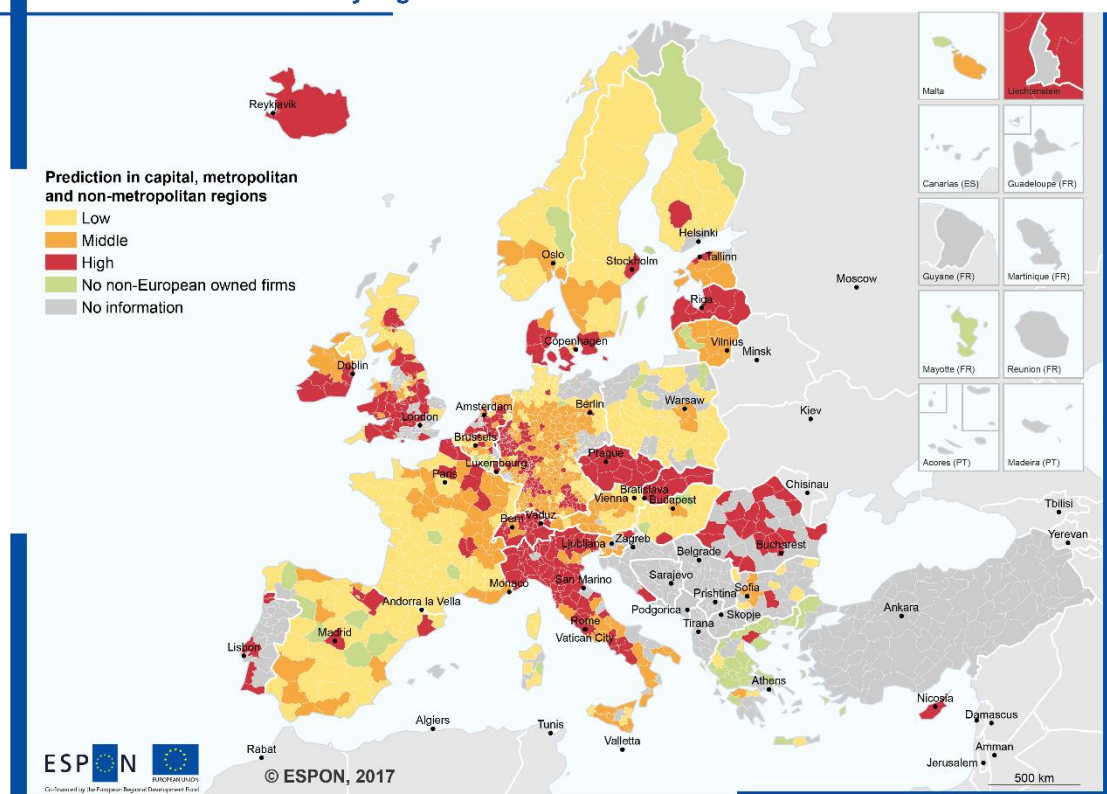
The results thus point to both similarities and differences in terms of the drivers of FDI into the different metropolitan regions. For metropolitan regions that do not contain the capital city, industry clusters, labour abundance and market size are especially important for attracting FDI, while the level of education, accessibility and population density are relatively more important for capital metropolitan regions.

While strong incumbent firms tend to deter investments from all regions, the effect is found to be especially large in capital metropolitan regions and in non-metropolitan regions. Finally, the presence of other foreign firms seems to be a particularly important attraction factor for non-European owned firms locating in non-metropolitan regions.

Again, as the importance of the various drivers and the potential for attracting FDI differ across the three types of metropolitan regions, we predict the attractiveness of individual NUTS3 regions relative to their peers in each type of metropolitan region separately. Whereas almost all capital metropolitan regions were among the most attractive regions when compared to all types of regions in Map 1, the most attractive capital metropolitan regions in Map 3 are mainly located in the old EU member states.

Map 3 The predicted attractiveness of metropolitan regions for non-European investors

Predicted attractiveness by region in 2015



Regional level: NUTS 3 (2013)
 Source: The World in Europe, global FDI flows towards Europe, 2017
 Origin of data: Copenhagen Economics based on BvD's Zephyr and the Financial Times databases, 2016
 © UMS RIATE for administrative boundaries

Note: The figure shows the predicted attractiveness of European capital, metropolitan and non-metropolitan regions for non-European investors. The predicted attractiveness of individual regions is measured as the predicted values from the drivers analyses displayed in Columns (2) to (4) in Table C.4 in Appendix C. The category 'High' attractiveness includes the third most attractive regions, for each type of region, and the category 'Low' includes the third least attractive regions, for each type of region. The category 'Middle' includes the remaining regions.

Source: ESPON FDI (2018) based on data described in Chapter 2

4.3 Drivers of FDI across regions with different levels of development

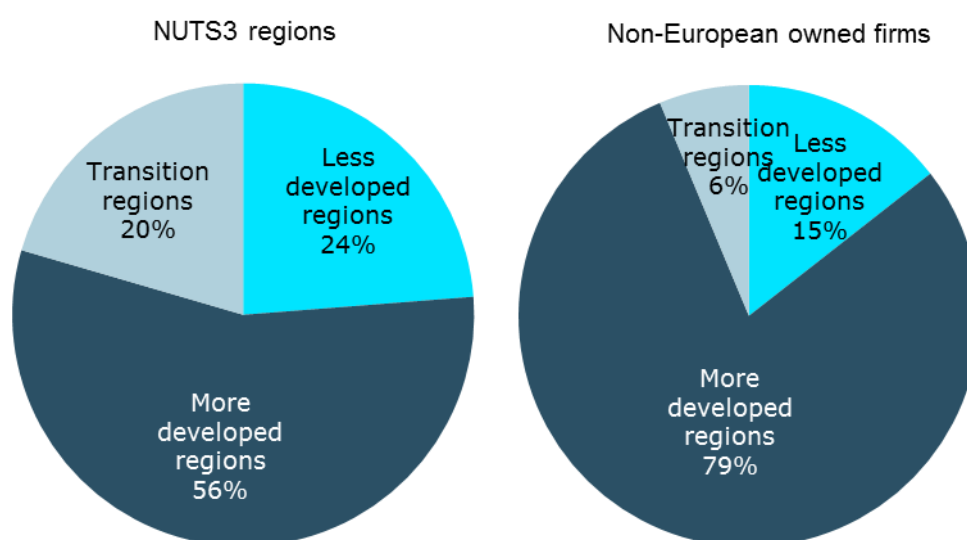
Finally, it is likely that the drivers of FDI will differ across regions with different levels of development, as both the type of FDI and the motivation for undertaking FDI are likely to differ between higher and lower income regions. Non-European investors attracted by local market opportunities, innovation and labour skills may thus be more likely to invest in higher income regions, while efficiency seeking investors seeking to cut cost, are more likely to locate in lower income regions.

In order to test the differences in the importance of the individual FDI drivers across regions with different levels of development, we split regions into three groups on the basis of the average regional GDP per capita over the period 2010-2013.¹⁵ Based on this information, we classify regions as:

- More developed regions, if the average GDP per capita over the period 2010-2013 was more than 90 per cent of the EU28 average
- Transition regions, if the average GDP per capita over the period 2010-2013 was between 75 per cent and 90 per cent of the EU28 average
- Less developed regions, if the average GDP per capita over the period 2010-2013 was less than 75 per cent of the EU28 average¹⁶

Due to the lack of data on GDP per capita in some regions, it has not been possible to split all 1,074 regions into one of these three groups. In total, we were able to do so for 1044 NUTS3 regions, of which 56 per cent are defined as more developed regions, while 20 per cent are defined as transition regions and 24 per cent as less developed regions.

Figure 18 FDI across regions with different levels of development



Note: The left figure shows the distribution of the type of NUTS3 regions in the sample, and the right figure shows the location of non-European owned investments across regions with different levels of development.

Source: ESPON FDI (2018) based on data from the Amadeus database

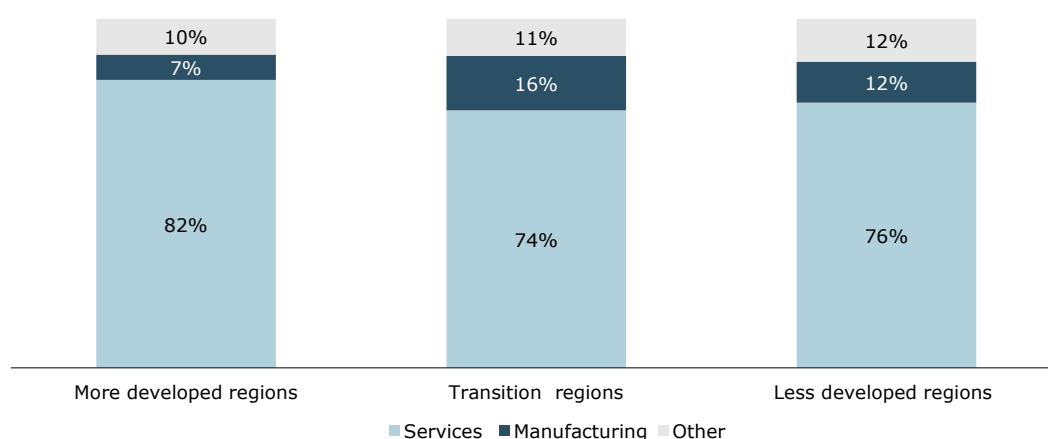
¹⁵ GDP per capita at the NUTS3 level is measured in purchasing power standard and obtained from Eurostat.

¹⁶ This classification uses the same thresholds as the classification used to determine regional eligibility for the European Regional Development Fund (ERDF) and the European Social Fund (ESF). The classification used for this purpose classifies NUTS2 regions into the same three groupings based on annual average GDP per capita (PPS) over the period 2007-2009 (<http://ec.europa.eu/eurostat/web/regions/overview>).

In total, there are just over 100,000 foreign owned firms located across these 1044 regions. 79 per cent of these are located in more developed regions, 6 per cent in transition regions and 15 per cent in less developed regions, cf. Figure 18. Transition and less developed regions thus attract a disproportionately low share of FDI.

In terms of the sector distribution, there are also significant differences with a larger share of non-European owned firms in the manufacturing sector in transition and less developed regions, compared to more developed regions. In transition regions, 16 percent of the non-European owned firms are thus in manufacturing, compared to 12 per cent less developed regions and 7 per cent in more developed regions, cf. Figure 19.

Figure 19 The sector distribution of non-European owned firms across regions with different levels of development



Note: The figure shows the distribution of non-European firms across the manufacturing and service sectors across regions with different levels of development. The sector affiliation is determined based on the NACE code of the primary activity of the firm, where NACE codes 10-33 are defined as manufacturing, while NACE codes 45-96 are defined as services. The category 'Other' covers remaining NACE codes, as well as firms for which it has not been possible to determine their sector affiliation due to missing NACE codes.

Source: ESPON FDI (2018) based on data from the Amadeus database

The impacts of the different drivers on FDI location in each of the three types of regions point to some interesting differences, cf. Figure 20.

First, the strength of industry clusters is especially important in less developed regions, where the presence of other foreign firms is also an important attraction factor. While this is something that could be looked at closer, these results point to the use of industrial policies promoting special enterprise zones as a possible way to attract more FDI to less developed regions.

Second, while labour abundance is a driver of FDI in all three types of regions, the effect is larger in more developed regions where bottlenecks in the labour market are more likely to limit business opportunities.

Third, tertiary education seems mainly to be a driver of FDI into more developed regions. This implies that non-European owned firms seeking to gain access to highly educated labour tend to mainly locate in more developed regions where the universities are typically located.

Fourth, accessibility is especially important for attracting FDI to both more and less developed regions, while it is negatively associated with the likelihood of hosting foreign firms in transition regions. However, the impacts is very small, indicating that accessibility in itself has little impact on the attractiveness of transition regions.

Fifth, the presence of other non-European owned firms is especially important for attracting FDI to less developed regions. This is likely a signalling effect, where existing investors help put the region on the map for investors searching for a suitable location.

Sixth, a higher population density is especially important for attracting FDI to transition regions but also to less developed regions, while it is negatively associated with the likelihood of hosting non-European owned firms in more developed regions. Again, this is likely to be due to higher costs associated with locating in highly dense regions in more developed regions, while it may indicate a larger consumer base in transition and less developed regions.

Seventh, market size is especially important for attracting FDI to more developed regions, while it is less important for transition regions and insignificant for less developed regions. This is not surprising as market seeking FDI is most likely to be attracted to more developed regions.

Eight, more developed regions with a border have less likelihood of attracting non-European owned firms. This is in contrast to other metropolitan and non-metropolitan regions, where border regions are found to be no less likely to host foreign firms, than non-border regions.

Figure 20 Drivers of FDI across regions with different levels of economic development



Note: The figure shows the results from the regression analysis conducted separately by origin of the investor. The percentages shown in the figure are the changes in the likelihood of a given FDI project being located in a given region, when the value of the respective regional driver is increased by 1 per cent (i.e. the average probability elasticity). Regression results are displayed in Columns (2) to (4) in Table C.7 in Appendix C.

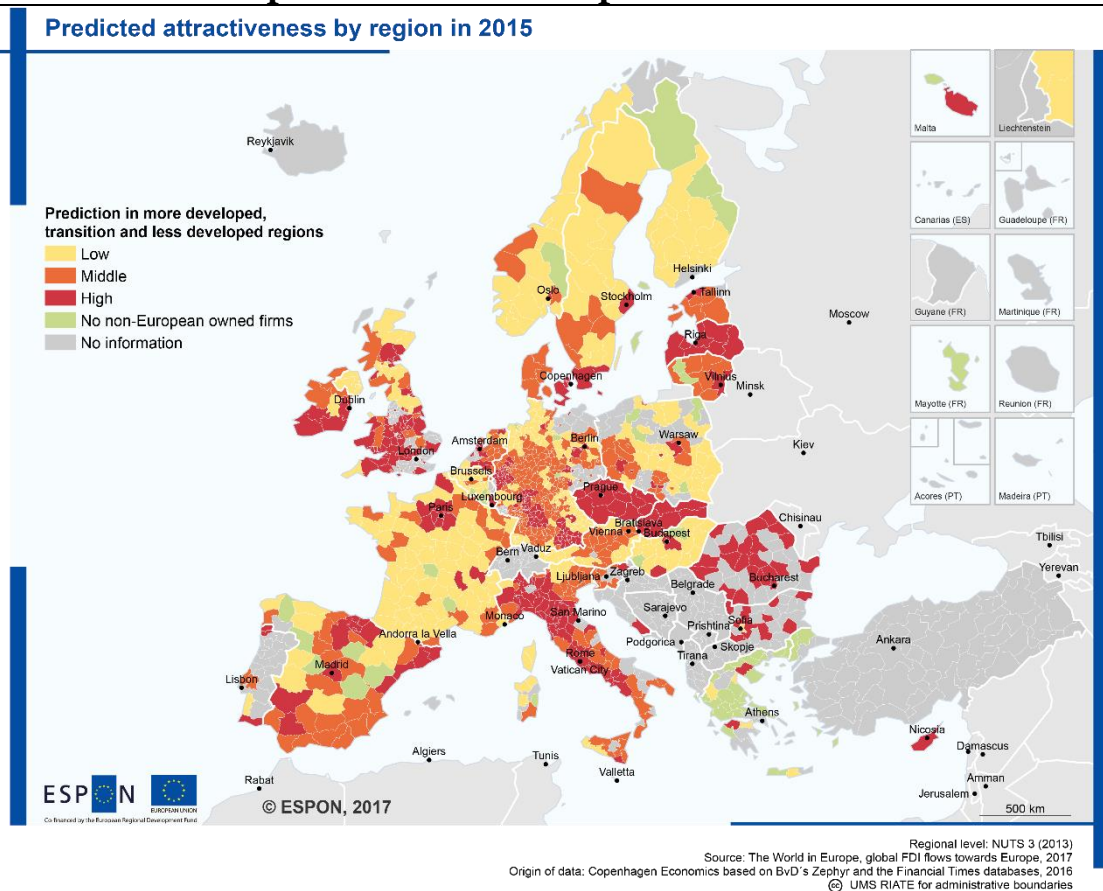
Source: ESPON FDI (2018) based on data described in Chapter 2

Finally, the dominance of incumbent firms is more important in less developed markets, where competition for specialised labour may be more intense and where market attractiveness may be especially reduced if there is a strong incumbent firm.

Again, the results point to differences and similarities in the drivers of FDI into regions with different levels of development. Labour abundance, the level of education and market size are especially important in more developed regions, while industry clusters and the presence of other foreign firms are especially important for attracting FDI to less developed regions. Population density is especially important for attracting FDI to transition regions.

The attractiveness of individual NUTS3 regions relative to their peers with similar level of development is shown in Map 4. Relative to the comparison with all types of regions in Map 1, a number of regions in UK, France, and Spain are now relatively more attractive.

Map 4 The predicted attractiveness of regions with different levels of economic development for non-European investors



Note: The figure shows the predicted attractiveness of European regions with different levels of development for non-European investors. The predicted attractiveness of individual regions is measured as the predicted values from the drivers analyses displayed in Columns (2) to (4) in Table C.5 in Appendix C. The category 'High' attractiveness includes the third most attractive regions, for each type of region, and the category 'Low' includes the third least attractive regions, for each type of region. The category 'Middle' includes the remaining regions.

Source: ESPON FDI (2018) based on data described in Chapter 2

4.4 Concluding remarks

While there are some common factors that help explain the location of foreign firms across all regions, some factors are more relevant in certain types of regions than others. In terms of policy implications, the results suggest that policies that promote the development of industrial clusters seem especially relevant in the case of rural and intermediate regions, other metropolitan regions and less developed regions.

Educational policies aimed at increasing the share of the population with a tertiary degree are especially relevant for urban regions, capital metropolitan regions, other metropolitan regions and more developed regions. Labour abundance is especially important in urban regions, capital metropolitan regions, other metropolitan regions and more developed regions. In terms of policy implications, this suggests that a flexible labour market may be one of the tools to attract investments into these regions. Finally, in the case of capital metropolitan regions, policies that promote accessibility are also found to be especially relevant.

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A. Appendix A – Firm level data

The firm-level data used is obtained from Bureau van Dijk's Amadeus database, which contains ownership and accounting data for a large sample of firms across Europe. The database contains company ownership structures, including information on shareholders and subsidiaries, as well as accounting statistics.

The process of cleaning and structuring the firm-level data for the driver analysis is extensive and includes the following three steps:

1. Identifying foreign owned firms
2. Identifying firm location
3. Generating agglomeration variables

Each of these steps are described below:

1. Identifying foreign owned firms

Based on information on each shareholders percentage of ownership and the home country of the shareholders, we are able to identify foreign owned firms. We apply an ownership threshold of at least 10 per cent and define firms that have a single foreign shareholder percentage of at least 10 per cent as foreign. In order to determine whether or not this is the case, we use the information on firm's *direct* shareholdings, which includes direct ownership linkages and does not take into account indirect foreign ownership via e.g. a domestic holding company. This means that if a US firm owns a French firm, which in turn owns another French firm, only the former French firm is considered foreign owned.

In accordance with the scope of the assignment, we focus exclusively on firms owned by non-European owners. In short, for a firm to be considered foreign owned at least 10 per cent of the firm must be directly held by a non-European owner. Thus, our sample of foreign owned firms excludes any firms in which only European shareholders have an ownership stake of at least 10 per cent.

The first step in terms of preparing the Amadeus firm-level data has thus been to clean and sort the ownership information. Based on this information, we identify foreign shareholders by the ISO code of the shareholders' home country. In cases where this information is missing, we assume that the shareholder is located in the same country as the firm itself and thereby treat these cases as domestic investments. In doing so, we follow the guidelines provided in Kalemli-Özcan et al. (2015).

Firms, in which a non-European shareholder directly holds at least 10 per cent of shares are treated as foreign owned.

In cases where several non-European shareholders from different home countries hold an ownership share of more than 10 per cent in a given firm, we attribute origin to the home country of the shareholder that owns the largest share of the company. In cases where there is no single dominant investor, we attribute origin to the home country of the largest group of

investors (i.e. if two US investors and a Chinese investor each holds a 20 per cent stake in a given firm, the firm is considered to be US owned), or else to the first listed shareholder.

2. Identifying firm location

The next step in preparing the firm-level data for the driver analysis is to identify the NUTS3 location of firms in the sample. As we also use information on the location of domestically owned firm to generate agglomeration variables used as explanatory regional variables in the model (see below), we undertake this step for all firms in our sample and not just foreign owned firms.

For the majority of firms, this step is straight forward as the Amadeus database lists the NUTS3 region (NUTS version 2013) in which a firm is located. In cases where this information is missing, we use the postcode of the firm's location and match these with NUTS3 regions using a concordance obtained from Eurostat¹⁷.

3. Control variables based on data from the Amadeus database

Finally, we also utilise the firm-level data from the Amadeus database to generate the following three variables:

- Industry clusters at the regional NUTS2 level
This is defined as the share of a region's employment in a given sector (2-digit NACE) relative to the country's employment in that given sector.
This is defined as the share of a sector's (2-digit NACE) employees employed in foreign owned firms within a given NUTS2 region.
- Dominance of incumbent firms
This is the Herfindahl index, which describes the market structure and is calculated as follows:

$$H = \sum_i^n (s_i^2)$$

Where s_i is the market share (number of employees) of firm i in a sector (3-digit NACE) and n is the number of firms. The Herfindahl index is calculated at the country-level. The variable ranges between zero and one, where higher values indicate a more concentrated market structure.

After we have generated all three control variables, we drop all firm that are not foreign owned, according to the definition given above. In the model, we then estimate the likelihood of foreign owned firms being located in a given NUTS3 region, as a function of a number of regional characteristics, including the above control variables. The remaining regional determinants are collected from Eurostat and ESPON's webpage and are described below.

4. Identifying the type of investment

In order to identify M&As, we match the BvD number of all non-European owned firms (ID number) and the BvD number of the non-European owner with the BvD number of all target firms and their acquirer in the BvD's Zephyr database, which contain information on M&A deals. Doing so allow us to identify 1.5 per cent of all of our non-European owned firms as being

¹⁷ Eurostat (2017)

M&As. However, there are a number of limitations to the Zephyr database, which means that we cannot capture all of the non-European owned firms, where the investment has occurred via M&As. Firstly, the Zephyr database covers only M&A deals that have occurred since 2000. This means that we cannot identify firms which have been acquired by a non-European investor prior to this year. Furthermore, the unique ID number, which we use to match firms in the two databases, may change over time if a firm has been absorbed into the acquirer's company, in which case we cannot find them in Zephyr, where we search for the targets ID number. This means that there are likely to be more of the non-European firms that should be classified as M&As than is possible. This also means that any firm not identified as a M&A cannot be automatically be perceived as a greenfield investment.

B. Appendix B – Tables referred to in Chapter 2 and 3

Table B.1 Drivers of FDI across all regions

	Mean	Standard deviation	Minimum	Maximum
Market size (GDP, mn. EUR)	79,945.52	96,716.01	2,951.00	641,753.00
Unemployment (per cent)	6.72	3.69	2.50	31.50
Border region	0.26	0.44	0.00	1.00
Tertiary education (per cent)	33.56	9.00	11.60	54.10
Accessibility (per cent accessibility of all areas)	102.97	28.95	43.77	176.53
Population density	15.35	0.80	11.36	16.85
Patents (number per million inhabitants)	102.67	146.36	0.31	1,770.50
Strenght of industry clusters	0.33	0.33	0.00	1.00
FDI concentration	0.04	0.05	0.00	1.00
Dominance of incumbent firms	0.04	0.09	0.00	1.00

Note: The table shows the summary statistics for all the individual drivers (see table 2 in Chapter 2 for explanatory notes for each driver).

Source: ESPON FDI (2018) based on data described in Chapter 2

Table B.2 Drivers of FDI across all regions

	All (1)	All (2)	Manufacturing (3)	Services (4)
Strength of industry clusters	1.453*** (0.0325)	1.475*** (0.0330)	2.173*** (0.161)	0.778*** (0.0408)
Labour abundance	0.154*** (0.00206)	0.147*** (0.00211)	0.0453*** (0.00666)	0.181*** (0.00230)
Tertiary education	0.122*** (0.000813)	0.123*** (0.000870)	0.0882*** (0.00247)	0.133*** (0.000944)
Accessibility	0.0407*** (0.000570)	0.0418*** (0.000611)	0.0273*** (0.00160)	0.0471*** (0.000650)
Level of innovation	0.000251*** (2.89e-05)	0.000270*** (3.00e-05)	0.000617*** (8.45e-05)	0.000218*** (3.21e-05)
FDI concentration	3.335*** (0.0444)	3.315*** (0.0450)	2.967*** (0.117)	4.151*** (0.0555)
Population density	0.353*** (0.0105)	0.364*** (0.0106)	0.244*** (0.0337)	0.333*** (0.0118)
Market size	0.0737*** (0.00952)	0.0722*** (0.00959)	-0.0563* (0.0290)	0.128*** (0.0108)
Border region	-0.742*** (0.00977)	-0.768*** (0.0101)	-0.468*** (0.0303)	-0.753*** (0.0109)
Dominance of incumbent firms	-2.513*** (0.0419)	-2.550*** (0.0423)	-1.208*** (0.130)	-3.189*** (0.0613)
Investment incentives allowed		0.118*** (0.0124)		
Observations	109,882,144	102,897,184	9,344,624	89,111,072

Number of firms	102,502	100,192	8,717	83,126
Number of regions	1,072	1,027	1,072	1,072
Pseudo R2	0.244	0.249	0.128	0.250

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The number of observations is the number of foreign owned firms times the number of NUTS3 regions. All regressions include a full set of country dummies. The regression includes 110,264,358 observations, but only 102667 firms since each firm can choose among 1072 NUTS3 regions.

Source: ESPON FDI (2018) based on data described in Chapter 2

Table B.3 Drivers of FDI by origin of the investor

	All (1)	US (2)	Russia (3)	Others (4)
Strength of industry clusters	1.453*** (0.0325)	1.381*** (0.0746)	1.467*** (0.0910)	1.526*** (0.0413)
Labour abundance	0.154*** (0.00206)	0.128*** (0.00405)	0.361*** (0.00665)	0.139*** (0.00263)
Tertiary education	0.122*** (0.000813)	0.125*** (0.00173)	0.123*** (0.00239)	0.124*** (0.00103)
Accessibility	0.0407*** (0.000570)	0.0448*** (0.00104)	0.110*** (0.00221)	0.0352*** (0.000723)
Level of innovation	0.000251*** (2.89e-05)	0.000654*** (4.66e-05)	0.000527*** (9.81e-05)	-4.13e-05 (3.96e-05)
FDI concentration	3.335*** (0.0444)	3.161*** (0.0951)	3.919*** (0.128)	3.106*** (0.0587)
Population density	0.353*** (0.0105)	0.0704*** (0.0208)	0.117*** (0.0297)	0.379*** (0.0135)
Market size	0.0737*** (0.00952)	0.192*** (0.0187)	-0.609*** (0.0301)	0.115*** (0.0121)
Border region	-0.742*** (0.00977)	-0.456*** (0.0206)	-1.364*** (0.0255)	-0.689*** (0.0127)
Dominance of incumbent firms	-2.513*** (0.0419)	-2.513*** (0.0994)	-2.258*** (0.119)	-2.371*** (0.0499)
Observations	109,882,144	22,297,600	19,649,760	67,934,784
Number of firms	102,502	20,800	18,330	63,372
Number of regions	1,072	1,072	1,072	1,072
Pseudo R2	0.244	0.147	0.488	0.247

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The number of observations is the number of foreign owned firms times the number of NUTS3 regions. All regressions include a full set of country dummies.

Source: ESPON FDI (2018) based on data described in Chapter 2

Table B.4 Drivers of FDI by type of investment

	All (1)	M&A (2)	Others (3)
Strength of industry clusters	1.453*** (0.0325)	2.168*** (0.260)	1.428*** (0.0328)
Labour abundance	0.154*** (0.00206)	0.0532*** (0.0151)	0.157*** (0.00208)
Tertiary education	0.122*** (0.000813)	0.0906*** (0.00656)	0.122*** (0.000821)
Accessibility	0.0407*** (0.000570)	0.0253*** (0.00342)	0.0415*** (0.000579)
Level of innovation	0.000251*** (2.89e-05)	0.000909*** (0.000165)	0.000237*** (2.93e-05)
FDI concentration	3.335*** (0.0444)	3.178*** (0.238)	3.322*** (0.0453)
Population density	0.353*** (0.0105)	0.0788 (0.0805)	0.355*** (0.0106)
Market size	0.0737*** (0.00952)	0.188*** (0.0704)	0.0720*** (0.00962)
Border region	-0.742*** (0.00977)	-0.0523 (0.0734)	-0.753*** (0.00986)
Dominance of incumbent firms	-2.513*** (0.0419)	-1.859*** (0.306)	-2.517*** (0.0423)
Observations	109,882,144	1,544,752	108,337,392
Number of firms	102,502	1,441	101,061
Number of regions	1,072	1,072	1,072
Pseudo R2	0.244	0.152	0.248

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The number of observations is the number of foreign owned firms times the number of NUTS3 regions. All regressions include a full set of country dummies.

Source: ESPON FDI (2018) based on data described in Chapter 2

C. Appendix C – Tables referred to in Chapter 4

Table C.5 Drivers of FDI across urban and rural regions

	All (1)	Urban regions (2)	Intermediate regions (3)	Rural regions (4)
Strength of industry clusters	1.453*** (0.0325)	0.498*** (0.0487)	2.689*** (0.0829)	1.711*** (0.153)
Labour abundance	0.154*** (0.00206)	0.168*** (0.00297)	0.0296*** (0.00443)	-0.0608*** (0.00892)
Tertiary education	0.122*** (0.000813)	0.132*** (0.00139)	0.00681*** (0.00225)	0.00858* (0.00473)
Accessibility	0.0407*** (0.000570)	0.0726*** (0.00101)	0.0423*** (0.00122)	0.00524** (0.00257)
Level of innovation	0.000251*** (2.89e-05)	-0.000798*** (3.99e-05)	0.00142*** (6.24e-05)	0.000298 (0.000214)
FDI concentration	3.335*** (0.0444)	4.852*** (0.0594)	2.787*** (0.0898)	4.181*** (0.241)
Population density	0.353*** (0.0105)	-1.315*** (0.0241)	-0.374*** (0.0258)	0.483*** (0.0395)
Market size	0.0737*** (0.00952)	0.457*** (0.0159)	0.0306 (0.0191)	-0.00661 (0.0377)
Border region	-0.742*** (0.00977)	-0.515*** (0.0161)	-0.219*** (0.0203)	-0.0923** (0.0424)
Dominance of incumbent firms	-2.513*** (0.0419)	-3.285*** (0.0772)	-2.435*** (0.0566)	-2.725*** (0.237)
Observations	109,882,144	20,611,378	12,460,786	1,862,500
Number of firms	102,502	70,346	25,906	6,250
Number of regions	1,072	293	481	298
Pseudo R2	0.244	0.284	0.224	0.170

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The number of observations is the number of foreign owned firms times the number of NUTS3 regions. All regressions include a full set of country dummies.

Source: ESPON FDI (2018) based on data described in Chapter 2

Table C.6 Drivers of FDI across metropolitan regions

	All (1)	Capital metropolitan regions (2)	Other metropolitan regions (3)	Non- metropolitan regions (4)
Strength of industry clusters	1.453*** (0.0325)	1.284*** (0.0416)	4.640*** (0.129)	1.765*** (0.128)
Labour abundance	0.154*** (0.00206)	0.131*** (0.00787)	0.172*** (0.00412)	0.0715*** (0.00445)
Tertiary education	0.122*** (0.000813)	0.126*** (0.00345)	0.112*** (0.00210)	- 0.00699*** (0.00254)
Accessibility	0.0407*** (0.000570)	0.272*** (0.00359)	0.0744*** (0.00118)	0.0458*** (0.00126)
Level of innovation	0.000251*** (2.89e-05)	0.00322*** (0.000248)	-8.50e-05** (3.84e-05)	0.00175*** (7.40e-05)
FDI concentration	3.335*** (0.0444)	3.344*** (0.0760)	3.714*** (0.0943)	4.460*** (0.0888)
Population density	0.353*** (0.0105)	2.572*** (0.241)	-0.965*** (0.0266)	0.134*** (0.0218)
Market size	0.0737*** (0.00952)	0.0395 (0.0581)	0.306*** (0.0190)	-0.131*** (0.0193)
Border region	-0.742*** (0.00977)	0.735*** (0.0356)	-0.202*** (0.0193)	-0.0480** (0.0217)
Dominance of incumbent firms	-2.513*** (0.0419)	-2.607*** (0.0512)	-1.674*** (0.114)	-3.157*** (0.144)
Observations	109,882,144	3,798,208	10,421,034	11,915,508
Number of firms	102,502	55,856	27,642	19,004
Number of regions	1,072	68	377	627
Pseudo R2	0.244	0.323	0.0842	0.151

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The number of observations is the number of foreign owned firms times the number of NUTS3 regions. All regressions include a full set of country dummies.

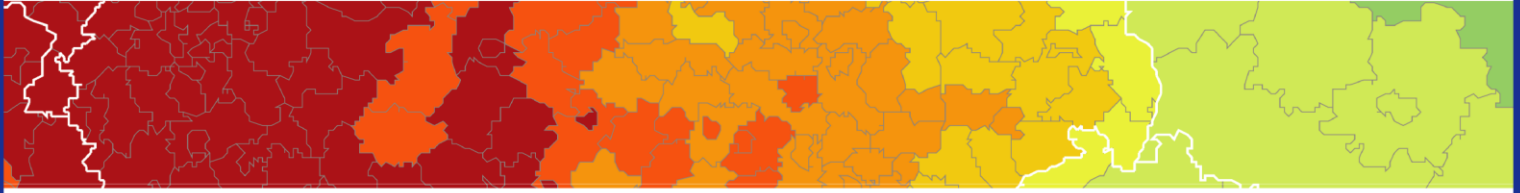
Source: ESPON FDI (2018) based on data described in Chapter 2

Table C.7 Drivers of FDI across regions with different levels of economic development

	All (1)	More developed regions (2)	Transition regions (3)	Less developed regions (4)
Strength of industry clusters	1.453*** (0.0325)	1.359*** (0.0372)	1.381*** (0.175)	2.755*** (0.161)
Labour abundance	0.154*** (0.00206)	0.338*** (0.00322)	0.0283*** (0.0102)	0.0520*** (0.00594)
Tertiary education	0.122*** (0.000813)	0.142*** (0.00123)	0.0197*** (0.00488)	0.0214*** (0.00365)
Accessibility	0.0407*** (0.000570)	0.0565*** (0.000912)	-0.00619*** (0.00200)	0.0621*** (0.00177)
Level of innovation	0.000251*** (2.89e-05)	0.000106*** (3.29e-05)	0.00133*** (0.000126)	-0.00170*** (0.000369)
FDI concentration	3.335*** (0.0444)	2.881*** (0.0528)	3.323*** (0.150)	7.321*** (0.125)
Population density	0.353*** (0.0105)	-0.522*** (0.0196)	0.571*** (0.0396)	0.172*** (0.0272)
Market size	0.0737*** (0.00952)	0.221*** (0.0119)	0.104*** (0.0383)	0.0632 (0.0427)
Border region	-0.742*** (0.00977)	-0.519*** (0.0144)	-0.0376 (0.0552)	-0.0112 (0.0336)
Dominance of incumbent firms	-2.513*** (0.0419)	-2.529*** (0.0445)	-1.996*** (0.195)	-4.012*** (0.272)
Observations	109,882,144	46,332,438	1,358,044	3,596,744
Number of firms	102,502	79,609	6,346	14,503
Number of regions	1,072	582	214	248
Pseudo R2	0.244	0.296	0.231	0.239

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The number of observations is the number of foreign owned firms times the number of NUTS3 regions. All regressions include a full set of country dummies.

Source: ESPON FDI (2018) based on data described in Chapter 2



ESPON 2020 – More information

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