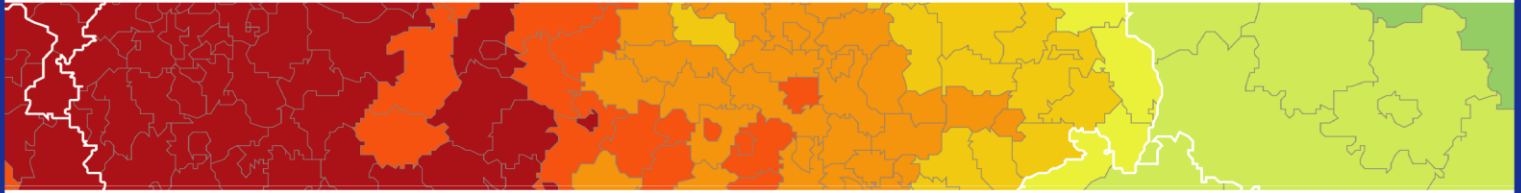


Inspire policy making by territorial evidence



The World in Europe, global FDI flows towards Europe

Collection of intra-European FDI flows

Applied Research

Scientific Report

March 2018

This applied research activity is conducted within the framework of the ESPON 2020 Cooperation Programme, partly financed by the European Regional Development Fund.

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

This delivery does not necessarily reflect the opinion of the members of the ESPON 2020 Monitoring Committee.

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Acknowledgements

Professor Asger Lunde from Aarhus University (Denmark).

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The World in Europe,
global FDI flows towards Europe

Collection of
intra-European FDI flows

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 *Collection of intra-European FDI flows* includes background information and documentation for the conclusions and recommendations brought forward in the main report on intra-European FDI.

Overview of the study

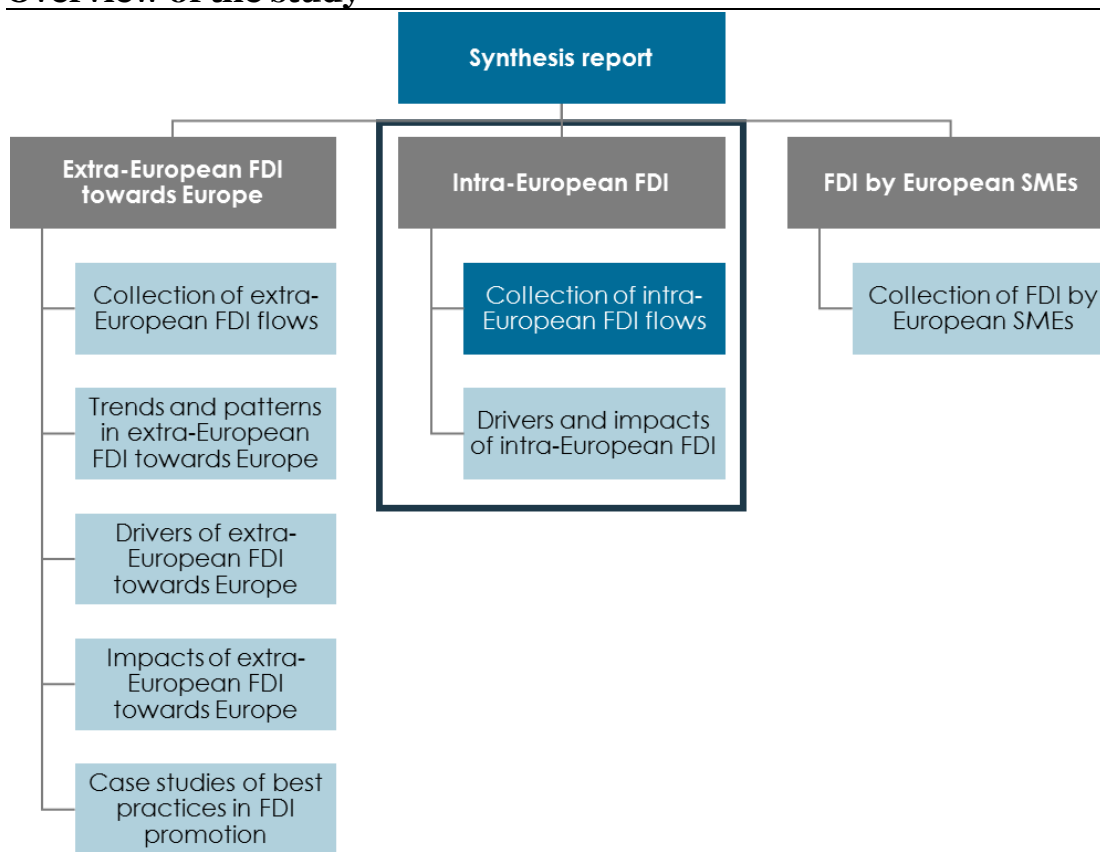


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Abbreviations

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

Introduction

This scientific report is part of the study *The World in Europe, global FDI flows towards Europe*. The overall purpose of the study is to understand recent trends in FDI flows towards Europe and the factors that determine their location in order to develop specific territorial policy measures for cities and regions in Europe.

This scientific report summarises the methodologies applied in the data collection on intra-European FDI flows and the main conclusions to be drawn.

We follow the same methodology to collect intra-European FDI that we used to collect extra-European FDI. This is done in order to obtain the highest possible degree of comparability between the two parts of the analysis.

In the scientific report *Collection of extra-European FDI flows*, we provide a definition of FDI and describe the process of collecting the sub-regional FDI data.

FDI is mainly composed of greenfield investments and Mergers & Acquisitions (M&As). In Chapter 1, we describe how we have collected regional data on greenfield investments and overcome some of the challenges related to allocating such investments on a NUTS3 level. In Chapter 2, we describe how we have collected regional data on M&As and how we have treated missing deal values. In Chapter 3, we sum up and draw conclusions about the quality of the data.

1 Greenfield investments across European regions

Greenfield investments in a country are a type of FDI, which take place when a new foreign company establishes itself in the country or when a foreign-owned company that is already located in the country expands its business. One important feature of greenfield investments is that they expand the capital stock in the country and are likely to support job creation and stimulate further activity in the country.

We have used the fDi Markets database provided by the Financial Times (FT database) to collect data on greenfield investments across European regions. This service tracks cross-border greenfield investments across sectors and countries worldwide, with real-time monitoring of investment projects, capital investment and job creation. This database is, to the best of our knowledge, the only available source of data on greenfield investments given the scope of our analysis.

The FT database contains 31,200 greenfield investment projects undertaken in Europe by a European investor during the period 2003-2015. After cleaning and consolidating the data, 24,395 of these projects can be directly matched with a NUTS3 code equal to around 70 per cent of the total value of intra-European greenfield FDI. In addition, 3,594 projects can be matched with a NUTS1 or NUTS2 code equal to 13 per cent of the total value of intra-European greenfield FDI.

This means that 27,989 projects are matched with a NUTS code, equalling 90 per cent of total greenfield FDI projects within Europe. For the remaining 3,211 projects, we distribute the value of the unallocated greenfield FDI proportionally across the regions in the country.

These aggregate numbers reflect important differences across countries. In general, we find that the greenfield data have a very high quality for the old EU member states, and medium quality for the new EU member states and for the candidate countries. As Bosnia and Herzegovina and Serbia do not have any NUTS codes we have used similar regional codes, namely SNUTS codes, which has been developed and defined in a previous ESPON study¹. Kosovo is not covered by the FT database and is therefore excluded

1.1 Matching of investment projects with NUTS codes

In this analysis, we are interested in the distribution of greenfield investments on a regional level – ideally on a NUTS3 level.

¹ ESPON (2013), *ITAN - Integrated Territorial Analysis of the Neighbourhoods*.

In total, the FT database contains 56,281 greenfield investments in 38 of the 39 European countries to be included in this study (excluding Kosovo which is not covered by the database) over the period 2003-2016. We exclude extra-European greenfield investments and narrow our analysis to the period 2003-2015 as figures for 2016 are incomplete.

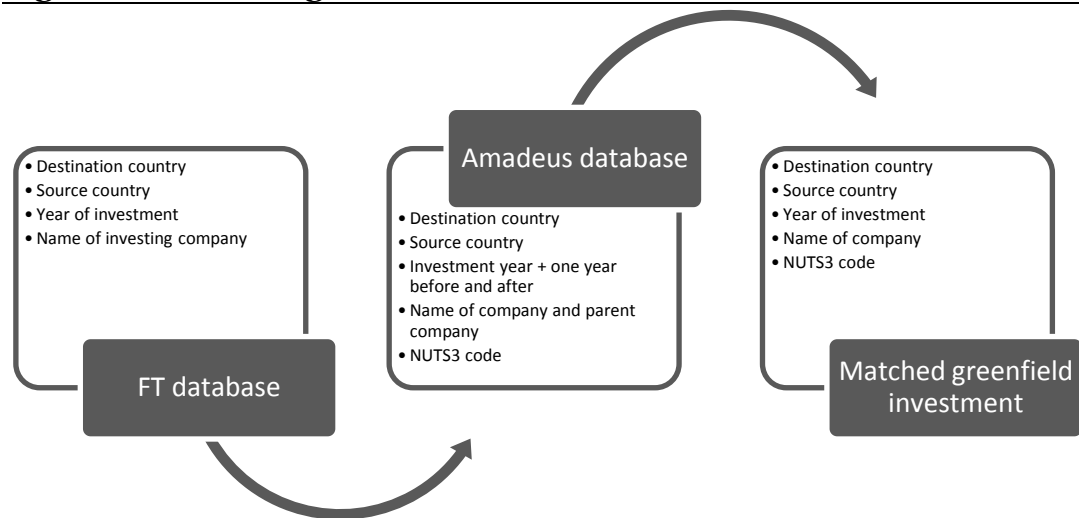
The FT database contains data on 31,200 greenfield investment projects undertaken in the 38 European countries by a European investor during the period 2003-2015. Merging these data on greenfield investments with NUTS codes has required a thorough cleaning and consolidation process due to:

- **City and region names in different languages.** This problem arises because cities in the FT database are listed with a mix of national and international names sometimes using national letters, while all NUTS codes are listed with international names.
- **Misspellings and typing mistakes.** This problem arises because there are several misspellings of the city names in the FT database and because the city name, NUTS codes and country names are not always consistent.
- **Countries with no postcodes.** Ireland has no postcodes, which makes it difficult to place investments. The same is true for cities and regions where the name of the region/city is not sufficient information to allocate an investment to a particular NUTS3 region. This is the case with Athens and London, but also for certain regions in e.g. France and Germany that themselves are larger than a NUTS3 region.

For projects where the information about the city or regions did not allow for an automatic matching with a NUTS code, we have performed a manual matching in two steps.

First, we have constructed a programme that has allowed us to combine data from the FT database with data from the Amadeus database offered by Bureau Van Dijk. This programme has enabled us to match information about the greenfield investments without a NUTS3 code with information about foreign companies in the same destination country and with the same source countries that were established the same year (+ one year before and after), and where the name of the investing company resembles the name of the company itself or the parent company. This methodology is illustrated in Figure 1.

Figure 1 Combining the FT and Amadeus databases



Source: ESPON FDI (2018)

Second, we have used Google Geocoding API² to automatically match city names with specific postcodes for the cities which did not have a NUTS code. The postcode information is then used to merge the cities with a NUTS3 code. The same approach has been applied at the regional level, where the projects with information on the regional level, but with missing NUTS and city information, have been automatically looked up and assigned a specific postcode. This is then matched to a NUTS2 region.³ Hence, this automatised the approach described in the scientific report *Collection of extra-European FDI flows*. This is not expected to affect the comparability of the results between extra- and intra-European FDI.

After cleaning, consolidating and matching the data, we are able to match the city names with NUTS3 codes for 24,395 of these projects, cf. Figure 2. These 24,395 projects are equal to 78 per cent of all the greenfield FDI projects included in the analysis and 70 per cent of the total deal value of intra-European greenfield FDI.

For 3,594 of the remaining projects, the city or regional name listed in the database can be matched with a NUTS2 or NUTS1 code. London and Athens are the only two cases where the city name in the database corresponds to a NUTS2 code (NUTS1 in the case of London). Moreover, some countries are themselves a NUTS1 (e.g. Denmark and Norway), NUTS2 (e.g.

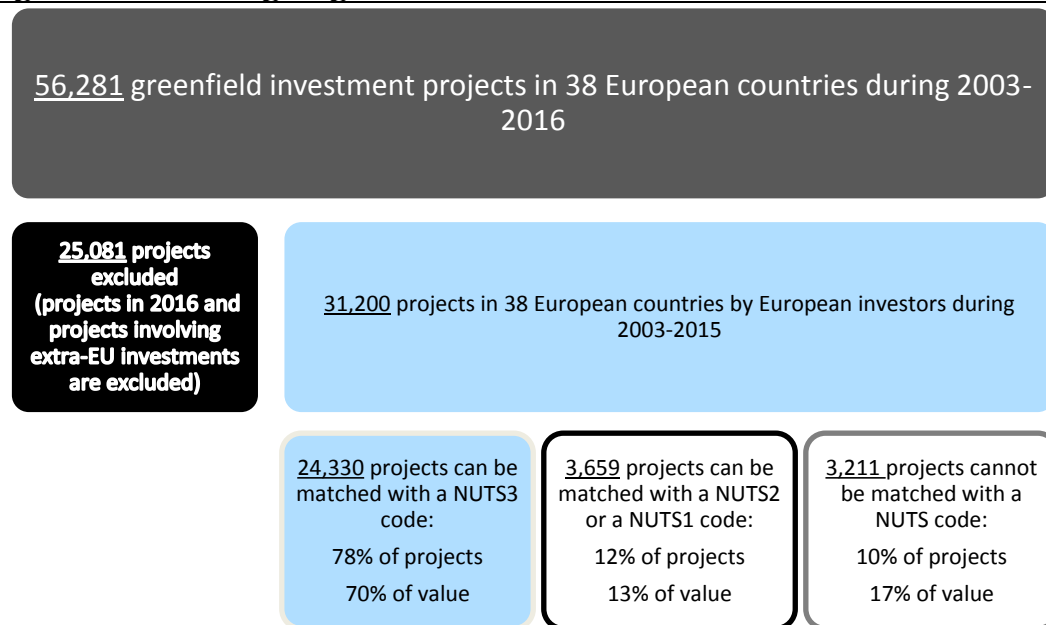
² <https://developers.google.com/maps/documentation/geocoding/start>.

³ Some of the reported regions span several NUTS2 codes. In this case, the approach with using Google Geocoding API poses the risk of associating the observation with a postcode in a wrong NUTS code. However, we do not judge this to be a major concern based on several checks. First, we have performed random checks confirming that the specified regional names were actually the names of NUTS2-level regions. However, we found five observations where “Jutland” (a Danish peninsula) was specified as the region, even though Jutland spans three NUTS2 codes. We excluded these observations from being matched with a NUTS code. Secondly, we have performed random checks on the observations that were matched with a NUTS2 code, making sure that the associated NUTS2 code covers the specified region. These checks give us certainty that the error, albeit possible, is very seldom, and we therefore trust the applied method.

Latvia and Malta) or even a NUTS3 region (e.g. Cyprus and Luxembourg). The projects with NUTS1 or NUTS2 information account for 13 per cent of the total deal value of intra-European greenfield FDI.

Out of the 3,211 projects that cannot be matched with a NUTS code, the FT database contains no information about neither the city nor the regional name in 2,278 cases. In the next section, we describe how we have allocated the value of the remaining investments across regions.

Figure 2 Matching of greenfield investments with NUTS code



Note: Following the procedure from the extra-European analysis, we have manually looked up the largest projects in terms of deal value that was not matched to a NUTS3 region. However, the largest investments were predominantly offshore wind farms and offshore installations and thus not possible to match to a NUTS region.

Source: ESPON FDI (2018) based on the FT database

1.2 Distributing unallocated greenfield investments

If all greenfield investment projects can be matched with a NUTS3 code, a comparison of investments over time and across regions can give interesting insights about the factors that drive this type of investments. However, if the match is better for some countries or for some years than for others, such a comparison can be misleading. To get a measure of FDI flows that can be compared across regions, we distribute the investments that cannot be matched with a NUTS3 code. For the 3,594 projects where we have NUTS1 or NUTS2 codes, we use this information to distribute the investments on NUTS3 codes.

London is a NUTS1 region that encompasses several NUTS2 as well as NUTS3 regions. In 939 cases, the location of the greenfield FDI project is registered as London but the database contains no information about the exact location in London. In this case, we distribute the greenfield investments in London on all the NUTS3 regions in London according to the value of the greenfield projects we have been able to place within London. For example, a NUTS3

region in London that accounts for 15 per cent of the total value of the projects within London that we have been able to match precisely at the NUTS3-level will be allocated 15 per cent of the greenfield investments in London that cannot be placed precisely.

Likewise, Athens is a NUTS2 region that encompasses several NUTS3 regions. In 79 cases, the location of the greenfield investment project is registered as Athens but the database contains no information about the exact location in Athens. These unallocated greenfield investments in Athens have been distributed across the NUTS3 regions in Athens according to the distribution of the value of the investment projects we have been able to place in Athens.

For the remaining 3,211 FDI projects not matched to a NUTS code, we assume that the greenfield FDI projects are distributed across regions in the same way as the greenfield investments that can be matched with a NUTS3 code. A NUTS3 region that receives 10 per cent of the greenfield investments into the country within a given year thus also receives 10 per cent of the greenfield investments that cannot be matched with a NUTS code that year.⁴

An overview of the *number of greenfield investments* that can be matched with NUTS codes for individual countries can be seen in Table 1. We find that the old EU member states have an overall larger share of NUTS3 allocated projects than new EU member states. As is evident, the number of projects that can only be matched with a NUTS1 or NUTS2 code are highly concentrated in the United Kingdom, corresponding to one third of such projects, due to the many FDI projects in London. Also, other large countries like Germany and France have a considerable number of projects where the information in the FT database only allows us to match the investment project on a NUTS1 or NUTS2 level.

An overview of the *value of greenfield investments* that can be matched with NUTS codes for individual countries can be seen in Table 2. We find that the share of the greenfield investments matched with a NUTS3 code generally is higher when measured in number of projects than measured by value. The unmatched projects therefore have a slightly higher average value than the projects that can be matched with a NUTS3 code. For countries with a large share of unmatched projects, this finding suggests that the quality of the greenfield data is relatively low.

⁴ This methodology has not been applied to some of the smaller countries that receive only few greenfield investments. When we have no data on the distribution of greenfield investments across NUTS3 regions in a given year, we use the distribution of investments across NUTS3 code over the entire period 2003-2015. This is the case for Albania and Slovenia.

Table 1 Number of greenfield investments, 2003-2015

Country	Number of projects with NUTS3	Share of projects with NUTS3	Number of projects with NUTS1 or NUTS2	Share of projects with NUTS1 or NUTS2	Number of projects with no NUTS code	Share of projects with no NUTS code	Total
Albania	31	42%	43	58%	0	0%	74
Austria	495	76%	54	8%	104	16%	653
Bosnia and Herzegovina	72	33%	148	67%	0	0%	220
Belgium	779	85%	68	7%	70	8%	917
Bulgaria	701	79%	5	1%	184	21%	890
Switzerland	583	86%	91	14%	0	0%	674
Cyprus	70	100%	0	0%	0	0%	70
Czech Republic	898	87%	139	13%	0	0%	1,037
Germany	3,184	81%	399	10%	349	9%	3,932
Denmark	364	76%	117	24%	0	0%	481
Estonia	235	77%	72	23%	0	0%	307
Greece	66	29%	96	42%	66	29%	228
Spain	2,067	89%	58	3%	194	8%	2,319
Finland	478	89%	9	2%	51	9%	538
France	2,171	77%	286	10%	368	13%	2,825
Croatia	209	78%	60	22%	0	0%	269
Hungary	1,044	86%	1	0%	164	14%	1,209
Ireland	632	92%	58	8%	0	0%	690
Iceland	3	23%	10	77%	0	0%	13
Italy	823	82%	32	3%	148	15%	1,003
Liechtenstein	9	100%	0	0%	0	0%	9
Lithuania	281	78%	79	22%	0	0%	360
Luxembourg	111	100%	0	0%	0	0%	111
Latvia	179	72%	69	28%	0	0%	248
Montenegro	34	100%	0	0%	0	0%	34
The former Yugoslavian Republic of Macedonia (fyROM)	113	67%	56	33%	0	0%	169
Malta	85	100%	0	0%	0	0%	85
Netherlands	595	79%	48	6%	111	15%	754
Norway	171	72%	65	28%	0	0%	236
Poland	1,711	79%	111	5%	336	16%	2,158
Portugal	288	68%	35	8%	98	23%	421
Romania	1,445	80%	0	0%	362	20%	1,807
Serbia	481	74%	23	4%	149	23%	653
Sweden	498	85%	14	2%	76	13%	588
Slovenia	101	73%	38	27%	0	0%	139
Slovakia	534	82%	115	18%	0	0%	649
Turkey	669	81%	5	1%	152	18%	826
United Kingdom	2,120	59%	1,255	35%	229	6%	3,604
Total	24,330	78%	3,659	12%	3,211	10%	31,200

Source: ESPON FDI (2018) based on the FT database

Table 2 Value of greenfield investments, 2003-2015

Country	Share of projects with NUTS3	Share of projects with NUTS1 or NUTS2	Share of projects with no NUTS code	Total (Million EUR)
Albania	8%	92%	0%	7,402
Austria	77%	8%	15%	17,255
Bosnia and Herzegovina	22%	78%	0%	8,242
Belgium	85%	8%	6%	25,300
Bulgaria	78%	0%	21%	32,373
Switzerland	83%	17%	0%	13,571
Cyprus	100%	0%	0%	1,866
Czech Republic	88%	12%	0%	29,444
Germany	76%	9%	15%	79,918
Denmark	68%	32%	0%	8,257
Estonia	72%	28%	0%	7,444
Greece	25%	29%	46%	14,205
Spain	80%	6%	15%	89,729
Finland	78%	5%	17%	10,017
France	71%	11%	18%	72,307
Croatia	74%	26%	0%	9,479
Hungary	82%	0%	18%	39,341
Ireland	90%	10%	0%	19,943
Iceland	10%	90%	0%	1,053
Italy	78%	6%	17%	39,140
Liechtenstein	100%	0%	0%	237
Lithuania	75%	25%	0%	7,088
Luxembourg	100%	0%	0%	2,057
Latvia	64%	36%	0%	10,309
Montenegro	100%	0%	0%	2,236
The former Yugoslavian Republic of Macedonia (fyROM)	62%	38%	0%	5,342
Malta	100%	0%	0%	1,740
Netherlands	80%	8%	11%	30,716
Norway	39%	61%	0%	8,617
Poland	77%	4%	18%	85,537
Portugal	66%	6%	28%	30,653
Romania	65%	0%	35%	90,432
Serbia	64%	3%	33%	18,992
Sweden	79%	3%	18%	16,103
Slovenia	76%	24%	0%	4,020
Slovakia	78%	22%	0%	32,102
Turkey	62%	1%	37%	56,158
United Kingdom	50%	37%	13%	147,662
Total	70%	14%	17%	1,076,284

Source: ESPON FDI (2018) based on the FT database

1.3 Assessment of the quality of the greenfield data

The FT database covers cross-border greenfield investments worldwide. The data contained in the database are collected from publicly available sources and cover, among others, source country, destination country, city, sector, sub-sector, business activity, cluster and project type (i.e. expansion of an existing company or establishment of a new company).⁵ The FT database is the most comprehensive database on greenfield investments and provides a strong foundation for analysing trends in greenfield investments into European countries.

The quality of the data on a *regional* level varies across countries, cf. Figure 3. For 6 countries in Group 1, we find that the quality of the data is high. For an additional 18 countries in Group 2, we find that that the quality of the data is medium. For these two groups of countries, the conclusions related to the trends in inward greenfield investments across European regions are valid and can be used to draw policy recommendations. For the 14 countries in Group 3, the quality of the data is relatively low and conclusions should only be extended to these countries with caution. The countries in Group 4 are excluded from the analysis.

Figure 3 Overall quality of greenfield data by country

	Countries
Group 1: High quality data More than 90% of the number and value of investments in the country have a NUTS3 code	Cyprus, Ireland, Liechtenstein, Luxembourg, Malta and Montenegro
Group 2: Medium quality data 75%-90% of the number and value of investments in the country have a NUTS3 code + countries with special characteristics	Austria, Belgium, Bulgaria, Czech Republic, Germany, Spain, Finland, Hungary, Italy, Lithuania, Netherlands, Norway*, Poland, Slovakia, Slovenia, Sweden, Switzerland and United Kingdom*
Group 3: Low quality data Less than 75% of the number and value of investments in the country have a NUTS3 code	Albania, Bosnia and Herzegovina, Denmark, Estonia, France, Croatia, Greece, Iceland, Latvia, The former Yugoslavian Republic of Macedonia (fyROM), Portugal, Romania, Serbia and Turkey
Group 4: Missing data	Kosovo (not included in the FT database)

Note: Countries with an asterisk represent countries, which fall below the 75 percent threshold due to special characteristics. Norway has a large share of investments in the oil industry, which takes place in the ocean and therefore cannot be placed in a NUTS region. For the United Kingdom, the lower share is due to the many projects in London, which can only be ascribed a NUTS1 and not a NUTS3 code.

Source: ESPON FDI (2018)

⁵ When data on capital expenditures are missing, the FT database contains an estimate of the investment value based on similar projects with registered investment values.

2 M&As across European regions

Mergers & Acquisitions (M&As) are a type of FDI, which take place when a foreign company acquires more than 10 per cent of the voting stock in a domestic company. M&As can help sustain existing economic activity in the region by bringing in new capital, but this type of FDI does not expand the capital stock in the region contrary to greenfield investments.

The M&A data used in this report stem from the Zephyr database, which is assembled by Bureau van Dijk (Zephyr database). Bureau van Dijk also has the Amadeus database available, which contains firm-level data on a large number of companies in Europe. While there are also other M&A databases available in the market, we chose the Zephyr database since we will use the Amadeus database in other parts of this study. In addition, the Amadeus database includes NUTS codes that can be transferred directly to the Zephyr database.

The Zephyr database contains 44,764 M&As undertaken in 38 European countries (excluding Kosovo) by a European investor during the period 2003-2015. After cleaning and consolidating the data, the city name in 39,899 of these projects can be directly matched with a NUTS3 code equal to 89 per cent of the total value of M&As within Europe. In 1,410 projects, the city name can be matched with a NUTS1 or NUTS2 code, and we distribute the value of these investments proportionally across the NUTS3 regions under the respective NUTS1 or NUTS2 code. For the remaining 3,455 projects, we distribute the value of the investments proportionally across the regions in the country.

These aggregate numbers reflect important differences across countries. In general, we find that the M&A data are of very high quality, but with slightly lower quality for the candidate countries.

2.1 Matching of M&As with NUTS codes

In total, the Zephyr database includes information on 325,056 M&As for all the 39 European countries included in this study over the period 2003-2016. Of these M&A projects 44,764 are undertaken by European investors during the period 2003-2015.

We therefore have a dataset of 44,764 M&A projects, which we use to analyse trends in the number of M&As across regions. However, for 25,114 projects, the database contains no information about the deal value of the M&A leaving us with 19,650 projects with confirmed deal values. Nonetheless, when we analyse trends in the distribution of M&A projects, we use all 44,764 projects. As the database contains no information about deal values for Kosovo, we exclude Kosovo from the entire analysis.

Table 3 M&As with missing deal value, 2003-2015

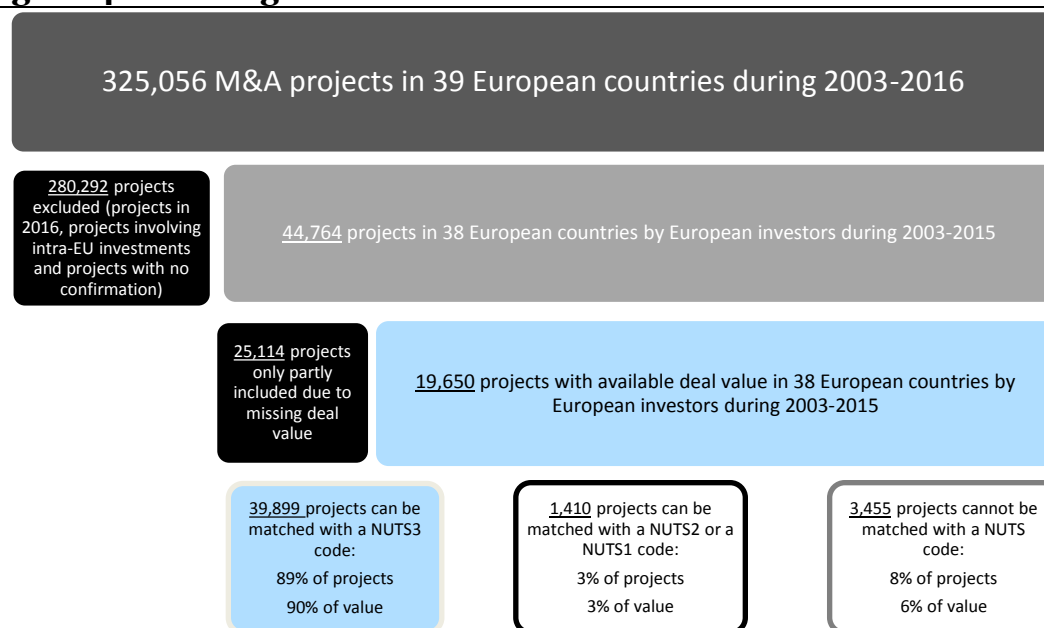
Country	Total number of projects	Number of projects with no deal value	Share of total projects with a reported deal value
Albania	39	19	51%
Austria	820	565	31%
Bosnia and Herzegovina	180	62	66%
Belgium	1,646	1,083	34%
Bulgaria	1,428	933	35%
Switzerland	1,442	933	35%
Cyprus	346	99	71%
Czech Republic	878	564	36%
Germany	4,808	2,884	40%
Denmark	1,356	894	34%
Estonia	460	356	23%
Greece	315	107	66%
Spain	2,160	1,104	49%
Finland	1,222	814	33%
France	3,510	1,734	51%
Croatia	249	135	46%
Hungary	533	318	40%
Ireland	894	430	52%
Iceland	73	22	70%
Italy	3,219	1,682	48%
Liechtenstein	28	24	14%
Lithuania	436	313	28%
Luxembourg	493	240	51%
Latvia	410	300	27%
Montenegro	46	14	70%
The former Yugoslavian Republic of Macedonia (fyROM)	106	40	62%
Malta	68	25	63%
Netherlands	2,786	1,494	46%
Norway	1,638	817	50%
Poland	1,554	626	60%
Portugal	762	312	59%
Romania	761	363	52%
Serbia	366	123	66%
Sweden	2,520	1,500	40%
Slovenia	183	92	50%
Slovakia	324	218	33%
Turkey	590	304	48%
United Kingdom	6,115	3,571	42%
Total	44,764	25,114	44%

Source: ESPON FDI (2018) based on the Zephyr database

After having corrected for misspellings of the city names in the Zephyr database and inconsistencies between the city names, NUTS codes and country names, 39,899 of the projects can be directly matched with a NUTS3 code equal to 90 per cent of the total value of intra-European M&As.

In 3,455 projects, the city name cannot be matched with a NUTS2 or NUTS1 code. In most of these cases, we only know in which country the investment is located and not in which city. These cases account for 6 per cent of the total M&A value into Europe.

Figure 4 Matching of M&As with NUTS code



Source: ESPON FDI (2018) based on the Zephyr database

2.2 Distributing unallocated M&As

To obtain the most comprehensive and comparable data on M&A deals on a sub-regional level, we distribute the deal values that have not been assigned a NUTS3 code using the methodology described in Section 1.2. An overview of the number of M&As that can be matched with NUTS codes for individual countries can be seen in Table 4. For most countries, we find that a large share of the projects can be matched with a NUTS3 code. The share of unallocated M&As appears to be equally distributed across old and new EU member states. Likewise, an overview of the value of M&As that can be matched with NUTS codes for individual countries can be seen in Table 5. We find that the share of unallocated observations in terms of value resembles the share of number of projects not allocated a NUTS3 code.

Table 4 Number of M&As with NUTS codes, 2003-2015

Country	Number of projects with NUTS3	Share of projects with NUTS3	Number of projects with NUTS1 or NUTS2	Share of projects with NUTS1 or NUTS2	Number of projects with no NUTS code	Share of projects with no NUTS code	Total
Albania	32	82%	7	18%	0	0%	39
Austria	683	83%	53	6%	84	10%	820
Bosnia and Herzegovina	90	50%	90	50%	0	0%	180
Belgium	1,462	89%	0	0%	184	11%	1,646
Bulgaria	1,331	93%	0	0%	97	7%	1,428
Switzerland	1,288	89%	154	11%	0	0%	1,442
Cyprus	346	100%	0	0%	0	0%	346
Czech Republic	778	89%	100	11%	0	0%	878
Germany	4,292	89%	0	0%	516	11%	4,808
Denmark	1,207	89%	149	11%	0	0%	1,356
Estonia	418	91%	42	9%	0	0%	460
Greece	235	75%	23	7%	57	18%	315
Spain	1,929	89%	0	0%	231	11%	2,160
Finland	1,125	92%	0	0%	97	8%	1,222
France	3,138	89%	0	0%	372	11%	3,510
Croatia	219	88%	30	12%	0	0%	249
Hungary	428	80%	0	0%	105	20%	533
Ireland	696	78%	198	22%	0	0%	894
Iceland	66	90%	7	10%	0	0%	73
Italy	2,888	90%	0	0%	331	10%	3,219
Liechtenstein	28	100%	0	0%	0	0%	28
Lithuania	388	89%	48	11%	0	0%	436
Luxembourg	493	100%	0	0%	0	0%	493
Latvia	373	91%	37	9%	0	0%	410
Montenegro	46	100%	0	0%	0	0%	46
The former Yugoslavian Republic of Macedonia (fyROM)	77	73%	29	27%	0	0%	106
Malta	36	53%	32	47%	0	0%	68
Netherlands	2,750	99%	4	0%	32	1%	2,786
Norway	1,510	92%	128	8%	0	0%	1,638
Poland	1,429	92%	0	0%	125	8%	1,554
Portugal	651	85%	0	0%	111	15%	762
Romania	652	86%	0	0%	109	14%	761
Serbia	148	40%	0	0%	218	60%	366
Sweden	2,281	91%	0	0%	239	9%	2,520
Slovenia	167	91%	16	9%	0	0%	183
Slovakia	265	82%	59	18%	0	0%	324
Turkey	415	70%	1	0%	174	29%	590
United Kingdom	5,539	91%	203	3%	373	6%	6,115
Total	39,899	89%	1,410	3%	3,455	8%	44,764

Table 5 Value of M&As with NUTS codes, 2003-2015

Country	Share of projects with NUTS3	Share of projects with NUTS1 or NUTS2	Share of projects with no NUTS code	Total (Million EUR)
Albania	57%	43%	0%	1,177
Austria	94%	5%	1%	55,272
Bosnia and Herzegovina	69%	31%	0%	1,935
Belgium	84%	0%	16%	89,301
Bulgaria	97%	0%	3%	15,281
Switzerland	90%	10%	0%	90,616
Cyprus	100%	0%	0%	14,071
Czech Republic	98%	2%	0%	30,435
Germany	92%	0%	8%	240,584
Denmark	92%	8%	0%	49,753
Estonia	91%	9%	0%	4,023
Greece	81%	14%	5%	36,537
Spain	96%	0%	4%	209,074
Finland	82%	0%	18%	34,660
France	93%	0%	7%	214,500
Croatia	80%	20%	0%	7,603
Hungary	88%	0%	12%	27,010
Ireland	77%	23%	0%	44,236
Iceland	99%	1%	0%	1,618
Italy	89%	0%	11%	274,746
Liechtenstein	100%	0%	0%	85
Lithuania	95%	5%	0%	6,011
Luxembourg	100%	0%	0%	143,749
Latvia	99%	1%	0%	2,416
Montenegro	100%	0%	0%	946
The former Yugoslavian Republic of Macedonia (fyROM)	56%	44%	0%	1,349
Malta	35%	65%	0%	1,723
Netherlands	100%	0%	0%	260,344
Norway	89%	11%	0%	55,932
Poland	97%	0%	3%	50,449
Portugal	92%	0%	8%	47,565
Romania	86%	0%	14%	28,978
Serbia	36%	0%	64%	7,859
Sweden	94%	0%	6%	116,450
Slovenia	97%	3%	0%	2,937
Slovakia	97%	3%	0%	6,767
Turkey	89%	0%	11%	97,428
United Kingdom	81%	10%	10%	425,402
Total	90%	3%	6%	2,698,821

Note: Due to rounding off some values are reported as 0% and deleted from this table even though a relative small deal value is reported in the dataset.

Source: ESPON FDI (2018) based on the Zephyr database

2.3 Assessment of the quality of the M&A data

Zephyr is the most comprehensive database on M&A deals. The data contained in the database are collected from publically available sources and cover, among others, source country, destination country, city, sector, investor type. The Zephyr database provides a strong foundation for analysing trends in intra-European M&As.

The quality of the M&As data on a regional level is generally higher than the quality of the greenfield data, cf. Figure 5. For 13 countries in Group 1, we find that the quality of the data is high. For an additional 19 countries in Group 2, we find that that the quality of the data is medium. For these two groups of countries, the conclusions related to the trends in intra-European M&As can be used to draw policy recommendations. There are six countries in Group 3. The countries in Group 4 are excluded from the analysis.

Figure 5 Overall quality of M&A data by country

	Countries
Group 1: High quality data More than 90% of the number and value of investments in the country have a NUTS3 code	Bulgaria, Cyprus, Estonia, Iceland, Italy, Liechtenstein, Luxembourg, Latvia, Montenegro, Netherlands, Poland, Sweden and Slovenia
Group 2: Medium quality data 75%-90% of the number and value of investments in the country have a NUTS3 code + countries with special characteristics	Austria, Belgium*, Switzerland*, Czech Republic*, Finland, Germany*, Denmark*, Greece, Spain*, France*, Croatia, Hungary, Ireland, Lithuania*, Norway, Portugal, Romania, Slovakia and United Kingdom
Group 3: Low quality data Less than 75% of the number and value of investments in the country have a NUTS3 code	Albania, Bosnia and Herzegovina, The former Yugoslavian Republic of Macedonia (fyROM), Malta, Serbia and Turkey
Group 4: Missing data	Kosovo (no information about deal value)

Note: Eight countries fall below the 90 percent threshold, but have a value of projects allocated to a NUTS3 region of 89 percent. Hence, even though these countries fall in the medium quality group, they are in the high end. In general, the M&A data is considered to be of high quality.

Source: ESPON FDI (2018)

3 Concluding remarks

The overall purpose of this study is to analyse trends in FDI inflows towards Europe over a 13 year period (2003-2015) on a regional level (preferably on a NUTS3 level). The data needed is not available from any official database. Therefore, we have collected and combined data from different databases to obtain an estimate of the number and value of FDI inflows on the regional level. This scientific annex contains a description of the sources of FDI used in this study and the method used to collect and consolidate the data to give the best possible estimates.

We have collected data on greenfield investments from the FT database and on M&As from the Zephyr database. Together, these two components add up to total FDI inflows. The data is available for 38 European countries (excluding Kosovo) on an annual basis over the period 2003-2015.

In around 80 per cent of the greenfield FDI projects listed in the FT database, the database contains a city name that can be matched with a NUTS3 code. This corresponds to 73 per cent of the total value of greenfield investments in the 38 European countries. For the remaining greenfield FDI projects, we distribute the value of the unallocated projects proportionately on the sub-regional level to get an estimate of greenfield investments that can be compared across countries. In general, we find that the quality of the greenfield investment data is relatively high for the old EU member states but medium or low for the new EU member states and for the candidate countries. However, some new member states have very good quality data and some old member states (Greece and Portugal) have data of a low quality.

In around 90 per cent of the M&A projects listed in the Zephyr database, the database contains a city name that can be matched with a NUTS3 code (equal to 91 per cent of the total value of M&As). For the remaining projects, we distribute the M&As proportionately on the sub-regional level. In general, we find that the quality of the M&A data is very high.

The total value of intra-European greenfield FDI during the period 2003-2015 amounted to 1,076 bn. EUR, whereas M&A FDI amounted to 2,699 bn. EUR. Since M&As account for a much larger share of total intra-European FDI flows in Europe, the high quality of the M&A data supports the use of this data for further analysis.

The quality of the combined FDI data is assessed in Figure 6. For most countries, the value of M&A is much higher than the value of greenfield investments. The quality of the FDI data is therefore very much dependent on the quality of the M&A data.

Generally, the quality of the overall FDI data on a regional level is high. For 9 countries in Group 1, we find that the quality of the data is high. For an additional 24 countries in Group 2, we find that the quality of the data is medium. For these two groups of countries, the conclusions related to the trends in intra-European FDI are valid and can be used to draw policy recommendations. Overall, we have 5 countries in Group 3, where the quality of the data is relatively low and conclusions should be drawn with caution. We are therefore able to make solid conclusions for all the countries included in the analysis. The countries in Group 4 are excluded from the analysis.

Eight countries (denoted by *) have 89% of their total number of projects matched to a NUTS3 code. Hence, these countries are right at the border of being classified as high quality. Three countries (denoted by **) have high quality M&A data, but low quality greenfield data. Finally, Ireland and Malta (denoted by ***) both have high quality greenfield data, but medium and low quality M&A data, respectively. Taking these reservations into account we assess the data for intra-European FDI to be of a similar quality level as extra-European FDI.

Figure 6 Overall quality of FDI data by country

	Countries
Group 1: High quality data High quality data on M&As and high/medium quality data on greenfield investments	Bulgaria, Cyprus, Liechtenstein, Luxembourg, Montenegro, Netherlands, Poland, Slovenia and Sweden
Group 2: Medium quality data Medium quality data M&As and medium/low on greenfield investments	Austria, Belgium*, Switzerland*, Czech Republic*, Germany*, Denmark*, Estonia**, Greece, Spain*, Finland, France*, Croatia, Hungary, Ireland***, Iceland**, Italy, Lithuania*, Latvia**, Malta***, Norway, Portugal, Romania, Slovakia and the United Kingdom
Group 3: Low quality data Low quality data on both greenfield investments and M&As	Albania, Bosnia and Herzegovina, The former Yugoslavian Republic of Macedonia (fyROM), Serbia and Turkey
Group 4: Missing data	Kosovo (no information about deal value)

Source: ESPON FDI (2018)

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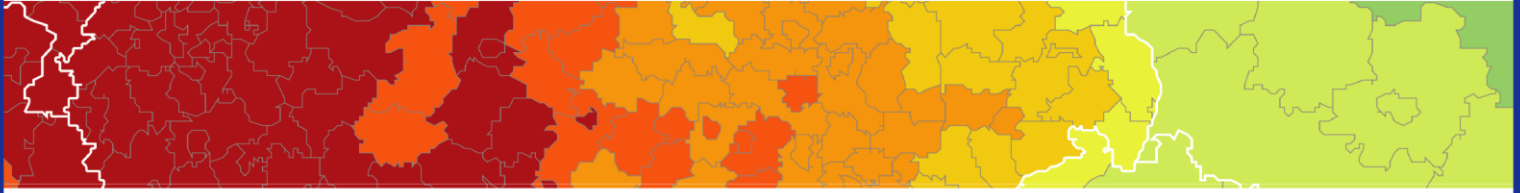
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The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.