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ENHANCING THE ATTRACTIVENESS OF THE ISLAND OF IRELAND TO HIGH-VALUE FOREIGN DIRECT INVESTMENT

IULIA SIEDSCHLAG, WEIJIE YAN AND NIGEL DRIFFIELD



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This report has been accepted for publication by the Institute, which does not itself take institutional policy positions. All ESRI Research Series reports are peer reviewed prior to publication. The author(s) are solely responsible for the content and the views expressed.

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LIST OF ABBREVIATIONS

BERD	Business expenditure on research and development
FDI	Foreign direct investment
GERD	Gross domestic expenditure on research and development
GVA	Gross value added
ICT	Information and communication technologies
OECD	Organisation for Economic Co-operation and Development
PMR	Product market regulations
PPS	Purchasing power standard
NUTS	Nomenclature of territorial units for statistics
R&D	Research and development
RUM	Random utility maximization

EXECUTIVE SUMMARY

In the context of intensified global competition, enhancing attractiveness to foreign direct investment (FDI) in high-value knowledge-intensive sectors is a policy objective in many advanced economies. Understanding what drives the location choice of FDI in high-value knowledge-intensive sectors is important for designing such policies.

This research report provides novel evidence on factors and policies underlying the attractiveness of Ireland and Northern Ireland to FDI in high-value knowledge-intensive sectors. Furthermore, this research explores opportunities for policy coordination on the island of Ireland that could enhance the attractiveness of both jurisdictions on the island to high-value FDI. The following knowledge-intensive sectors are included in the analysis: aerospace, biotechnology, pharmaceuticals, medical devices, semiconductors, business machines and equipment, electronic components, consumer electronics, communications, software and IT services, financial services, business services, and space and defence.

The research focuses on new greenfield FDI projects – new operations established by foreign companies at new sites on the island of Ireland and the rest of the EU and UK over the period 2003–2020. The analysis uses a newly generated dataset combining information from a range of data sources. Information on new greenfield FDI projects established on the island of Ireland and across EU and UK regions and countries over the past two decades (sourced from the Financial Times fDi Markets database) are combined with data on location-specific factors that influence the location choices of FDI projects (sourced from the European Commission, Eurostat and OECD).

The research report provides novel empirical evidence on the following:

- i. patterns of high-value FDI on the island of Ireland compared with patterns for Great Britain and the rest of the EU;
- ii. the importance of a range of location-specific factors that influence the location choice of FDI in high-value sectors in the EU and UK – domestic and EU market potential, workforce skills, labour costs, research and development (R&D) expenditure in the public sector, agglomeration economies, government funding of R&D in the business sector, corporate taxation, broadband access and business regulations; and
- iii. possible scenarios for enhancing the attractiveness of the two jurisdictions on the island to high-value FDI associated with a range of policy choices

and coordination options available to the Government of Ireland and the Northern Ireland Executive. Potential policy levers considered include workforce skills, R&D expenditure in the public sector, broadband access and corporate taxation.

KEY FINDINGS AND IMPLICATIONS FOR POLICY

Patterns of high-value FDI

High-value FDI in Ireland and Northern Ireland account for substantial shares of all new greenfield FDI projects. At over 70%, these shares are higher than the corresponding averages for Great Britain and the rest of the EU. The intensity of jobs created by high-value FDI over the period (the number of jobs created per high-value FDI project) is also higher than the respective averages for Great Britain and the rest of the EU.

High-value FDI in services dominate in both jurisdictions, accounting for 86% of all high-value FDI projects in Ireland and 91% of all high-value FDI projects in Northern Ireland. The corresponding shares for Great Britain and the rest of the EU are 87% and 80%, respectively.

Over two-thirds of high-value FDI on the island of Ireland is by investors from outside the EU. Investors from non-EU countries account for three-quarters of high-value FDI in Great Britain while in the rest of the EU, high-value FDI is evenly split between investors from EU and non-EU countries.

In terms of FDI intensity (measured as the cumulated number of FDI projects in high-value sectors per one million inhabitants over the period 2003–2020), for all high-value FDI, out of 98 locations in the EU and UK included in the analysis, Ireland ranks fourth and Northern Ireland ranks seventeenth (above Scotland, North East England and Wales). Ireland's best performance (ranked first across the 98 locations in the EU and UK) is for high-value FDI in manufacturing while Northern Ireland's best performance (ranked twelfth across the 98 locations in the EU and UK) is for high-value FDI from non-EU countries.

Determinants of the attractiveness to high-value FDI

Consistent with international evidence, the research results indicate that the attractiveness of a given location in the EU and UK is positively associated with EU market potential, domestic market growth, low labour costs, agglomeration economies in knowledge-intensive sectors, availability of skills, R&D expenditure in the public sector, government funding of R&D in the business sector, broadband

access, low corporate taxation, less restrictive regulations with respect to FDI and less complex business regulations.

Some of these factors can be influenced directly by government policy, in particular R&D expenditure in the public sector, workforce skills (participation in education and training and educational attainment), government funding of R&D in the business sectors, corporate taxation, broadband access and the regulatory framework for business (barriers to FDI and the complexity of business regulations).

The report highlights a number of complementarities between the two jurisdictions on the island with respect to factors that influence the attractiveness to high-value FDI. Data for 2020 or the latest available year indicate that Ireland has a better performance than Northern Ireland in terms of EU market potential, market growth, workforce skills (participation in education and training of the working age population; upper secondary and third-level education attainment), agglomeration economies in knowledge-intensive sectors, the intensity of R&D expenditure in the public sector, statutory corporate tax rate and fewer barriers to FDI. Compared to Ireland, Northern Ireland has comparative advantages with respect to domestic market potential (due to access to other UK regions), labour costs and broadband access.

Enhancing the attractiveness of the island of Ireland to high-value FDI

The research report examines a range of possible scenarios for enhancing the attractiveness of both jurisdictions on the island of Ireland. These relate to factors that can be influenced directly by government policy, including R&D expenditure in the public sector, workforce skills, broadband access and corporate taxation. The research finds that the largest gains in terms of the number of high-value FDI projects that would be attracted to both Ireland and Northern Ireland would be in the case of higher R&D expenditure in the public sector. Northern Ireland's attractiveness to high-value FDI would also be substantially increased in a situation of increased educational attainment of the working-age population.

To the extent that an all-island view of high-value FDI is possible, attractiveness to high-value FDI across the island could be enhanced by considering complementarities between the two jurisdictions, in particular with respect to EU market potential, availability of workforce skills and investment in R&D in the public sector. Such an approach, particularly with respect to the availability of workforce skills, is facilitated by recognition of professional qualifications and labour mobility enabled by the Common Travel Area between Ireland and the UK.

Northern Ireland’s continued access to the EU Single Market for goods secured through the Northern Ireland Protocol is a key competitive advantage for Northern Ireland relative to other UK regions. This is supported by the evidence provided in this report indicating that EU market potential is a key driver of the location choice of high-value FDI, including high-value FDI in manufacturing.

To the extent that north–south cooperation on R&D in the public sector increases investment in R&D, existing cooperation initiatives on an all-island basis such as the North–South Research Programme and the proposed all-island centres of research excellence are likely to contribute to enhancing the attractiveness of both jurisdictions to high-value FDI. This key takeaway is supported by evidence provided in this report indicating that increased investment in R&D within both Government and higher education sectors could substantially enhance the attractiveness of Ireland and Northern Ireland to high-value FDI.

Our estimates indicate that moving to a corporate tax rate of 15% – in line with the proposed minimum corporate tax rate in the OECD-led global reform of corporate taxation – would increase the expected number of high-value FDI going to Northern Ireland by 7.5% per annum, with a corresponding decrease of 4.4% per annum in Ireland.

Possible policy choices that could be considered to compensate Ireland’s reduced attractiveness to FDI due to the higher corporate tax rate include: increased R&D expenditure in the public sector; increased government funding of R&D in the business sector; incentivising a higher proportion of the working-age population to participate in education and training programmes; and a higher proportion of the working-age population having upper secondary and third-level education.

CHAPTER 1

Introduction

In recent years, in the context of intensified global competition, economic growth in advanced economies has become increasingly dependent on the creation, diffusion and absorption of knowledge. There is growing international evidence that knowledge-intensive sectors make an important contribution to innovation, productivity and export-led economic growth (OECD 2013a) and that investment in knowledge-based capital is a key driver of innovation and productivity growth (Corrado et al., Sichel, 2009; Corrado et al., 2018; Di Ubaldo and Siedschlag, 2021).

As documented by a large body of international evidence, foreign direct investment (FDI) is associated with new technologies and management know-how, which boost productivity and competitiveness in host countries (for examples of recent reviews of this international evidence, see Schiffbauer et al., 2017, and Bloom et al., 2012). FDI projects, particularly greenfield investments, are linked to net job creation in host countries (see among others, Siedschlag and Tong Koecklin, 2019).¹ Furthermore, FDI generates wider benefits to the host economies via spillovers on productivity (Jude, 2016; Havranek and Irsova, 2011; Driffield and Lavoratori, 2020; Barrios et al., 2012; Haller, 2014; Di Ubaldo et al., 2018) and trade performance of domestic firms (Ciani and Imbruno, 2017; Bajgar and Javorcik, 2020; Di Ubaldo and Siedschlag, 2020). Driffield and Lavoratori (2020) find that productivity spillovers from foreign affiliates to domestic firms are larger in Northern Ireland than the average productivity spillovers in Great Britain. Di Ubaldo and Siedschlag (2020) provide evidence on spillovers from multinationals on the export and import performance of local firms in Ireland.

In light of this evidence, both policy and academic inquiry has developed an understanding of the benefits of attracting FDI, particularly those associated with high-tech sectors, or in research and development (R&D) more specifically. Traditionally inward investment promotion has focused on employment generation and indeed in several countries, notably the UK and the US, inward investment policy has been synonymous with regional policy, seeking to attract investment to lagging regions. However, there has been a trend in recent years towards recognising that simply engaging in a strategy of maximising short-term employment growth is inadequate if one wishes to maximise the benefits of inward investment for a given location. This is expressed in some detail for Scotland,² for

¹ New greenfield FDI projects are new operations established by foreign companies at a new site. The foreign company may or may not already be present in the country, but the FDI project is in a new location within the country. It can also include relocation from one country to another.

² An example of this approach for the West Midlands of England can be found here: <https://www.wmca.org.uk/media/2232/inward-investment-productivity-across-sectors.pdf>.

example, with the strategy focused on productivity, R&D as well as the indirect benefits (such as innovation or productivity spillovers), in addition to employment growth.³ Investment promotion strategies have therefore evolved, and continue to evolve, retaining a focus on seeking to attract inward investment in order to generate jobs, but incorporating an understanding of the potential wider benefits of attracting inward investment, with an emphasis on high-tech activity or R&D. Prospects for development, through, for example, generating productivity and innovation externalities and fostering technological intensity in related sectors and along supply chains, are discussed in detail in the academic literature (see, for example, Driffield et al., 2021).

Enhancing attractiveness to high-value knowledge-intensive FDI is a policy objective of Ireland and Northern Ireland, as well as many other regions and countries. Understanding what drives the location choice of FDI in high-value knowledge-intensive sectors is important for designing such policies. To the best of our knowledge, factors underlying the attractiveness of both jurisdictions on the island of Ireland to high-value FDI have so far not been examined. This research also explores opportunities for policy coordination that could enhance the attractiveness of both Ireland and Northern Ireland to high-value FDI.

Previous research has examined factors underlying the attractiveness of Ireland to FDI (Barry and Bradley, 1997; Barrios et al., 2006; McCoy et al., 2018). Siedschlag and Tong Koecklin (2019) examined the impact of Brexit on the attractiveness of Northern Ireland to FDI. The research results suggest that, in the medium to long term, Northern Ireland would become more attractive to FDI if it remained in the EU Customs Union and the Single Market for goods, while the rest of the UK had a free trade agreement with the EU. The highest gains for Northern Ireland's attractiveness would be for FDI in manufacturing by non-EU investors. These research results suggest that Northern Ireland's continued full access to the EU Single Market for goods could be an opportunity for greater mutually beneficial cooperation on the island of Ireland, including coordination on policies aimed at enhancing the attractiveness of the island of Ireland to FDI in high-value sectors. McGuinness and Bergin (2020) compared the performances of the two jurisdictions on the island in a number of areas, including trade, FDI and labour markets. With respect to FDI, their analysis found a number of differentials in the performance of foreign-owned businesses in Ireland and Northern Ireland including sectoral distribution and productivity. On the basis of their analysis (which did not take into account the possibility that Northern Ireland would continue to have full access to the EU Single Market), the authors concluded that

³ This issue is discussed in detail in *An evaluation of selective financial assistance in Northern Ireland, 2004–2011*, published by the Department for the Economy Northern Ireland. See: <https://www.economy-ni.gov.uk/publications/evaluation-selective-financial-assistance-northern-ireland-2004-2011>.

Brexit was likely to make Northern Ireland and Great Britain less attractive to FDI in the long-run.

An all-island offering for FDI in key sectors has been highlighted as an opportunity associated with cross-border collaboration on innovation policy in Ireland and Northern Ireland (Nauwelaers et al., 2013). In this context, economies of scale (critical mass) and economies of scope (knowledge complementarities) have been identified as important drivers of cross-border cooperation (OECD, 2013). Potential benefits of developing sectoral ecosystems on the island of Ireland have also been highlighted by a research study published by InterTradeIreland (Morgenroth et al., 2015). Potential opportunities for both Ireland and Northern Ireland have been identified on the basis of an in-depth analysis of three sectors: pharmaceuticals, medical devices and software.

Against this background, this research report examines factors and policies underlying the attractiveness of Ireland and Northern Ireland to FDI in high-value knowledge-intensive sectors such as aerospace, pharmaceuticals, information and communication technologies (ICT) and software. To assess and understand the attractiveness of the island of Ireland to FDI in high-value sectors, we analyse the likelihoods of Ireland and Northern Ireland being chosen as locations for FDI in high-value sectors relative to competing locations. The analysis focuses on competing locations in the EU and UK given that access to the EU Single Market is an important driver of FDI (see, for example, Davies et al., 2018; Bruno et al., 2021).

The research is presented in three stages. First, patterns of high-value FDI on the island of Ireland are described and compared with patterns for Great Britain and other EU countries and regions. Second, the analysis identifies and quantifies the importance of a range of location-specific factors and policies on the location choice of FDI in high-value sectors in the EU including: market potential; workforce skills; labour costs; investment in R&D in the public sector; agglomeration economies; corporate taxation; broadband access; and business regulations. Third, on the basis of the results of this analysis, possible scenarios are considered for enhancing the attractiveness of the two jurisdictions on the island to high-value FDI associated with a range of policy choices and coordination options available to the Government of Ireland and the Northern Ireland Executive. Potential policy levers considered include R&D expenditure in the public sector, workforce skills, broadband access and corporate taxation.

The remainder of this report is structured as follows. Chapter 2 describes patterns of FDI in high-value sectors in Ireland, Northern Ireland, Great Britain and the rest of the EU over the past two decades. Chapter 3 discusses the empirical methodology for a multivariate analysis of determinants of the location choice of

high-value FDI in the EU and UK. Chapter 4 presents estimated effects of factors and policies on the location choice of FDI in high-value sectors on the island of Ireland, north and south, and across other locations in the EU and UK. On the basis of these estimates, Chapter 5 examines a range of possible policy scenarios for enhancing the attractiveness of both jurisdictions on the island to FDI in high-value sectors. Finally, Chapter 6 summarises the key findings and suggests implications for policies and policy cooperation options that could enhance the attractiveness of the island as a whole to FDI in high-value sectors. It concludes by suggesting directions for further research that could build on and extend the research findings of this report.

CHAPTER 2

High-value FDI on the island of Ireland: Data and descriptive analysis

2.1 DATA

As discussed in the introduction, this report considers the attractiveness of the two jurisdictions on the island of Ireland to FDI in high-value sectors relative to competing locations in the rest of the EU. The analysis is based on a newly generated dataset including information on new greenfield FDI projects⁴ in high-value sectors established on the island of Ireland and across EU and UK regions over the past two decades (sourced from the Financial Times fDi Markets up to the end of 2020), combined with data on factors and policies that influence the location choices of FDI projects (sourced from the European Commission, Eurostat and OECD). The high-value sectors considered in the analysis include the following knowledge-intensive sectors: aerospace; biotechnology; pharmaceuticals; medical devices; semiconductors; business machines and equipment; electronic components; consumer electronics; communications; software and IT services; financial services; business services; and space and defence.⁵

We analyse 60,743 new greenfield FDI projects,⁶ of which 33,482 are in high-value sectors established over the period 2003–2020 (1,404 FDI projects in Ireland and 219 FDI projects in Northern Ireland). Given the economic sizes of Ireland and Northern Ireland, for data comparability purposes, the locations for FDI projects considered in the empirical analysis are Ireland, Northern Ireland (both classified as NUTS 1 regions) and other locations in the rest of the EU and UK classified as NUTS 1 regions.⁷ Details of the locations for FDI projects included in the analysis are given in Appendix 1.

2.2 The importance of high-value FDI and related job creation

As shown in Table 2.1 below, over 2003–2020, high-value FDI accounted for 70% or more of all new greenfield FDI in Ireland as well as in Northern Ireland: 76% of all new greenfield FDI projects and 70% of all FDI related jobs created in Ireland;

⁴ New greenfield FDI projects are new operations established by foreign companies at a new site. The foreign company may or may not already be present in the country, but the FDI project is in a new location within the country. It can also include relocation from one country to another.

⁵ These sectors have been identified following the Eurostat classification for knowledge-intensive sectors matched with the sectoral classification used by the Financial Times fDi Markets.

⁶ For the purpose of this analysis, examining new greenfield projects is motivated by the fact that these are less likely to influence the *ex-ante* location-specific characteristics we analyse.

⁷ The NUTS classification (Nomenclature of Territorial Units for Statistics) is the Eurostat's hierarchical system of the economic territory of the EU and UK. NUTS 1 regions are major socio-economic regions.

70% of all new greenfield FDI projects and 76% of all FDI related jobs created in Northern Ireland. The intensity of job creation (the number of new jobs per high-value FDI project) over the period was considerably higher in both Ireland (72 new jobs per FDI project) and Northern Ireland (76 new jobs per FDI project) relative to Great Britain (34 new jobs per FDI project) and the other EU countries (50 new jobs per FDI project).

TABLE 2.1 NEW HIGH-VALUE GREENFIELD FDI ON THE ISLAND OF IRELAND, GREAT BRITAIN AND THE EU26, 2003–2020

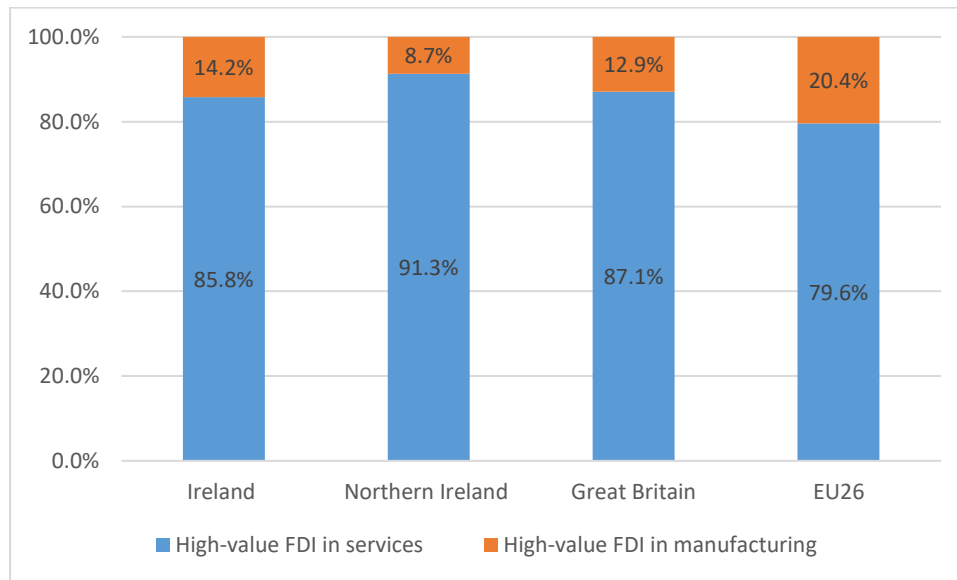
	Ireland	Northern Ireland	Great Britain	EU26
Number of new high-value FDI projects	1,404	219	7,550	24,395
% of all new greenfield FDI projects	76%	70%	67%	51%
Number of jobs created by new high-value FDI	101,077	16,630	255,785	1,216,935
% of all new greenfield FDI related new jobs	70%	76%	39%	24%
Number of new jobs/high-value FDI project	72	76	34	50

Note: EU26 include: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

Source: Authors' elaboration based on data from the Financial Times fDi Markets.

2.3 SECTORAL COMPOSITION

Over the analysed period, most high-value FDI projects were in services, accounting for 86% of high-value FDI projects in Ireland and 91% in Northern Ireland, respectively. The corresponding share of FDI in services were 87% in Great Britain and 80% in the EU26 countries (Figure 2.1).

FIGURE 2.1 SECTORAL COMPOSITION OF NEW HIGH-VALUE GREENFIELD FDI ON THE ISLAND OF IRELAND, GREAT BRITAIN AND THE EU26, 2003–2020

Source: Authors' elaboration based on data from the Financial Times fDI Markets.

Table 2.1 compares the detailed sectoral compositions of high-value FDI projects attracted to the two jurisdictions on the island of Ireland, Great Britain and the EU26.

Software and IT services account for 53% of all high-value FDI projects in Northern Ireland and 36.3% in Ireland. The share of this sector in all high-value FDI projects is also the highest across all high-value sectors in Great Britain and the rest of the EU, at 42.4% and 32.1% respectively. FDI in business services had the second highest shares, at 20.4% in Ireland and 19.2% in Northern Ireland. The corresponding shares of business services across all high-value sectors were very similar: 20.3% in Great Britain and 21.9% in the rest of the EU. FDI in financial services represented 18.5% of all high-value FDI projects in Ireland, 8.7% in Northern Ireland, 15.6% in Great Britain and 15.3% in the rest of the EU. The share of FDI in communications in all high-value FDI projects was 10.5% in both Ireland and Northern Ireland, 8.7% in Great Britain and 10.4% in the EU26.

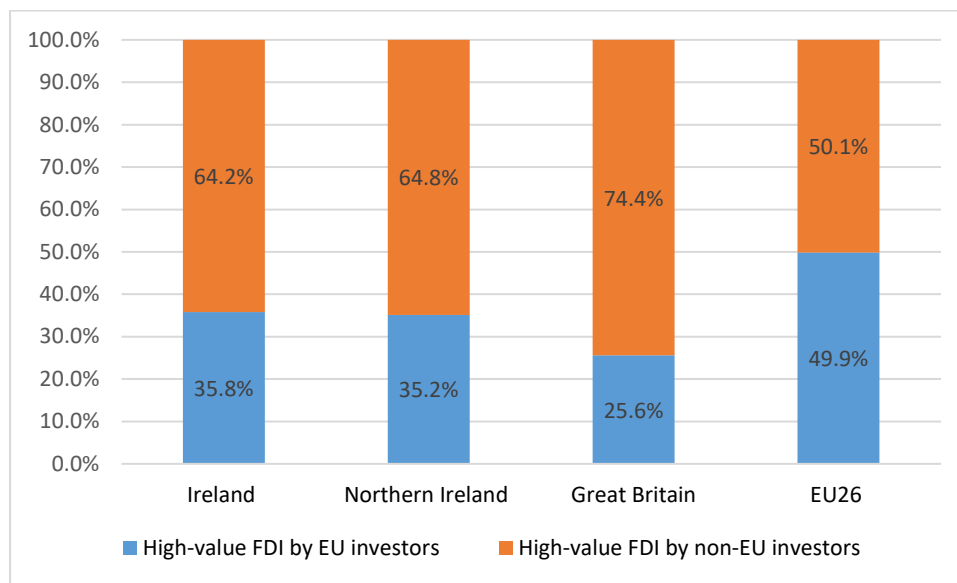
TABLE 2.1 DETAILED SECTORAL COMPOSITION OF NEW HIGH-VALUE GREENFIELD FDI ON THE ISLAND OF IRELAND, GREAT BRITAIN AND THE EU26, 2003–2020

	Ireland	Northern Ireland	Great Britain	EU26
Software and IT services	36.3%	53.0%	42.4%	32.1%
Business services	20.4%	19.2%	20.3%	21.9%
Financial services	18.5%	8.7%	15.6%	15.3%
Communications	10.5%	10.5%	8.7%	10.4%
Pharmaceuticals	3.6%	1.4%	3.0%	6.5%
Medical devices	3.3%	0.9%	1.9%	3.2%
Business machines and equipment	1.6%	1.8%	1.6%	2.7%
Aerospace	1.6%	1.4%	1.4%	2.2%
Biotechnology	1.5%	0.5%	1.3%	2.0%
Semiconductors	1.1%	0.5%	1.2%	1.2%
Electronic components	1.0%	0.9%	1.1%	1.2%
Consumer electronics	0.4%	0.9%	0.8%	1.1%
Space and defence	0.1%	0.5%	0.5%	0.3%
Total	100.0%	100.0%	100.0%	100.0%

Source: Authors' elaboration based on data from the Financial Times fDi Markets.

2.4 HIGH-VALUE FDI BY THE ORIGIN OF INVESTORS

Fig 2.2 shows the composition of high-value FDI over 2003–2020 by the origin of investors. Over two-thirds of high-value FDI projects in Ireland and in Northern Ireland were by investors with headquarters outside the EU. The share of non-EU investors in high-value FDI located in Great Britain was higher, at three-quarters. High-value FDI in the EU26 countries were split equally between investors based in other EU countries and non-EU investors.

FIGURE 2.2 NEW HIGH-VALUE GREENFIELD FDI BY THE ORIGIN OF INVESTORS ON ISLAND OF IRELAND, GREAT BRITAIN AND THE EU26, 2003–2020

Source: Authors' elaboration based on data from the Financial Times fDI Markets.

2.5 HIGH-VALUE FDI INTENSITY

In this section, we analyse patterns of intensity of FDI in high-value sectors in Ireland, Northern Ireland and either the rest of the EU or the UK. We begin with the intensity of all high-value FDI projects and then analyse the intensity of FDI projects by sector (manufacturing and services), as well as by the origin of investors (EU and UK; and non-EU and non-UK investors).

To put the performances of Ireland and Northern Ireland with respect to high-value FDI in an EU context, we need to account for their respective economic size. We therefore examine the cumulated number of high-value FDI projects over 2003–2020 per one million inhabitants in Ireland, Northern Ireland and the other comparable locations (NUTS1 countries and regions) in the EU and UK.

Table 2.2 below shows the performances of Ireland and Northern Ireland relative to the top ten locations in the EU and UK ranked by the intensity of FDI in high-value sectors measured as the cumulated number of FDI projects in high-value sectors over 2003–2020 per one million inhabitants. Since the performance of Northern Ireland with respect to FDI is often compared to Scotland, Wales and North East England,⁸ the performances of these three regions are also shown. In addition, Table 2.2 shows the FDI intensity of the median location (in the middle of the distribution of FDI intensity). The intensity of FDI in high-value sectors across

⁸ See, for example, Driffield and Lavoratori (2020).

all locations (NUTS 1 regions) in the EU and UK are shown in Figure A3.1 in Appendix 3.

TABLE 2.2 TOP 10 LOCATIONS IN THE EU AND UK FOR FDI IN HIGH-VALUE SECTORS, 2003–2020

Rank	Location	FDI in high-value sectors Number of projects per 1 million inhabitants
1	Greater London	482.95
2	Luxembourg	381.17
3	Brussels Region	304.45
4	Ireland	286.28
5	Berlin Region	247.20
6	Malta	237.05
7	Hamburg Region	198.24
8	Île-de-France	178.90
9	East Sweden	174.19
10	West Netherlands	154.26
17	Northern Ireland	115.61
25	Scotland	77.19
40	North East England	39.14
41	Wales	38.90
49	Yorkshire and the Humber	28.61

Source: Authors' calculations based on data from the Financial Times fDi Markets and Eurostat.

Taken together, the data shown in Table 2.2 and Fig A3.1 indicate that, over the past two decades, the two jurisdictions on the island of Ireland have been more attractive to FDI in high-value sectors than many competing locations in the EU and UK. Out of the 98 locations in the EU analysed, Ireland ranks fourth (286 high-value FDI projects per one million inhabitants, behind Greater London, Luxembourg and Brussels Region) while Northern Ireland ranks seventeenth (116 FDI projects per one million inhabitants), above the median region Yorkshire and the Humber (28.61 high-value FDI projects per one million inhabitants). Relative to other regions in the UK, Northern Ireland ranks above Scotland, Wales and North East England.

Table 2.3 below shows the performances of Ireland and Northern Ireland relative to the top ten locations in the EU and UK ranked by the intensity of FDI in high-value manufacturing and in high-value services. As in Table 3.1 above, the respective intensities of FDI in Scotland, Wales and North East England are also included. Table 2.3 also shows the FDI intensity of the median location (in the middle of the distribution of FDI intensity). Figures A3.2 and A3.3 in Appendix 3 show the distribution of the intensity of FDI in high-value manufacturing and in high-value services, respectively, across EU and UK regions included in the analysis.

TABLE 2.3 TOP 10 LOCATIONS IN THE EU AND UK FOR FDI IN HIGH-VALUE MANUFACTURING AND SERVICES SECTORS, 2003–2020

Rank	Location	FDI in manufacturing Number of projects per 1 million inhabitants	Rank	Location	FDI in services Number of projects per 1 million inhabitants
1	Ireland	40.37	1	Greater London	459.91
2	Malta	34.44	2	Luxembourg	351.85
3	Baden-Württemberg	29.90	3	Brussels	283.88
4	Luxembourg	29.32	4	Ireland	245.91
5	East Sweden	28.37	5	Berlin Region	219.21
6	Berlin Region	27.98	6	Malta	202.61
7	Denmark	27.90	7	Hamburg Region	171.09
8	Mainland Finland	27.70	8	Île-de-France	160.21
9	Hessen	27.29	9	East Sweden	145.82
10	Hamburg Region	27.16	10	West Netherlands	135.60
21	Scotland	18.70	15	Northern Ireland	105.58
31	Wales	14.35	27	Scotland	58.49
39	Northern Ireland	10.03	36	North East England	32.74
59	North East England	6.40	44	Wales	24.55
49	North-West England	8.03	49	South-West Poland	20.10

Source: Authors' calculations based on data from the Financial Times fDi Markets and Eurostat.

Taken together, the data shown in Table 2.3 (and Figures A3.2 and A3.3) indicate that over the past two decades, both jurisdictions have been more attractive relative to many competing locations in the EU and UK particularly for FDI in high-value services. Out of 98 locations across the EU regions and countries analysed, Ireland tops the ranking for FDI in high-value manufacturing sectors and ranks fourth for FDI in high-value services (behind Greater London, Luxembourg and Brussels Region). Northern Ireland ranks thirty-ninth for FDI in high-value manufacturing and fifteenth for FDI in high-value services. In comparison to other regions in the UK, for FDI in high-value manufacturing, Northern Ireland ranks above North East England but below Scotland and Wales. In the case of FDI in high-value services, Northern Ireland ranks above all three regions.

Table 2.4 shows the performances of Ireland and Northern Ireland relative to the top ten locations in the EU and UK ranked by the intensity of FDI in high-value sectors by EU and non-EU investors. The respective intensities of FDI in Scotland, Wales and North East England are also included. Table 2.4 also shows the FDI intensity of the median location (in the middle of the distribution of FDI intensity). Figures A3.4 and A3.5 in Appendix 3 show the intensity of FDI in high-value sectors by EU and non-EU investors respectively, across all EU locations.

TABLE 2.4 TOP 10 LOCATIONS IN THE EU AND UK FOR FDI IN HIGH-VALUE SECTORS BY EU/UK AND NON-EU/UK INVESTORS, 2003–2020

Rank	Location	FDI by EU/UK investors – Number of projects per 1 million inhabitants	Rank	Location	FDI by non-EU/UK investors – Number of projects per 1 million inhabitants
1	Luxembourg	197.10	1	Greater London	360.60
2	Brussels Region	171.15	2	Luxembourg	184.07
3	Malta	141.83	3	Ireland	183.11
4	Greater London	122.35	4	Brussels Region	133.30
5	Berlin Region	119.07	5	Berlin Region	128.13
6	Ireland	103.18	6	Hessen	106.93
7	Hamburg Region	92.33	7	Hamburg Region	105.91
8	Estonia	86.05	8	Île-de-France	101.28
9	East Sweden	85.86	9	Malta	95.23
10	Mainland Finland	83.27	10	West Netherlands	94.28
24	Northern Ireland	40.65	12	Northern Ireland	74.96
35	Scotland	20.72	16	Scotland	56.47
44	North East England	16.18	34	Wales	27.74
61	Wales	11.16	38	North East England	22.96
49	West Austria	14.24	49	Slovenia	14.90

Source: Authors' calculations based on data from the Financial Times fDI Markets and Eurostat.

Taken together, the data shown in Table 2.4 (and Figures A3.4 and A3.5) indicate that the two jurisdictions on the island of Ireland have been more attractive relative to many competing locations in the EU and UK particularly to FDI in high-value sectors by investors from outside the EU and UK. Out of 98 locations across the EU regions and countries analysed, Ireland ranks sixth for FDI in high-value sectors by EU or UK investors (behind Luxembourg, Brussels Region, Malta, Greater London and Berlin region), while Northern Ireland ranks twenty-fourth (above the median FDI intensity location of 14.24 high-value FDI projects per one million inhabitants over 2002–2020). In the case of FDI in high-value sectors by non-EU/UK investors, Ireland ranks third (behind Greater London and Luxembourg) and Northern Ireland ranks twelfth. Northern Ireland ranks above Scotland, Wales and North East England for FDI by the EU or UK, as well as FDI by non-EU/UK investors.

2.6 SUMMARY

This chapter provides a descriptive analysis of patterns of high-value FDI in Ireland and Northern Ireland over the past two decades and compares these to the performances of Great Britain and the EU26. The analysis focuses on new greenfield FDI projects over the period 2003–2020 for which data on FDI are available.

The analysis finds that over the analysed period, high-value FDI in Ireland and Northern Ireland have accounted for substantial shares of all new greenfield FDI projects and the related new jobs created. At over 70%, these shares are higher than the corresponding averages for Great Britain and the rest of the EU. The performances of Ireland and Northern Ireland in terms of the intensity of jobs created by high-value FDI over the period (the number of jobs created per high-value FDI project) is also better than the corresponding averages for Great Britain and the EU26.

In terms of the sectoral composition, high-value FDI in services dominate in both jurisdictions, accounting for 86% of all high-value FDI projects in Ireland and 91% of all high-value FDI projects in Northern Ireland. The corresponding shares for Great Britain and the EU26 are 87% and 80%.

Over two-thirds of high-value FDI on the island of Ireland is by investors from outside the EU. Investors from non-EU countries account for three-quarters of high-value FDI in Great Britain, while in the rest of the EU, high-value FDI is evenly split between investors from the EU and non-EU countries.

Taking into account their respective economic sizes, the respective intensities of high-value FDI (the cumulated number of high-value FDI projects over 2003–2020 per one million inhabitants) in Ireland and Northern Ireland are higher than in many competing regions and countries in the EU and Great Britain. Out of 98 locations included in the analysis, Ireland is among the top ten locations and Northern Ireland ranks above the performance of the median location (the location in the middle of the distribution of FDI intensity). For all high-value FDI, Ireland ranks fourth, while Northern Ireland ranks seventeenth (above Scotland, North East England and Wales). Ireland's best performance (ranked first across the 98 locations in the EU and UK) is for high-value FDI in manufacturing, while Northern Ireland's best performance (ranked twelfth across the 98 locations in the EU and UK) is for high-value FDI from non-EU countries.

The next chapter presents the findings of a multivariate analysis that seeks to identify and quantify the importance of a range of location-specific factors underlying the attractiveness of countries and regions in the EU and Great Britain to high-value FDI.

CHAPTER 3

Attractiveness to high-value FDI: Multivariate analysis

3.1 MODELLING LOCATION CHOICES

In this chapter, econometric modelling techniques are used to identify and quantify the importance of location-specific factors that influence the location choice of FDI. Following a discussion of the modelling of location choices by investing firms, we highlight, on the basis of existing theoretical and empirical literature, location-specific factors used in the modelling of the location choices of FDI in high-value sectors.

Modelling location choices of foreign affiliates by multinational firms has been carried out using the theoretical random utility maximization (RUM) framework introduced by McFadden (1974). In this modelling setting, firms choose where to locate their investment projects by selecting from a set of locations the one which maximises their expected profit (utility). Following this theoretical framework, the location decisions of investment projects have been analysed empirically with discrete choice models such as conditional logit or nested logit models (see, for example, Devereux and Griffith, 1998; Basile et al., 2008; Barrios et al., 2012; Siedschlag et al., 2013a, 2013b; Lawless et al., 2018), as well as data count models such as the Poisson model (see, for example, Papke, 1991; Guimarães et al., 2003, 2004; Brühlhart and Schmidheiny, 2015; McCoy et al., 2018) and the negative binomial model (see, for example, Mukim and Nunnenkamp, 2012; Anderson and Sutherland, 2015; Burger et al., 2021).

One of the econometric issues when using discrete choice models such as the conditional logit model is the assumption that all alternative locations are independent of each other (perfectly distinct from each other). In reality, this assumption is unlikely to hold given unobserved location characteristics. Papke (1991) shows that the Poisson estimator with location-fixed effects can absorb all unobserved characteristics of a location. Wooldridge (1999) demonstrates that the Poisson fixed-effect estimator provides consistent and robust estimates which allow for any serial correlation and are also robust to any distributional misspecification. More specifically, this latter result means that the distribution of the dependent variable is not restricted and therefore over-dispersion or under-dispersion are not reasons for concern.

Guimarães et al. (2003) demonstrate that the log likelihood functions for the conditional logit and the Poisson estimators are identical up to a constant and the estimated β parameters obtained with the maximum likelihood estimation are

identical to those obtained with the conditional logit. This result implies that the parameters obtained with the Poisson regression models can be given an economic interpretation compatible with the random utility (profit) maximisation. Studies invoking the equivalence result include Holl (2004), Brühlhart et al. (2012), Arzaghi and Vernon Henderson (2008), Davis and Vernon Henderson (2008), Coeurdacier et al. (2009), and Brühlhart and Schmidheiny (2015).

Location decisions for investment projects have been analysed using the negative binomial model, which is also a count data model. In a cross-section setting, the estimates obtained with the negative binomial model are more efficient than those obtained with the Poisson model in that they are corrected for a possible over-dispersion of the dependent variable leading to downward biased standard errors (see, for example, Burger et al., 2021). However, in a panel data setting, in comparison to the Poisson fixed effects estimator, the fixed effects negative binomial model has a number of shortcomings. As shown by Wooldridge (1999), while the Poisson fixed effects estimator allows any mean-variance relationship, the fixed effects negative binomial model rules out under-dispersion and imposes a very specific over-dispersion. Furthermore, it does not allow for serial correlation. Guimarães (2008) demonstrates that the negative binomial fixed effects estimator does not remove the individual fixed effects in count data unless these are related in a very specific way to the individual parameter of over-dispersion. Finally, the fixed effects negative binomial estimator often fails to converge when all regressors are included in the model (see, for example, Mukim and Nunnenkamp, 2012).

Following the literature discussed above, we use a Poisson model with fixed effects to examine the importance of factors that determine the location choice of high-value FDI in Ireland, Northern Ireland and competing locations across the EU and UK. The underlying assumptions of the model and key estimated outcomes are described below.

Suppose that there are N investing firms, $i=1, \dots, N$ considering $j=1, \dots, J$ alternative locations. Investing firm i considers the investment profitability in each location j at time t , π_{ijt} which is a function of observable location characteristics \mathbf{X}_{jt} and a stochastic term of unobservable profit specific to each firm and location μ_{ijt} :

$$\pi_{ijt} = \alpha_j + \mathbf{X}_{jt}\boldsymbol{\beta} + \mu_{ijt} \quad (3.1)$$

where $\boldsymbol{\beta}$ is a vector of coefficients related to the corresponding vector of observable location characteristics \mathbf{X}_{jt} and α_j is the fixed effect that is specific to each location. The investor i will choose the location j that provides the maximum π_{ijt} among all J possible locations alternatives.

The expected number of investment projects n_{jt} in location j at time t is obtained as follows:

$$E(n_{jt}) = \exp(\alpha_j + \mathbf{X}_{jt}\boldsymbol{\beta}) \quad (3.2)$$

The expected share of investment projects attracted to region j at time t in the total number of investment projects at time t (equivalent to the probability of region j to be chosen as a location) can be expressed as follows:

$$P_{jt} = \frac{E(n_{jt})}{\sum_{j=1}^J E(n_{jt})} \quad (3.3)$$

The elasticity of the expected number of investment projects in location j at time t , $E(n_{jt})$ with respect to a change in the location-specific characteristic k of region j is given by the following:

$$\epsilon_{jjk} = \frac{\partial \ln E(n_{jt})}{\partial x_{jkt}} = \beta_k \quad (3.4)$$

A distinct feature of the Poisson model is that a change in the attractiveness of one region j does not affect the number of investment projects attracted to any of the other location alternatives, $J-j$.

The elasticity of the expected number of investment projects in location i , $i \neq j$, at time t , $E(n_{it})$ with respect to a change in the location-specific characteristic k of region j is given by:

$$\epsilon_{ijk} = \frac{\partial \ln E(n_{it})}{\partial x_{jkt}} = 0 \quad (3.5)$$

Taken together, equations 3.4 and 3.5 imply that the expected number of investment projects in a given location changes only with respect to changes in the characteristics of that location, while it would not be affected by changes in the characteristics of other locations. This result implies that the responsiveness of investment projects counts to given changes in location-specific characteristics is more elastic in the Poisson model than in the conditional logit model.⁹

As discussed by Schmidheiny and Brülhart (2011), although the estimated parameters with the Poisson count estimator are identical to those obtained with the conditional logit estimator, their implications are different. The conditional logit model assumes that the number of FDI projects is fixed and changes in the attractiveness of one region will imply a reallocation of FDI projects across all

⁹ This feature of the Poisson model is discussed in more detail by Schmidheiny and Brülhart (2011).

locations (zero-sum allocation process). In contrast, in the Poisson model, the response of the FDI location choices to improvements in the attractiveness of one region could come through an increase in the number of FDI projects, either related to an increased supply of entrepreneurship or by attracted FDI projects from outside the considered set of regions. This feature of the Poisson model is reflected in the elasticity of the expected total number of investment projects with respect to a change in the locational characteristic k of a given location j at time t given by:

$$\varepsilon_{jt} = \frac{\partial \log E(n_t)}{\partial X_{jtk}} = \frac{E(n_{jt})}{E(n_t)} \beta_k = P_{jt} \beta_k \quad (3.6)$$

The dependent variable in the econometric models we estimate is the annual count of new greenfield high-value FDI projects in Ireland, Northern Ireland and each of the EU and UK locations included in the analysis. The explanatory variables, location-specific factors that influence the location choices of FDI, are lagged by one year with respect to the dependent variable.

One methodological issue that often poses a challenge in econometric modelling is the identification of causality in the examined relationships. In the case of the location choice of FDI projects, this issue is present because large multinationals may influence location-specific factors. Potential sources of bias are reverse causality, unobserved or omitted variables, and measurement error of the explanatory variables. Our analysis deals with these sources of potential bias insofar as is possible, given data and resources available for this research. Analysing new greenfield FDI projects which are less likely to influence *ex-ante* local activities and using lagged explanatory variables with respect to the dependent variable reduces potential reverse causality. The fixed effects estimates control for unobserved and omitted variables bias. However, measurement error in the variables used in regressions could not be accounted for. We therefore interpret our results as reflecting associations between the attractiveness of locations to FDI and location-specific factors, rather than causal effects. The Poisson estimates can be interpreted as upper bounds given that responsiveness of investment counts to changes in location characteristics is more elastic in the Poisson model compared to the conditional logit model. A final caveat is that while the fixed effects Poisson estimates are consistent with the direction of economic effects, standard errors might be biased downwards, affecting the efficiency of the estimates.

In the next section we discuss the location-specific factors included in the modelling of the location choice of FDI projects in high-value sectors across the analysed EU and UK locations.

3.2 DETERMINANTS OF THE LOCATION CHOICE OF FDI IN HIGH-VALUE SECTORS

When deciding where to invest, multinational firms consider a range of location-specific factors such as market size and market potential, production costs, sourcing inputs including human capital and technology, as well as fiscal incentives and business regulations.¹⁰ The location-specific factors we include in the econometric modelling of the location choice of FDI in high-value sectors on the island of Ireland and in the rest of the EU and UK are described in greater detail below.

Market potential – the economic size of the host location and access to other markets – is among the key factors driving the location choice of FDI projects, as the magnitude of demand affects firm revenue and profit. We measure the economic size of the host location with gross value added in constant prices, which is a proxy for local demand. As in previous studies on the location choice for FDI projects,¹¹ we measure market potential as the combination of the economic size of each location (proxied by gross value added in constant prices) and its accessibility, taking into account the transport costs involved.¹²

We distinguish between *domestic market potential* – the combined market potential of a given location (NUTS1 country or region) and of all other NUTS1 regions within the same country – and *EU market potential*, which is the combined market potential of all locations other than the domestic market potential in the EU that can be accessed.

The *domestic market potential* is calculated as follows:

$$DMP_{it} = \frac{X_{it}}{d_{ii}} + \sum_{j \neq i, t} \frac{X_{jt}}{d_{ij}} \quad (3.7)$$

DMP_{it} denotes the domestic market potential of a given location i at time t ; X_{it} is a measure of the economic size of a given location i at time t ; d_{ii} is a measure of the internal transport cost in the given location i ; d_{ij} measures the transport cost between a given location i and location j , within the same country other than location i .

¹⁰ International evidence on determinants of the location choice of foreign affiliates of multinational firms has been reviewed by, among others, Fontagné and Mayer (2005), Nielsen et al. (2017), Lawless et al. (2018) and Davies et al. (2021).

¹¹ See, for example, Head and Mayer (2004) and Siedschlag et al. (2013a).

¹² In the case of Ireland, to account for the distortions in the national accounts due to large multinationals, we adjust the gross value added from 2015 onwards in line with the modified gross national income, GNI*.

The EU market potential is calculated as the market potential of all locations in the EU, other than within country domestic markets:

$$EUMP_{it} = \sum_{r \neq i, t} \frac{X_{rt}^{EU}}{d_{ir}} \quad (3.8)$$

$EUMP_{it}$ denotes the EU market potential of a given location i at time t ; X_{rt}^{EU} is a measure of economic size of location r in the EU and the UK at time t ; d_{ir} is the transport cost between a given location i and location r .

We proxy the economic size of locations with their gross value added (GVA) in constant prices. Transportation costs between locations are calculated using data available from Persyn et al. (2020). The transportation cost is the estimated average cost incurred by a representative 40t heavy duty vehicle travelling within a region or between regions. It has two components: the distance-related costs and the time-related costs. The distance-related costs consist of the length of the road, the fuel price and fuel consumption, tolls, taxes, maintenance of tires and other vehicle maintenance costs. The time-related costs are calculated by taking into account the wage of drivers and the travel time over a route, which is affected by the maximum speed, road conditions, the length of the road and the resting times required by the European transport regulations. Persyn et al. (2020) report that driver wage costs contribute most to the transportation cost (42.1%), followed by fuel costs (21.1%). The components of other costs are ownership taxes (0.6%), vignettes and tolls (5.9%), other time-related cost (17.1%) and other distance-related costs (13.3%).

In addition to market potential, we also include in the model the annual growth rate of gross value added in constant prices since the prospects of demand growth is another factor found to influence the location choice of FDI (see, for example, Casi and Resmini, 2014).

Production costs affecting firm profitability are particularly important for FDI seeking efficiency gains. To account for the effect of production costs on the location choice of FDI in high-value sectors, we include *real gross value added per employee* in the host locations as a proxy for labour costs.¹³

Existing evidence on the location choice of FDI in knowledge-intensive activities, such as research and development (R&D) and information and communication technologies (ICT) industries, indicates that the *knowledge-base* of locations and proximity to other foreign affiliates in high-value sectors are important factors

¹³ Data on labour costs at the NUTS 1 regional level are available only for a limited period (six years) or are not available. The available data on labour costs and gross value added for EU countries are highly correlated (the correlation coefficient is 0.95).

considered by multinationals in these sectors seeking to source knowledge. Crescenzi et al. (2013) find that the innovation capacity of locations and previous investments are key drivers in the location choice of R&D activities by multinational companies across regions in the EU. Siedschlag et al. (2013a) provide evidence showing that important determinants of the location choice of R&D activities by multinationals across EU regions include: the availability of high skills; proximity to other R&D activities by multinationals; the research and innovation capacity of locations; and proximity to centres of research excellence. Further, Siedschlag et al. (2013b) find that market size, the innovation intensity of locations and proximity to other foreign affiliates in the ICT industries enhance the attractiveness of EU regions to FDI in ICT industries. To account for these knowledge-related factors that influence the location choice of FDI in high-value sectors, we include in the econometric model the following variables: *participation in education and training* (percentage of working age population); *workforce skills* (percentage of the working age population with upper secondary and third-level education); and *gross expenditure on R&D in the public sector* (within Government and higher education sector).

A large body of international evidence indicates that geographical concentration of economic activity generates benefits in the form of knowledge spillovers and networking externalities, availability of workforce skills, intermediate goods and services (Krugman, 1991; Devereux et al., 2007). There is also evidence that the existence of such agglomeration economies increase the attractiveness of locations to FDI (Head et al., 1995; Guimarães et al., 2000; Belderbos and Caree, 2002; Crozet et al., 2004; Brülhart et al., 2004), including FDI in high-tech sectors (Siedschlag et al., 2013a, 2013b; Belderbos et al., 2014). Feldman and Audretsch (1999) provide evidence that industries that share the same science base tend to cluster geographically. A key factor driving clustering of industries is the fact that knowledge flows are limited geographically (Jaffe et al., 1993; Botazzi and Peri, 2003). This evidence has informed policies aimed at industrial clustering, which have been pursued in many regions and countries in the EU, including Ireland and Northern Ireland (see, for example, Morgenroth et al., 2015). To account for agglomeration economies as a driver of high-value FDI, we include in the model specifications a variable measuring the *count of firms in the knowledge-intensive sectors per 100km²* in each of the considered locations.

Fiscal incentives such as corporate taxation and R&D tax credits, as well as direct government funding of R&D in the business sectors, have been found to enhance the attractiveness of countries and regions to FDI in R&D activities (Hines, 1994; Bloom et al., 2000; Yang et al., 2012; Belderbos et al., 2014). Hines (1994) found that the location of R&D activities by US multinationals are very sensitive to tax incentives. To account for the effects of fiscal incentives on the location choice of

FDI in high-value sectors, we include in the econometric model the following variables: *the statutory corporate tax rate* and *government-funded R&D in the business sector* as a share of the total business expenditure on research and development (BERD). Government-funded R&D includes direct and indirect funding via R&D tax credits.

In line with existing international evidence (see, for example McCoy, et al., 2018), in the modelling of location choice of FDI in high-value sectors, we account for the role of *access to broadband* (percentage of households).

Finally, existing evidence suggests that business regulations and ease of doing business affect the decisions of inward FDI (see, for example, Zhang, 2012; Contractor et al., 2020). For this reason, in the modelling of location choice of FDI in high-value sectors, we include two variables that capture the locations' regulatory stance: *barriers to FDI*, measuring the restrictiveness of national regulations related to FDI; and *complexity of business regulations*. The data for both variables are taken from the OECD Indicators of Product Market Regulations (PMR) database.¹⁴ Barriers to FDI is a country score measuring the restrictiveness of national regulations in terms of foreign equity limitations, screening or approval mechanisms, restrictions on the employment of foreigners as key personnel and operational restrictions. The score ranges from zero to six and it increases with the restrictiveness of regulations. The complexity of regulations is a country score measuring the complexity of regulatory procedures with respect to the system of licences and permits and the communication and simplification of rules and procedures related to administrative burdens of interacting with Government. The score ranges from zero to six and higher values signal a higher complexity of procedures.

3.3 SUMMARY

This chapter describes the empirical methodology used for modelling the location choices of high-value FDI in Ireland, Northern Ireland and competing regions and countries in the EU and UK. This is followed by a discussion of methodological issues and how these are dealt with, in particular the challenge of identifying causality in the examined relationships.

The subsequent analysis uses a panel data Poisson model with fixed effects, which relates the annual number of high-value FDI projects in each of the analysed locations to observed and unobserved location-specific factors. It then discusses in detail the location-specific factors included in the empirical analysis. These factors

¹⁴ The OECD PMR indicators are constructed based on objective data on existing national laws and regulations. The methodology and underlying data are described in more detail in Koske et al. (2015).

are selected on the basis of existing theoretical and empirical literature and include: demand factors (market potential and market growth); the knowledge base of locations (workforce skills and R&D expenditure in the public sector); fiscal incentives and government funding of R&D in the business sector (including corporate taxation); externalities from agglomeration economies; broadband access; and business regulations.

CHAPTER 4

Attractiveness to high-value FDI: What location-specific factors matter?

4.1 ESTIMATED EFFECTS OF LOCATION-SPECIFIC FACTORS ON ATTRACTIVENESS TO HIGH-VALUE FDI PROJECTS IN THE EU AND UK

Table 4.1 shows estimated effects of location-specific factors on the attractiveness of a given location in the EU and UK to FDI in high-value sectors. The figures indicate the percentage change in the number of expected high-value FDI projects associated with an increase by 1% or by one unit of the respective analysed factors. Column 1 shows estimates for all FDI projects, while the columns that follow show estimates for FDI by sector (manufacturing and services) and by the origin of investors (from EU and UK or from non-EU/UK countries). The estimates are obtained with the fixed effects Poisson model described in Chapter 3. The detailed definitions of the variables and data sources are given in Appendix 2.

The fixed effects estimates account for unobserved location-specific characteristics that do not change or change very little over time and which affect the attractiveness of a given location to FDI; examples include common languages, common borders and common law systems. Time-specific effects common to all locations that affect the location choice of high-value FDI are captured with a time trend.

Looking first at the estimates for all FDI projects, the attractiveness of a given location to high-value FDI is positively associated with EU market potential, market growth, participation rate of the working age population in education and training programmes, workforce skills, the presence of agglomeration economies, R&D expenditure in the public sector (within Government and higher education sectors), government funding of business expenditure on research and development (BERD) and broadband access. Locations with low labour costs are also attractive to FDI in high-value sectors. Consistent with existing international evidence, our estimates indicate that FDI in high-value sectors are deterred by high corporate taxes, barriers to FDI and the complexity of business regulations.

The estimates in Columns 2 and 3 suggest only a few differences depending on whether FDI is in high-value manufacturing sectors or in high-value services. While the educational attainment of the working age population (upper secondary and third-level education) and R&D expenditure in the public sectors enhance the

attractiveness of a given region to FDI in services, these factors are not as important for FDI in manufacturing.

Finally, the estimates in Columns 4 and 5 indicate that investors from the EU and UK value location factors differently to investors from non-EU countries. While the participation rate of the working age population in education and training and broadband access are associated with enhanced attractiveness to FDI in high-value sectors by non-EU/UK investors, these location-specific factors do not affect the probability of a given location being chosen by EU investors over and above other determinants of FDI. While barriers to FDI deter EU investors, they do not affect the location choices by non-EU investors.

TABLE 4.1 ESTIMATED EFFECTS OF LOCATION-SPECIFIC FACTORS ON ATTRACTIVENESS TO HIGH-VALUE FDI PROJECTS IN THE EU AND UK

	(1)	(2)	(3)	(4)	(5)
Location-specific factors	All FDI	FDI in services	FDI in manufacturing	FDI by EU and UK investors	FDI by non-EU/UK investors
Domestic market potential (log)	0.176 (0.180)	0.083 (0.198)	0.443 (0.447)	0.374 (0.255)	0.107 (0.257)
EU market potential (log)	2.108*** (0.377)	1.835*** (0.418)	3.910*** (0.873)	2.526*** (0.563)	1.597*** (0.510)
GVA growth (%)	0.022*** (0.002)	0.023*** (0.003)	0.015*** (0.006)	0.025*** (0.004)	0.019*** (0.003)
Labour costs (log)	-1.484*** (0.177)	-1.128*** (0.197)	-2.787*** (0.426)	-1.842*** (0.252)	-1.236*** (0.251)
Education and training (%)	0.005** (0.002)	0.004* (0.002)	0.017*** (0.005)	-0.004 (0.003)	0.009*** (0.003)
Workforce skills (%)	0.024*** (0.003)	0.027*** (0.003)	0.004 (0.007)	0.020*** (0.004)	0.028*** (0.004)
Agglomeration economies (log)	0.115*** (0.016)	0.109*** (0.017)	0.104*** (0.037)	0.144*** (0.023)	0.091*** (0.021)
GERD in the public sector (log)	0.190*** (0.048)	0.268*** (0.055)	0.092 (0.103)	0.123* (0.066)	0.231*** (0.071)
Government funded BERD (%)	0.005*** (0.001)	0.003** (0.002)	0.010*** (0.003)	0.006*** (0.002)	0.004** (0.002)
Statutory corporate tax (%)	-0.018*** (0.003)	-0.018*** (0.003)	-0.019*** (0.006)	-0.028*** (0.004)	-0.010*** (0.004)
Broadband access (%)	0.004*** (0.001)	0.002** (0.001)	0.010*** (0.002)	-0.002 (0.002)	0.008*** (0.001)
Barriers to FDI	-0.271*** (0.081)	-0.182** (0.091)	-0.806*** (0.178)	-0.311*** (0.109)	-0.185 (0.121)
Complexity of regulations	-0.076*** (0.020)	-0.077*** (0.023)	-0.133*** (0.044)	-0.098*** (0.028)	-0.062** (0.028)
Time trend	-0.034*** (0.007)	-0.023*** (0.008)	-0.099*** (0.017)	-0.022** (0.011)	-0.041*** (0.010)
Observations	1,764	1,746	1,728	1,746	1,764
Number of locations	98	97	96	97	98
Number of FDI projects	30,736	25,233	5,503	13,385	17,351
Location-specific fixed effects	Yes	Yes	Yes	Yes	Yes
Log likelihood	-5305	-4635	-2909	-3939	-3976

Source: Authors' estimates.

Notes: Dependent variable: annual count of new greenfield FDI projects in high-value sectors in the EU and UK over 2003–2020. Estimates are obtained with a fixed effects Poisson estimator. Explanatory variables are lagged by one year with respect to the dependent variable. All explanatory variables are in logarithmic form with the exception of those in % and country scores (barriers to FDI and complexity of regulations). *, **, and *** indicate the variable is significant at the 10%, 5% and 1% level of significance, respectively. The estimates can be interpreted as percentage changes in the number of high-value FDI projects in a given location associated with a 1% change or a unit change in a given location-specific factor. Standard errors are shown in parentheses.

4.2 SUMMARY

This chapter discusses estimated effects of factors that influence the location choice of FDI on the attractiveness of regions and countries in the EU and UK to high-value FDI. Consistent with international evidence, the results indicate that the attractiveness of a given location is positively associated with: EU market potential; domestic market growth; low labour costs; agglomeration economies in knowledge-intensive sectors; availability of skills; R&D expenditure in the public sector; government funding of R&D in the business sector; broadband access; low corporate taxation; less restrictive regulations with respect to FDI; and less complex business regulations.

Some of these factors can be influenced directly by government policy; in particular, R&D expenditure in the public sector, workforce skills (participation in education and training and educational attainment), government funding of R&D in the business sectors, corporate taxation, broadband access and the regulatory framework for business (barriers to FDI and the complexity of business regulations).

The next chapter examines potential performance outcomes associated with policy choices and policy coordination options for enhancing the attractiveness to FDI in high-value sectors available to the Government of Ireland and the Northern Ireland Executive.

CHAPTER 5

Policy options for enhancing the attractiveness of the island of Ireland to high-value FDI

The estimates discussed in Chapter 4 indicate that the attractiveness of a given location to FDI in high-value sectors across the EU and UK is associated with a range of factors that could be influenced directly by government policy: investment in R&D in the public sector (within Government and higher education sectors); workforce skills (participation in education and training, upper secondary and third-level education attainment); government funding of R&D in the business sector; corporate taxation; broadband access; and the regulatory framework for businesses (barriers to FDI and complexity of business regulations).

On the basis of these results, in this chapter we examine a range of counterfactual performance outcomes associated with policy choices and potential policy coordination for enhancing the attractiveness to FDI in high-value sectors available to the Government of Ireland and the Northern Ireland Executive. We begin by examining a range of counterfactual estimates suggesting possible options for enhancing the attractiveness of Ireland and Northern Ireland to FDI in high-value sectors. We then examine complementarities and potential policy coordination options aiming at enhancing the attractiveness of both jurisdictions on the island to high-value FDI.

The estimates presented in Table 4.1 with respect to the importance of EU market potential as a driver of FDI in high-value sectors, including FDI in manufacturing, suggests that Northern Ireland's continued access to the EU Single Market for goods secured through the Northern Ireland Protocol is a key comparative advantage for Northern Ireland relative to the other regions in the UK. This result is in line with findings by Siedschlag and Tong Koecklin (2019), indicating sizeable gains in terms of attracting FDI in manufacturing in the case of Northern Ireland remaining in the EU Customs Union and the Single Market for goods and a Free Trade Agreement for the rest of the UK. In this context, improved transport connectivity such as through the Dublin–Belfast corridor could be beneficial for maximising potential gains.

TABLE 5.1 DETERMINANTS OF THE ATTRACTIVENESS TO HIGH-VALUE FDI: PERFORMANCES OF IRELAND AND NORTHERN IRELAND, 2015–2019 AND LATEST AVAILABLE YEAR

Factors that influence the attractiveness to high-value FDI	2015–2019		2020 or latest available year	
	Ireland	Northern Ireland	Ireland	Northern Ireland
Domestic market potential (€million)	1,511.5	3,043.2	1,696.5	3,020.6
EU market potential (€million)	6,170.2	4,452.3	6,295.5	4,673.4
Market growth (%)	4.8	1.3	4.9	-2.1
Labour costs (€thousand per employee)	101.0	66.9	107.0	66.8
Participation in education and training, pop. aged 25-64 (%)	9.4	10.5	11	10.9
Educational attainment of population aged 25-64 (%)	82.4	74.1	85.5	76.2
Agglomeration economies in knowledge-intensive sectors	20.1	14.7	19.8	15.9
GERD in the public sector per person (PPS per person)	143.4	94.9	141.9	97.6
Broadband access (%)	87.0	90.2	92.0	94.0
Government funded R&D in the business sector, % of BERD	28.3	28.3	17.4	28.2
Statutory corporate tax rate (%)	12.5	19.4	12.5	19.0
Barriers to FDI	0.26	0.37	0.26	0.37
Complexity of business regulations	3.37	2.46	3.37	2.46

Source: Authors calculations based on data from the Eurostat, European Commission, and OECD.

Notes: Agglomeration economies in knowledge intensive sectors are measured as the number of firms in knowledge-intensive sectors per 100 km². Domestic market potential, EU market potential, and labour costs are in 2015 prices. Gross expenditure on R&D (GERD) are in purchasing power standards (PPS) in 2005 prices. Barriers to FDI and Complexity of business regulations are country scores ranging from 0 to 6.

Table 5.1 shows the recent performance of Ireland and Northern Ireland with respect to the location-specific factors that influence the attractiveness to high-value FDI analysed in this report. Data for 2020 or the latest available year show Ireland performing better than Northern Ireland for a range of factors that influence the attractiveness to high-value FDI: EU market potential; market growth; participation in education and training of the working age population; workforce skills (upper secondary and third-level education); agglomeration economies in knowledge-intensive sectors; the intensity of R&D expenditure in the public sector; statutory corporate tax rate; and fewer barriers to FDI. Compared to Ireland, Northern Ireland has a comparative advantage with respect to domestic market potential (due to access to the rest of UK regions), labour costs and broadband access. Northern Ireland's performance in terms of government-funded R&D in the business sectors and the score for the complexity of business regulations are based on data for the UK. In the absence of data at regional level, it is not possible to assess whether Northern Ireland performs better than Ireland for these factors.

The above comparative data suggest that an all-island view of high-value FDI should take into account complementarities between the two jurisdictions, in

particular with respect to EU market potential, availability of workforce skills and investment in R&D within the public sector.

5.1 POLICY CHOICES FOR ENHANCING THE ATTRACTIVENESS OF IRELAND AND NORTHERN IRELAND TO HIGH-VALUE FDI

This section examines potential changes in the attractiveness of the two jurisdictions on the island of Ireland to high-value FDI associated with policy choices available to the Government of Ireland and the Northern Ireland Executive.

We focus on the following factors that can be influenced by government policy:

- participation in education and training of the working age population;
- educational attainment (upper secondary and third-level education) of the working age population;
- R&D expenditure in the public sector (within Government and higher education sectors);
- broadband access; and
- corporate tax rate.

The methodology for the counterfactual analysis is described in Box 5.1 below.

Box 5.1 Methodology for counterfactual analysis

We estimate a range of counterfactual changes in the expected number of FDI projects in Ireland and Northern Ireland associated with improved performance for factors that can influence their attractiveness to high-value FDI.

The estimated number of FDI projects \hat{y}_{jt} in location j (Ireland or Northern Ireland) at time t could be calculated from the following equation derived from the Poisson model with fixed effects described in Equation (3.2) in Chapter 3:

$$\hat{y}_{jt} = \exp(\hat{\alpha}_j + \mathbf{X}_{jt}\hat{\boldsymbol{\beta}}) \quad (5.1)$$

where $\hat{\alpha}_j$ is the estimated location fixed effects, \mathbf{X}_{jt} is the set of location-specific characteristics that are of interest and $\hat{\boldsymbol{\beta}}$ is the set of estimated coefficients that are associated with the location's characteristics.

Suppose we have a number of m location-specific factors. To estimate counterfactual outcomes, we replace the value of a chosen location-specific factor for Ireland and Northern Ireland, X_{jtk} , that can be influenced by policy with a chosen counterfactual (hypothetical) value, z_{jtk} , and keep the value of the rest $X_{jt,m-k}$ of the characteristics unchanged. Based on the estimated location fixed effects, the coefficients and the actual and counterfactual values of location characteristics, the counterfactual number of FDI projects is calculated as follows:

$$\tilde{y}_{jt} = \exp(\hat{\alpha}_j + \mathbf{X}_{jt,m-k}\hat{\boldsymbol{\beta}}_{m-k} + \hat{\beta}_k z_{jtk}) \quad (5.2)$$

The change in the expected number of FDI projects in the counterfactual relative to the baseline scenarios is given by:

$$\Delta y_{jt} = \tilde{y}_{jt}/\hat{y}_{jt} - 1 \quad (5.3)$$

The assumed values for the counterfactual performances of location-specific factors are as follows:

- Scenario 1: Performance similar to the average of the top three locations for high-value FDI;
- Scenario 2: Performance similar to the average of the top five locations for high-value FDI;
- Scenario 3: Performance similar to the average of the top ten locations for high-value FDI.

The above assumptions for the counterfactual performances considered in the analysis are made for the purpose of examining the sensitivity of the attractiveness of Ireland and Northern Ireland to high-value FDI to possible changes in location-specific factors that could be influenced by policy. These should not be interpreted as policy targets.

Table 5.2 shows the location-specific variables used in the counterfactual analysis.

TABLE 5.2 LOCATION-SPECIFIC VARIABLES USED IN THE COUNTERFACTUAL ANALYSIS

Location-specific factors	Ireland	Northern Ireland	Top 3 FDI locations average	Top 5 FDI location average	Top 10 FDI locations average
Education and training, % of population aged 25-64	11.0%	10.9%	14.2%	12.9%	14.5%
Educational attainment, % of population aged 25-64	85.5%	76.2%	79.3%	76.8%	80.4%
GERD in the public sector, million per person	141.9	97.6	346.7	351.8	383.9
Broadband access, % of households	92.0%	94.0%	94.0%	93.6%	93.9%

Source: Authors' calculations based on data from the Financial Times fDi Markets, Eurostat and OECD.

Notes: Gross expenditure on R&D (GERD) are in purchasing power standards (PPS) at 2005 prices.

These results of the counterfactual performance outcomes are obtained using the estimates for all high-value FDI presented in Column 1 of Table 4.1, the actual location-specific factors for Ireland and Northern Ireland including the unobserved factors captured by fixed effects and the respective counterfactual values. The baseline performances to which counterfactual outcomes are for 2020 or the latest available year.

Tables 5.3 and 5.4 show the estimated changes in the attractiveness of both jurisdictions on the island of Ireland in the cases of the three scenarios discussed above, using the location-specific factors shown in Table 5.2.

We estimate that the largest gains in terms of the number of high-value FDI projects would be in the case of higher R&D expenditure in the public sector. The number of high-value FDI projects would be higher by 18.5%–20.8% in Ireland and by 27.3%–29.8% in Northern Ireland. Further, we estimate that in a situation of a higher rate of participation in education and training, the number of FDI projects in high-value sectors would be higher by 1.0%–1.8% per annum in both Ireland and Northern Ireland (the current participation rates in Ireland and Northern Ireland are nearly the same). In a situation of a better educational attainment in Northern Ireland, the expected number of high-value FDI projects would be higher by 1.4%–10.6%. Given that Ireland's educational attainment performance is better than the corresponding average performances of the top three, top five and top ten locations respectively, we do not examine this policy scenario. Instead we estimate the changes in the expected numbers of high-value FDI projects in Ireland in a situation of an improved broadband access. In this situation, the number of high-value FDI projects attracted to Ireland would be higher by 0.6%–0.7% per annum.

TABLE 5.3 POTENTIAL CHANGES IN IRELAND'S ATTRACTIVENESS TO HIGH-VALUE FDI

% change in the annual average number of FDI projects in high-value sectors

Policy variables	Scenario 1	Scenario 2	Scenario 3
Education and training, % of population aged 25-64	1.7%	1.0%	1.8%
	(.007)	(.004)	(.007)
Gross R&D expenditure in the public sector, PPS per person	18.5%	18.8%	20.8%
	(.051)	(.052)	(.058)
Broadband access, % of households	0.7%	0.6%	0.7%
	(.002)	(.002)	(.002)

Notes: Gross expenditure on R&D (GERD) are in purchasing power standards (PPS) at 2005 prices. Standard errors are computed using the delta method and are reported in parentheses.

Source: Authors' calculations based on data from the Financial Times fDi Markets, Eurostat, and OECD.

TABLE 5.4 POTENTIAL CHANGES IN NORTHERN IRELAND'S ATTRACTIVENESS TO HIGH-VALUE FDI

% change in the annual average number of FDI projects in high-value sectors

Policy variables	Scenario 1	Scenario 2	Scenario 3
Education and training, % of population aged 25-64	1.7%	1.0%	1.8%
	(.007)	(.004)	(.007)
Educational attainment, % of population aged 25-64	7.7%	1.4%	10.6%
	(.010)	(.002)	(.014)
Gross R&D expenditure in the public sector, PPS per person	27.3%	27.6%	29.8%
	(.077)	(.079)	(.085)

Notes: Gross expenditure on R&D (GERD) are in purchasing power standards (PPS) at 2005 prices. Standard errors are computed using the delta method and are reported in parentheses. Educational attainment is measured as the share of the population aged 25-64 with upper secondary and third-level education.

Source: Authors' calculations based on data from the Financial Times fDi Markets, Eurostat and OECD.

In the case of the corporate tax rate, we estimate changes in the number of expected high-value FDI projects in Ireland and Northern Ireland in a situation of moving to a 15% statutory corporate tax rate in all jurisdictions.¹⁵ Such a scenario is in line with the proposed minimum corporate tax rate in the OECD-led global reform of corporate taxation. The results are shown in Table 5.5.

Table 5.5 shows estimated changes in the number of FDI projects in high-value sectors in Ireland and Northern Ireland in a situation of moving to a corporate tax rate of 15% in both jurisdictions. In such a situation, the number of high-value FDI projects attracted to Ireland would decrease by 4.4% per annum, while Northern Ireland would attract a larger number of high-value FDI projects, at an increase of 7.5% per annum.

¹⁵ Moving to a minimum 15% corporate tax rate in all jurisdictions will affect the attractiveness to FDI of each jurisdiction and the total number of FDI across all locations. We report the estimates for Ireland and Northern Ireland because these are of interest for the analysis in this report. The estimated changes for the rest of the locations in the EU and UK are available from the authors upon request.

TABLE 5.5 EFFECTS ON THE ATTRACTIVENESS TO FDI IN HIGH-VALUE SECTORS OF MOVING TO A STATUTORY CORPORATE TAX RATE AT 15% IN IRELAND AND NORTHERN IRELAND

	Statutory corporate tax rate, 2020	Number of high-value FDI projects, baseline	Expected number of high-value FDI projects	Change relative to baseline, %
Ireland	12.5	104.5	99.9	-4.4% (0.006)
Northern Ireland	19.0	17.6	19.0	7.5% (0.012)

Notes: Standard errors are computed using the delta method and are reported in parentheses.

Source: Authors' estimates based on data from the Financial Markets fDi Markets and OECD.

On the basis of our analysis discussed in Chapter 4, we suggest a number of policy choices available to the Government of Ireland to compensate for the reduced attractiveness to high-value FDI due to the increased corporate tax rate. We examine the potential compensatory effects of three such policy choices:

- increasing government funding of R&D in the business sector;
- incentivising and enabling a higher proportion of the working age population to enrol in education and training programmes; and
- increasing R&D expenditure in the public sector.

The required change in the respective location-specific factors to compensate for the effect of the increased corporate tax rate is obtained using the definition of the elasticity of the expected number of FDI projects with respect to a change in a location-specific characteristic, ϵ_{jk} :

$$\epsilon_{jk} = \frac{\partial \ln E(n_{jt})}{\partial x_{jkt}} \quad (5.4)$$

The required change in a specific location factor, ∂x_{jkt} , to compensate for the 4.4% reduction in the number of FDI projects in Ireland is obtained as follows:

$$\partial x_{jkt} = 4.4\% / \epsilon_{jk} \quad (5.5)$$

Table 5.8 shows the results of estimated increases needed for each of the four policy levers in order to compensate a reduction by 4.4% per annum in the number of expected high-value FDI projects in Ireland.

TABLE 5.6 POLICY CHOICES TO COMPENSATE THE REDUCTION IN ATTRACTIVENESS TO FDI DUE TO MOVING TO A STATUTORY CORPORATE TAX RATE AT 15% IN IRELAND

Location-specific factors	Elasticity	Estimated change in expected number of high-value FDI projects relative to baseline	Performance in 2020 or latest available year	Estimated performance
Gross R&D expenditure in the public sector, PPS per person	0.19	23.1%	141.9	174.7
Government funding of BERD, % of BERD	0.49	9.0 pp	17.4%	26.4%
Education and training participation, % of population age 25-64	0.51	8.6 pp	11.0%	19.6%
Workforce skills, % of population age 25-64	2.40	1.8 pp	85.5%	87.3%

Notes: Gross R&D expenditure in the public sector are in purchasing power standards (PPS) at 2005 prices. BERD stands for R&D expenditure in the business sector. Workforce skills are measured by the proportion of the working age population with upper secondary and third-level education. The elasticities for Ireland with respect to the location-specific factors are obtained using the estimates reported in Table 4.1 for all FDI (Column 1) and Ireland's observed and unobserved specific factors.

Source: Authors' estimates based on data from the Financial Markets fDi Markets and OECD.

The estimates shown in Table 5.6 above suggest that the 4.4% per annum reduction in the expected number of high-value FDI projects associated with moving to a corporate tax rate of 15% could be compensated by an increase by 23.1% in the intensity of gross R&D expenditure in the public sector, from 141.9 PPS per person (in 2005 prices) to 174.7 PPS per person (in 2005 prices).

Alternatively, Government could increase the share of government funding of R&D in the business sectors by 9.0 percentage points, from 17.4% (in 2018) to 26.4%. Another option could be to incentivise and enable a higher proportion of the working age population to participate in education and training, from 11% to 19.6% – an increase of 8.6 percentage points.

Finally, the reduction in Ireland's attractiveness to high-value FDI associated with an increase in the corporate tax rate to 15% can be compensated by a higher proportion of the working wage population with upper secondary and third-level education: from 85.5% to 87.3%, or an increase of 1.8 percentage points.

5.2 ENHANCING THE ATTRACTIVENESS OF THE ISLAND OF IRELAND TO FDI IN HIGH-VALUE SECTORS THROUGH POLICY COORDINATION AND COOPERATION

This section discusses potential benefits from policy coordination and cooperation between the Government of Ireland and the Northern Ireland Executive in terms

of enhancing the attractiveness of the island of Ireland to high-value FDI. For this purpose, we link the results of our empirical analysis to insights from international evidence and draw implications for policy coordination and cooperation options.

There is a large body of literature on FDI into the EU that explores the importance of inter-country cooperation. This research largely focuses on the use of various regional or structural funds at EU level to support less developed regions. (See, for example, Basile et al., 2008, and Bruno et al., 2021. The extent of historical EU collaboration and the effects on FDI flows is discussed in detail in Crescenzi et al., 2021.) However, some literature focuses more generally on the importance of cooperation, or its lack, in determining the volume of FDI that a region will attract. A particularly well-known example of this is the Mercosur region, with Baer et al. (2016) demonstrating that had there been greater collaboration between the countries concerned, FDI into the region would have been significantly higher.¹⁶

Perhaps the recent analysis by Barota et al. (2019) is more pertinent to our focus. This work explores the links between FDI collaboration, as well as collaboration in other related areas such as innovation. It shows that greater collaboration on both FDI policy and innovation policy, while treating these two issues as distinct in policy terms, not only maximises FDI flows but also the benefits from FDI in terms of spillovers. This is particularly important in the case of the island of Ireland, where the long-term aim should be not simply to maximise FDI flows, but also to maximise the benefits that accrue from this, either side of the border. A border, where present, requires policy coordination. The absence of competitions between regions regarding an investment, which in turn facilitates a location that fosters the greatest level of collaboration between domestic firms and inward investors, will generate overall better outcomes than a situation in which bordering regions compete for FDI. Coordination of supply chains is also important, as is facilitating cooperation across the border. Recent work on the Western Balkans by Uvalić (2019) is instructive here, detailing how high levels of economic integration increased trade, FDI, financial and banking integration.

One must also consider how other policies may come into play here, particularly in terms of regional or national governance. Pasquinelli and Vuignier (2020) explore this through a series of case studies: Ontario (Canada), Tuscany (Italy) and western Switzerland. They illustrate how FDI policy cannot exist in a vacuum, but is part of the narrative on place marketing and planning, in addition to the issues around innovation discussed above.

¹⁶ Full members of Mercosur are Argentina, Brazil, Paraguay and Uruguay. Venezuela is a full member but has been suspended since 1 December 2016. Associate countries are Bolivia, Chile, Colombia, Ecuador, Guyana, Peru and Suriname.

Our research finds that EU market potential is a key driver of location choice of high-value FDI. This result is consistent with theoretical and empirical literature on the location choice of multinationals. Indeed, one could argue that one of the most significant aspects of the creation of the Single Market was the amount of ‘market-seeking’ FDI that the EU attracted. This highlights both the opportunity that Brexit presents for inward investment generation within the island of Ireland, and the need for cross-border cooperation. As discussed by Lawless (2021), recognition of qualifications and the labour mobility enabled by the Common Travel Area between Ireland and the UK will mitigate some of the potential negative effects of Brexit on cross-border services trade on the island of Ireland.

Insofar as it is possible to present a coordinated investment offering for particular sectors, supply chains or regions, and to align policies to maximise the benefits of these opportunities, Ireland and Northern Ireland have an opportunity to enhance the FDI proposition of the island as a whole. Both scale and policy coordination are fundamental to this, especially where markets for key factors are thin on the ground (for example, skilled labour), and the potential for cross-border supply chains in key FDI sectors can maximise the place-based assets, north and south of the island. The examples presented by Pasquinelli and Vuignier (2020) illustrate this, through the critical aspects of policy integration.

Our research results indicate that investment in R&D within both Government and higher education sectors is an important driver of high-value FDI. Existing cooperation on R&D on an all-island basis, such as through initiatives like the North–South Research Programme¹⁷ and the proposed all-island centres of research excellence¹⁸ could contribute to enhancing the attractiveness of both jurisdictions to high-value FDI. Further research could analyse in greater depth the impact of these and future research cooperation initiatives on the attractiveness of the island of Ireland to high-value FDI.

5.3 SUMMARY

This chapter examines possible policy choices and coordination options available to the Government of Ireland and Northern Ireland Executive for enhancing the attractiveness of Ireland and Northern Ireland to high-value FDI.

A range of possible scenarios for enhancing the attractiveness of both jurisdictions on the island of Ireland were examined related to factors that can be influenced directly by government policy, including R&D expenditure in the public sector, workforce skills, broadband access and corporate taxation. The research finds that

¹⁷ Details are available from <https://hea.ie/funding-calls/north-south-research-programme/>.

¹⁸ Details are available from <https://www.sfi.ie/strategy/SFI-Strategy-2025-Shaping-Our-Future.pdf>.

the largest gains in terms of the number of high-value FDI that would be attracted to both Ireland and Northern Ireland would be in the case of higher R&D expenditure in the public sector. Northern Ireland's attractiveness to high-value FDI would be also substantially increased in a situation of increased educational attainment of the working age population.

Our estimates indicate that moving to a corporate tax rate of 15% would increase the expected number of high-value FDI projects going to Northern Ireland by 7.5% per annum, with a corresponding reduction of 4.4% per annum in the case of Ireland. To compensate for Ireland's reduced attractiveness to FDI due to the higher corporate tax rate, possible policy choices that could be considered include: increased R&D expenditure in the public sector (an increase of 23.2% per annum regarding the intensity of R&D expenditure in the public sector); increased government funding of R&D in the business sector (an increase of nine percentage points of the share of the direct and indirect government funding of R&D in the business sector); incentivising a higher proportion of the working age population to participate in education and training programmes (an increase of 8.6 percentage points per annum); and having a higher proportion of the working age population with upper secondary and third-level education (an increase of 1.8 percentage points).

On the basis of international evidence and research results presented in this report, this chapter highlights potential benefits in terms of enhancing the attractiveness of both jurisdictions on the island of Ireland that are to be gained by policy cooperation and cooperation between the Government of Ireland and Northern Ireland.

The research finding that EU market potential is a key driver of the location choice of high-value FDI, including high-value FDI in manufacturing, suggests that Northern Ireland's continued access to the EU Single Market for goods secured through the Northern Ireland Protocol is a key comparative advantage for Northern Ireland relative to other regions in the UK. This chapter also highlights both the opportunity that Brexit presents for inward investment generation within the island of Ireland, and the need for cross-border cooperation.

The results of this research suggest that to the extent that an all-island view of high-value FDI is possible, attractiveness to high-value FDI across the island could be enhanced by considering complementarities between the two jurisdictions, in particular with respect to EU market potential, availability of workforce skills and investment in R&D in the public sector. Such an approach, particularly with respect to the availability of workforce skills, is facilitated by recognition of professional

qualifications and labour mobility enabled by the Common Travel Area between Ireland and the UK.

Our research results indicate that investment in R&D within both Government and higher education sectors is an important driver of high-value FDI. This finding suggests that existing frameworks for cooperation on R&D on an all-island basis, such as the North–South Research Programme and the proposed all-island centres of research excellence, are likely to contribute to enhancing the attractiveness of both jurisdictions to high-value FDI. Further research could analyse in greater depth the impact of these and future research cooperation initiatives on the attractiveness of the island of Ireland to high-value FDI.

CHAPTER 6

Conclusions and implications for policy

This research study examined factors and policies that could enhance the attractiveness of the island of Ireland to FDI in high-value knowledge-intensive sectors. Building on the existing theoretical and empirical literature, the attractiveness to FDI was assessed in terms of the likelihood of Ireland and Northern Ireland being chosen as locations for FDI relative to competing locations in the EU and UK.

The research focused on new greenfield FDI projects established on the island of Ireland and the rest of the EU and UK over the period 2003–2020. The empirical analysis used a newly generated dataset combining information from a range of data sources. Data on new greenfield FDI projects established on the island of Ireland and across EU and UK regions and countries over the past two decades (sourced from the Financial Times fDi Markets) were combined with data on location-specific factors that influence the location choices of FDI projects (sourced from the European Commission, Eurostat and OECD). In terms of methodology, the research combines descriptive analysis with econometric modelling.

The research report provides novel empirical evidence on the following:

- i. patterns of high-value FDI on the island of Ireland compared with patterns for Great Britain and the rest of the EU;
- ii. the importance of a range of location-specific factors that influence the location choice of FDI in high-value sectors in the EU and UK – domestic and EU market potential, workforce skills, labour costs, R&D expenditure in the public sector, agglomeration economies, government funding of R&D in the business sector, corporate taxation, broadband access and business regulations; and
- iii. possible scenarios for enhancing the attractiveness of the two jurisdictions on the island to high-value FDI associated with a range of policy choices and coordination options available to the Government of Ireland and the Northern Ireland Executive. Potential policy levers considered include workforce skills, R&D expenditure in the public sector, broadband access and corporate taxation.

The key research findings and implications for policy are summarised below.

Over the analysed period, high-value FDI in Ireland and Northern Ireland accounted for substantial shares of all new greenfield FDI projects. At over 70%, these shares are higher than the corresponding averages for Great Britain and the rest of the

EU. The performances of Ireland and Northern Ireland in terms of the intensity of jobs created by high-value FDI over the period (the number of jobs created per high-value FDI project) are also better than the corresponding averages for Great Britain and the rest of the EU.

In terms of sectoral composition, high-value FDI in services dominate in both jurisdictions, accounting for 86% of all high-value FDI projects in Ireland and 91% of all high-value FDI projects in Northern Ireland. The corresponding shares for Great Britain and the rest of the EU are 87% and 80%.

Over two-thirds of high-value FDI on the island of Ireland is by investors from outside the EU. Investors from non-EU countries account for three-quarters of high-value FDI in Great Britain while in the rest of the EU, high-value FDI is evenly split between investors from the EU and non-EU countries.

In terms of FDI intensity (measured as the cumulated number of FDI projects in high-value sectors per one million inhabitants over the period 2003–2020), out of 98 locations included in the analysis, Ireland is among the top ten locations and Northern Ireland ranks above the performance of the median location (the location in the middle of the distribution of FDI intensity). For all high-value FDI Ireland ranks fourth, while Northern Ireland ranks seventeenth (above Scotland, North East England and Wales). Ireland's best performance (ranked first across the 98 locations in the EU and UK) is for high-value FDI in manufacturing, while Northern Ireland's best performance (ranked twelfth across the 98 locations in the EU and UK) is for high-value FDI from non-EU countries.

Consistent with international evidence, the research results indicate that the attractiveness of a given location in the EU and UK is positively associated with: EU market potential; domestic market growth; low labour costs; agglomeration economies in knowledge-intensive sectors; availability of skills; R&D expenditure in the public sector; government funding of R&D in the business sector; broadband access; low corporate taxation; less restrictive regulations with respect to FDI; and less complex business regulations. Some of these factors can be influenced directly by government policy; in particular, R&D expenditure in the public sector, workforce skills (participation in education and training and educational attainment), government funding of R&D in the business sectors, corporate taxation, broadband access and the regulatory framework for business (barriers to FDI and the complexity of business regulations).

The report highlights a number of complementarities between the two jurisdictions on the island with respect to factors that influence attractiveness to high-value FDI. Data for 2020 or the latest available year indicate that Ireland

performs better than Northern Ireland in terms of: EU market potential; market growth; workforce skills (participation in education and training of the working age population, upper secondary and third-level education attainment); agglomeration economies in knowledge-intensive sectors; intensity of R&D expenditure in the public sector; statutory corporate tax rate; and having fewer barriers to FDI. Compared to Ireland, Northern Ireland has comparative advantages with respect to domestic market potential (due to access to the rest of UK regions), labour costs and broadband access.

A range of possible scenarios for enhancing the attractiveness of both jurisdictions on the island of Ireland were examined. These relate to factors that can be influenced directly by government policy, including R&D expenditure in the public sector, workforce skills, broadband access and corporate taxation. The research finds that the largest gains in terms of the number of high-value FDI that would be attracted to both Ireland and Northern Ireland would occur with higher R&D expenditure in the public sector. Northern Ireland's attractiveness to high-value FDI would also be substantially increased through an increase in the educational attainment of the working age population.

Our estimates indicate that moving to a corporate tax rate of 15% – in line with the proposed minimum corporate tax rate in the OECD-led global reform of corporate taxation – would increase the expected number of high-value FDI going to Northern Ireland by 7.5% per annum, with a corresponding decrease of 4.4% per annum in those going to Ireland. To compensate for the reduction in Ireland's attractiveness to FDI caused by the higher corporate tax rate, policy choices include: increased R&D expenditure in the public sector; increased government funding of R&D in the business sector; incentivising a higher proportion of the working age population to participate in education and training programmes; and having a higher proportion of the working age population with upper secondary and third-level education.

On the basis of international evidence and our research results, this report highlights potential benefits, in terms of enhancing the FDI attractiveness of both jurisdictions on the island of Ireland, to be gained from policy cooperation and cooperation between the Government of Ireland and Northern Ireland.

The research finding that EU market potential is a key driver of location choice of high-value FDI, including high-value FDI in manufacturing, suggests that Northern Ireland's continued access to the EU Single Market for goods secured through the Northern Ireland Protocol is a key comparative advantage for Northern Ireland relative to other regions in the UK.

Our research results indicate that investment in R&D within Government and higher education sectors is an important driver of high-value FDI. This finding suggests that to the extent that existing cooperation initiatives on an all-island basis, such as the North–South Research Programme and the proposed all-island centres of research excellence, increase investment in R&D, these are likely to contribute to enhancing the attractiveness of both jurisdictions to high-value FDI. Further research could analyse in more depth the impact of these and future research cooperation initiatives on the attractiveness of the island of Ireland to high-value FDI.

The results of this research suggest that attractiveness to high-value FDI across the island could be enhanced by considering complementarities between the two jurisdictions, in particular with respect to EU market potential, availability of workforce skills and R&D expenditure in the public sector.

The findings of this study could inform policy choices seeking to enhance the attractiveness of the island of Ireland to FDI in high-value sectors and to strengthen the productivity and competitiveness of both Ireland and Northern Ireland. To the extent that an all-island view on attracting high-value FDI is possible, policy coordination and cooperation in these areas could contribute to maximising benefits both sides of the border.

Further research

Building on the findings of this study, further research could examine factors and enterprise policies underlying the establishment of new indigenous companies in high-value sectors and cross-border spillover effects from establishment by foreign affiliates on the performance of indigenous companies across the island of Ireland. The analysis would also assess and take into account the implications of the Northern Ireland Protocol offering comparative advantages to Northern Ireland in terms of attractiveness to FDI compared to the rest of the UK.

A further research strand could examine in greater depth the factors and policies underlying the attractiveness of border regions in both jurisdictions to FDI and indigenous companies in high-value sectors. The potential for knowledge spillovers from foreign affiliates to indigenous companies in border regions might also be usefully explored. The results of this research could inform the design of policies that might be taken in both jurisdictions to enhance the attractiveness of border regions to high-value tech-sectors and to identify opportunities for cross-border economic integration.

Further research could also explore the interactive influence of national and sub-national factors, as well as the influence of interactions of economic factors with

local governance on the location choice of FDI across the island. This would require the availability of data at a more disaggregated level than is currently the case. It would also require the development of more advanced methodological tools to deal with causality and spatial dependence. The results of such research could inform the design of policies seeking to enable and foster the diffusion of knowledge and innovation on the island of Ireland, thus strengthening the productivity and competitiveness of both Ireland and Northern Ireland.

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APPENDIX 1

NUTS 1 regions in the EU and the UK

TABLE A.1 NUTS 1 REGIONS IN THE EU AND THE UK

Country	Country code	NUTS 1 code	Region name
Austria	AT	AT1	East Austria
		AT2	South Austria
		AT3	West Austria
Belgium	BE	BE1	Brussels Capital Region
		BE2	Flemish Region
		BE3	Walloon Region
Bulgaria	BG	BG3	Northern and Eastern Bulgaria
		BG4	South Western and South Central Bulgaria
Cyprus	CY	CY0	Cyprus
Czech Republic	CZ	CZ0	Czech Republic
Germany	DE	DE1	Baden-Württemberg
		DE2	Bavaria
		DE3	Berlin
		DE4	Brandenburg
		DE5	Bremen
		DE6	Hamburg
		DE7	Hessen
		DE8	Mecklenburg-Vorpommern
		DE9	Lower Saxony
		DEA	North Rhine-Westphalia
		DEB	Rhineland-Palatinate
		DEC	Saarland
		DED	Saxony
		DEE	Saxony-Anhalt
		DEF	Schleswig-Holstein
Denmark	DK	DK0	Denmark
Estonia	EE	EE0	Estonia
Greece	EL	EL3	Attica
		EL4	Nisia Aigaiou, Kriti
		EL5	Voreia Ellada
		EL6	Kentriki Ellada

TABLE A.1 (CONTD.) NUTS 1 REGIONS IN THE EU AND THE UK

Country	Country code	NUTS 1 code	Region name
Spain	ES	ES1	North West
		ES2	North East
		ES3	Community of Madrid
		ES4	Centre
		ES5	East
		ES6	South
		ES7	Canary Islands
Finland	FI	FI1	Mainland Finland
		FI2	Åland*
France	FR	FR1	Île-de-France
		FRB	Centre-Val de Loire
		FRC	Bourgogne-Franche-Comté
		FRD	Normandy
		FRE	Hauts-de-France
		FRF	Grand-Est
		FRG	Pays de la Loire
		FRH	Brittany
		FRI	Nouvelle-Aquitaine
		FRJ	Occitane
		FRK	Auvergne-Rhône-Alpes
		FRL	Provence-Alpes-Côte d'Azur
		FRM	Corsica
Croatia	HR	HR0	Croatia
Hungary	HU	HU1	Central Hungary
		HU2	Transdanubia
		HU3	Great Plain and North
Ireland	IE	IE0	Ireland
Italy	IT	ITC	North West
		ITF	South
		ITG	Islands
		ITH	North East
		ITI	Centre
Lithuania	LT	LT0	Lithuania
Luxembourg	LU	LU0	Luxembourg
Latvia	LV	LV0	Latvia
Malta	MT	MT0	Malta
Netherlands	NL	NL1	North Netherlands
		NL2	East Netherlands
		NL3	West Netherlands
		NL4	South Netherlands

TABLE A.1 (CONTD.) NUTS 1 REGIONS IN THE EU AND THE UK

Country	Country code	NUTS 1 code	Region name		
Poland	PL	PL2	South Macroregion		
		PL4	North West Macroregion		
		PL5	South West Macroregion		
		PL6	North Macroregion		
		PL7	Central Macroregion		
		PL8	East Macroregion		
		PL9	Masovian Macroregion		
		Portugal	PT	PT1	Continental Portugal
				PT2	Azores*
PT3	Madeira*				
Romania	RO	RO1	Macroregion One		
		RO2	Macroregion Two		
		RO3	Macroregion Three		
		RO4	Macroregion Four		
Sweden	SE	SE1	East Sweden		
		SE2	South Sweden*		
		SE3	North Sweden*		
Slovenia	SI	SI0	Slovenia		
Slovakia	SK	SK0	Slovakia		
United Kingdom	UK	UKC	North East		
		UKD	North West		
		UKE	Yorkshire and the Humber		
		UKF	East Midlands		
		UKG	West Midlands		
		UKH	East of England		
		UKI	Greater London		
		UKJ	South East		
		UKK	South West		
		UKL	Wales		
		UKM	Scotland		
UKN	Northern Ireland				

Notes: * These regions were not included in the analysis because data on FDI in high-value sectors were not available.

APPENDIX 2

Definitions of variables and data sources

TABLE A.2 DEFINITIONS OF VARIABLES AND DATA SOURCES

Variables	Variable definitions	Data sources
FDI in high-value sectors, number of projects	Number of new greenfield FDI projects in high-value sectors	Financial Times fDi Markets database.
Demand factors		
Domestic market potential (GVA-based)	Summation over all regions in a country of their GVAs divided by internal transport costs of the home region or bilateral transportation costs between them and the home region (€million at 2015 prices).	Authors' calculations based on data from the Eurostat and Persyn et al. (2020).
EU market potential (GVA based)	Summation over all EU28 regions, other than the home region, of their GVAs divided by the bilateral transport costs between them and the home region (€million at 2015 prices).	Authors' calculations based on data from the Eurostat and Persyn et al. (2020).
Market growth – Average annual growth of real GVA	GVA in 2015 constant prices in a given year divided by GVA in the previous year minus 1 and multiplied by 100 (%).	Authors' calculations based on data from Eurostat.
Production costs		
Labour costs	Gross value added in 2015 prices divided by total number of employed persons (€thousand at 2015 prices).	Authors' calculations based on data from Eurostat.

TABLE A.2 (CONTD.) DEFINITIONS OF VARIABLES AND DATA SOURCES

Variables	Variable definitions	Data sources
Knowledge base		
Education and training participation	Participation rate of education or training in the last four weeks of population age 25-64 years.	Eurostat
Workforce skills	Percentage of population aged 25-64 years with upper secondary and third-level education.	Eurostat
GERD in the public sector per population	Gross domestic expenditure on R&D (GERD) in the government sector and in the higher education sector per person (purchasing power standards in 2005 prices).	Authors' calculations based on Eurostat data.
Agglomeration economies		
Number of firms in knowledge-intensive sectors per 100km ²	Number of firms in knowledge-intensive sectors per 100km ²	Authors' calculations based on Eurostat data.
Fiscal incentives		
Corporate tax rate	Statutory corporate tax rate, %	OECD

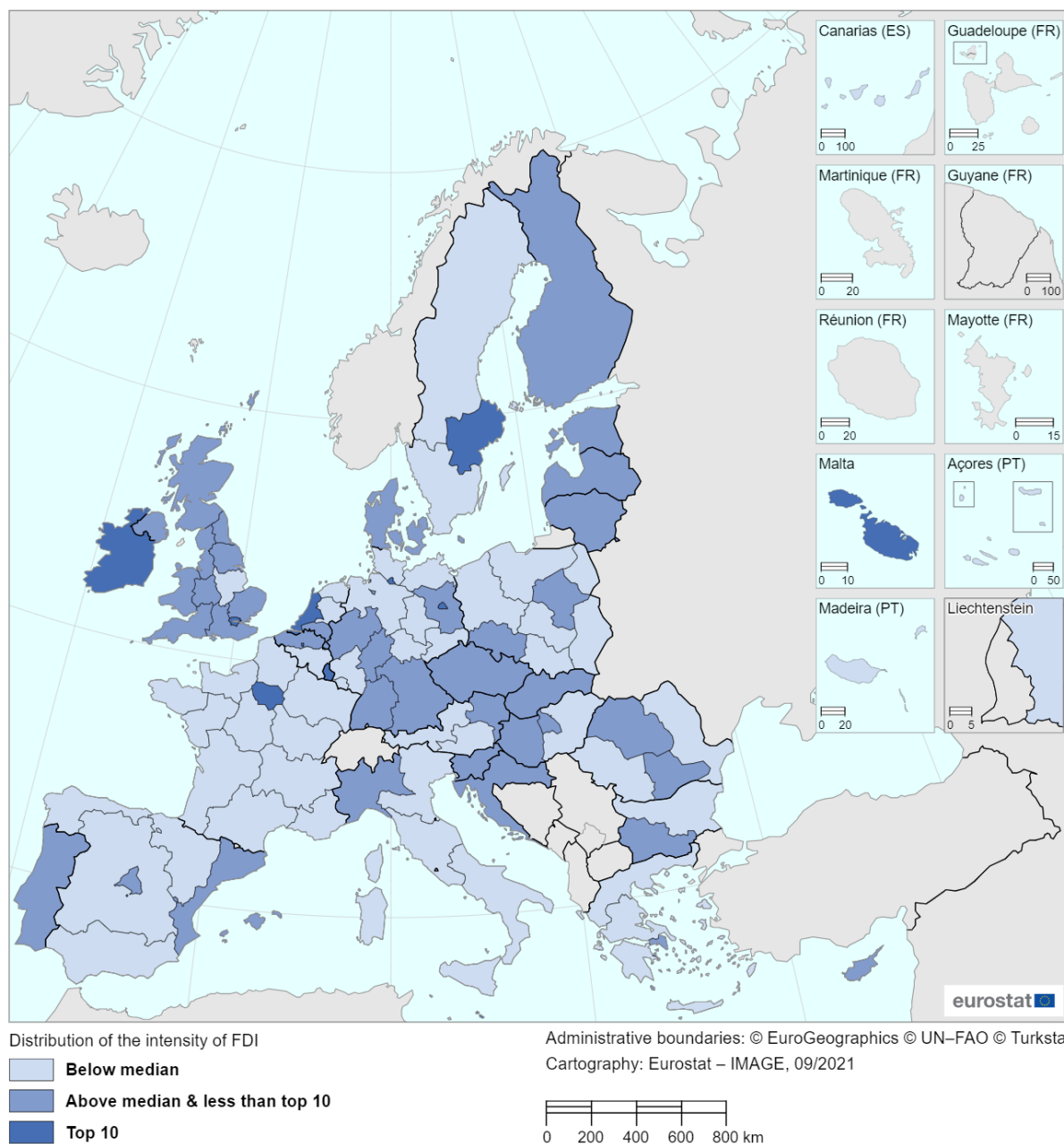
TABLE A.2 (CONTD.) DEFINITIONS OF VARIABLES AND DATA SOURCES

Variables	Variable definitions	Data sources
Indirect government funding of business expenditure on R&D (BERD)	Indirect government support through R&D tax incentives, % of BERD.	OECD
Direct government funding of BERD	Direct government funded R&D in the business sector, % of BERD.	OECD
Government funding of BERD, % of BERD	Cumulated indirect and direct government funding of R&D in the business sector, % of BERD.	OECD
Infrastructure		
Broadband access	Percentage of households with broadband access, %	Eurostat
Business regulations		
Barriers to FDI	Country score measuring the restrictiveness of a country's FDI rules in terms of foreign equity limitations, screening or approval mechanisms, restrictions on the employment of foreigners as key personnel and operational restrictions. The country scores range from 0 (no restrictions) to 6 (highest restrictiveness).	OECD indicators of product market regulations.
Complexity of regulatory procedures	Country score measuring complexity of regulatory procedures in licenses and permits system and in communication and simplification of rules and procedures. The country scores range from 0 (least complexity) to 6 (highest complexity).	OECD indicators of product market regulations.

APPENDIX 3

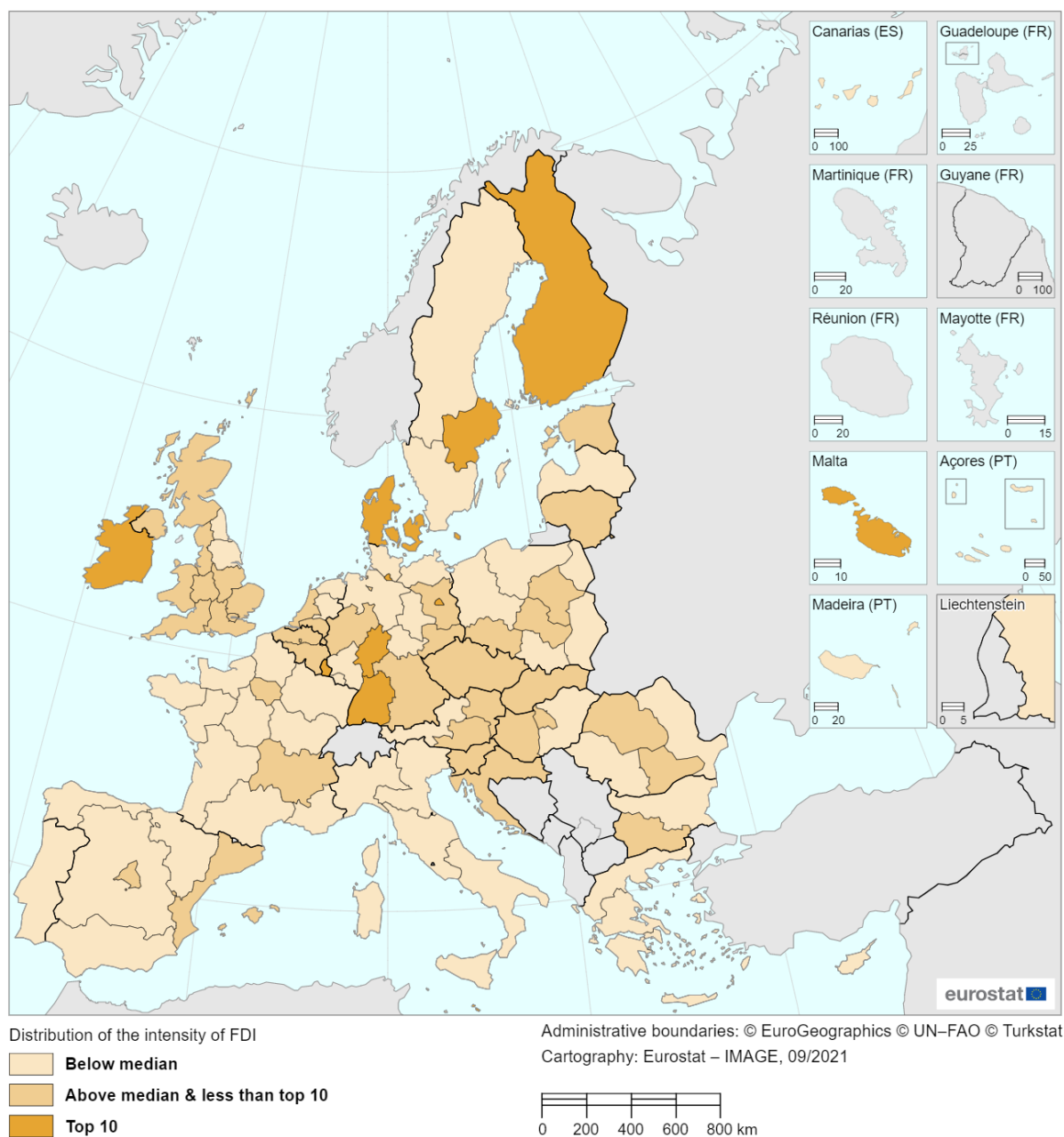
Maps

FIGURE A3.1 INTENSITY OF FDI IN HIGH-VALUE SECTORS IN THE EU AND UK, 2003–2020 – ALL FDI



Notes: The FDI intensity is measured as the cumulated number of high-value FDI projects over the period 2003–2020 per one million inhabitants. Locations outside the EU and UK (shown in grey colour) are not included in the analysis. The median FDI intensity across the analysed locations is 27.2 high-value FDI projects per one million inhabitants. The top ten locations for high-value FDI projects are the following (NUTS1 regions): Greater London, Luxembourg, Brussels Region, Ireland, Berlin Region, Malta, Hamburg, Île-de-France, East Sweden and West Netherlands.

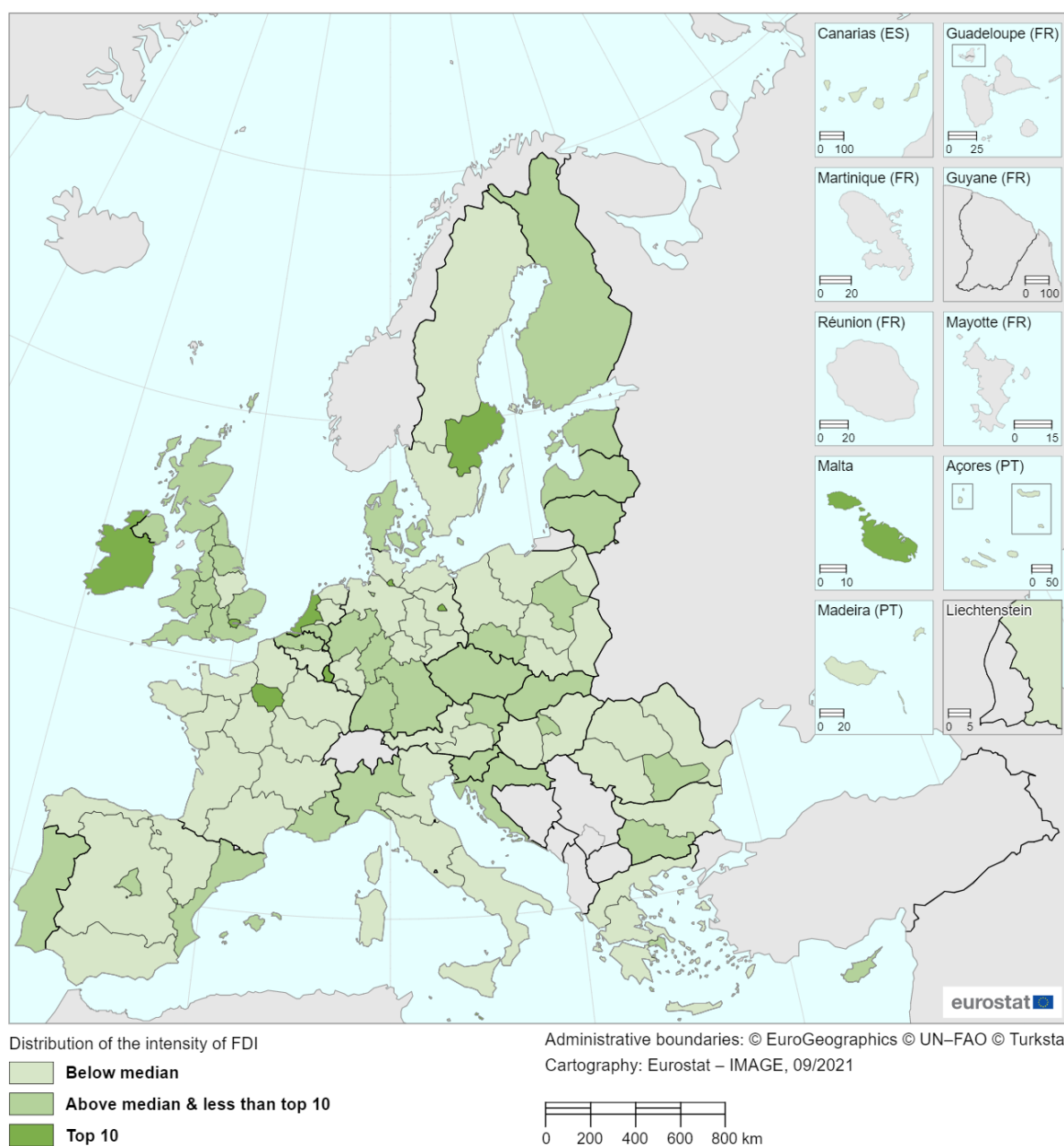
Source: Authors’ calculations based on data from the Financial Times fDi Markets and Eurostat. Maps were produced using the Eurostat IMAGE software.

FIGURE A3.2 INTENSITY OF FDI IN HIGH-VALUE SECTORS IN THE EU AND UK – FDI IN MANUFACTURING

Notes: The FDI intensity is measured as the cumulated number of high-value FDI projects over the period 2003–2020 per one million inhabitants. Locations outside the EU and UK not included in the analysis (shown in grey colour). The median FDI intensity across the analysed locations is 7.3 high-value FDI projects in manufacturing per one million inhabitants. The top ten locations for high-value FDI projects in manufacturing are the following (NUTS1 regions): Ireland, Malta, Baden-Württemberg, Luxembourg, East Sweden, Berlin Region, Denmark, Mainland Finland, Hessen and Hamburg Region.

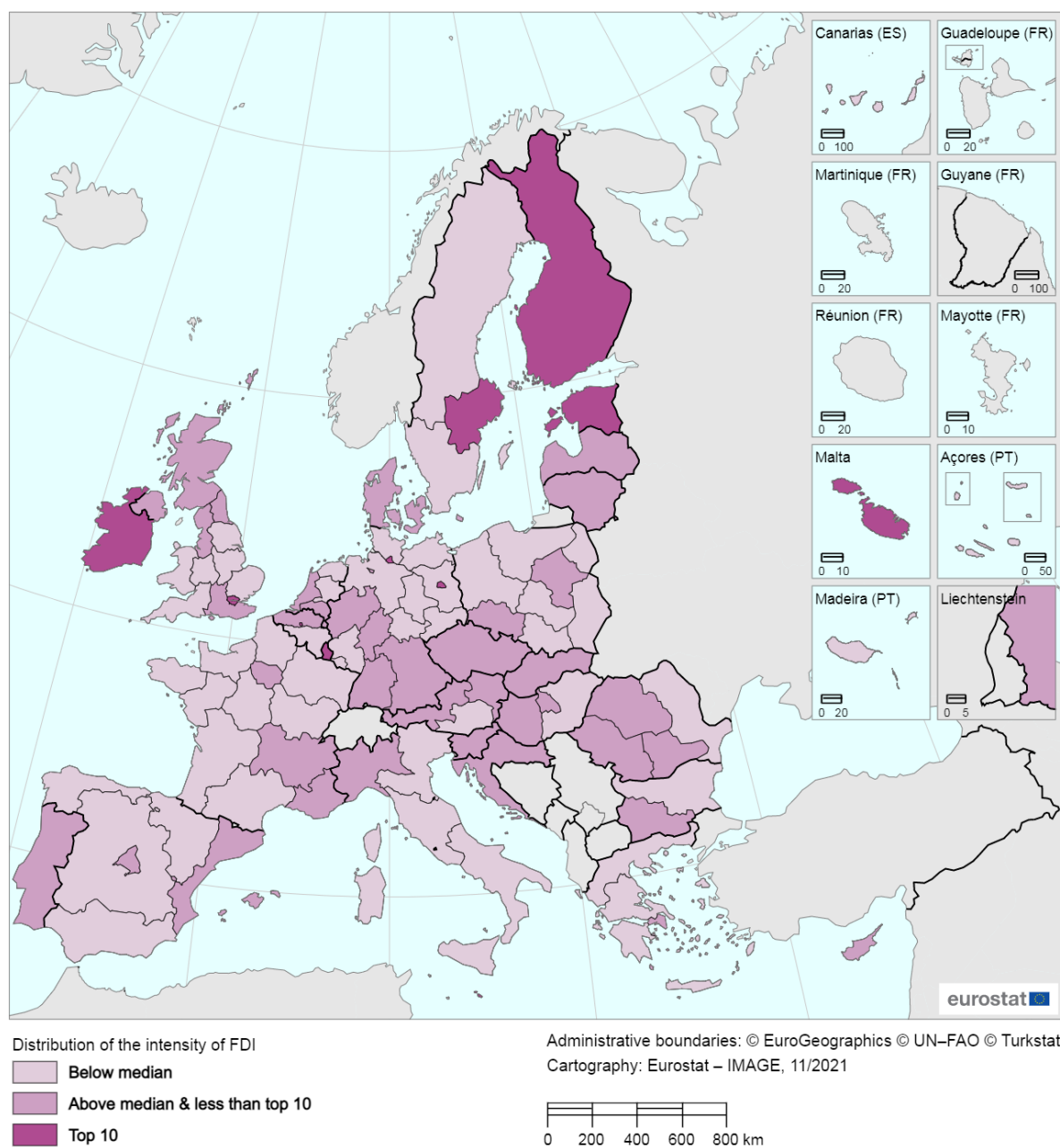
Source: Authors' calculations based on data from the Financial Times fDi Markets and Eurostat. Maps were produced using the Eurostat IMAGE software.

FIGURE A3.3 INTENSITY OF FDI IN HIGH-VALUE SECTORS IN THE EU AND UK – FDI IN SERVICES



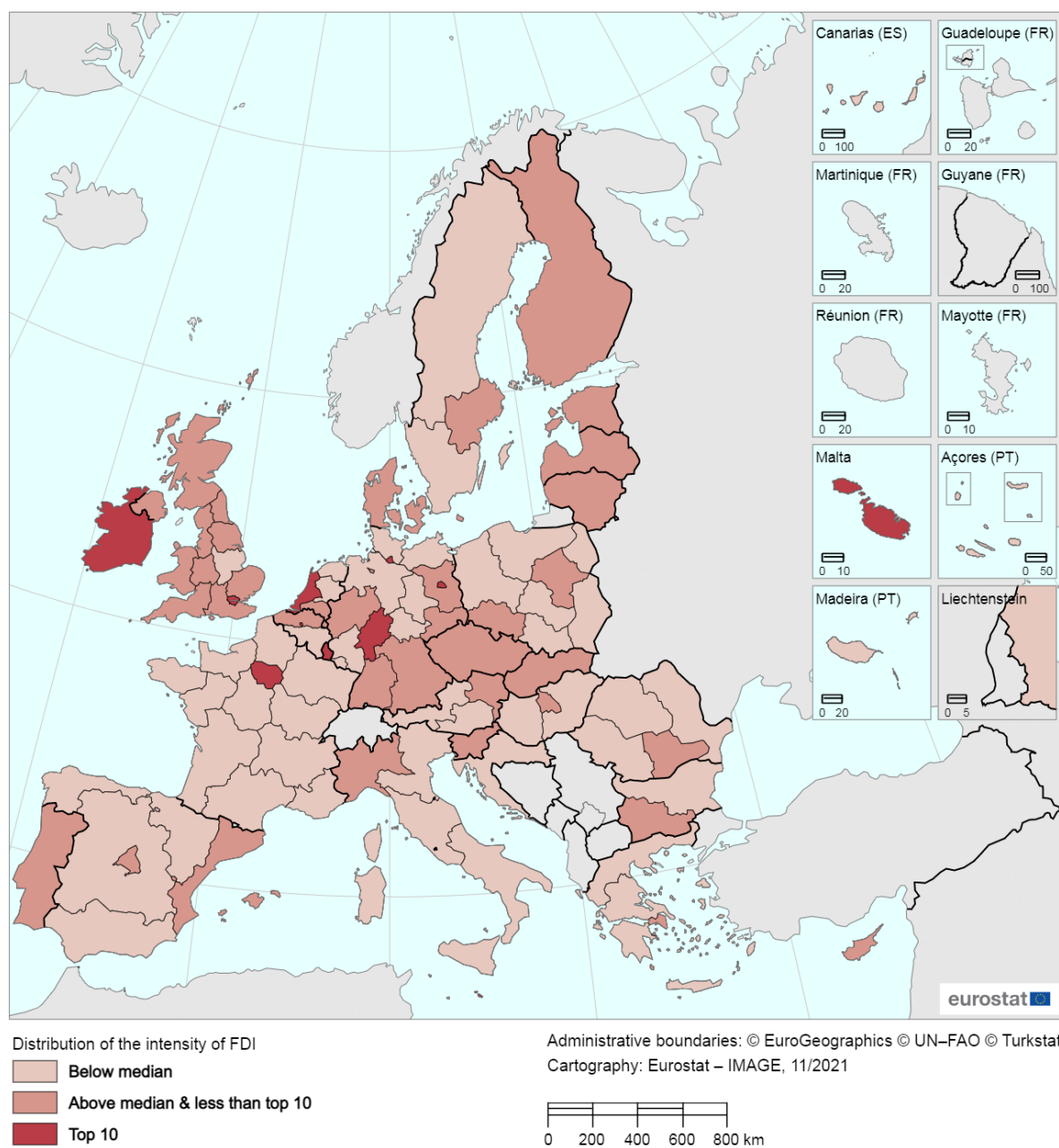
Notes: The FDI intensity is measured as the cumulated number of high-value FDI projects over the period 2003–2020 per one million inhabitants. Locations outside the EU and UK (shown in grey colour) are not included in the analysis. The median FDI intensity across the analysed locations is 18.3 high-value FDI projects in services per one million inhabitants. The top ten locations for high-value FDI projects in services are the following (NUTS1 regions): Greater London, Luxembourg, Brussels Region, Ireland, Berlin Region, Malta, Hamburg Region, Île-de-France, East Sweden and East Netherlands.

Source: Authors’ calculations based on data from the Financial Times fDI Markets and Eurostat. Maps were produced using the Eurostat IMAGE software.

FIGURE A3.4 INTENSITY OF FDI IN HIGH-VALUE SECTORS IN THE EU AND UK – FDI BY EU AND UK INVESTORS

Notes: The FDI intensity is measured as the cumulated number of high-value FDI projects over the period 2003–2020 per one million inhabitants. Locations outside the EU and UK (shown in grey colour) are not included in the analysis. The median FDI intensity is 13.2 high-value FDI projects by EU and UK investors per one million inhabitants. The top ten locations for high-value FDI projects by EU and UK investors are the following (NUTS1 regions): Luxembourg, Brussels Region, Malta, Greater London, Berlin Region, Ireland, Hamburg, Estonia, East Sweden and Mainland Finland.

Source: Authors' calculations based on data from the Financial Times fDi Markets and Eurostat. Maps were produced using the Eurostat IMAGE software.

FIGURE A3.5 INTENSITY OF FDI IN HIGH-VALUE SECTORS IN THE EU AND UK – FDI BY NON-EU/UK INVESTORS

Notes: The FDI intensity is measured as the cumulated number of high-value FDI projects over the period 2003–2020 per one million inhabitants. Locations outside the EU and UK (shown in grey colour) are not included in the analysis. The median FDI intensity across the analysed locations is 12.3 high-value FDI projects by non-EU/UK investors per one million inhabitants. The top ten locations for high-value FDI projects by non-EU/UK investors are the following (NUTS1 regions): Greater London, Luxembourg, Ireland, Brussels Region, Berlin Region, Hessen, Hamburg Region, Île-de-France, Malta and West Netherlands.

Source: Authors' calculations based on data from the Financial Times fDI Markets and Eurostat. Maps were produced using the Eurostat IMAGE software.

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