Scoping the Possible Economic Implications of Brexit on Ireland

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The Authors

Alan Barrett is Director and Research Professor, Edgar Morgenroth and Iulia Siedschlag are Associate Research Professors and Adele Bergin is Senior Research Officer, at the Economic and Social Research Institute (ESRI) and all also have adjunct positions at the Department of Economics, Trinity College Dublin. Daire McCoy and Zuzanna Studnicka are Post-Doctoral Fellows and Derek Lambert is Research Assistant at the Economic and Social Research Institute. John FitzGerald is Research Affiliate at the ESRI and Adjunct Professor at Trinity College, Dublin.

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Executive Summary

With the election success of the Conservative Party in the UK in the recent general election, the new UK government is committed to holding a referendum on EU membership following negotiations between the UK and the EU on key issues of concern to the UK government. While the outcome of these negotiations and the possible referendum are uncertain, a number of scenarios for the future relationship between the UK and the EU can be identified. These include situations in which the UK remains in a reformed EU and situations where it leaves. In the latter case, further sets of possibilities exist which differ in terms of the extent to which current arrangements with respect to free trade, for example, are maintained or dismantled.

A changed relationship between the UK and the EU could potentially have far-reaching consequences for Ireland especially if there were changes in areas such as trade and migration. Given this, the goals of this study are as follows:

- to describe and quantify the key economic linkages which have developed over time between Ireland and the UK in the context of EU membership, and
- arising from the above, to make an initial assessment of the risks and opportunities to these economic linkages in the context of potential future developments at EU-level, in particular a UK exit from the EU.

The following areas are covered in the analysis: trade, foreign direct investment, energy and migration. While the focus of the analysis in the report is within those four areas, a broader macroeconomic view is included. As most analyses suggest that a Brexit will have negative implications for the UK economy, a simulation is included which shows how reduced GDP in the UK leads to reduced demand for Irish exports and hence reduced GDP in Ireland.

The main findings are as follows:

Trade

- Estimates from the literature suggest that a Brexit is likely to significantly reduce bilateral trade flows between Ireland and the UK. The impact could be 20 per cent or more.

- While the 20 per cent estimate is an average figure, the impact would differ significantly across sectors and products. For merchandise trade in particular, trade is very concentrated in a few product types, which implies that increased trade barriers for the most important products would have a particularly significant impact on total trade volumes.
- Some sectors such as Chemicals and Pharmaceuticals account for a large share of exports to the UK; however sectors such as Agriculture, Food and Beverages and Basic Metals are relatively more dependent on exports to the UK and so the impacts on them would be more severe.
- Trade between Ireland and Northern Ireland has been declining as a share and the overall volume is below the level expected for two trading partners located on an island. Overall Ireland is more important to Northern Irish exporters than Northern Ireland is for Irish exporters so, again, there would be differing impacts of a Brexit.

Foreign Direct Investment

- The UK outside the EU would be less attractive to FDI because of uncertainty and reduced access to the EU Single Market. Less FDI in the UK would be likely to translate into a lower potential growth in the UK with negative consequences on Ireland's economic growth.
- It might be thought that this negative effect could be counterbalanced by a positive boost for Ireland through additional FDI projects relocating from the UK. However, on the basis of patterns of the location choice of new FDI projects in Europe over the past ten years, the expected additional attractiveness of Ireland to new FDI projects is likely to be small.
- Corporate tax reforms in the UK are likely to increase the attractiveness of the UK to FDI while the magnitude of their negative impact on Ireland's attractiveness is expected to be small.
- These effects arise in part from the fact that Ireland's attractiveness to FDI is already high, relative to its size and geographical position in Europe. Relative to Ireland, the UK has a number of attractiveness advantages due to its larger market size and better performance with respect to financial market development, technological and innovation capacity, macroeconomic environment, and labour market efficiency. These advantages are likely to continue to attract FDI to the UK even outside the EU. Ireland's advantage relative to the UK's attractiveness to FDI is its more competitive corporate taxation.

Energy

- The first point that needs to be noted is the fact that an all-island electricity market has existed since 2007. Interconnection between Ireland and Northern Ireland is particularly important for Northern Ireland which relies on electricity imports from Ireland to make up for insufficient local electricity generation capacity.
- If the electricity market in Britain remains independent of the rest of the EU, enhanced interconnection with Britain would leave Ireland vulnerable to any problems in the British market. Under these circumstances enhanced interconnection by Ireland with the rest of the EU, most probably to France, could provide useful diversification, reducing risk for Irish consumers. However, this would require a large infrastructural investment.
- If the UK left the EU, it would no longer be subject to EU rules on climate change policy and renewables. Outside the EU, there would be a lower chance that they would reopen discussions on trade in renewables.
- If the UK left the EU it would no longer be subject to EU regulatory measures to deal with a possible crisis situation in the case of a gas or oil shortage. Ireland would then have to consider how best to provide protection from very unlikely, but potentially catastrophic outcomes.

Migration

- A UK exit from the EU opens up the possibility of restrictions on the free movement of people between Ireland and the UK for the purposes of work. As the UK remains an important destination for Irish emigrants especially at times of high unemployment, such restrictions could have implications for the Irish labour market.
- More broadly, the imposition of passport controls at the border with Northern Ireland would be at best inconvenient and at worst a worryingly regressive step in terms of facilitating cooperation between both parts of the island. This is possibly the strongest reason which can be advanced when arguing in favour of the maintenance of the CTA.
- Finally, almost 400,000 people who were born in the Republic of Ireland were resident in the UK in 2011. Similarly almost 230,000 British-born people were resident in Ireland in 2011. While many of these people in both jurisdictions will have passports which relate to their current residencies as opposed to their places of birth, many others could find themselves post-Brexit being resident in a country where their right to residency has come into question.

This report is a scoping study and is aimed at identifying issues and providing quantifications to the extent that this is possible. However, more detailed impact assessments would require additional new research. For example, in relation to trade, the possibility exists that Irish firms could capture market share within the EU from UK firms. Alternatively, they could lose market share in the UK market to third-country firms. These issues are not considered here. While it is likely that the incidence of trade barriers following a Brexit is likely to be greater for smaller Irish firms, an assessment of the scale of the impact would require further research. In relation to FDI, further research is needed to assess whether Brexit would impact on the sectoral composition of FDI to Ireland, how changed FDI might impact on trade and whether there might be a switch from Greenfield FDI to more merger and acquisition activity.

Chapter 1

Introduction

With the election success of the Conservative Party in the UK in the recent general election, the new UK government is committed to holding a referendum on EU membership following negotiations between the UK and the EU on key issues of concern to the UK government. While the outcome of these negotiations and the referendum are uncertain, a number of possible scenarios for the future relationship between the UK and the EU can be identified. These have been outlined in a number of recent publications such as The CityUK (2014), and O'Ceallaigh and Gillespie (2015). The landscape of alternatives includes:

- The UK remains inside the EU:
  - The UK remains inside a reformed EU within the existing treaties;
  - The UK remains inside a reformed EU following Treaty change;
  - The UK remains inside the EU and obtains opt-outs in certain policy areas and/or initiates institutional changes to repatriate competences to all Member States;
  - The UK remains inside a more integrated EU by giving up its current opt-outs.
- The UK leaves the EU:
  - Membership of the European Economic Area (EEA) and the European Free Trade Area (EFTA) – similar to Norway's relationship with the EU;
  - Bilateral agreements with the EU and membership of EFTA – similar to Switzerland's model;
  - Membership of a Customs Union with the EU – similar to Turkey's relationship with the EU;
  - Bilateral Free Trade Agreement with the EU;
  - No preferential trade agreement with the EU (most favoured nation tariffs will be applied in line with membership of the World Trade Organisation).

The legal consequences with respect to the UK's rights and obligations in each of the above mentioned possible alternatives are summarised in Appendix 1. Given the wide range of possible outcomes, and the significant impact that differences in the detail of the ultimate position have on the size and nature of the effects of

the changes, it is easier to focus on a worst case scenario; an exit of the UK from the EU – Brexit. The best case scenario would involve either the status quo or indeed continued UK membership based on renegotiated terms which benefits all Member States including Ireland.

Recent assessments of the economic consequences for the UK of a Brexit under alternative scenarios indicate that the economic losses are likely to outweigh savings from cancelled annual payments to the EU budget (Ottaviano et al., 2014). Depending on the assumptions underlying the UK's future relationship outside the EU, Ottaviano et al. (2014) estimate that real GDP losses in the UK would be between 1.1 and 3.1 per cent.[1] If additional dynamic effects due to lower productivity growth are taken into account, the economic loss to the UK would range between 6.3 to 9.5 per cent. The Ifo Institute in Germany (as reported in Bertelsmann Stiftung, 2015) estimates that if the UK exits the EU in 2018, its GDP per capita in 2030 will be lower by 0.6 to 3.0 per cent relative to its GDP per capita inside the EU. The same study finds that among EU countries, Ireland will be hardest hit, with anticipated GDP per capita losses of 0.8 to 2.7 per cent. These estimates are linked to the effects of trade losses while additional effects due to other channels associated with EU membership (higher research and development intensity, integration in European and global value chains) are more difficult to assess. As a consequence, the real resulting total economic losses are likely to be larger.

The trade impact of exiting the EU would be more significant for the UK than individual EU Member States as the UK's trade with 27 EU Member States would be affected compared to the bilateral impact between the remaining Member States and the UK (Morgenroth, 2015). However, given the significant economic linkages between the UK and Ireland, a reduction in the UK's GDP will have a negative impact on Ireland. At the aggregate level these demand effects can be quantified using the ESRI's HERMES model, in which the UK is the main driver of demand in the traditional Manufacturing and Food sectors, thereby capturing the tendency for exports to the UK to come from these sectors, while the more modern sectors export to countries beyond the UK. Model simulations suggest that the effect of a 1 per cent reduction in UK GDP is to reduce Ireland's GDP and GNP by 0.3 per cent in the medium term. Employment would fall by 0.2 per cent and unemployment would rise by 0.2 per cent. The general government balance

[1] Under the more benign scenario the UK would become a member of EFTA while under the more pessimistic scenario the UK would have Most Favoured Nation status with respect to trade with the EU.

would be 0.1 per cent lower.[2] These estimated effects can be scaled in a linear manner.

These simulations only capture the effect of lower UK GDP growth on Ireland. Given the close economic, cultural and social links between the UK and Ireland, and the fact that some of the key relationships are significantly framed by EU treaties and Directives, any change to the relationship between the UK and the EU is also likely to have a significant impact on the relationship between the UK and Ireland. In this report the key channels through which a changed relationship between the UK and the EU might impact on Ireland are explored. Following the terms of reference for this study, the channels are:

1. Trade (including merchandise and services, with services sub-divided into financial and non-financial services);
2. Foreign Direct Investment flows between Ireland and the UK;
3. Energy;
4. Migration and the labour market.

The goals of this study are: (a) to describe and quantify the key economic linkages which have developed over time between Ireland and the UK in the context of EU membership and (b) arising from the above, to make an initial assessment of the risks and opportunities to these economic linkages in the context of potential future developments at EU level. This is achieved with reference to the existing Irish and international literature and by using existing analytical models where they are available to provide simulation results.

The report is structured as follows. Chapter 2 analyses the trade linkages between the UK and Ireland in the context of the overall patterns of trade, and considers both merchandise and services trade. This encompasses a more detailed analysis of sectors and types of firm as well as the trade links with Northern Ireland. Trade patterns are closely linked to Foreign Direct Investment (FDI) through the location choices and activities of multinational corporations and FDI plays a particularly important role in the Irish economy. Chapter 3 considers the possible impacts of a changed UK relationship with the EU on FDI. Ireland has strong links with the UK and particularly Northern Ireland in relation to energy supply which are analysed in Chapter 4 on energy. There is a long history of migration flows between Ireland and the UK and there are close links between the labour markets of the two countries, which are explored in Chapter 5. Chapter 6 summarises the findings

[2] The basic approach is to run the HERMES model with forecast values for UK GDP and then to re-run the model with lower forecast values for UK GDP. The differences in the forecast values of Irish GDP, employment and other variables can be taken as the impact of reduced UK GDP.

from the other chapters and points to areas in need of further more detailed analysis. The chapter also presents estimates of broad macroeconomic implications of Brexit.

Chapter 2

Trade

Key Points:

- Both merchandise exports to, and particularly imports from the UK continue to account for a significant share of Irish trade, although that importance has been declining.
- Overall, Ireland has a merchandise trade deficit with the UK.
- The UK is a more important destination for services exports than merchandise exports, but is less important for services imports than merchandise imports.
- The importance of the UK as a trading partner differs significantly across sectors and products. For merchandise trade in particular, trade is very concentrated in a few product types, which implies that increased trade barriers for the most important products would have a particularly significant impact on total trade volumes as these account for a very significant share of exports to the UK.
- While some sectors such as Chemicals and Pharmaceuticals account for a large share of exports to the UK, sectors such as Agriculture, Food and Beverages and Basic Metals are more dependent on exports to the UK.
- Financial services and Business services constitute the most important services exports to and imports from the UK.
- The sectoral trade patterns are significantly driven by FDI, but the UK is a more important export destination for Irish firms.
- Trade between Ireland and Northern Ireland has been declining as a share and the overall volume is below the level expected for two trading partners located on an island. Overall Ireland is more important to Northern Irish exporters than Northern Ireland is for Irish exporters.
- Estimates from the literature suggest that a Brexit is likely to significantly reduce bilateral trade flows between Ireland and the UK. The impact could be 20 per cent or more.

Perhaps the most significant economic linkage between the UK and Ireland is via trade links. These encompass not just trade in goods but also increasingly trade in services. A substantial literature, starting with the writings of Adam Smith and

David Ricardo in the eighteenth century, has shown that trade tends to benefit both trading partners. This also implies that a reduction in trade tends to have a negative impact on both partners. While in the past trade was largely concentrated on trade in goods, or what is referred to as merchandise trade, services trade has grown rapidly over recent decades, and in 2013 services exports from Ireland exceeded merchandise exports. Merchandise trade comprises manufactured goods, raw materials, energy, live animals and unprocessed animal carcasses, fish and timber. Services trade is also diverse and covers tourism, computer services, communications, transport, insurance, leasing, merchanting, financial services and other business services. A further component of services trade relates to royalties.

As outlined above, the outcome of the UK referendum on EU membership and the negotiations between the UK and the EU before and after the referendum are uncertain. However a number of possible scenarios would impact significantly on trade flows between the UK and the EU and thus on the bilateral trade flows between the UK and Ireland, while others would have no significant impact on trade. In particular a situation where the UK would leave the EU, with or without a subsequent bilateral trade agreement, is likely to significantly impact on trade, as non-tariff barriers such as customs controls, or technical barriers would be reintroduced and there may also be specific tariffs liable on imports from the UK. In 2013 the average tariff on imports from outside the EU into the EU was 5.2 per cent (WTO, 2014), which while low by international standards contrasts with the zero tariff for trade within the EU.

The EU maintains a range of quotas and/or tariffs with respect to a number of products originating in either all third countries or specific non-EU countries. This relates particularly to agricultural products, food and beverages but also metals such as aluminium, chemicals, electrical and optical equipment, textiles and many other products. Thus, under the more extreme scenarios, imports from the UK would be treated as third-country imports and would therefore automatically be subject to the existing tariff and quota regime of the EU. The UK in turn might introduce tariff or other restrictions in addition to non-tariff barriers such as customs controls. Furthermore, the UK might remove trade barriers from what are now third countries, for example on agricultural and food products,[3] which would impact on Irish exports of such products to the UK by increasing competition and reducing prices.

[3] A House of Commons research paper notes that following Brexit the UK would be free to negotiate lower tariffs with third countries (House of Commons, 2013). However, as the UK has been critical of the EU Common Agricultural Policy, it is also likely to reduce direct supports to farmers, which may lead to reduced agricultural output and thus an increased market for exports (Mathews, 2015).

The impact of tariff and non-tariff barriers has been studied extensively in the international trade literature. This literature has found that, while the pass-through of tariff and non-tariff barriers into prices is not necessarily complete and varies by product (see Feenstra, 1989), there are substantial welfare losses due to trade barriers (e.g. Bradford 2003).

While common technical standards have been found to increase trade, country-specific standards are more likely to reduce trade, with standards having a more negative impact on the Agriculture and Food sectors than other sectors (Li and Beghin, 2012). One of the dimensions of the development of the EU Single Market has been the development of single standards that apply throughout the EU. Brexit would allow the UK to set separate standards that may hinder imports. Border and related costs between the US and Canada where a free trade agreement is in place have been estimated to amount to 2.7 per cent of the value of merchandise trade (see Taylor et al., 2004).

Importantly Free Trade Agreements (FTA) have been found to yield significant benefits in terms of the trade volume, doubling the volume of trade over the ten years following an integration agreement (Baier and Bergstrand, 2007; Bergstrand et al., 2015). Disintegration can therefore be expected to lead to reductions in trade volumes. An interesting study on the trade patterns among former member republics of the Soviet Union that broke up in 1991, the constituent parts of Yugoslavia that broke up in 1990/1991 and Czechoslovakia that split into the Czech Republic and the Slovak Republic in 1993, shows that following their break-up the trade intensities between these declined significantly (Firdrmuc and Fidrmuc, 2003). Nevertheless the intensities were still larger than the expected level in 1998. These results suggest that even though disintegration leads to significant reductions in trade, the disproportionately large levels of trade that are observed among members of an FTA persist for some time, perhaps due to similarities in tastes or familiarity with suppliers and brands. This suggests that the full impact of Brexit on trade flows would arise over a longer time period.

The potential impact of Brexit on Ireland is a function of the intensity and nature of the trade relationship with the UK. In this section the potential impact of a changed trade relationship is explored by considering the existing trade relationship between the UK and Ireland in terms of aggregate flows, flows at sectoral and product level and across firm size groups and firm ownership.

2.1 TOTAL MERCHANDISE TRADE

Ever since independence the UK has been an important trading partner. Figures 2.1 shows real merchandise exports to the UK, the EU excluding the UK, and the US and Canada, over the period 1973 to 2014. The figure shows the significant growth in trade over time. The average annual growth in real exports to EU members other than the UK was 9.8 per cent over the period 1973 to 2014, that for exports to the US and Canada was 10.5 per cent, while exports to the UK have grown by just 4.6 per cent.

Thus, while total merchandise export volumes to the UK have grown, the relative importance of the UK as an export destination has diminished over time. The share of Irish exports destined for the UK reached 56.3 per cent in 1974 but by 2014 the proportion of exports destined for the UK was just over 15 per cent. The UK is now the second largest export destination for Irish merchandise exports, with the US accounting for over 22 per cent of merchandise exports in 2014. Other major destinations of Irish merchandise exports include Belgium (13.2 per cent), Germany (6.6 per cent), Switzerland (5.9 per cent), France (5.2 per cent), Netherlands (3.8 per cent), Spain (2.8 per cent), Italy (2.4 per cent), Japan (2 per cent) and China (1.7 per cent).

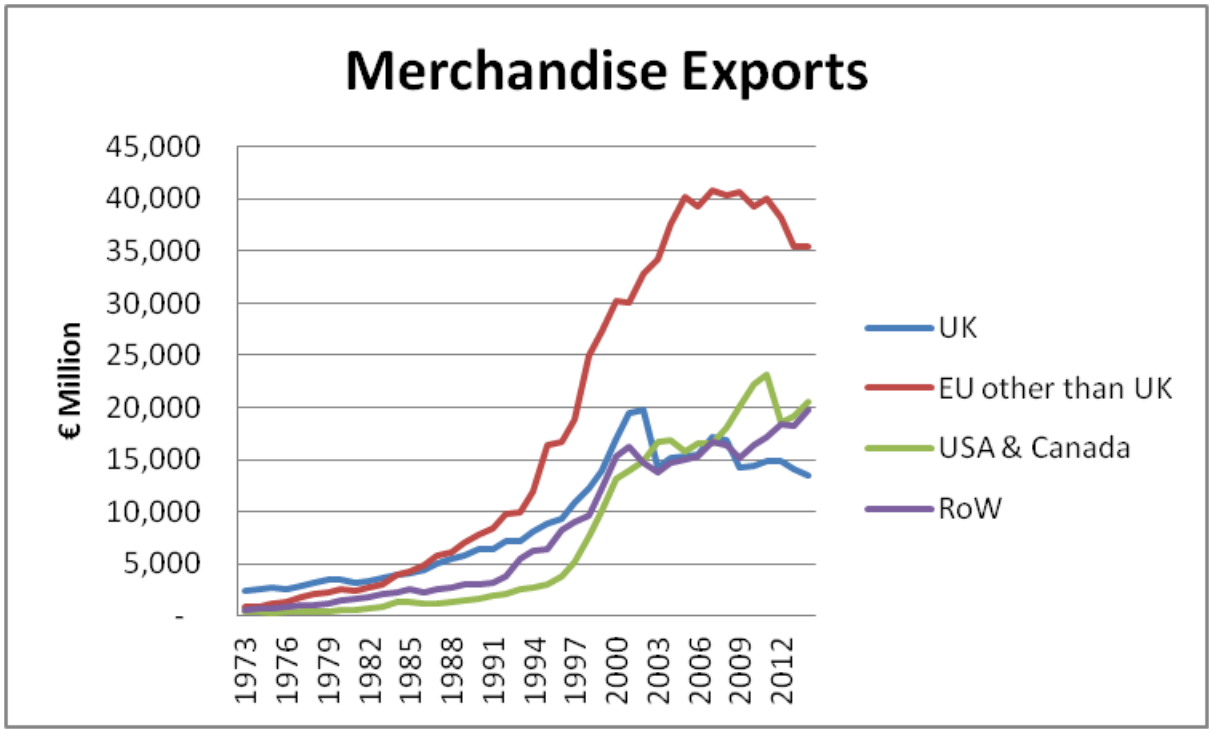
Real merchandise imports have also increased significantly over the period 1973 to 2014 (see Figure 2.2). However, the scale of the increase is less than that seen for merchandise exports, as merchandise exports to the EU other than the UK, and to the US and Canada, grew significantly faster than merchandise imports from these regions. While imports to the UK grew by an average of almost 9 per cent per year over the period 1973 to 2014, those to the EU other than the UK and the US and Canada grew by 20 per cent per annum. Thus, while the UK has become less important as an import source this decline has been less marked than the decline as an export destination. The UK continues to be the most important source for merchandise imports and accounted for 32.2 per cent of merchandise imports. Other significant import source countries include the US (10.8 per cent), Germany (7.9 per cent), China (6.3 per cent), Netherlands (4.9 per cent), France (4.7 per cent), Japan (3.3 per cent), Switzerland (2.3 per cent) and Belgium (2.1 per cent).

Overall, Ireland has a merchandise trade deficit with the UK but a merchandise trade surplus with the rest of the EU and the US and Canada that has been increasing over time. This suggests that the nature of the merchandise trade relationship between Ireland and the UK is different to that with the other trading partners. In particular it indicates the continuing importance of the UK as a

supplier of intermediate and consumption goods for Ireland, which is important in the context of a possible Brexit.

Any increase in tariff and/or non-tariff barriers would increase the price of imports, although the pass-through need not necessarily be perfect. In the case of a larger market like the UK there is a greater possibility to switch to locally produced goods as a larger country tends to produce a larger variety of goods and services. This implies that the impact of an increase of import prices into the UK is likely to result in reduced export volumes from Ireland. As a small country, Ireland does not produce as big a range of goods as larger countries,[4] which limits the possibility of substituting local goods for foreign ones. Furthermore strong supply chain linkages with the UK, particularly in relation to consumer goods, similar tastes and familiarity with brands, would reduce the likelihood of switching to goods produced in other EU countries at least in the short term. Thus, the impact would be to raise prices in Ireland.

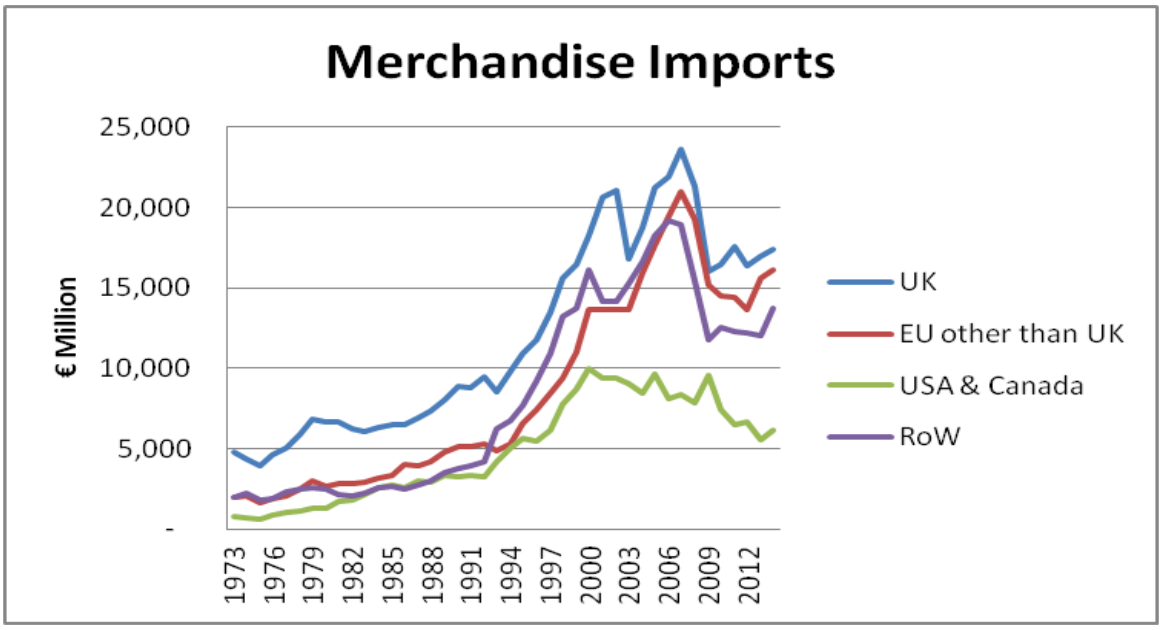
FIGURE 2.1 Real Merchandise Exports by Destination, 1973 to 2014



Source: CSO Trade Statistics.

[4] Detailed analysis at product level confirms this.

FIGURE 2.2 Real Imports by Destination, 1973 to 2014



Source: CSO Trade Statistics.

2.2 TOTAL SERVICES TRADE

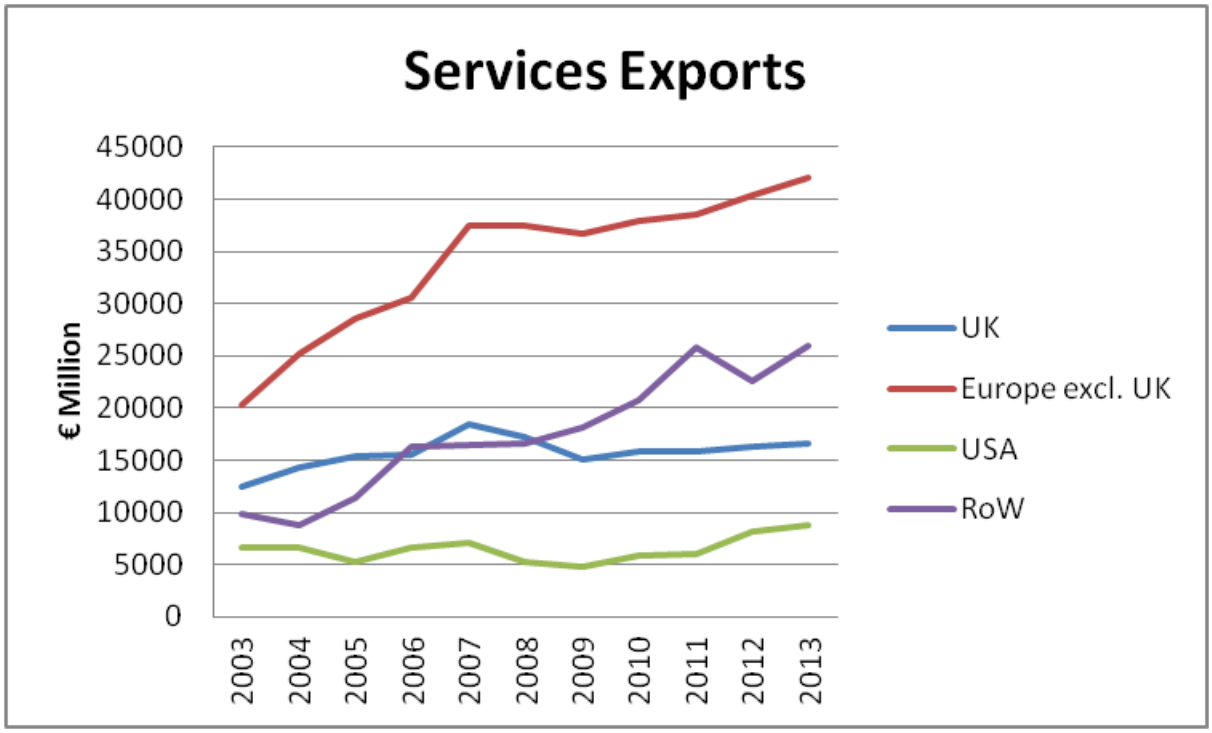
The available data series for services trade is more limited so that the long-term trends cannot be easily identified. Overall real services exports have grown significantly since 2003, but this growth has been largely confined to exports to the EU other than the UK and to the Rest of the World (see Figure 2.3). Real services exports to the UK grew on average by just 3.4 per cent per year, while those to the rest of the EU grew by 10.7 per cent and those to the Rest of the World grew by 16.3 per cent per annum.

Nevertheless, the UK accounts for a greater share of services exports than of merchandise exports with 17.8 per cent of services exports destined for that market. The rest of the EU also accounts for a slightly larger share of services exports than merchandise exports suggesting that geographic or cultural proximity are more important for services trade than merchandise trade. In addition to the UK the most important single services export destinations include Germany (9.8 per cent), US (9.4 per cent), Italy (6.3 per cent), France (5.4 per cent), Netherlands (3.8 per cent), Switzerland (2.9 per cent), Spain (2.8 per cent), Japan (2.7 per cent) and China (2.6 per cent).

Real services imports have grown more slowly than services exports (5.8 per cent per year compared to 9 per cent per year). The share of total services imports originating in the UK is just one-third of that for merchandise imports and the UK

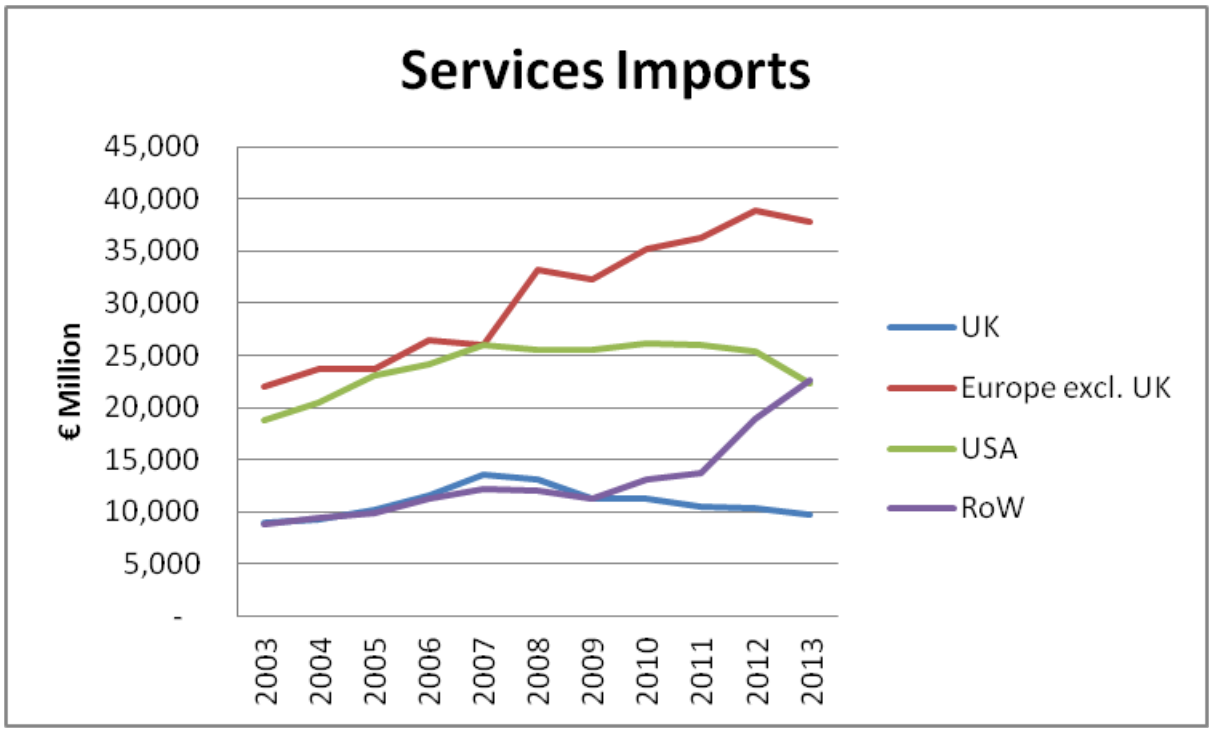
is just the third largest source of total services imports. The most important source countries for services imports include US (24.1 per cent), Netherlands (16.0 per cent), UK (10.6 per cent), Luxembourg (8.0 per cent), Bermuda (4.6 per cent), Germany (2.9 per cent), France (2.5 per cent), Italy (2.5 per cent), Switzerland (2.3 per cent), and Spain (1.9 per cent). As will be shown below, the geography of services imports is strongly influenced by particular types of services imports and in particular the royalties and licences which are counted as services trade. Overall Ireland has a significant services trade surplus with the UK, the rest of the EU and the Rest of the World but a services trade deficit with the US.

FIGURE 2.3 Real Services Exports by Destination, 2003 to 2013



Source: CSO Balance of Payments Statistics.

FIGURE 2.4 Real Services Imports by Destination, 2003 to 2013



Source: CSO Balance of Payments Statistics.

2.3 DETAILED ANALYSIS OF TRADE FLOWS: THE ROLE OF SECTORS, PRODUCTS, OWNERSHIP AND FIRM SIZE

The size and trend of merchandise and services trade flows is likely to be significantly shaped by the sectors or products that are traded, and the type of firm that engages in trading activity. For example transport costs vary significantly across products and this will shape the geography of merchandise trade. Indigenous enterprises may have different trade patterns than foreign-owned enterprises. These aspects are further analysed below.

2.3.1 Sectors and Products

Nahuis (2004) showed that the effects of EU membership on trade volumes differ across sectors. In particular he found EU membership to be particularly trade enhancing for agricultural products, textiles, trade services and transport equipment. This suggests that Brexit would have differentiated impacts across sectors in the UK economy. In so far as Brexit would constitute market disintegration it is also likely that sectors within the EU (and thus Ireland) would be differentially affected. For example the burden of customs controls is likely to fall heavier on low value high volume/weight products as these require more transportation. Indeed Chen and Novy (2011) found significant heterogeneity across industries in the EU with respect to their degree of economic integration

and they also found significant technical barriers and high transport costs for low value-to-weight industries.

Figure 2.5 below shows total trade with the UK (merchandise and services) broken down by broad sectors. This shows the significant differences across sectors. For exports to the UK the top four sectors, Food and Beverages (26.4 per cent), Chemicals, Pharmaceuticals and Non-Metallic Minerals (24.8 per cent), Financial Intermediation (11.9 per cent) and Business Services (10.2 per cent) together accounted for 73.3 per cent of total exports to the UK. The top four sectors for imports from the UK, Other Business Services (16.5 per cent), Financial Intermediation (15.7 per cent), Chemicals, Pharmaceuticals and Non-Metallic Minerals (13.4 per cent) and Wholesale, Retail, Hotels and Restaurants (9.3 per cent) together account for 54.9 per cent of total imports from the UK. This shows that exports are concentrated in a few sectors while imports are more evenly distributed.

Figure 2.5 considers the share of total exports that is destined for the UK. It thus does not take into account the relative size of the sectors and the importance of the UK for specific sectors. This is shown in Figure 2.6 which shows the share of exports of each sector accounted for by the UK. This shows clearly that the UK is a particularly important destination for the Basic and Fabricated Metals, Agriculture, Forestry and Fishing, Food and Beverages and the Textiles and Textile products sectors where exports to the UK account for over 30 per cent of total exports from that sector.

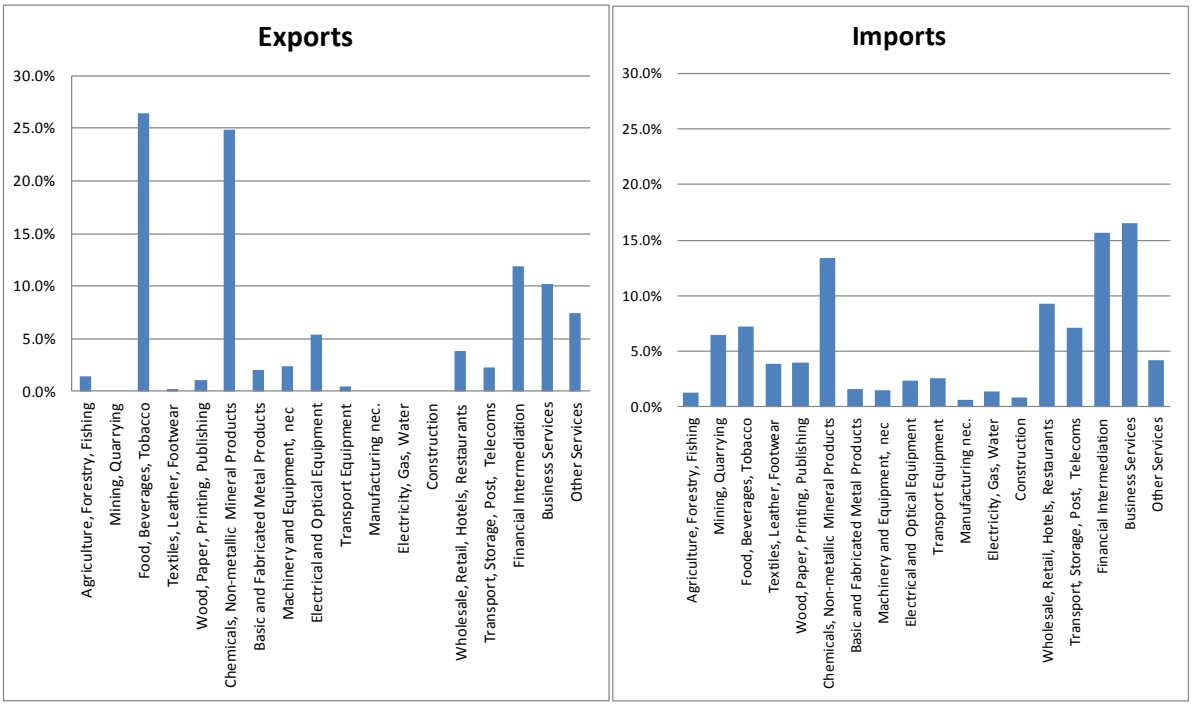
The particular concentration of merchandise trade in particular sectors might also result in regionally differentiated impacts of Brexit. Using a special tabulation from the CSO Census 2011 Travel to Work data (POWSCAR), it is possible to identify the geographic distribution of jobs by county.[5] This shows that for Agriculture, Forestry and Fishing employment is disproportionately large in counties Kilkenny, Laois, Tipperary, Waterford county, Roscommon, Cavan and Monaghan. The Food and Beverages sector is particularly important in counties Kilkenny, Longford, Cavan and Monaghan.[6] Textiles are important in Wicklow and Donegal. The Basic and Fabricated Metal Products sector is disproportionately represented in counties Offaly, Limerick county, Waterford county and Monaghan. Finally the Chemicals and Pharmaceuticals sector is more important in

[5] See Morgenroth (2008/2009) for an outline of the methodology and a detailed analysis of the economic geography of Ireland in 2006.

[6] Here a sector is disproportional if the share of national employment in that sector in a county is twice the share of total employment of the county in total national employment (i.e. a location quotient of 2 or more).

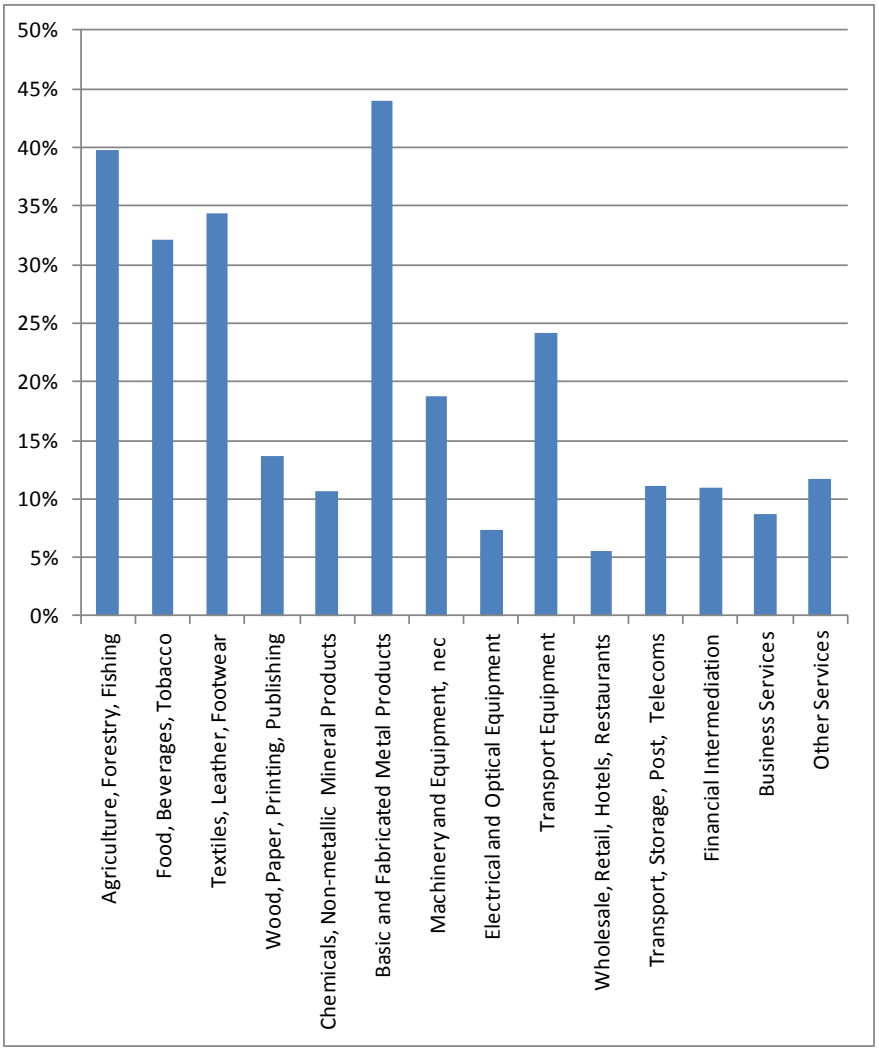
South Dublin, Wicklow, Cork, Waterford and Roscommon. Thus, for Waterford county and Monaghan three important sectors would be particularly vulnerable while for Kilkenny, Roscommon, Cavan and Wicklow two important sectors might be particularly vulnerable to Brexit.

FIGURE 2.5 Export and Import Shares to and from the UK by Sector, 2009



Source: OECD-WTO: Statistics on Trade in Value Added.

FIGURE 2.6 Share of Exports by Industry Destined for the UK, 2009



Source: OECD-WTO: Statistics on Trade in Value Added.

It is possible to analyse the composition of merchandise trade in more detail as the trade flows for individual product types are available.[7] In 2014 Ireland exported products in 3,217 product categories to the UK and imported products in 4,527 categories from the UK. The 10 most important product types out of this large list of traded products account for 30.9 per cent of exports and 31 per cent of imports (see Figures 2.7 and 2.8). The top 50 products accounted for 58.3 per cent and the top 100 products accounted for 70.4 per cent of total merchandise exports in 2014 indicating the very heavy concentration of exports to the UK in a limited number of narrow product categories. While this may appear as extremely concentrated, the data show that exports to the UK are less concentrated in specific products than total exports to all countries, where the top 10 products accounted for 45.7 per cent and the top 50 products accounted for 73.6 per cent

7 The UN-COMTRADE database allows for the analysis of products at the six-digit product level.

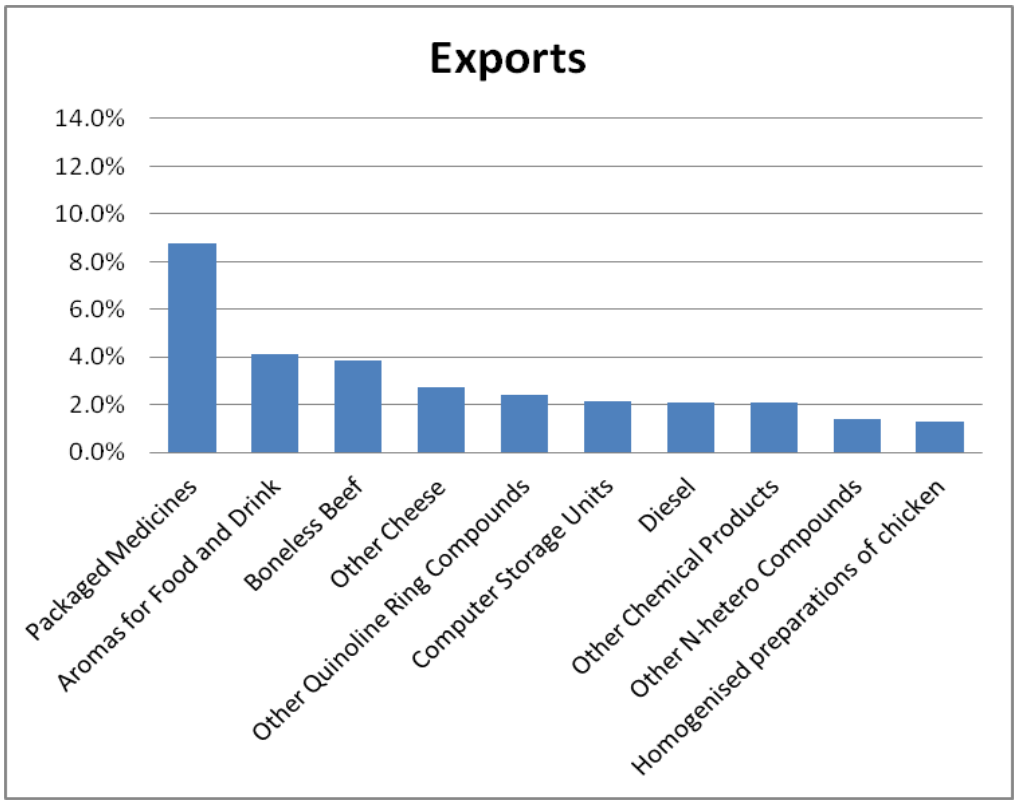
of total merchandise exports in 2014. In contrast, total imports from all sources are less concentrated in particular products than imports from the UK with 24.3 per cent accounted for by the top 10 products and 45.5 per cent accounted for by the top 50 products.

In relation to exports, Packaged Medicines accounted for 8.8 per cent of total merchandise exports to the UK. This constitutes 8.5 per cent of the Packaged Medicines exports from Ireland which in total accounted for 15.2 per cent of all Irish merchandise exports in 2014. A number of other important products also originated from the Chemicals and Pharmaceuticals sector and together these account for 12.6 per cent of merchandise exports to the UK. Aromas for Food and Drink, Beef, Cheese and Chicken Preparations account for 12 per cent of exports. Importantly, while Boneless Beef exports to the UK accounted for just 3.9 per cent of total exports to the UK, this constitutes 43.9 per cent of Chilled Boneless Beef exports from Ireland. Similarly while Other Cheese accounts for 2.7 per cent of exports to the UK, this represents 58.1 per cent of all exports of that product. Overall, the UK is a particularly important export destination for food products and in many products the share of exports accounted for by the UK is in excess of 50 per cent and as high as 100 per cent. For imports the key product group relates to energy imports which together account for 24 per cent of imports from the UK. Particularly noteworthy is the fact that with respect to gas imports 100 per cent are sourced from the UK. The remainder of the more important import products is quite heterogeneous.

The implication of the concentrated nature of Irish exports to the UK is that narrowly applied trade barriers on the products/sectors where Irish exports are concentrated could have very significant implications. The UK market is particularly important for some sectors such as Agriculture, Food and Textiles, which have been found to benefit particularly from free trade through EU memberships (see Nahuis, 2004), which suggests that these may be particularly exposed to the negative impacts of Brexit.

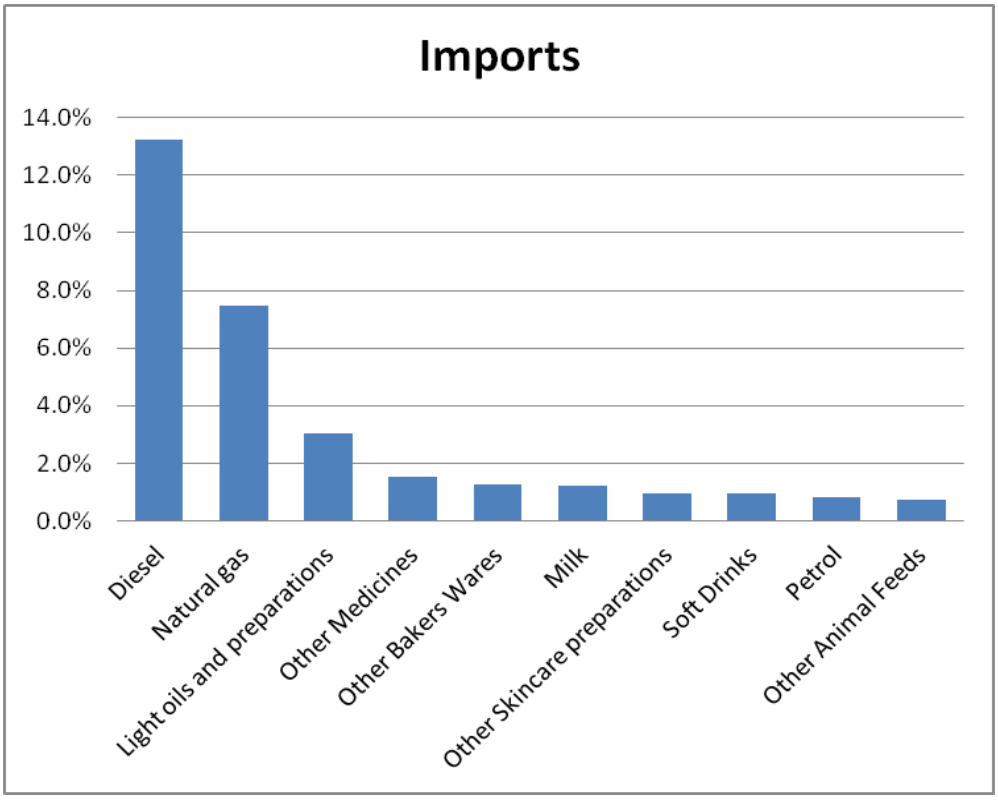
Given the significant connection between the UK and Ireland in relation to energy markets the potential impact of Brexit on energy is considered in more detail in Chapter 4 below. With respect to other imports the exposure is less on specific products or sectors but relates to the scale of the dependence on imports from the UK.

FIGURE 2.7 Top 10 Export Products to the UK, 2014



Source: UN COMTRADE database.

FIGURE 2.8 Top 10 Import Products from the UK, 2014



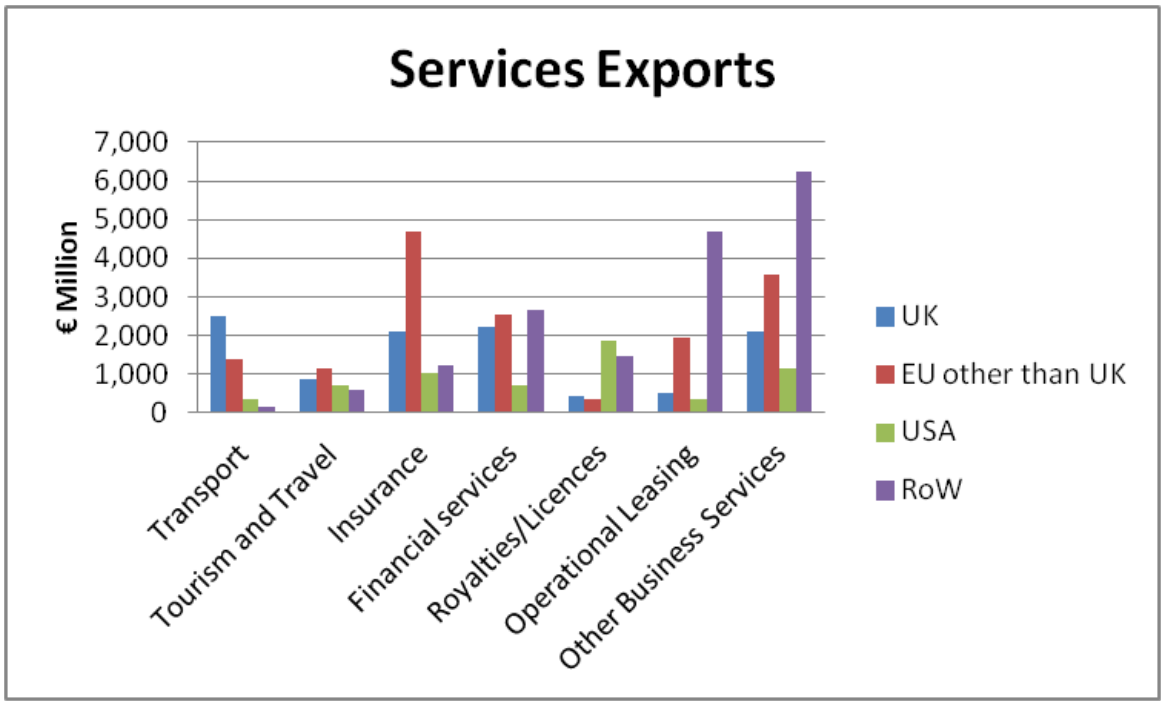
Source: UN COMTRADE database.

Services trade can also be disaggregated into different types of service. Unfortunately detailed data for some subsectors are not available for all major trading partners. Figures 2.9 and 2.10 show services exports and imports for those services for which data are available for all trading partners. This shows that for transport services the UK is the most important export destination. Indeed, over 57 per cent of transport services exports go to the UK. Travel and Tourism account for a relatively small proportion of total services exports. For Insurance services the UK is an important destination (23.2 per cent) and the UK is almost as important an export destination for Financial services (27.5 per cent) as the remainder of the EU and the Rest of the World. This highlights the significance of the UK and in particular the City of London in the global financial system, along with the linkages between the financial institutions based in Ireland and the City of London. Business services exports including operational leasing constitute the most important group of services exports and they are destined significantly for the EU other than the UK, and for the Rest of the World. Computer services which are not shown in the graph, as data for the US are not available, account for over 42 per cent of services exports overall and 31.3 per cent of exports to the UK.

A significant proportion of services imports are royalties and licences which account for 38.8 per cent of total services imports. However these are largely from other EU countries (principally Luxembourg). The other major component of services imports relates to other business services which account for 39.7 per cent of total services imports. Travel and Tourism, Insurance and Financial services account for roughly similar proportions of services imports, and for each of these the UK is an important import source although in the case of Travel and Tourism and Insurance the rest of the EU is the most important source of imports, and in the case of financial services the US is the most important source of imports. The UK is also the most important supplier of transport services (32.6 per cent) to Ireland but these account only for a very small share of services imports (just 1.8 per cent).

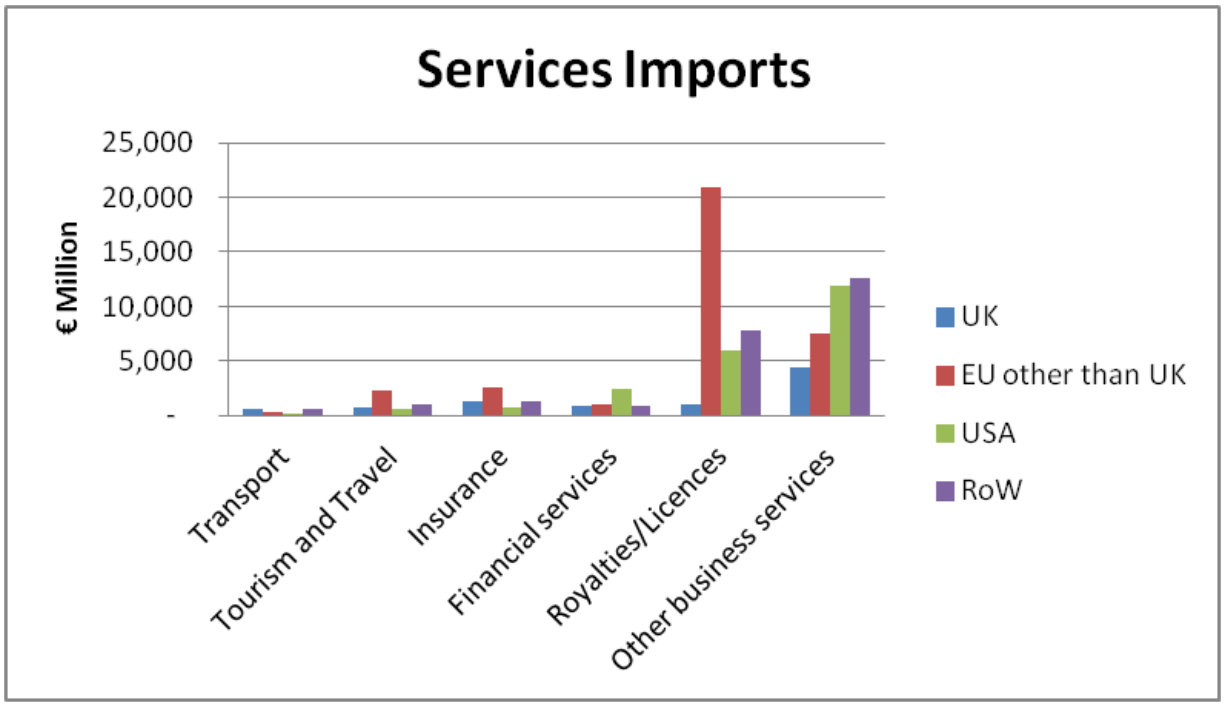
Research has shown that the removal of barriers to services trade such as through the implementation of the EU Services Directive will significantly increase services trade by up to 60 per cent (Cox and Lejour, 2006). The services trade relationship with the UK is stronger than that for merchandise, which implies that the benefits from closer market integration come disproportionately from this relationship with the UK. Thus, any impediment to services trade between Ireland and the UK would also have a significant negative impact. This is important as it has been shown that services trade is a source of productivity gains in the wider economy (Francois and Hoekman, 2010).

FIGURE 2.9 Services Exports by Type of Service, 2013



Source: CSO International Trade in Services.

FIGURE 2.10 Services Imports by Type of Service, 2013



Source: CSO International Trade in Services.

Tourism does not rank among the most significant services exports from Ireland but is important both in terms of regional impacts and since this sector employs a greater share of lower skilled workers than for example Financial Services. For example in 2013, 62.5 per cent of visitors travelled to counties outside of Dublin.

Figure 2.11 shows that Great Britain is the single most important origin of visitors to Ireland, accounting for almost 42 per cent of all visitors in 2014. However, that share had been as high as 63.5 per cent in 1983. Nevertheless, for counties such as Carlow, Cavan, Kildare, Leitrim, Longford, Monaghan, Tipperary N.R. and Wexford visitors from Great Britain accounted for more than half the total number of visitors. In addition to the visitors to Ireland from Great Britain, data from InterTradeIreland suggest that an additional 1,574,000 visitors travelled to Ireland from Northern Ireland in 2013.

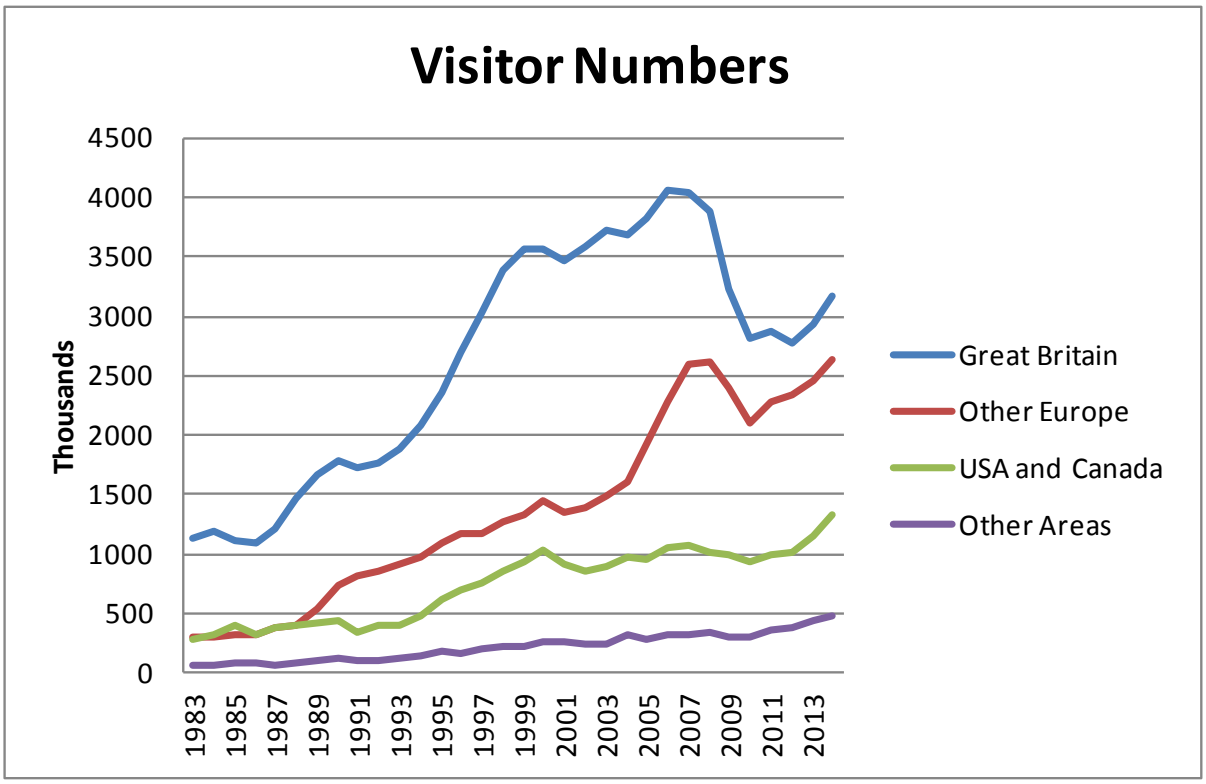
The absolute numbers of visitors together with their length of stay and expenditure determine the ultimate economic impact. The average length of stay of visitors has been decreasing over time and visitors from Great Britain stay for a shorter period than visitors from the rest of Europe, North America and the Rest of the World. While visitors from Great Britain traditionally spent less per day than other visitors, their expenditure has been higher than that for visitors from the rest of Europe. Taking all factors together, tourism revenue from British visitors to Ireland amounts to €847 million (26 per cent) compared to €1,234 million (37.8 per cent) from visitors from the rest of Europe and €822 million (25.2 per cent) from visitors from North America in 2013.

Assessing the degree to which tourist flows would be impacted by Brexit is not easy, as the impact of EU membership on tourism does not appear to have been estimated. However, research has shown that the introduction of the Euro increased the volume of tourism in Euro Zone countries (see Gil-Pareja et.al. 2007), which suggests that EU integration also had a positive impact on tourist numbers, by facilitating free movement of people within the EU without a need for visas. This might suggest that Brexit could impact negatively on tourist numbers from the UK in the unlikely event that any impediments to travel were introduced.[8] However, reduced visitor numbers might arise through reduced business travel due to lower trade intensities as a causal relationship between the volume of trade and business travel has been found in the literature (see Kulendran and Wilson, 2000 or Park and Jang, 2014). Just over 20 per cent of British visitors to Ireland travel for business purposes and over 40 per cent travel

[8] For more discussion on this point, see Chapter 5.

to visit friends and family which is unlikely to be affected by Brexit. Thus, overall it is possible that Brexit would not lead to a significant decline tourist numbers from the UK.

FIGURE 2.11 Visitor Numbers to Ireland by Origin.



Source: CSO Tourism and Travel Statistics.

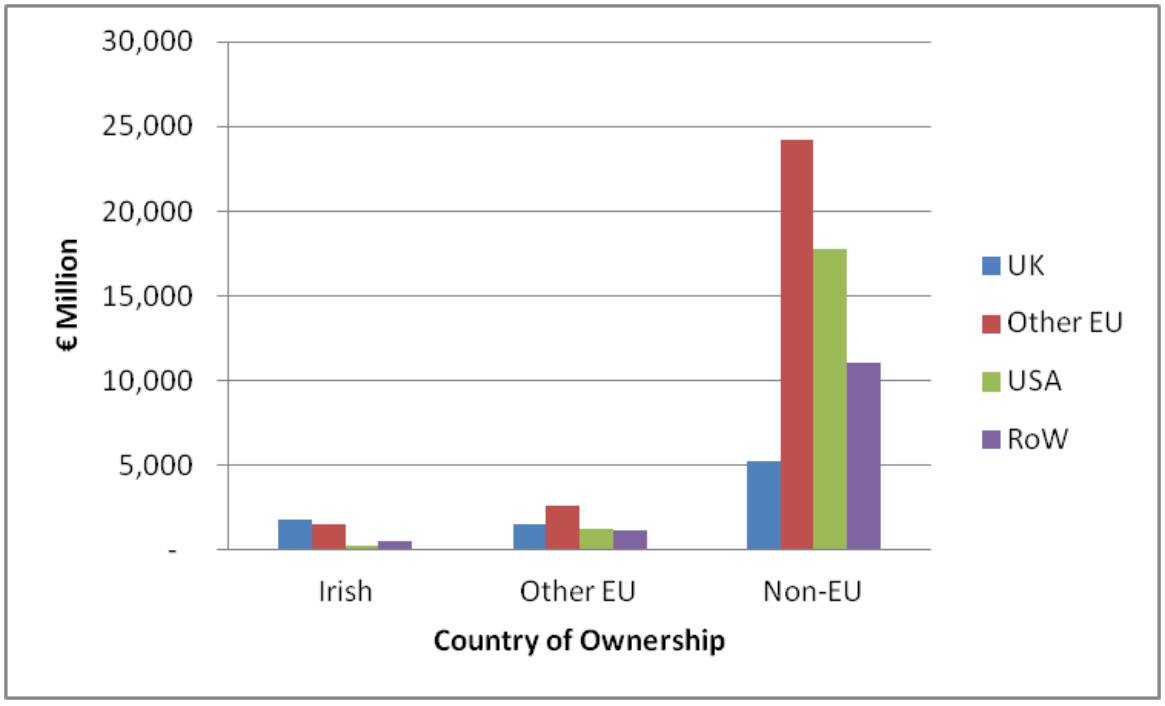
2.3.2 Ownership and Size of Firms

The sectoral analysis revealed significant heterogeneity with respect to the importance of the UK as an export destination and source of imports. These patterns are strongly related to the significance of multinational firms in individual sectors. The literature has identified significant heterogeneity across firms with respect to their trade participation probability (Melitz, 2003, Melitz and Redding, 2014). In particular this literature also shows that larger and more productive firms are more likely to export. The effect of this is to increase overall productivity within a sector since the more productive firms push out the less productive firms as the former make use of the benefits of a larger market. Increasing trade costs have been shown to increase productivity in lagging firms but reduce productivity in more efficient firms with the overall effect being to reduce productivity (Konings and Vandenbussche, 2008). Here only the trade patterns of firms of different ownership and firm size are considered as the data for this are readily

available. Further research using micro-data would be required to provide a more complete analysis of the potential impact of Brexit at the firm level in Ireland.

A number of interesting findings emerge from an analysis of the published data on trade by industrial (manufacturing) firms broken down by country or region of ownership (see Figure 2.12). Indigenous firms export less (just 52.9 per cent) than foreign-owned firms (94.4 per cent) but they export a greater proportion to the UK (43.5 per cent) than foreign-owned firms (10.6 per cent). Among foreign-owned firms, those owned by a corporation outside the EU export almost all of their output but a relatively small share of this is destined for the UK. Overall, foreign-owned firms account for the majority of industrial exports to the UK but Irish firms are considerably more dependent on the UK as an export market. This is likely to be due to the fact that the fixed costs associated with exporting to the UK are lower, due to a shared language, legal system and culture, making it easier for smaller indigenous firms to trade with the UK. In contrast multinational firms tend to trade extensively with other plants of the same company located in other countries and also tend to serve larger international markets. Thus the pattern of trade for multinational firms is significantly determined by the location of other plants owned by the same corporation and particularly the location of the headquarters. This explains the significant proportion of exports to the UK and the rest of the EU.

FIGURE 2.12 Output Exported by Irish and Foreign Industrial Firms by Destination, 2012



Source: CSO Census of Industrial Production, 2012.

Considering industrial firms by size of firm reveals a slightly surprising picture in that the smallest firms (less than 20 employees), both Irish and foreign owned, tend to export substantially more to the rest of Europe than the UK when compared to medium sized firms (between 20 and 49 employees) which are significantly dependent on the UK as an export market. For Irish firms with less than 20 employees, 43.7 per cent of exports are destined for the rest of the EU, while 25.2 per cent are exported to the UK, compared to 27.9 per cent and 47.3 per cent for Irish firms with between 20 and 49 employees. For small foreign firms the respective shares are 82.2 per cent and 8.5 per cent and for medium sized firms 49.0 per cent and 20.2 per cent. For Irish firms with more than 50 employees 43.5 per cent of exports are destined for the UK and 37.5 per cent go to the rest of the EU. For foreign firms the respective shares are 10.6 per cent and 40.7 per cent.

2.3.3 Value-Added Trade

The production of exports often requires the use of imported intermediate goods and services. Thus the - that is produced in one country and exported to another is typically less than the total value of the export flow. This is particularly important in countries and sectors which have a significant presence of multinational firms since these tend to have internationally fragmented production structures where intermediates are sourced from other plants of the same company located abroad.

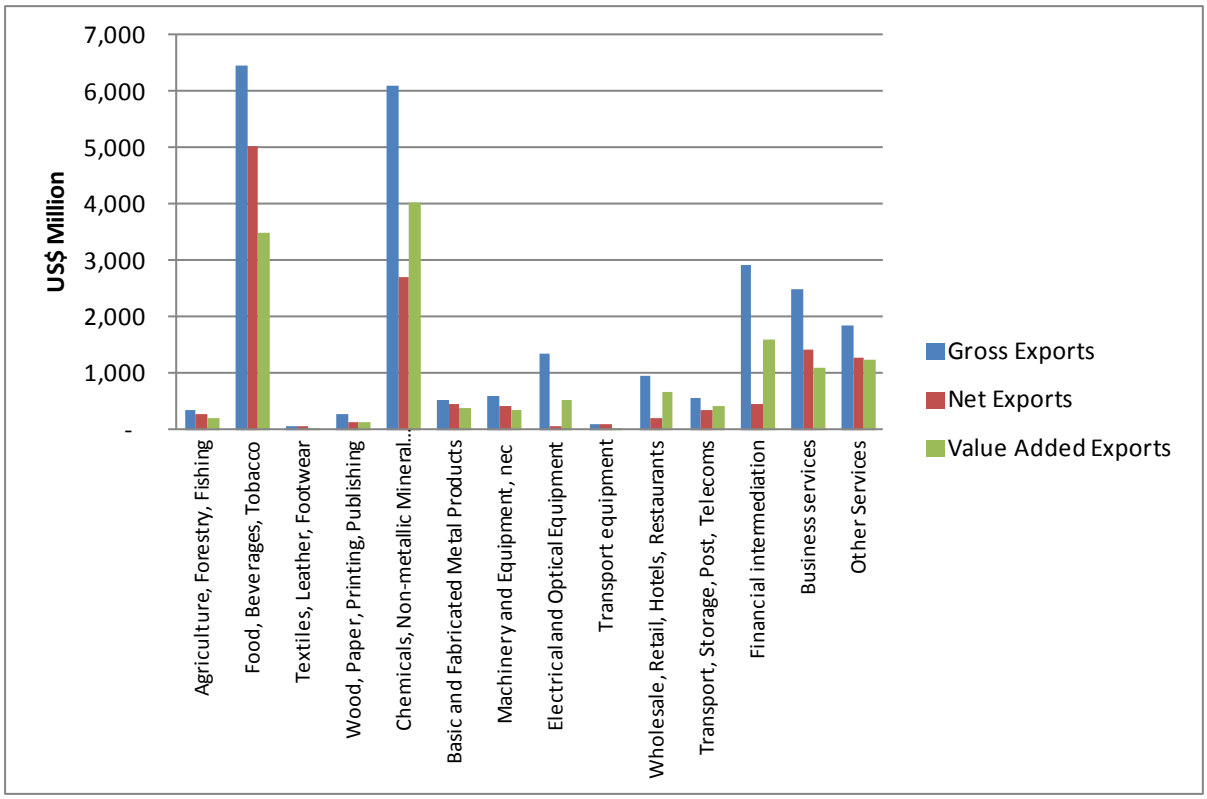
Figure 2.13 shows the total exports to the UK by sector, the value added created in Ireland that is exported, and the net position where the value added imported from the UK is subtracted from the value of exports to the UK. The difference between gross exports and net exports thus highlights the importance of the UK as a destination for exports as well as the importance of imports from the UK in the sector. For sectors where the net exports are lower than the value-added exports, value-added imports from the UK are particularly significant, which is important as potential effects of Brexit would have an impact not just on the export side but also in terms of intermediate imports.

Overall, just 57.7 per cent of Irish exports are Irish value added compared to 82.7 per cent for the UK, 73.4 per cent for Germany and 88.7 per cent for the US. This is a function of the openness and size of the economy and the importance of multinational firms in the production of output.

There are also differences across sectors with the lowest Irish value-added share of exports being recorded in Transport Equipment, where just 35 per cent of exports are Irish value added while the domestic value-added share is highest in the Basic and Fabricated Metals sector with 73.5 per cent of exports being Irish value added. These sectoral differences are reflected in the graph by the gap between the gross exports and the value-added exports.

Overall the graph shows that the Irish value added exported is considerably smaller than the value of gross exports. Thus, the impact of any export reduction on Ireland will be less than implied by the total flows. There are some sectors where imports from the UK are particularly important, which implies that there will also be an import effect of an imposition of any trade barriers. These sectors include Chemicals and Pharmaceuticals, Electrical and Optical Equipment, Transport Equipment, and Financial services.

FIGURE 2.13 Total Exports, Value-Added Exports and Net Value-Added Exports to the UK by Sector, 2009



Source: OECD-WTO: Statistics on Trade in Value Added.

2.3.4 Northern Ireland

Assessing the trade relationship between Ireland and Northern Ireland is not straightforward as there are significant data discrepancies with respect to

merchandise trade (Anyadike-Danes and Morgenroth, 2003; Love et al., 2009) and no data on bilateral services trade between Ireland and Northern Ireland exist. Nevertheless a number of important features of the trade relationship between the two parts of Ireland can be identified.

While in 1974, 47 per cent of Irish merchandise exports were destined for Great Britain and 9.3 per cent destined for Northern Ireland, this share has declined to 13.3 per cent and 1.8 per cent respectively. The share of exports going to Northern Ireland declined more over the 1973 to 2014 period than that going to the UK, and there is little evidence of any increase in the Northern Ireland share since the Good Friday Agreement.

Likewise the share of imports into Ireland from Northern Ireland peaked in 1981, accounting for 5.1 per cent but has declined to just 1.8 per cent by 2014, while that from Great Britain peaked in 1980 (46.7 per cent) and declined to 30.5 per cent in 2014. Statistics on the sales destination of the Northern Ireland Manufacturing sector for the 2013/2014 financial year show that the Republic of Ireland accounted for over 25 per cent of sales (exports) by firms in Northern Ireland outside the UK (see NISRA, 2014).

Overall Northern Ireland has a merchandise trade deficit with Ireland, which contrasts with the significant merchandise trade surplus of the UK with respect to Ireland. However, separate analysis on business links between firms from Ireland and Northern Ireland has shown that Northern Irish firms are more dependent on the Irish market than firms from the Republic of Ireland are on the Northern Irish market (InterTradeIreland, 2007). This suggests that Northern Irish firms are more exposed to the impact by any trade barriers that might emerge if the UK left the EU than those from Ireland.

In relation to merchandise trade it has been shown that overall trade between the two parts of the island is less than expected overall, with only the Food and Beverages and Non-metallic Minerals sectors recording a trade intensity at or above that expected for two jurisdictions located on an island which have only one land border (Morgenroth, 2009). Subsequent analysis on the underlying drivers for the lower trade intensity suggests that this is driven by differences in sectoral structure and the importance of foreign multinational firms particularly in Ireland, which would not regard Northern Ireland as a specific market (Morgenroth, 2011).

The only data source for services trade between Ireland and Northern Ireland is a study by the Northern Ireland Statistics and Research Agency (NISRA 2013). It focuses on the services sectors with export potential and firms that employ more than 10 persons in Northern Ireland. These data show that Ireland is a very important destination for services exports from Northern Ireland, accounting for between 37.9 per cent and 29 per cent of services exports from Northern Ireland. While no data are available to assess the importance of Northern Ireland as a services export destination, with services exports from Ireland to the whole UK accounting for 17.8 per cent of total Irish services exports, Northern Ireland is not as important a services export destination for Irish services exports as Ireland is for Northern Irish services exports.

2.4 POTENTIAL IMPACTS OF BREXIT

The preceding sections have outlined in detail the trade relationship between Ireland and the UK. This showed that regarding merchandise trade that both exports to and particularly imports from the UK continue to account for a significant share of Irish trade, although that importance has been declining. The more detailed analysis showed that the importance of the UK as a trading partner differs significantly across sectors and products and that these patterns are also significantly driven by FDI. Irish firms are more dependent on the UK as an export market. Financial services and Business services constitute the most important services exports to and imports from the UK.

The impact of Brexit on trade depends on the ultimate position that is reached. If this only encompasses minor impacts on trade barriers then the impact will be very limited. However, in a worst case scenario the UK would be outside the EU, which is likely to be associated with a significant increase in trade barriers. Trade barriers can impact on prices and/or quantities. Furthermore, in the extreme example the UK may negotiate trade agreements with non-EU countries, particularly for certain sectors such as Agriculture and Food. This would result in additional competition in the UK market, which is likely to put Irish exporters under pressure (Mathews, 2015). Of course UK exports to the EU will also be affected and this may lead to opportunities for Irish exporters to capture some of this market share within the EU.

In the case of exports to the UK there would be downward pressure on prices, which would be particularly damaging to firms or sectors that are more dependent on the UK market. While firms might be able to find alternative markets it is likely that the fixed costs for firms to trade in these markets will be higher markets impacting on prices as well as the propensity to export. This is

likely to be more challenging for smaller Irish firms. Similarly for imports trade barriers will impact on import prices, and sourcing imports from other markets may be difficult at least in the short-run especially given the deep supply chain linkages between the UK and Ireland, including the significant role of UK retailers in the Irish market.[9] Given the fact that the share of imports from the UK is double the export share, the exposure on the import side could be more significant than that on exports.

In order to assess the magnitude of the potential impacts the results from the literature on the impact of membership of the EU and other trade agreements can be utilised. This approach was used in Morgenroth (2015) who used estimates from a study by Hufbauer and Schott (2009) to assess the impact on aggregate trade flows between Ireland and the UK. Hufbauer and Schott (2009) estimate the impact of a range of different trade agreements, including EU membership, EFTA membership and a bilateral trade agreement with the EU, using a gravity model estimated with a large cross country dataset covering bilateral trade flows over the period 1976 to 2005. Their results indicate that bilateral trade between the UK and EU countries would be reduced by 21.6 per cent in the event of a Brexit where the EU and the UK would negotiate a bilateral trade agreement. Baier and Bergstrand (2007) found that a free trade agreement between two countries increases the bilateral trade between the two countries by 100 per cent in 10 years, and in their subsequent research they estimated the effect of creating the EEC was an increase in trade among the founding members by 8 per cent per annum in the period up to 1970 (Baier and Bergstrand, 2009). Another estimate by Eicher and Henn (2011) suggests that joining the EU increases trade by 37 per cent.[10]

While most studies consider the impact of joining a customs union or the signing of a trade agreement, one study analysed the impact of the disintegration of trade blocks including the Soviet Union, Yugoslavia and Czechoslovakia (Fidrmuc and Fidrmuc, 2003). This analysis showed that trade within the three countries was up to 43 times greater than that with third countries i.e. a strong home country bias. While this home bias diminished following disintegration it did persist such that trade between the constituent parts was still between double and thirty times more than expected. This result implies that while trade volumes would decline following Brexit, the strong trade relationship between Ireland and the UK is likely to persist for some time.

[9] The literature has shown that exchange rate changes are passed through to more significantly in markets where the supplier has a higher market share (Feenstra et al., 1996). It is therefore likely that price increases due to other factors such as tariff or non-tariff barriers are also passed through more completely.

[10] Similar results are obtained by estimating an extended gravity model using the dataset of Morgenroth (2009).

Given the fact that some sectors are more dependent on the UK as a market it is also important to consider the sectoral impact of EU membership. The EU internal market has been found to be particularly trade enhancing for agricultural products, textiles, trade service and transport equipment (Nahuis, 2004).

Overall, the results from the literature suggest that the impacts of Brexit on trade are likely to be substantial. A 21.6 per cent reduction in merchandise exports to the UK as suggested by the results of Hufbauer and Schott (2009) when applied to merchandise exports from Ireland to the UK would amount to a 3.3 per cent drop in total merchandise exports from Ireland. The more detailed description of the trade linkages between Ireland the UK suggest that the incidence of this impact will vary across sectors and is likely to be more substantial for Irish firms as these are more dependent on the UK market. Given the importance of imports from the UK, which may be more difficult to source from other EU Members at least in the short term is likely to put upward pressure on prices in Ireland.

The analysis in this section focused on identifying the trade relationship between Ireland and the UK and identified the possible impacts of a withdrawal of the UK from the EU with reference to the international literature. While such an analysis provides some indicative estimates particularly at the more aggregate level, more research is needed to more fully assess the potential impact of Brexit. For example there may also be third-country effects, perhaps because the UK loses market share in the EU which might open an opportunity for Irish firms to increase their market share. However, there may also be additional negative effects on Irish exports to the UK if the UK were to facilitate trade with any third country. While the analysis above noted the differences in export destination across different types of firms, many aspects of firm heterogeneity could not be explored. For example, the UK might be a springboard market particularly for smaller firms, whereby they first learn to export to the UK and subsequently export to other countries. The analysis treated services and merchandise trade separately, but these may also be linked which could compound the potential losses.

Chapter 3

Brexit: FDI-related Implications

Key Points:

- The UK is a leading destination for FDI. Its inward FDI stock is the largest in Europe and the second largest in the world after the US.
- EU membership has played a key role in attracting FDI to the UK from inside as well as from outside the EU.
- The UK's inward FDI stock is a source of technology diffusion and productivity growth that is likely to be beneficial to Ireland also via trade and investment linkages with the UK.
- Further EU integration, as well as additional trade and investment if the Transatlantic Trade and Investment Partnership (TTIP) is successfully negotiated, are likely to have positive effects on the UK's and Ireland's economies.
- The UK outside the EU would be less attractive to FDI because of uncertainty and reduced EU market access. Less FDI is likely to translate into lower productivity growth and a lower potential growth in the UK with negative consequences on Ireland's economic growth.
- Ireland may attract additional FDI projects including some relocation of FDI from the UK. However, on the basis of patterns of the location choice of new FDI projects in Europe over the past ten years, the expected additional attractiveness of Ireland to new FDI projects is likely to be small.
- Corporate tax reforms in the UK are likely to increase the attractiveness of the UK to FDI while the magnitude of their negative impact on Ireland's attractiveness is expected to be small.
- Relative to Ireland, the UK has a number of attractiveness advantages due to a larger market size and better performance with respect to financial market development, technological and innovation capacity, macroeconomic environment, and labour market efficiency. Ireland's advantage relative to the UK's attractiveness to FDI is its more competitive corporate taxation.

This chapter examines current patterns of inward FDI in the UK and analyses possible FDI-related channels and implications of Brexit on the UK's and Ireland's economies. Further, it examines how the UK's and Ireland's attractiveness to new FDI projects would be affected in several possible Brexit scenarios. In particular, it

considers implications of a more competitive corporate tax rate in the UK and of reductions in the UK's access to the EU Single Market. Finally, on the basis of these findings, this chapter identifies FDI-related issues to be further analysed in the context of Brexit.

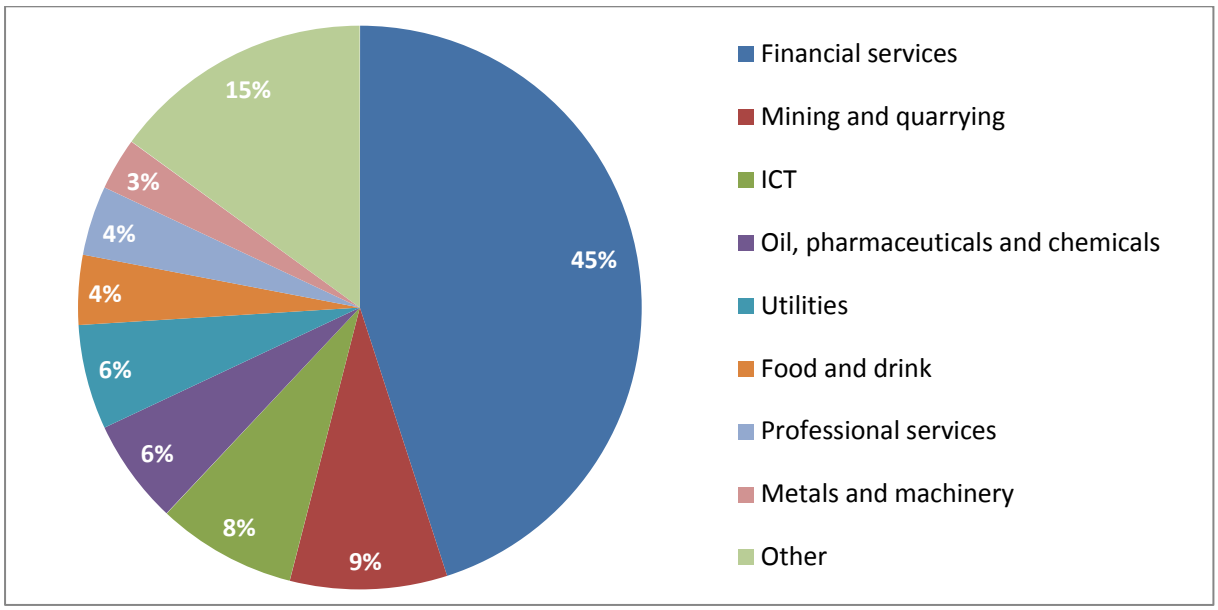
3.1 CURRENT PATTERNS OF INWARD FDI IN THE UK

Before examining possible FDI-related implications of Brexit on Ireland's economy, it is useful to look at current patterns of inward FDI in the UK and their link to the UK's EU membership.

The UK is a leading location for FDI. The UK's inward FDI stock is the largest in Europe and the second in the world after the US. In 2014, the inward FDI stock in the UK amounted to $1,662.9 billion (UNCTAD, 2015). Existing evidence indicates that EU membership has been a key factor in attracting FDI to the UK from outside as well as from inside the EU (Barrell and Pain, 1997). As documented in the *World Investment Report 2015*, other EU countries account for 50 per cent of the UK's inward FDI stock. Major holders of the UK's FDI stock from the EU are: the Netherlands (15 per cent), France (8 per cent), and Germany (7 per cent). Ireland's share in the UK's inward FDI stock is 1.5 per cent. The US is the largest investing country in the UK, holding 29 per cent of the UK's FDI stock.

A key feature of the UK's inward FDI stock is its high concentration in financial services. As shown in Figure 3.1, financial services account for nearly half of the UK's inward FDI stock (45 per cent). The shares of other sectors attracting FDI are much less sizeable: Mining and Quarrying (9 per cent); ICT (8 per cent); Oil, Pharmaceuticals and Chemicals (6 per cent); Utilities (6 per cent); Food and Beverage (4 per cent); Professional Services (4 per cent); and Metals and Machinery (3 per cent).

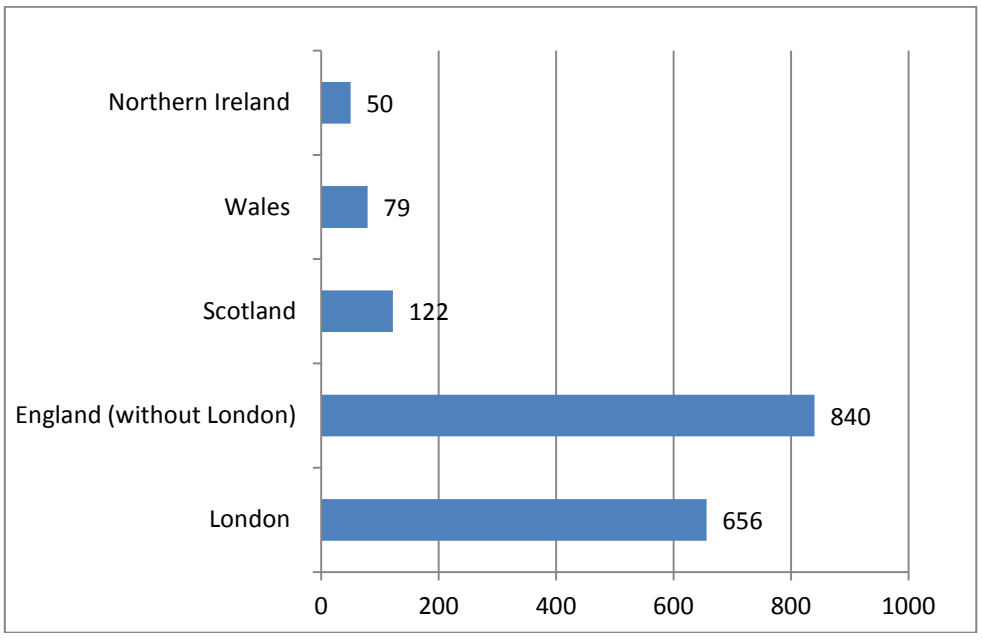
FIGURE 3.1 Inward FDI Stock in the UK by Sector



Source: Office for National Statistics (ONS), 2014. Estimates as end of 2012.

The geographical distribution of the inward FDI stock inside the UK is also highly concentrated, England being by far the leading destination. As shown in Figure 3.2, in 2013-2014, England attracted 85 per cent of all new FDI projects of which 44 per cent went to London. Over the same period, Scotland attracted 7 per cent while Wales accounted for 5 per cent and Northern Ireland for 3 per cent of all new FDI projects located in the UK.

FIGURE 3.2 Regional Distribution of New FDI Projects in the UK, 2013-2014



Source: UK Trade and Investment, *Inward Investment Report 2013/14*.

Further integration of EU markets, particularly in services, is likely to continue to have a positive effect on FDI and productivity growth in the UK. Ireland's output growth is likely to benefit from these positive effects of FDI via increased demand for trade with the UK.

The UK and Ireland would also benefit from additional liberalisation of trade and investment with the US if a successful conclusion of the Transatlantic Trade and Investment Partnership (TTIP) is reached. A recent study (CEPR 2013) has estimated that the implementation of the TTIP would increase the UK's GDP by 0.14-0.35 per cent annually over a ten-year period compared to a baseline scenario without an agreement.[11] The largest gains would come from the lowering of the non-trade barriers (NTBs) for trade in goods. In manufacturing, the highest output increase would be in motor vehicles (2.7-7.3 per cent). In the services sector, Financial Services, Insurance, and Business Services would benefit most, with anticipated output increases of 0.6-1.14 per cent, 0.4-0.7 per cent and 0.1-0.2 per cent, respectively. The UK's aggregate exports to all countries would increase by 1.2-2.9 per cent while imports would increase by 1.0-2.5 per cent. A similar study for the impact of the TTIP on Ireland[12] estimated that the gains from a potential TTIP would increase Ireland's GDP by 1.1 per cent. Ireland's exports would increase by 3.8 per cent and its investment by 1.5 per cent. Export expansion linked to the TTIP is expected to generate 5,000 -10,000 additional jobs in Ireland.

3.2 BREXIT: POSSIBLE FDI-RELATED CHANNELS AND IMPLICATIONS ON THE UK'S AND IRELAND'S ECONOMIES

Existing empirical evidence indicates that multinational enterprises are more productive than domestic enterprises (Griffith and Simpson 2001; Helpman et al., 2004; Girma and Görg 2007; Temouri et al., 2008). It has also been documented that FDI is an important channel for advanced technology transfer which contributes to substantial productivity gains and long-term economic growth (Borensztein et al., 1998; Branstetter 2001; Javorcik 2004; Lee 2006; Haskel et al., 2007; Keller and Yeaple 2009). Depending on their motivation, FDI could substitute trade ('market-seeking' or 'horizontal' FDI) or complement trade ('efficiency-seeking' or 'vertical' FDI). Recent evidence highlights that multinational enterprises are major drivers of the emergence of global value chains which enable countries to benefit from their comparative advantages and

[11] The expected gains from the TTIP for the EU are estimated to be larger, between 0.4 and 0.8 per cent of the EU's GDP. This result is linked to the higher removable trade and investment barriers between the EU and US.

[12] Copenhagen Economics (2015) *TTIP Impact in Ireland*, Dublin.

associated productivity gains (OECD 2013). In the context of European integration, FDI in EU countries, including the UK and Ireland, has been linked to exporting to other European countries ('export-platform' FDI).

Given the important role FDI has on economic growth and its linkages to trade, one important question to examine is how Brexit would impact on the UK's attractiveness to FDI and what the associated implications would be on the UK's and Ireland's economies. On the basis of existing relevant evidence (see for example, Ottaviano et al., 2014), Table 3.1 summarises FDI-related channels and potential implications on the UK's and Ireland's economies in the case of Brexit.

TABLE 3.1 Brexit: Possible FDI-related Implications in the UK and Ireland

FDI-related effects in the UK	Anticipated impact on the UK's economy	Anticipated impact on Ireland's economy
Less attractiveness to FDI projects due to uncertainty and reduced EU market access	Lower productivity growth Lower potential growth Lower demand for imports of goods and services Lower export activity	Lower trade and investment activity with the UK Lower output and employment growth Location/relocation of FDI to Ireland in manufacturing and financial services
Less integration in European and global value chains (trade – FDI complementarities)	Lower trade activity Lower productivity and economic growth	Lower trade and investment activity with the UK Lower output and employment growth Location/relocation of FDI to Ireland to replace UK in global production chains
Increased attractiveness to FDI following reforms of the corporate taxation system or trade – FDI substitution	Higher productivity growth	Higher trade and investment activity with the UK Less FDI projects located in Ireland

The UK outside the EU would be less attractive to vertical FDI due to uncertainty and loss of access to the EU Single Market. In particular this would affect new investments in industries with large and irreversible fixed costs (i.e. heavy manufacturing). This loss of FDI would affect negatively the UK's productivity growth as well as its long-term potential growth. Lower potential growth in the UK is likely to affect negatively economic growth in Ireland via less demand for imports from Ireland.

The UK's loss of access to the EU market would lead to its reduced integration in European and global value chains. This development would also impact negatively Ireland's trade and investment with the UK. Additional economic losses in the case of Brexit would be foregone trade, investment, productivity and employment growth which are likely if the TTIP with the US will be agreed and implemented.

As discussed above, following the implementation of the TTIP, the UK's GDP would increase annually by 0.14-0.35 per cent over a ten-year period.

Following the loss of the UK's attractiveness to vertical FDI due to reduced access to the EU market, Ireland may attract additional FDI, possibly in manufacturing and financial services. However, given large sunk costs, disinvestment in the UK is less likely, particularly in large fixed cost sectors.

In the case of Brexit, to compensate for the loss of attractiveness to FDI linked to reduced access to the EU market, the UK might consider to further reform its tax system in order to make its corporation tax system more competitive. Currently at 20 per cent, the UK's corporation tax rate is one of the lowest in the G20. Further reductions of the UK's corporate tax rate have been already announced in the Summer Budget in July 2015. Thus, the corporation tax rate will be reduced to 19 per cent from 1 April 2017 and 18 per cent from 1 April 2020. A more competitive corporate tax rate is likely to attract more FDI to the UK which would impact positively on the UK's productivity growth. While the UK's increased attractiveness to FDI might divert some FDI away from Ireland, its overall effect would depend on gains generated by Ireland's additional trade and investment with the UK.

In the case of Brexit, trade between the UK and other EU countries would face higher costs. Depending on the extent and nature of trade agreements between the UK and the EU, such trade costs would be in the form of non-tariff barriers (rules of origin, product standards, and licensing requirements) and tariffs (custom duties). In the presence of higher trade costs, firms willing to serve the UK market might decide to do this via FDI rather than trade. As a result, the UK would attract more horizontal FDI to substitute trade. This gain would have to be balanced against losses in vertical FDI. As nearly all studies find that the net effect of trade barriers is to lower FDI (see Blonigen and Piger, 2011, for a survey), *a priori* our expectation is that Brexit would reduce FDI in the UK, a result supported by our analysis below.

3.3 POSSIBLE BREXIT SCENARIOS

To better understand possible implications of Brexit on FDI in the UK and Ireland, we examine the UK's and Ireland's attractiveness to new FDI projects in the case of the following scenarios: (i) a more competitive corporate tax rate in the UK; (ii) reduced access to the EU Single Market for the UK. The analysed scenarios include two options for a more competitive corporate tax rate in the UK (18 per cent and 12.5 per cent) and two options for reduced access to the EU Single Market (by 25

per cent, and 50 per cent). The full set of estimated location probabilities to new FDI projects for the UK, Ireland and other EU countries are shown in Table A.1 in the Appendix.

Location probabilities for the UK, Ireland and other EU countries were estimated using data[13] on the location of newly established foreign affiliates in EU countries over the period 2005-2014.[14] The estimates were obtained using an updated and extended analysis based on Lawless et al. (2014). To simulate the change in the average location probability for each country under the considered scenarios, the corresponding countries' predicted location probabilities are computed on the basis of an econometric model[15] that links the location of new foreign affiliates to country-level factors found to influence the location choice of multinational activities.[16] These include factors such as market size, market potential, labour costs, human capital, proximity to other foreign affiliates, trade and investment barriers, and corporate taxation.[17] The location probabilities in the case of the scenarios mentioned above were obtained assuming all other factors that influence the location choice by multinationals would not change. This assumption implies that these estimates can only be interpreted as indicative of the direction and magnitude of the impact of policy and market access changes on the country-specific attractiveness to new FDI projects.

Figures 3.3 and 3.4 show the corresponding country-specific location probabilities in the case of a more competitive tax rate in the UK. Country-specific location probabilities in each of the analysed scenarios (represented in percentages on the vertical axis) are compared with the corresponding location probabilities in the baseline scenario (represented on the horizontal axis in percentages). In the baseline scenario, at an average corporate tax rate of 25.9 per cent, the UK's average probability to attract new FDI projects over the period 2005-2014 was 12.7 per cent. Over the same period, Ireland's average location probability was 4.0 per cent, at a corporate tax rate of 12.5 per cent.

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13 The Amadeus dataset provided by Bureau van Dijk. This data set contains information on companies established in Europe. A description of the data set is available from www.bvdinfo.com/en-gb/our-products/company-information/international-products/amadeus.

14 The analysis also includes Norway which under the European Economic Area (EEA) Agreement is part of the EU Single Market.

15 The methodology to obtain predicted location probabilities under alternative scenarios follows the 'Policy Experiment' section of Lawless et al. (2014).

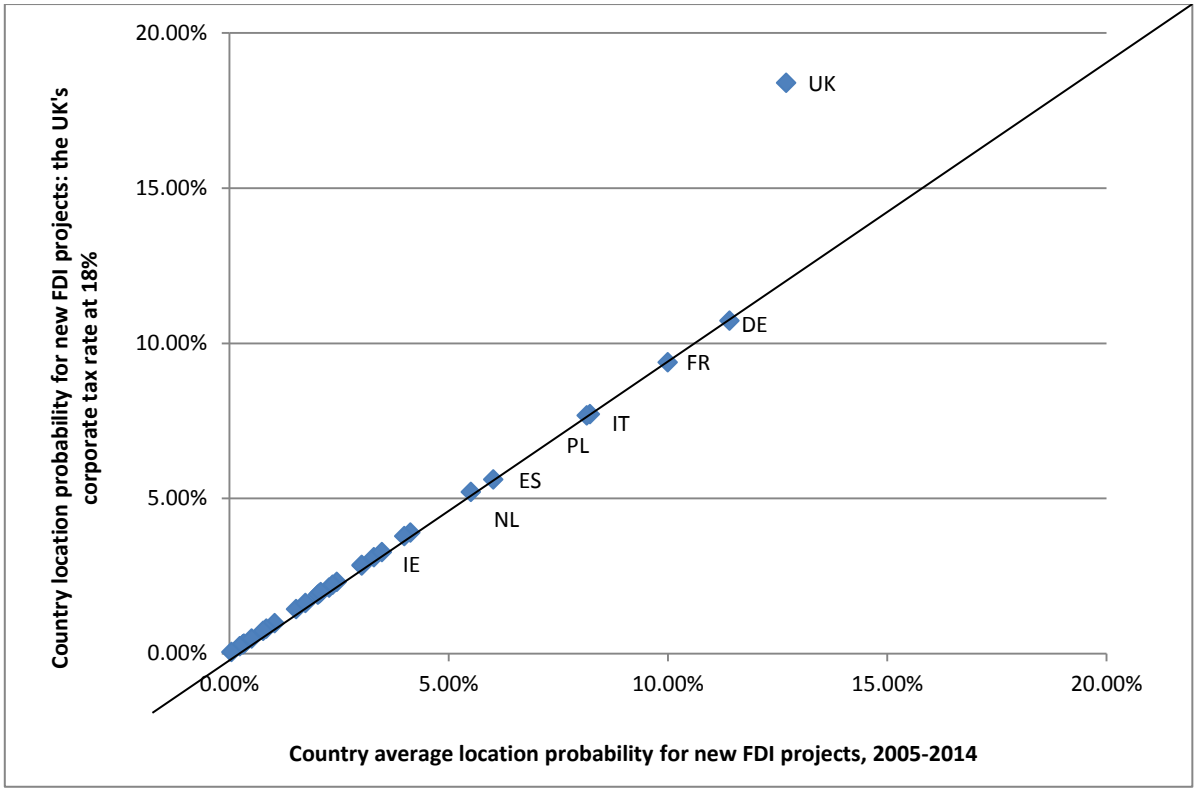
16 Recent reviews of the relevant literature on the location choice of multinational activities include Fontagné and Mayer (2005), Siedschlag et al. (2013a, 2013b) and Lawless et al. (2014).

17 Time variant factors that influence the location choices are considered in the year preceding the establishment of new foreign affiliates to account for the fact that the implementation of investment decisions are in practice lagged. Definitions of variables and data sources are described in Table A.2 in Appendix 2.

Figure 3.3 shows that at a corporate tax rate of 18 per cent, all else equal, the UK's attractiveness to new FDI projects would increase from 12.7 per cent to 18.4 per cent (an increase by 5.7 percentage points), while Ireland's attractiveness would decline marginally, from 4.0 per cent to 3.8 per cent (a decrease by 0.2 percentage points). If the UK would reduce its corporate tax rate to 12.5 per cent, as shown in Figure 3.4, relative to the baseline scenario, its attractiveness to new FDI projects would increase substantially (by 9.7 percentage points) while Ireland's attractiveness would be slightly lower (a decrease by 0.4 percentage points).

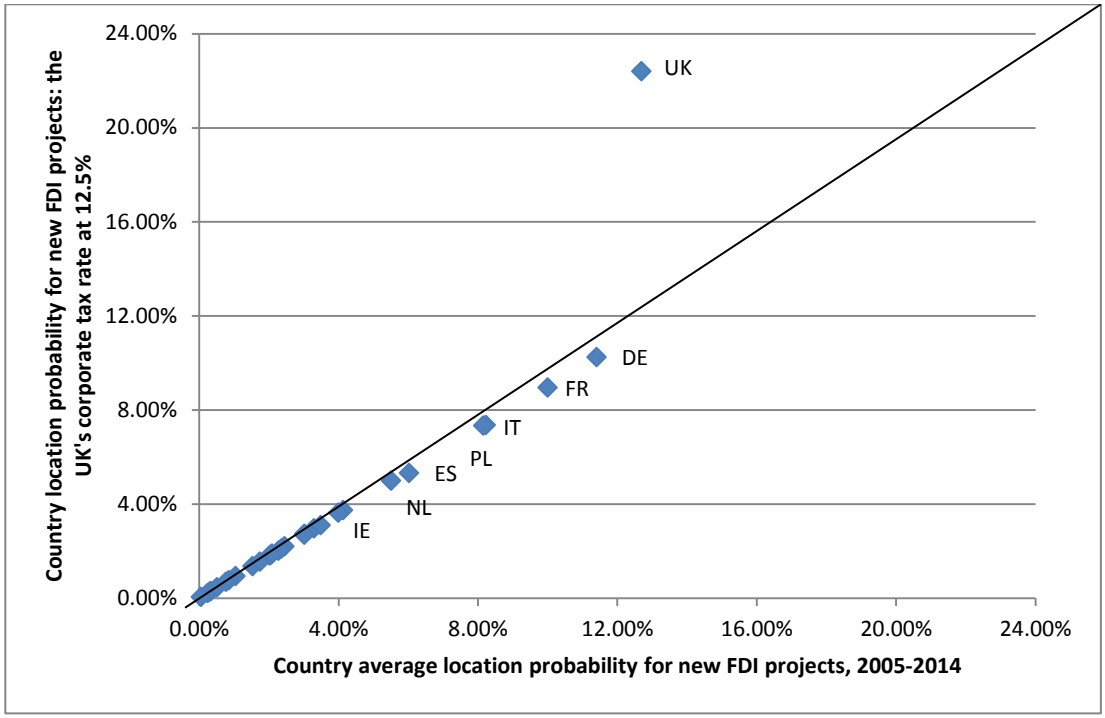
To put these estimates into perspective, it is worthwhile to note that in the case of a more competitive corporate tax rate in the UK, relative to other EU countries, Germany, France, Italy, and Poland would lose most in terms of their location attractiveness to new FDI projects. For example, at a corporate tax rate of 12.5 per cent in the UK, all else equal, the corresponding attractiveness to new FDI projects would decrease in Germany by 1.2 percentage points, in France by 1.0 percentage point, in Italy by 0.9 percentage points, and in Poland by 0.8 percentage points.

FIGURE 3.3 EU Countries' Attractiveness to New FDI Projects at 18 per cent Corporate Tax Rate in the UK



Source: Authors' estimates following the methodology in Lawless et al. (2014).

FIGURE 3.4 EU Countries' Attractiveness to New FDI Projects at 12.5 per cent Corporate Tax Rate in the UK



Source: Authors' estimates following the methodology in Lawless et al. (2014).

Figure 3.5 shows how EU countries' attractiveness to new FDI projects would change in the case of the UK's corporate tax at 18 per cent and its EU market access reduced by 25 per cent.[18] In this scenario, relative to their attractiveness over the period 2005-2014, the UK's location probability would be lower by 2.0 percentage points, while Ireland's location probability would be higher by 0.1 percentage points. The corresponding location probabilities for Germany would be higher by 0.3 percentage points, and the corresponding probabilities for France, Italy, and Poland would be higher by 0.2 percentage points.

Figure 3.6 shows the estimated countries' location probabilities at the same corporate tax rate in the UK, 18 per cent, and its reduced EU market access by 50 per cent. In this scenario, the UK's location probability would be lower by 8.3 percentage points while Ireland would see its attractiveness increased by 0.3 percentage points. In this latter case, the corresponding location probabilities in the large countries would increase in Germany by 1.0 percentage point, in France by 0.9 percentage point, and in Italy and Poland by 0.7 percentage points.

[18] The analysis also takes into account the corresponding proportional reductions in the market potential of EU countries following the UK's reduced integration with the EU.

Taken together, the estimates in the considered scenarios suggest that the UK's attractiveness to new FDI projects appears to be very sensitive to a sizeable reduction in its access to the EU market even at a more competitive corporate tax rate. Relative to the impact on the UK and other large economies, Ireland's attractiveness to new FDI projects under possible Brexit scenarios would change little.

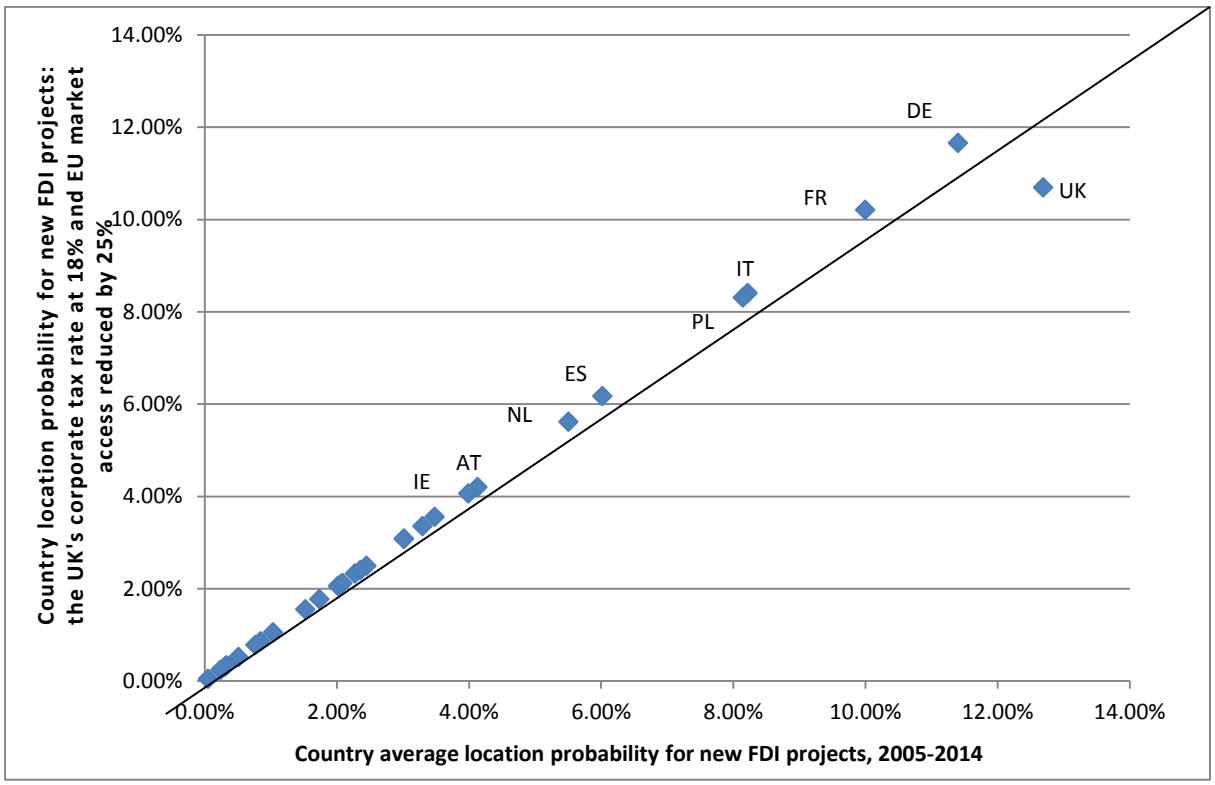
To better understand these possible changes in the UK's and Ireland's attractiveness to FDI, it is worthwhile to recall that in addition to corporate taxation and market access, multinational enterprises base their location choices on a range of other relevant country-specific macroeconomic and microeconomic structural factors.[19] Figure 3.7 shows the performance of the UK and Ireland with respect to factors which are likely to influence their attractiveness to FDI relative to the best country performer in the EU. These scores are based on executive opinions surveyed by the World Economic Forum and published in the most recent Global Competitiveness Report 2014-2015.

In comparison to the UK, Ireland has a similar perceived performance with respect to: the quality of institutions; the performance of the Health and Primary Education sectors; the quality of higher education and training; and the efficiency of product markets. Relative to Ireland, in addition to its larger market size, the UK has better scores with respect to: its macroeconomic environment; infrastructure; financial market development; labour market efficiency; technological development; innovation; and business sophistication. The UK is perceived as the best EU performer with respect to labour market efficiency. In the other dimensions, the best perceived performers are Finland (institutions; health, and primary education; higher education and training; financial market development; innovation); Luxembourg (macroeconomic environment; efficiency of product markets; technological readiness); the Netherlands (infrastructure; business sophistication); and Germany (market size; business sophistication).

Taking all these scores together suggests that further improvements in Ireland's macroeconomic environment as well as microeconomic structural factors such as innovation capacity, the quality of infrastructure, and financial market development would increase its perceived attractiveness to FDI.

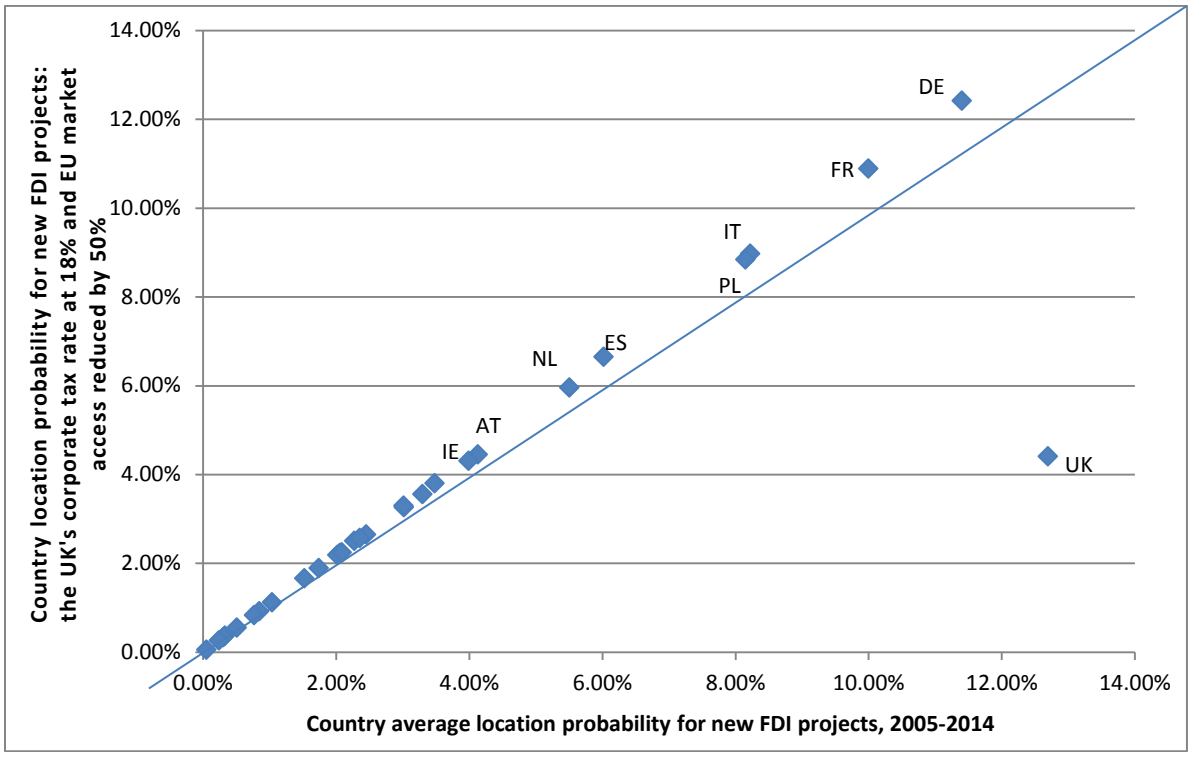
[19] Relevant evidence is reviewed by Fontagné and Mayer (2005), Resmini and Siedschlag (2013) and Siedschlag et al. (2013a, and 2013b).

FIGURE 3.5 EU Countries' Attractiveness to New FDI Projects at 18 per cent Corporate Tax Rate in the UK and Reduced EU Market Access by 25 per cent



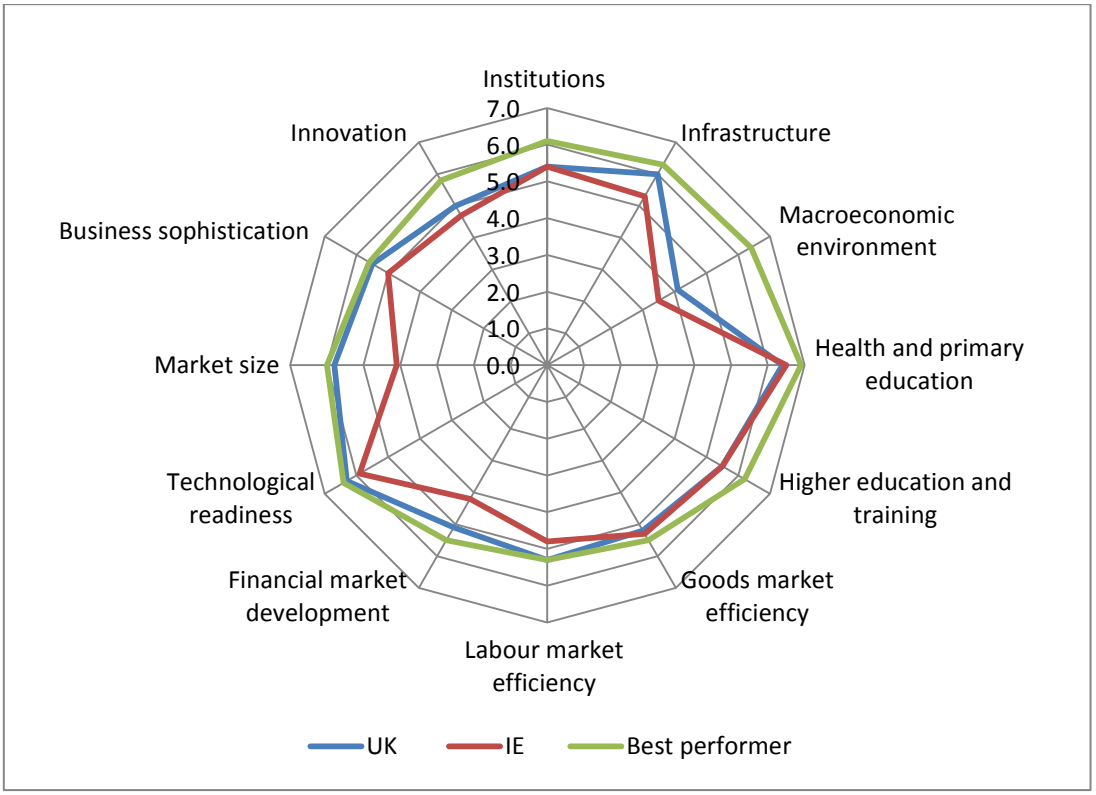
Source: Authors' estimates following the methodology in Lawless et al. (2014).

FIGURE 3.6 EU Countries' Attractiveness to New FDI Projects at 18 per cent Corporate Tax Rate in the UK and Reduced EU Market Access by 50 per cent



Source: Authors' estimates following the methodology in Lawless et al. (2014).

FIGURE 3.7 Indicators of FDI Attractiveness: the UK, Ireland, and the Best EU Performer



Source: Based on data collected with the Executive Opinion Survey conducted by the World Economic Forum, *Global Competitiveness Report 2014-2015.*

In summary, if the UK remains in the EU, and there is further integration of EU markets as well as the conclusion of international trade and investment liberalisation agreements such as the TTIP, FDI-related effects on Ireland are likely to be positive via increased trade with the UK and associated productivity gains. The UK outside the EU would be less attractive to FDI due to reduced access to the EU Single Market. Our estimates suggest that reduced access to the EU Single Market would impact negatively on the UK's attractiveness to new FDI projects even at a more competitive corporate tax rate. Less FDI in the UK would result in lower potential growth in the UK which would also affect negatively Ireland's economic growth due to less trade. Our estimates also indicate that changes in the UK's attractiveness to new FDI would impact only marginally on Ireland's attractiveness to new FDI. This result is consistent with the evidence indicating that Ireland's attractiveness to FDI is already high relative to its size and geographical position in Europe. The magnitude of gains or losses in terms of attractiveness to new FDI projects is likely to be more important in larger countries, such as Germany, France, Italy, and Poland. While the estimates discussed here were obtained under the assumption of no changes in the other

EU countries, structural and fiscal reforms in these countries could also impact on Ireland's attractiveness to FDI.

The above analysis suggests that Brexit is likely to have sizeable effects on the UK's attractiveness to new FDI projects while Ireland's attractiveness to such new FDI projects would be less affected. Brexit might lead to further changes in the UK's corporate tax system. Such possible tax reforms could include further reductions of the UK's corporate tax rate and/or changes in the corporate tax base (for example, by allowing a larger share of capital expenditure to be deducted from revenues each year), and/or reducing the complexity of paying corporate tax.

To deepen the understanding of possible FDI-related implications of Brexit, updated and additional analysis could focus on:

- How would possible changes in the corporate tax system in the UK affect Ireland's industrial mix of FDI?
- How would these changes in multinational activity in Ireland affect its export and import patterns? How would possible changes in the corporate tax system in the UK affect output and employment growth in Ireland?
- How would these effects differ for Irish-owned (SMEs) and foreign-owned (large) enterprises?
- How does the location choice of greenfield FDI investments compare to cross-border mergers and acquisitions?

Chapter 4

British Exit and the Energy Sector in Ireland

Key Points:

- There is an all-island electricity market since 2007. Interconnection between Ireland and Northern Ireland is particularly important for Northern Ireland which relies on electricity imports from Ireland to make up for insufficient local electricity generation capacity.
- It is unlikely that tariff restrictions on electricity would be introduced whatever arrangements were made following UK exit.
- If the GB market remains independent of the rest of the EU, enhanced interconnection with GB would leave Ireland vulnerable to any problems in the GB market. Under these circumstances enhanced interconnection by Ireland with the rest of the EU, most probably to France, could provide useful diversification, reducing risk for Irish consumers.
- If the UK left the EU, it would no longer be subject to EU rules on climate change policy and renewables. Outside the EU, there would be a lower chance that they would reopen discussions on trade in renewables.
- If the UK left the EU it would no longer be subject to EU regulatory measures to deal with a possible crisis situation in the case of a gas or oil shortage. Ireland would then have to consider how best to provide protection from very unlikely, but potentially catastrophic outcomes.

Over recent decades the Energy sector has become more integrated into a broader British Isles framework as a result of a number of developments in the Electricity and Gas sectors. In particular, the integration of the electricity and gas networks on the island of Ireland in the last 20 years has introduced a very high degree of interdependence. Any move which would see the UK, and hence Northern Ireland, leave the EU could have major implications for Ireland as a result of this interdependence.

This Chapter considers a number ways that the Energy sector in Ireland could be affected by UK exit from the EU: The operation of the all-island electricity market; the degree of integration of the Irish electricity market with the GB market; climate change policy and its implications for the Energy sector; security of gas supplies; gas storage; security of oil supplies. As discussed in the introduction,

much would depend on the terms of UK exit. In the case where the UK remained an associate member of the EU, subject to EU law in relevant areas of the economy, there might be very limited effects on the Energy sector in Ireland. However, if UK exit involved full UK independence from the rule of EU law and also, possibly, tariffs or restrictions on some trade, the effects could be much wider.

4.1 ALL-ISLAND ELECTRICITY MARKET

The island of Ireland has constituted a single electricity market since 2007. It is underpinned by legislation in both Westminster and in the Oireachtas. It was established because of the clear benefits for both parts of the island from having a common electricity market.

Since its establishment it has generally operated as expected. The way it is structured has ensured that the market is competitive. The market based incentives to ensure adequate capacity have worked. While there is excess capacity in the system today, this reflects the effects of the crisis on demand: the reduced level of economic activity means that demand is much less than had been anticipated.

In any electricity system supply and demand must always be equal at every second of the day. In an isolated system this means that electricity generation must always be sufficient to meet any demand. However, in an integrated all-island system this is no longer the case for Ireland or Northern Ireland taken on their own. While initially there was surplus generation in the North, which helped meet shortages in the South, this position is reversing. As a result, it is imperative for security of supply in the North that a second North-South interconnector is built to allow surplus power in the Republic to be transferred to the North. In its absence, from 2016 there will be a risk to the security of electricity supply in the North. Thus, over the second half of the decade, the North (and hence the UK) will be more exposed to an interruption in cross-border supplies from any change in regime than will the Republic.

However, the interconnectedness of the electricity system on the island means that in the case of a major shortage of gas supplies, on which the Irish electricity system depends, the Republic would have leverage vis-à-vis Northern Ireland because of the North's dependence on electricity from the Republic.

As discussed later, in the case of an exceptional event leading to a shortage of gas on the European market, failure by the UK authorities to share gas with the Republic could disproportionately affect Northern Ireland. Hence, there would be some leverage in persuading the UK authorities to share gas supplies in accordance with pre-existing agreements.

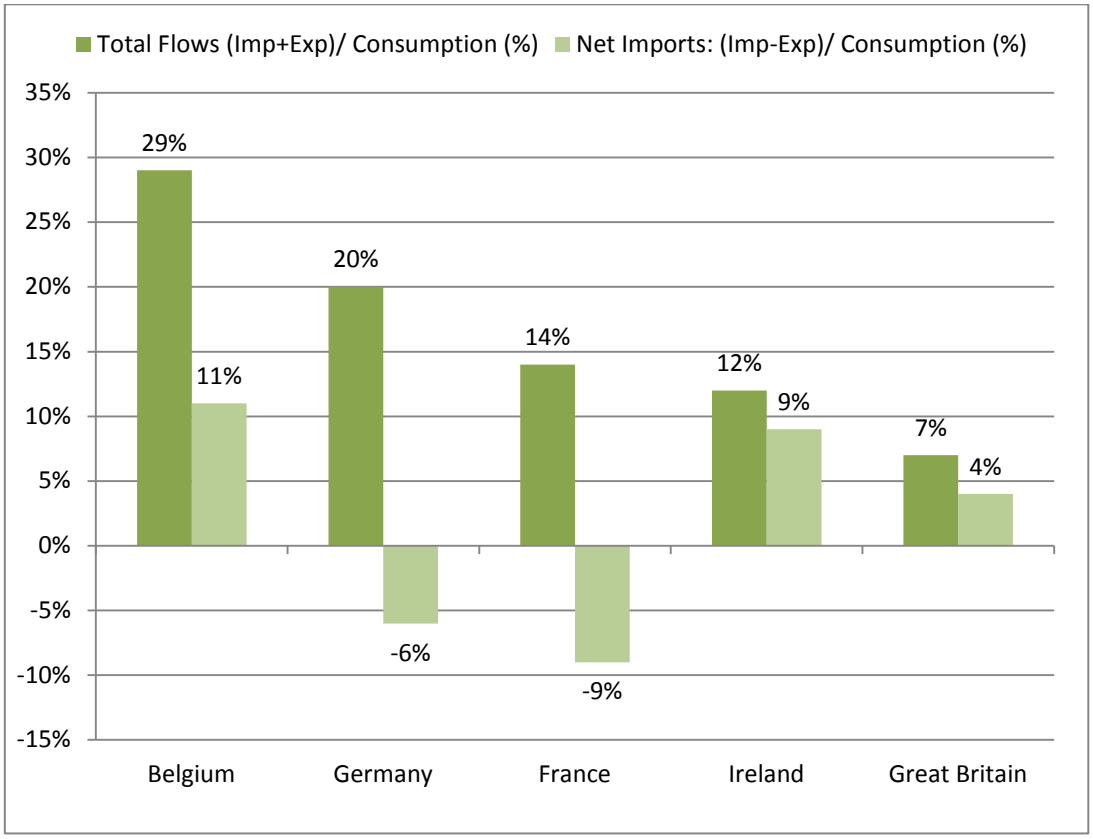
The main concern arising from UK exit would be if there were restrictions on trade, such as tariffs. However, it seems very unlikely that such restrictions would be introduced whatever the arrangements were made following UK exit. The fact that there is free trade in electricity between Russia and Finland and the Baltics highlights this.

Finally, the Single Electricity Market is underpinned by legislation and legal agreements between the two governments. Consequently, should the UK leave the EU, the previous bilateral agreements would remain in force.

4.2 IRISH AND UK ELECTRICITY MARKETS

The development of the EU electricity market, the increasing deployment of wind in Ireland, the developing market in renewables and the wider need to enhance security and competitiveness all require increased interconnection between the Irish electricity market and the rest of the EU. However, there are a range of questions around how much interconnection there should be between the Irish market and the rest of the EU and where this interconnection should take place. In addition, if the UK were to leave the EU there would be even greater uncertainty about the structure of the GB market in the future.

FIGURE 4.1 Interconnection Flows as a Percentage of Consumption, 2013



Source: FitzGerald and Malaguzzi Valeri (2014), elaboration from ENTSO-E: Statistical Factsheet 2013.

It is not clear how much interconnection there will be between GB and the rest of the EU over the coming decade. At present, because of the limited interconnection (Figure 4.1), GB is effectively a separate market from the rest of the EU, with prices for each time period being set based on supply and demand conditions in the GB market. However, with increasing interconnection GB would eventually become part of a wider EU market, with prices set by the EU demand and supply conditions. Irish concerns about imperfections in the GB market would no longer be relevant and interconnection to GB would have the same effect on prices as interconnection to France. However, for the next five to ten years the GB market is likely to be largely independent of the rest of the EU and enhanced interconnection between Ireland and GB would gradually integrate Ireland into the GB market.

While UK exit could affect the willingness of the UK to build further interconnection to the rest of Europe this also seems unlikely. They are currently working on an interconnector to Norway, a country that is not an EU member but whose electricity system is fully integrated in Nordpool (covering Scandinavia).

If the GB market remains independent of the rest of the EU, enhanced interconnection with GB would leave Ireland vulnerable to any problems in the GB market. Under these circumstances enhanced interconnection by Ireland with the rest of the EU, most probably to France, could provide useful diversification, reducing risk for Irish consumers. If, instead, GB becomes part of the wider EU market through extensive investment in new interconnectors, connecting directly to France would prove unnecessarily costly for Ireland. Thus, the lack of clarity about GB intentions makes long-term planning for the development of Irish interconnection difficult.

Future EU developments could lead to a much more coherent EU electricity market, which might be much better from an Irish point of view than being dependent on the independent GB market. If the UK remained an EU member, then we would share the benefits of such an EU-wide reform. However, if the UK left the EU it would be much less likely to participate in such an initiative, leaving Ireland dependent on an unsatisfactory UK market.

The possibility of UK Exit would increase the potential value of diversifying risk through favouring direct connection of the Irish electricity system to the rest of the EU, albeit at a higher price.

4.3 CLIMATE CHANGE POLICY

If the UK left the EU, it would no longer be subject to EU rules on climate change policy and renewables. This would raise the possibility that the UK could change its current policies – for example, where they are currently likely to impose a high cost on the domestic economy to produce the necessary investment in renewables to meet their EU obligations. It is difficult to predict how UK energy policy might develop if it were no longer subject to EU law. In turn, because all of our gas and electricity interconnection is to the UK it is very difficult to predict what the implications would be for Ireland.

However, research has been done into the implications for Ireland of the unilateral adoption of a carbon floor in the UK (Curtis and di Cosmo, and Deane, 2014). This research suggested that where the UK imposed on itself a higher carbon price than in Ireland, the effect would be to raise the price of electricity in Ireland. This would be good for producers in Ireland but bad for Irish consumers. It would result in a windfall gain for Irish producers.

The conclusion of this study was that it might well be desirable for Ireland to impose a similar carbon floor in Ireland to transfer the windfall gain from producers of electricity to consumers in Ireland. As a result of a High Court decision it might be difficult to collect the windfall gains through the alternative of a special tax on producers.

The UK has already introduced such a carbon floor unilaterally. However, because of the adverse implications for the UK economy of the planned high floor price, it has been capped at a lower level than had originally been planned. It seems unlikely that the UK outside the EU would adopt an even higher price floor. While we have focussed on the effects on Ireland, a UK policy of a very high carbon price floor, well above the EU price, would impose significant costs on the UK, albeit reducing emissions. It could also lead to windfall gains for producers elsewhere in the EU.

An alternative UK strategy, after exit, might involve dropping out of the EU Emissions Trading Scheme (ETS) altogether and reducing the cost of carbon below the EU level. This may seem unlikely considering that the UK has expressed dissatisfaction with the low carbon signal stemming from the EU ETS. If the UK were to adopt this approach, this would mean that electricity producers in the North (and GB) would be able to produce electricity more cheaply than those in the Republic. In turn this would be good for Irish consumers who would import much more electricity from the North (and GB). However, it would be bad for Irish producers and very bad for the environment as it would encourage more electricity consumption in the UK and also in the Republic, albeit with the emissions being credited to the UK. It would also affect the wider EU market, which is also interconnected to the UK, albeit to a limited extent.

If such a policy were adopted by the UK to promote competitiveness at the expense of the environment it could, in theory, provoke an EU response in terms of tariffs etc. However, that might not be possible under WTO rules. Also the EU currently imports electricity from Russia in spite of their failure to take comparable action to the EU on climate change. Thus it would be most unlikely that the EU would take countervailing action. In any event, the rhetoric of all parties in the UK favours action to tackle climate change and a permanent reversal of this policy seems very unlikely.

Another strand of EU climate change policy is the promotion of renewables through national targets. Currently the UK is committed to this policy, though the way they plan to meet it (avoiding onshore wind) is likely to make it much more

expensive than in Ireland. Hence the UK government considered trading in renewable electricity with Ireland, which could have reduced the cost of UK compliance. However, negotiations on this strategy stalled because of a reluctance to pay the necessary subsidy to Irish producers, in spite of the fact that it would have reduced the overall cost of compliance for the UK. Nonetheless, these discussions could be restarted at some later date if the UK remains in the EU, given the possible gains for both parties to such an arrangement.

However, if the UK left the EU they would no longer be faced with a renewables obligation. As the logic for such an obligation, from a climate change point of view, is much less than for the ETS, the UK could well abandon this scheme. Helm and others have shown that the UK could do much more to reduce emissions at much lower cost if it abandoned the offshore wind programme and used some of the subsidy to take other sensible measures to reduce emissions. Hence there is a much greater chance of a change in UK renewables policy after exit than there is of them abandoning the commitment to climate change policy altogether (including the ETS). This would suggest that, outside the EU, there would be a lower chance that they would reopen discussions on trade in renewables.

An abandonment by the UK of a renewables policy would also affect Northern Ireland. However, the full implications of such a policy for the all-island electricity market are not clear. Even today the support for renewables in each jurisdiction is treated as a subsidy and the cost is levied as a tax on consumers at different levels in the two jurisdictions. It is only the externalities arising from high levels of wind penetration on the system that are reflected in the wholesale price of electricity. Thus it seems likely that separate strategies on renewables in the two jurisdictions, facilitated by UK exit, would not pose a major problem.

4.4 ENERGY SECURITY

If the UK were to leave the EU it would no longer be subject to EU law. This could lead to uncertainty in many areas of energy policy. In particular, Ireland currently relies on EU regulatory measures to deal with a possible crisis situation in the case of a gas or oil shortage. Current provisions of EU law provide for an equitable sharing of energy resources under such circumstances, facilitating coordinated emergency planning and resolution of any disputes among Member States. If the UK left the EU it would no longer be subject to these provisions. Ireland would then have to consider how best to provide protection from very unlikely, but potentially catastrophic outcomes. The experience of the Second World War was that the UK unilaterally hoarded scarce energy resources and felt no requirement to provide for Ireland's needs, notwithstanding any pre-existing legal agreements.

A major gas outage would have serious implications for the Irish economy. Even with Ireland's domestic source of natural gas, 92 per cent of the country's gas supply was imported in 2008, (SEAI, 2009) increasing to 95 per cent by 2012 (SEAI, 2013a). Production of indigenous gas decreased by 90 per cent over the period 1990 to 2012, with the exception of a 7.4 per cent increase occurring in 2012. This decrease in indigenous production is reflected in the increase in dependence on GB for imported energy (SEAI, 2013b). At the same time GB itself has changed from being a net exporter of gas to being a net importer. Thus, the British Isles market is gradually becoming integrated into the wider EU gas market and, in the long run, any shock to EU gas supply will have knock-on effects on Ireland. The fact that the UK is becoming more dependent on external gas supplies provides some assurance that they could not act unilaterally in the face of a crisis, even if they had left the EU.

Gas supplies are of crucial importance to Ireland because gas plays a central role in electricity generation. Because of this, any interruption to supply could have very serious consequences. Nearly all of the gas used in Ireland comes through the interconnectors with the UK. There are three undersea pipelines but only one onshore pipeline in Scotland carrying all the gas for the island of Ireland. Clearly, any problem with the one onshore pipeline in Britain would be very serious for Ireland. Experience elsewhere suggests that such problems can generally be repaired relatively rapidly onshore. Nonetheless, there remain concerns about dependence on this single piece of infrastructure.

Whatever about the security of the onshore pipe, any break in an offshore pipe would take much longer to fix. After the first undersea interconnector was built in 1993, a second interconnector was completed in 2002 in order to fulfil both the obligations imposed by the EU Regulation on Security of Gas Supply and also to protect Ireland against any risk of service disruptions through a fault in the existing undersea pipeline. The second interconnector replicates the maximum capacity of the first interconnector (measured as 17 million cubic meters/day) and provides an additional capacity of 6 million cubic meters/day to take into account the rise in the gas demand expected when the pipeline was opened in 2002.

As a result of the building of the second pipeline there is greatly enhanced security, not just for those who source their gas from GB directly through the pipelines, but also for all users of gas, from whatever source, and all users of electricity. With the building of the North-South pipeline the benefits of security of supply were further enhanced for consumers both North and South.

This still left a vulnerability to damage to the single onshore pipeline in GB. However, with the advent of Corrib, Ireland will have two alternative sources of supply of gas for the coming decade. While Corrib will never be able to supply all of Ireland's needs, it is likely to be able to meet the needs of the Electricity sector until at least 2020. Thus Ireland's vulnerability to a possible very low probability event (damage to the onshore pipeline in GB which would take more than a week to repair) will have been eliminated for the current decade. There is, as a result, no reason for consumers to pay for an additional premium for security of supply over the next few years. Also, Ireland will be reasonably immune to unilateral action by a UK outside the EU while the Corrib supply meets a substantial share of Ireland's needs.

The Corrib gas field is currently being developed as a new source of indigenous gas and is expected to supply slightly over 60 per cent of Irish demand when in operation, but only for about six years (Leahy et al., 2012). Thereafter, over the following decade, the gas supply from this source will gradually fall off. Due to continued delays, the Corrib gas field will not produce the first gas flow till 2015.

Ireland's increasing dependence on GB for natural gas imports over the last 15 years has put security of supply and cost of transmission at the centre of energy policy. Security of supply can be defined as

> *...an uninterrupted flow of energy to meet demand in an environmental sustainable manner and at a price level that does not disrupt the course of the economy* (Damigos et al., 2009).

In a 2009 report (CER, 2009), the CER stated that at the end of 2005 the average number of days of gas storage in Ireland was 11 days whereas for the EU15 it was on average 52. Thus a prolonged interruption of supplies could not be met from storage.

The economic cost of a natural gas outage measures the consequences of the unavailability of natural gas for heating, electricity and industrial production. This can be done by measuring lost consumer surplus in the residential sector, the cost of lost electricity in all sectors (by estimating the value of lost load) and lost VAT on the sale of gas and electricity. Lyons and Morgenroth (2013) estimate the daily economic cost for Ireland of a natural gas outage in 2008 as ranging from €350 million to €640 million with the loss in electricity accounting for an estimated 80 per cent of the total cost. The estimated cost varies significantly with demand, the time of year and day of the week, and how capacity is managed. Such a loss, if sustained over many days, would result in a truly dramatic loss of GNP, dwarfing

the cost of the recent economic crisis. Hence, even if this is a very low probability event, action to render it even less likely is of considerable national importance.

Thus once Corrib is largely depleted, Ireland will once again be dependent on the UK for transit of gas supplies. With UK exit there would be the danger that in the case of an extreme event, they might choose to hoard gas supplies whereas if they were still in the EU this would not be possible.

4.5 OIL STORAGE

Currently a significant part of the Irish emergency oil supply is stored in the UK. If the UK left the EU, in the case of an emergency they would no longer be bound by EU law. As in the Second World War it would be open to them to use the oil stored in the UK for UK purposes. While such an event affecting world oil supplies would be extremely unlikely, nonetheless the issue of storing all Ireland's emergency oil supplies within the EU would need to be considered.

4.6 GAS STORAGE

At present there is very limited gas storage in Ireland. The absence of storage has two costs. The first is the security of supply risk, arising from an absence of supply due to an extreme event and the second is that it does not permit smoothing of the seasonal fluctuation in gas prices. The energy security issue has already been discussed above.

Probably the best location to provide large-scale gas storage, if it is required, is in salt caverns near Kilroot in Northern Ireland. A full study of the economics of such an investment is not available. However, the fact that it would be located in a Northern Ireland, that might find itself outside the EU, could affect any future decision on undertaking such a project on an all-island basis.

However, such storage would have limited usefulness for energy security purposes: the storage would be full in late autumn and empty in late spring. Hence it would not provide security during the season when it would be empty – it would not provide a full hedge against a major gas interruption.

As the risk to existing or new bilateral agreements on gas would only arise in an emergency situation, under normal circumstances the risks to a gas storage investment in Northern Ireland from UK exit would be small, provided it was covered by appropriate legal agreements.

Chapter 5

Migration/Labour Market Brexit and Migration

Key Points:

- Large migratory flows between Ireland and the UK continue and these flows are related in part to economic conditions.
- Net flows from Ireland to the UK increase when the Irish unemployment rate rises relative to the UK rate. This suggests that the closure of the UK labour market for emigrants from Ireland would tend to put upward pressure on unemployment rates and possibly downward pressure on wage rates if the unemployed competed for jobs in Ireland.
- Approximately 60,000 people moved from Ireland to the UK between 2011 and 2013.
- Simulating the effect of an inflow of 60,000 labour force participants in Ireland i.e. 'non-outflow' due to migration restrictions, shows that wages in Ireland would fall by almost 4 per cent.

One of the key areas of concern in the context of a possible Brexit is the free movement of people between Ireland and the UK and in particular the free movement of labour. Through the Common Travel Area (CTA), Irish and British citizens enjoy a remarkable degree of migratory freedom between the Republic of Ireland and the UK and maintenance of the CTA has been a core feature of Ireland's policy on migration. Among the tangible benefits of this arrangement with the UK is the absence of a border in practical terms between the Republic and Northern Ireland.

A UK exit from the European Union could potentially have the effect of passport controls being placed on the border with Northern Ireland, a reduction in the ease of movement between the Republic of Ireland and Britain and the removal of the automatic right to work in Britain for Irish people. Such outcomes would clearly be a dramatic departure from current arrangements and for this reason there may be a temptation to believe that any agreement on a UK exit would guarantee continued free movement between Ireland and the UK. It could also be argued that the imposition of border controls between Northern Ireland and the Republic would be avoided so as to protect progress on an enormously sensitive political issue. However, there does not appear to be any certainty on this point.

Another point which is relevant in this context is the centrality of migration to the UK's desire to renegotiate its relationship with the EU. The discussions which will be conducted in the lead up to the UK referendum will see migration as being a key issue. If the UK voted to leave the EU, there would be ongoing discussions about migratory arrangements post-Brexit including, for example, the situations of UK nationals resident in other EU Member States and EU nationals (including Irish people) resident in the UK. It is difficult to predict how UK-Irish bilateral issues would interact with these broader EU-UK discussions and how the post Brexit UK-Ireland situation would look.

In the remainder of this chapter, we will look more closely are the migratory links between Ireland and the UK. We do this in an effort to get a stronger sense of the quantitative impact of a Brexit as it relates to the movement of people. Our analysis will tend to focus on the extreme case in which the UK leaves the EU without ongoing arrangements to facilitate a continuation of the four freedoms. We will also tend to assume that there will be no Nordic-type arrangement between Ireland and the UK on mobility. In this way, we will be considering a worst case scenario.

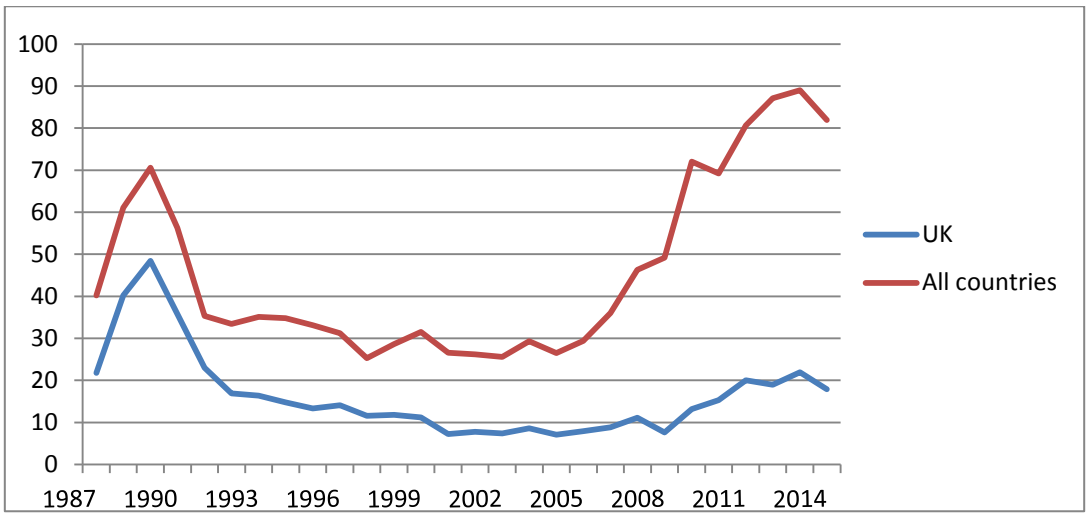
In Section 2 we look at the flows of people between Ireland and the UK in recent times using published CSO data. In Section 3, we discuss how these flows have impacted upon the operation of Ireland's labour market drawing on existing research in economics. In Section 4, we use a model of the Irish labour market to quantify the possible impacts of a changed migration situation for Ireland. As will be seen, the impact comes through two possible routes: a reduced outflow from Ireland as a result of the UK being closed off to emigration and the diversion of migration from away from the UK towards Ireland. In Section 5, we provide some concluding remarks.

5.1 FLOWS BETWEEN IRELAND AND THE UK

In Figures 5.1 and 5.2, we present data on emigration out of and immigration into Ireland between 1987 and 2014, showing flows to all countries and also to the UK specifically. These figures capture moves by people where relocation is happening as opposed to shorter visits which are discussed below. Looking at Figure 5.1 first, a number of interesting points emerge. First, over this 27-year period, the proportion of emigration from Ireland that was bound for the UK has fallen. In 1987, the proportion was 55 per cent; in 2014, this had fallen to 22 per cent. Second, even though the proportion of the emigration going to the UK has fallen, the UK remained a destination for emigration from Ireland through the boom of

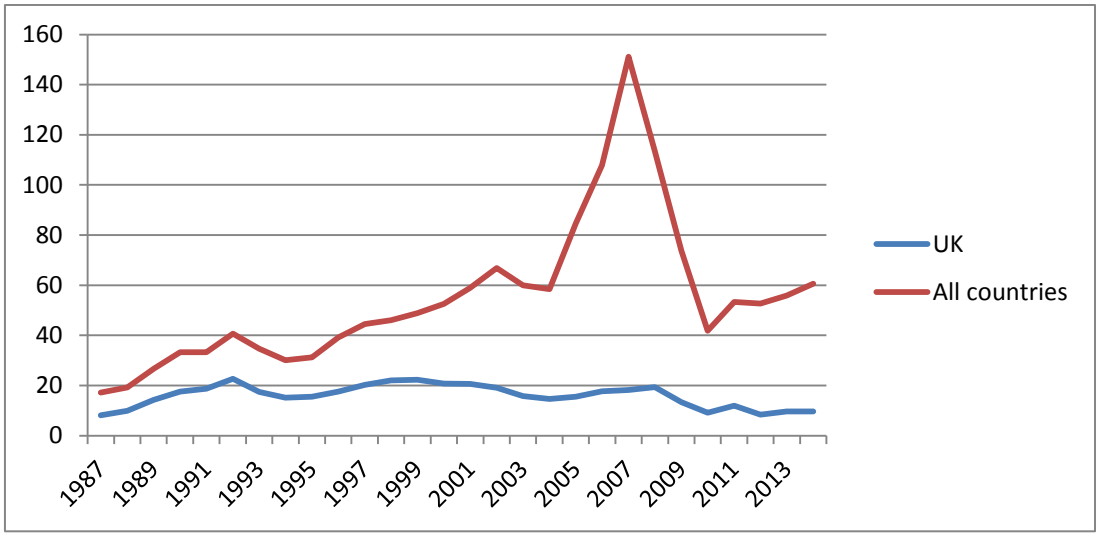
the 2000s with close to 10,000 emigrating there each year between 2000 and 2006. Third, as the recession impacted in the late 2000s, emigration to the UK doubled and reached almost 22,000 in 2013.

FIGURE 5.1 Emigration in Thousands, 1987 to 2014



Source: Central Statistics Office.

FIGURE 5.2 Immigration in Thousands, 1987 to 2014



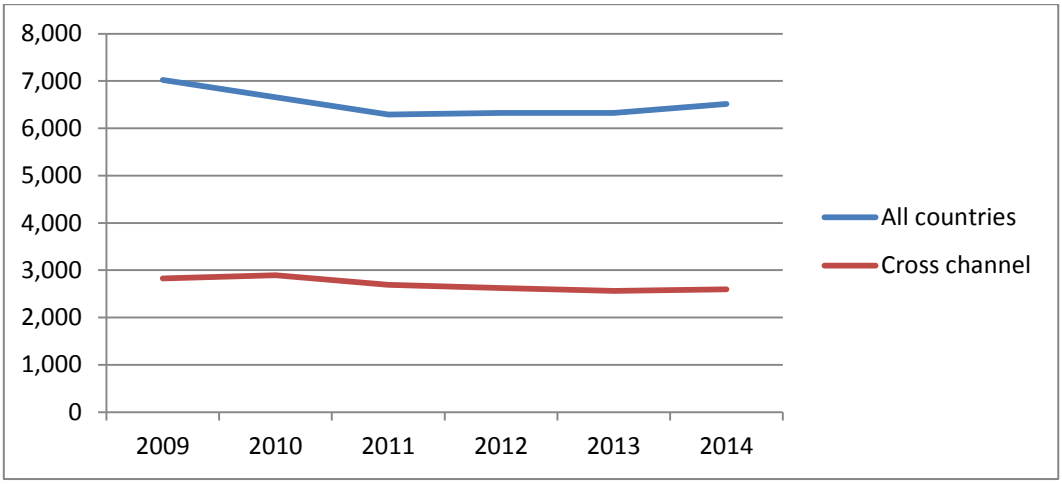
Source: Central Statistics Office.

Looking at Figure 5.2, we again see a fall in the UK's proportion of a migratory flow. In 1987, 47 per cent of immigration was from the UK but by 2014 this had fallen to 16 per cent. However, from Figure 5.2, we are given a clue as to one reason for the apparent weakening of the Irish-UK migratory link. The large jump in immigration between 2004 and 2007 relates to EU accession and the inflow of

citizens from the New Member States but an increasing number of citizens from beyond Ireland and the UK was becoming a part of Ireland's migratory make-up from the late 1990s. Many of these migrants will have come from outside Britain and Ireland and will have emigrated back to their countries of origin (or beyond). For this reason, a simple interpretation of Figures 5.1 and 5.2 may under-state the ongoing propensity of Irish people to move between Ireland and the UK.

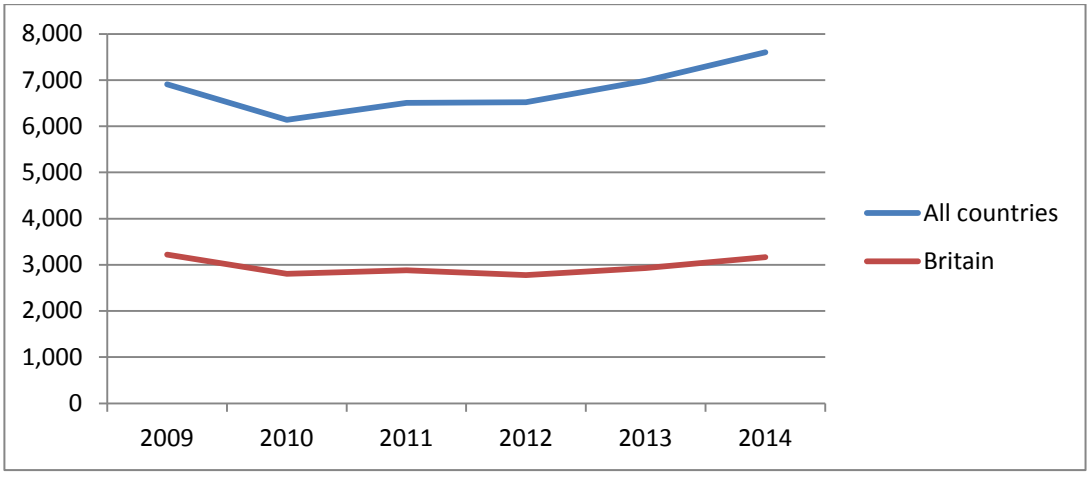
In Figures 5.3 and 5.4, we present data on overseas trips to and from Ireland looking again at the overall numbers and cross-channel numbers.

FIGURE 5.3 Overseas Trips by Irish Residents in Thousands, 2009 to 2014



Source: Central Statistics Office.

FIGURE 5.4 Overseas Trips to Ireland by Non-residents in Thousands, 2009 to 2014



Source: Central Statistics Office.

The most striking point from both figures is the fact that trips to and from Britain represent about 40 per cent of total trips. While this is another indicator of the close link between the UK and Ireland in terms of the movement of people, it is less clear that a Brexit would have a large impact for people travelling between Ireland and mainland Britain. Despite the existence of the CTA, travelling by air from the UK can involve the need to show a passport so it is not clear how great a change would arise in that specific context from the loss of the CTA. On arrival at UK airports from Ireland, there is generally no need to present a passport but even the need to do so should only lead to a modest increase in delays. If the UK imposed visa requirements on Irish citizens, this would create greater inconvenience but it is not clear that such requirements would be imposed.

The biggest impact of a Brexit in terms of short term movements could be with respect to the border with Northern Ireland, depending on the arrangements put in place, and we return to this below.

5.2 LINKS BETWEEN THE IRISH AND UK LABOUR MARKETS

From Figures 5.1 and 5.2 above it is clear that there have been, and continue to be, large migratory flows between Ireland and the UK and that these flows are related in part to economic conditions. Over many years, economists in Ireland have studied this link and have observed that the link with the UK has an important impact on the operation of the Irish labour market. This point is probably illustrated best with reference to two papers by Honohan (1984 and 1992). Although these papers are relatively old now, the points made are still relevant and continue to influence how economists view the Irish labour market.

In the first of these papers, Honohan (1984) makes the point that most studies up to that time which had looked at the links between the Irish and British labour markets had done so by relating wage and unemployment differentials between Ireland and the UK to flows between the two labour markets. A number of authors had shown that if wages in the UK grew relative to Ireland or if the rate of unemployment in the UK fell relative to Ireland, net flows in the expected direction would emerge. In turn, these flows would continue until an equilibrium gap between Irish wages and unemployment rates was re-established.

While these studies had shown qualitatively similar results, the quantification of the relationships between relative wages, unemployment rates and migration flows tended to vary depending on time period used. Honohan argued that the studies suffered from serious data problems and he proposed simply looking at Irish and UK unemployment rates. He maintained that closely related movements

in the UK and Irish unemployment rates were at least consistent with a story which says that in times of high UK unemployment, Irish emigrants return home or chose not to move, thus increasing Irish unemployment. Similarly, as UK unemployment falls, emigration resumes and the Irish unemployment problem eases.

His empirical work indicated that Irish unemployment did indeed react to movements in British unemployment and that over time, Irish unemployment would converge to an equilibrium relationship with UK unemployment whereby it stood at 5 per cent above the UK level. This issue was re-visited by Honohan (1992) using data up to the last quarter of 1991. While arguing that UK unemployment still has a strong influence on Irish unemployment, he believed that the equilibrium gap was no longer constant and had risen. He suggested that the reduced strength of the link may be a result of a growing group of long-term unemployed in Ireland who did not form part of a once mobile labour force and who instead remained in Ireland even if unemployed. While that argument may have had merit in the late 1980s and early 1990s, its relevance in the 2000s would have diminished.

The picture that emerges from Figure 5.1 suggests that a mechanism is still in operation through which net flows from Ireland to the UK increase when the Irish unemployment rate rises relative to the UK rate. This suggestion continues to be borne out in econometric analyses of the Irish labour market where conditions in the UK labour market are still shown to have explanatory power when modelling features of the Irish labour market. This suggests that the closure of the UK labour market for emigrants from Ireland would tend to put upward pressure on unemployment rates and possibly downward pressure on wage rates if the unemployed competed for jobs in Ireland.

5.3 QUANTIFYING THE IMPACTS

In order to provide a sense of the possible impact from a Brexit-related change in Ireland's migration situation, we undertake a simulation using the ESRI's Small Labour Market Model.[20] This model has been used in papers such as Barrett et al. (2006) to quantify the impact of immigration on variables such as wages and rates of unemployment. An important feature of the model is that it differentiates between high-skilled and low-skilled labour. This is a particularly important

[20] Similar results would emerge from the ESRI's HERMES model but the alternative model is used here due to the focus labour market issues.

feature in the context of immigration because the impacts differ depending on whether the inflow is primarily high-skilled or low-skilled.

We use the model to simulate the effect of an inflow of 60,000 labour force participants[21] and in so doing we are trying to capture two possible effects of a Brexit. First, as shown in Figure 5.1, approximately 60,000 people moved from Ireland to the UK between 2011 and 2013. Our simulation exercise can be viewed in terms of restricting the outflow of this group – this 'non-outflow' can be captured in the model as an inflow because both amount to a labour supply increase within Ireland. Of course, those who would choose to go to the UK could go elsewhere if the UK was closed off but we will omit that possibility for now and will note that many people may not chose to go further afield.

A second possible effect of a Brexit is to divert immigration to Ireland from the EU that would otherwise have gone to the UK. It is impossible to quantify how large this effect might be but it is possible to envisage that the situation would arise. We know from research on immigration that migration can be part of a process of investment in human capital (Barrett and Goggin, 2010). We also know that good English language skills are a valuable form of human capital. To the extent that there are potential migrants from Central and Eastern Europe who are eager to acquire stronger English language skills, they may be willing to move to Ireland if the UK is removed as a potential destination. Net migration to the UK in 2014 was 300,000 (across all nationalities) so we simply take 20 per cent of this and ask what would happen in the Irish labour market if 60,000 entered.

The results of the simulation are presented in Table 5.1. Before discussing the results some points need to be clarified. First, the model has been estimated using data pre-crisis and so the model relates to a time of more normal labour market conditions in terms of unemployment than currently exists. For this reason, the results should be seen as holding at a time where the labour market is more able to absorb immigration into employment. Given that Brexit would not happen until the later part of this decade, this is not a disadvantage. Second, we assume for the purposes on the simulation that the inflow has the same proportion of high- and low-skilled labour as the resident labour force in Ireland and we assume that high skilled immigrant labour is employed in high skilled occupations. We know from

[21] While the CSO publishes estimates of migration flows by origin/destination and by education level separately, they do not publish tables which show these variables combined. Hence, we cannot say any definitive about the skill mix of the UK/Ireland flows. However, it is worth noting that some element of the UK/Ireland flow relates to professionals whose qualifications are readily recognised across the two jurisdictions and where job experience would be readily transferable due to similar institutional environments.

earlier research (Barrett et al., 2006) that this may not hold but it is a useful simplifying assumption for now.

As can be seen in Table 5.1, the largest effects of the inflow of 60,000 are with respect to wages. In the middle column, we are assuming that low-skilled wages are fixed and that all the adjustment in the labour market for low-skilled people occurs along through unemployment. In the case of both the middle and right-hand columns, only wages adjust for high-skilled people. According to the simulations, average wages fall by either 3.9 per cent or by 3.7 per cent, depending on the low-skill adjustment assumption. The wage fall is larger for high-skilled people at almost 5 per cent. In the situation where low-skilled wages are allowed to adjust, we see an increase in spite of the inflow and the increase in supply. This arises from the fact that low-skilled and high-skilled workers are complements in production and so more high-skilled workers leads to an increase in demand for low-skilled workers. The unemployment rate of low-skilled workers rises by 1 percentage point in the middle column.

The conclusion to be drawn from this simulation is that the effect of a changed migration situation for Ireland could be significant. Our model is constructed in such a way that most of the adjustment is through wages and this produces average wage falls of almost four per cent. If we constrained the model so that unemployment was the primary path for adjustment, equally large results would emerge.

TABLE 5.1 Results of a Simulation in which 60,000 Labour Force Participants are Added to Ireland's Labour Force

	Low-skilled unemployment adjustment	Low-skilled wages adjustment
% Change		
GNP per head	0.9	0.8
GNP per worker	0.8	0.8
GNP	3.0	2.8
Total Employment	2.2	2.0
Average wage	-3.9	-3.7
High-skilled	-5.0	-4.8
Low-skilled	0.0	0.8
As % of labour force:		
Unemployment rate	-0.4	0.0
Low-skilled unemployment rate	-1.0	0.0

Chapter 6

Summary and Conclusions

With the election of a Conservative government in the UK in May 2015, the UK is set to attempt a re-negotiation of its relationship with the EU followed by an in-out referendum. As the UK remains one of Ireland's closest economic partners and given that much of economic activity between EU members is governed by EU rules, any change in the relationship between the UK and the EU is also likely to impact on the relationship between the UK and Ireland. This report has analysed the main economic channels through which a changed UK-EU relationship might affect Ireland. The channels include trade, both merchandise and services, FDI, energy and migration and the labour market. In doing so it considered in particular the outcomes which are likely to have the most negative economic consequence for Ireland, namely an exit of the UK from the EU, which may not necessarily involve the UK becoming a member of the European Economic Area (EEA).

Overall the analysis presented here suggests that the most significant impact is likely to be concentrated in the trade relationship. This involves both exports and imports and is likely to have a bigger negative impact on smaller indigenous companies. While there may be some limited diversion of FDI from the UK to Ireland, the positive growth effect of FDI into a UK within the EU would outweigh this. Brexit could impact on Ireland through UK environmental policy via the operation of the Single Electricity Market on the island of Ireland, and could also necessitate more costly interconnection infrastructure in order to connect to the EU electricity market. Barriers to migration into the UK could impact on Ireland through lower levels of emigration of Irish people to the UK and/or diversion of migrants from the UK to Ireland, which could have a significant impact on wages or the unemployment rate.

The analysis of trade flows showed that both merchandise exports to and particularly imports from the UK continue to account for a significant share of Irish trade, although that importance has been declining. Indeed Ireland has a merchandise trade deficit with the UK. Importantly, the UK is a more important destination for services exports than merchandise exports, but is less important for services imports than merchandise imports.

The analysis also highlights the fact that the importance of the UK as a trading partner differs significantly across sectors and products. This is important as most of the existing analysis of the impact of Brexit is aggregate and thus ignores the incidence of the impacts on different parts of the economy. The analysis of detailed trade by product shows that merchandise trade is very concentrated in a few product types, which implies that increased trade barriers for most of the important products would have a particularly significant impact on total trade volumes. While some sectors such as Chemicals and Pharmaceuticals account for a large share of exports to the UK, sectors such as Agriculture, Food and Beverages and Basic Metals are more dependent on exports to the UK. Financial services and Business services constitute the most important services exports to and imports from the UK. These sectoral trade patterns are significantly driven by FDI, but overall the UK is a more important export destination for Irish firms.

In relation to the all-island dimension the analysis shows that trade between Ireland and Northern Ireland has been declining as a share and the overall volume is below the level expected for two trading partners located on an island. Overall Ireland is more important to Northern Irish exporters than Northern Ireland is for Irish exporters, which suggests that the negative impact of Brexit would be greater for Northern Ireland.

Existing estimates from the literature on the impact of EU and other trading blocks on trade intensity suggest that a Brexit is likely to significantly reduce bilateral trade flows between Ireland and the UK. In a worst case scenario with the UK outside the EU the impact could be 20 per cent or more and given that more than 15 per cent of Irish exports are destined for the UK would have a significant impact on total trade volumes. The impact would be particularly damaging for sectors that export disproportionately to the UK such as the Food and Beverages sector. Ireland is also very dependent on imports from the UK. As new supply channels will need to develop, any increase in trade barriers is likely to result in an increase in prices. This would have a negative impact on competitiveness that would impact on the wider economy in Ireland.

The UK is a leading destination for FDI. Its inward FDI stock is the largest in Europe and the second largest in the world after the US. EU membership has played a key role in attracting FDI to the UK from inside as well as from outside the EU. The UK's inward FDI stock is a source of technology diffusion and productivity growth that is also beneficial to Ireland via trade and investment linkages. Further EU integration as well as trade and investment liberalisation following the successful completion of the Transatlantic Trade and Investment Partnership (TTIP) would have a positive effect in the UK and Ireland.

The UK outside the EU is likely to be less attractive to FDI because of uncertainty and loss of EU market access. Less FDI will translate into lower productivity growth and a lower potential growth in the UK with negative consequences on Ireland's economic growth. Ireland may attract additional FDI projects including some relocation of FDI from the UK. However, the expected increased attractiveness of Ireland to FDI is likely to be small. Corporate tax reforms in the UK could increase the attractiveness of the UK to FDI while the magnitude of the negative impact on Ireland's attractiveness would be small. Relative to Ireland, the UK has a number of attractiveness advantages due to a larger market size and better performance with respect to financial market development, technological and innovation capacity, macroeconomic environment and labour market efficiency. Ireland's advantage relative to the UK's attractiveness to FDI is its corporate taxation.

The analysis in this report shows the particular importance of the trade connections between Ireland and the UK that are also closely related to FDI and the heterogeneity of likely impacts across sectors and firms. These relationships require further detailed analysis. For example a potential Brexit might lead to changes in the tax system in the UK. The current statutory corporate tax rate in the UK is 20 per cent, one of the lowest in the G20. In contrast, compared with other advanced economies, the set of capital allowances in the UK is less generous. Possible tax reforms could include a further reduction of the UK's corporate tax rate and/or changes in the corporate tax base (for example, by allowing a larger share of capital expenditure to be deducted from revenues each year).

Such changes are likely to impact on the attractiveness of Ireland to foreign direct investment. In particular the impact of potential changes in the corporate tax base in the UK on the attractiveness of Ireland to foreign direct investment in different sectors needs to be investigated.

A potential Brexit will increase costs related to trade between Ireland and the UK. Such higher trade costs will affect Ireland's trade and multinational activity which in turn will have medium and long term effects on Ireland' s productivity, employment and economic growth. The extent of such trade costs will depend on the nature of the future relationship of the UK with the EU. The analysis in this report points to likely differences in impact of increased trade costs across sectors and types of firms. More detailed research using firm-level data can uncover how

higher trade costs with the UK through tariffs and non-tariff barriers affect export participation and volumes for different types of firms.

The analysis in this report highlights the importance of the broad Financial Services sector in relation to both services trade and FDI. With the UK significantly specialised in Financial Services, Brexit could have particularly significant impacts on this sector. However, given that the financial services sector encompasses many subsectors and is geographically fragmented, it is difficult to assess the impact of Brexit with published data. However, a more detailed understanding of the likely impacts of Brexit on the Financial Services sector in Ireland is needed not least to assess the regulatory implications as well as the economic effects. We therefore recommend that further specific analysis on this sector be carried out.

There is an all-island electricity market since 2007. Interconnection between Ireland and Northern Ireland is particularly important for Northern Ireland which relies on electricity imports from Ireland to make up for insufficient electricity generation capacity. While a UK outside the EU may result in the imposition of tariff barriers on merchandise trade and increased non-tariff barriers on both merchandise and services trade, it is unlikely that tariff restrictions on electricity would be introduced whatever the arrangements were made following UK exit. If the UK remains independent of the rest of the EU, enhanced interconnection with UK would leave Ireland vulnerable to any problems in the GB market. Under these circumstances enhanced interconnection by Ireland with the rest of the EU, most probably to France, could provide useful diversification, reducing risk for Irish consumers, but this would come at a substantial cost. If the UK left the EU it would no longer be subject to EU rules on climate change policy and renewables, which would reduce the likelihood of renewed discussions on trade in renewables between Ireland and the Britain. If the UK left the EU it would no longer be subject to EU regulatory measures to deal with a possible crisis situation in the case of a gas or oil shortage to these provisions. Ireland would then have to consider how best to provide protection from very unlikely, but potentially catastrophic outcomes.

What the uncertainty about the UK's status in the EU suggests is that energy policy in the longer term should strive to reduce Ireland's dependence on its interconnection to the UK and place more emphasis on interconnection to the wider EU market. However, implementing such a strategy could itself prove very expensive so that the speed with which such a solution should be pursued is far from clear. Obviously, the best solution is if the UK makes a long-term commitment to its EU membership.

Any strategy by the Irish authorities that would help reconcile the UK to its EU partners would be important, given the very serious consequences for Ireland of a UK exit. Until the UK decides on its future membership of the EU, all major energy policy decisions in Ireland need to be tested against the effects of differing outcomes on UK membership of the EU. This also applies to investment decisions, where future reliance on EU law may not provide adequate protection for Irish interests.

The focus of the migration analysis above has been on the labour market impacts generated by the migration link between Ireland and the UK and, by extension, the implications of cutting that link. Clearly, the implications are significant as shown by the estimate of a 4 per cent fall in wages which would result from 60,000 people staying in Ireland who would otherwise have left. However, a number of other impact routes can also be mentioned.

First, we noted above that a substantial number of people continued to emigrate to the UK during the boom years of the 2000s. It is possible that much of this migration was younger people building up skills and competencies in the UK which they then brought back to Ireland. Given the similarities between Ireland and the UK in terms of institutions and also as regards recognition of qualifications, the UK may represent a particularly important source of post-graduate experience for Irish people. The end of the UK migration option could block that avenue of human capital formation.

Second, the imposition of passport controls at the border with Northern Ireland would be at best inconvenient and at worst a worryingly regressive step in terms of facilitating co-operation between both parts of the island. This is possibly the strongest reason which can be advanced when arguing in favour of the maintenance of the CTA.

Finally, almost 400,000 people who were born in the Republic of Ireland were resident in the UK in 2011. Similarly almost 230,000 British-born people were resident in Ireland in 2011. While many of these people in both jurisdictions will have passports which relate to their current residencies as opposed to their places of birth, many others could find themselves post-Brexit being resident in a country where their right to residency has come into question.

While the analysis in this report sought to highlight the key implications of Brexit, identifying some more detailed impacts would require additional new research. For example, while in relation to trade the impact of third-country effects, either opening the possibility for Irish firms to capture market share within the EU from UK firms or the loss of market share of Irish firms in the UK market to third-country firms was not considered. While it is likely that the incidence of trade barriers following a Brexit is likely to be greater for smaller Irish firms, an assessment of the scale of the impact would require further research. In relation to FDI further research is needed to assess whether Brexit would impact on the sectoral composition of FDI to Ireland, how changed FDI might impact on trade and whether there might be a switch from Greenfield FDI to more merger and acquisition activity.

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Appendix 1

The UK - EU Future Relationship: The Landscape of Alternatives

Alternative scenarios	Rights	Obligations
The UK in a reformed EU	- Access to the EU Internal Market - Membership rights for the EU Customs Union - Representation in the Council of the EU and elected membership in the European Parliament - To nominate a commissioner for the European Commission - To nominate a judge for the Court of Justice and the General Court of the European Union - Funding from EU policies and funding programmes - The right to OPT OUT/RIGHT TO JOIN - the Schengen free-movement area, the Single Currency, to various Justice and Home Affairs measures - Rights created by the EU Charter of Fundamental Rights do not create rights enforceable in UK courts	- To act in accordance with the provisions of EU law, particularly in areas of the EU Internal Market and EU Customs Union / Common Commercial Policy - Trade deals are negotiated by the EU as a single entity under the Common Commercial Policy with customs controls abolished under the Customs Union and external tariffs imposed by the EU - To act in accordance with the rulings of the Court of Justice and the General Court of the European Union - To contribute to the EU budget
The UK + repatriation of competences	- Access to the EU Internal Market - Membership rights for the EU Customs Union - Representation in the Council of the EU and elected membership in the European Parliament - To nominate a commissioner for the European Commission - To nominate a judge for the Court of Justice and the General Court of the European Union - Funding from EU policies and funding programmes - The right to OPT OUT/RIGHT TO JOIN - the Schengen free-movement area, the Single Currency, to various Justice and Home Affairs measures - Rights created by the EU Charter of Fundamental Rights do not create rights enforceable in UK courts	- To act in accordance with the provisions of EU law, particularly in areas of the Internal Market and EU Customs Union; this prevents Member States from imposing tariff and non-tariff barriers on the trade of outside goods and requires the European Commission to negotiate trade and investment agreements on the EU's behalf - To act in accordance with the rulings of the Court of Justice and the General Court of the European Union - To contribute to the EU budget
The UK+ more European integration	- Access to the EU Internal Market - Membership rights for the EU Customs Union - Representation in the Council of the EU, the European Parliament, the European Commission, and on the Court of Justice of the European Union - Participation within the Single Currency Union - Participation within the Schengen free-movement area and within all Justice and Home Affairs measures - Provision to fully apply the EU Charter of Fundamental Rights	To act in accordance with the provisions of EU law, particularly in areas of the Internal Market and EU Customs Union; this prevents Member States from imposing tariff and non-tariff barriers on the trade of outside goods and requires the European Commission to negotiate trade and investment agreements on the EU's behalf - To act in accordance with the rulings of the Court of Justice - To contribute to the EU budget

Contd.

Contd.

Alternative scenarios	Rights	Obligations
		- - To act in accordance with the provisions of EU law applicable to membership of the Single Currency
The UK outside the EU **EEA+ EFTA membership**	- Access to the EU Internal Market for goods – no full access to the Internal market for financial services - Freedom to set own external trade policy – no need to apply the EU's common external tariff - Participation in consultations on the preparatory work of the Commission - Freedom to set own agricultural policy, own fisheries policy, own VAT regime - Freedom from participation in the Schengen free-movement zone, Justice and Home Affairs co-operation and Defense - Free movement of persons for UK citizens and institutions	- To abide by EU rules of origin - To abide by the EU law in relation to the EU Internal Market - Free movement of persons from other EEA Member States - To contribute to the EU budget
The UK outside the EU **Bilateral agreements + EFTA**	- Freedom to conclude trade agreements with third countries either independently or jointly with the other EFTA members - No obligation to transpose EU Internal Market legislation automatically into UK law - No obligation to apply and or contribute to the CAP, CFP, and structural funds - Freedom to apply the EU social legislation under bilateral agreements	- UK exports to the EU would be subject to EU rules of origin - UK goods exported to the EU would have to comply with all relevant EU standards
The UK outside the EU **Customs Union**	- Partial freedom to set own external trade policy - Access to the EU Internal Market for goods without the need to comply with EU Rules of Origin for non-EU countries - No contribution to the EU budget, no participation in EU common policies (CAP, CFP, regional policy) - The right to regulate its own financial sector	- Common external tariff on imports from outside the UK/EU customs union - EU product standards for goods - EU common commercial policy
UK outside the EU **UK/EU Free Trade Agreement**	- Freedom to set own external trade policy - Freedom to conclude FTAs with third countries - Freedom to establish its own VAT regime - No obligation to contribute to the EU budget	- UK exports to the EU would be subject to EU rules of origin - UK good exported to the EU would have to comply with all relevant EU standards
The UK outside the EU **WTO option**	- National competence over trade policy - National competence over border control - Removal of the requirement to contribute to the EU budget - Removal of all EU legislative rights	- UK goods exported to the EU would be required to comply with current EU product standards - The EU's Common External Tariff would apply to UK firms - The UK would continue to abide by global level WTO and related agreements

Source: Based on *A Legal Assessment of the UK Relationship with the EU*, The City UK, April 2014.

Appendix 2

Location Probabilities and Data Sources

TABLE A.1 EU Countries' Attractiveness to New FDI Projects under Possible Brexit Scenarios

Country	Baseline scenario %	The UK's corporate tax rate at 18%	The UK's corporate tax rate at 12.5%	The UK's EU market access reduced by 25%	The UK's EU market access reduced by 50%	The UK's corporate tax rate at 18% and its EU market access reduced by 25%	The UK's corporate tax rate at 18% and its EU market access reduced by 50%
Austria	4.1	3.9%	3.7%	4.3%	4.5%	4.2%	4.5%
Belgium	3.3	3.1%	3.0%	3.5%	3.6%	3.4%	3.6%
Bulgaria	1.5	1.4%	1.4%	1.6%	1.7%	1.6%	1.7%
Cyprus	0.3	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%
Czech Republic	3.0	2.8%	2.7%	3.2%	3.3%	3.1%	3.3%
Germany	11.4	10.7%	10.2%	12.1%	12.6%	11.7%	12.4%
Denmark	2.1	1.9%	1.8%	2.2%	2.3%	2.1%	2.2%
Estonia	0.3	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Spain	6.0	5.6%	5.3%	6.4%	6.8%	6.2%	6.6%
Finland	2.0	1.9%	1.8%	2.1%	2.2%	2.1%	2.2%
France	10.0	9.4%	9.0%	10.6%	11.1%	10.2%	10.9%
Greece	3.0	2.8%	2.7%	3.2%	3.3%	3.1%	3.3%
Croatia	1.0	1.0%	0.9%	1.1%	1.1%	1.1%	1.1%
Hungary	2.4	2.3%	2.2%	2.6%	2.7%	2.5%	2.6%
Ireland	4.0	3.8%	3.6%	4.2%	4.4%	4.1%	4.3%
Italy	8.2	7.7%	7.4%	8.7%	9.1%	8.4%	9.0%
Lithuania	0.8	0.8%	0.8%	0.9%	0.9%	0.9%	0.9%
Luxembourg	0.2	0.2%	0.2%	0.3%	0.3%	0.2%	0.3%
Latvia	0.5	0.5%	0.5%	0.5%	0.6%	0.5%	0.6%
Malta	0.0	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%
Netherlands	5.5	5.2%	5.0%	5.8%	6.0%	5.6%	6.0%
Poland	8.1	7.7%	7.3%	8.6%	9.0%	8.3%	8.8%
Portugal	2.3	2.1%	2.0%	2.4%	2.5%	2.3%	2.5%
Romania	3.5	3.3%	3.1%	3.7%	3.9%	3.6%	3.8%
Sweden	2.4	2.2%	2.1%	2.5%	2.6%	2.4%	2.6%
Slovenia	0.8	0.7%	0.7%	0.8%	0.8%	0.8%	0.8%
Slovakia	2.1	2.0%	1.9%	2.2%	2.3%	2.1%	2.2%
United Kingdom	12.7	18.4%	22.4%	7.1%	2.9%	10.7%	4.4%

Source: Authors' estimations following the methodology in Lawless et al. (2014).

TABLE A.2 Variables Definitions and Data Sources (Chapter 3)

Variable	Definition	Data source
Corporate tax rate	Statutory corporate tax rate	KPMG
Distance to the Frontier (DTF)	An economy's distance to frontier indicated on a scale from 0 to 100, where 0 represents the lowest performance and 100 the best performance across all tax complexity indicators and across all countries and years since 2005.	The World Bank, Doing Business Indicators
Real GDP	GDP in 2005 prices	The World Bank, World Development Indicators
Market potential	The sum of real GDP in the host country and the inverse distance-weighted real GDP of all alternative locations other than the host country.	The World Bank, World Development Indicators, and CEPII
Labour cost	Total compensation per employee	European Commission, AMECO dataset
Human capital	Years of schooling	UNDP, Human Development Indicators and UNESCO
FDI stock	Inward FDI stock as percentage of GDP	The World Bank, World Development Indicators
Distance	Distance in km between the host and home country capital cities	CEPII
Common language	Dummy variable equal to 1 if home and host countries have a common official primary language, 0 otherwise	CEPII
Contiguity	Dummy variable equal to 1 if home and host countries share a border, 0 otherwise	CEPII
Colonial relationship	Dummy variable equal to 1 if home and host countries had a colonial relationship, 0 other wise	CEPII

The Economic & Social Research Institute
Whitaker Square
Sir John Rogerson's Quay
Dublin 2, Ireland
+ 353 1 863 2000 www.esri.ie
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