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INTERMEDIATE GOODS INPUTS AND THE UK CONTENT OF IRISH GOODS EXPORTS

MARTINA LAWLESS

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ABBREVIATIONS

BEC	Broad Economic Classification
CSO	Central Statistics Office
EU	European Union
IEM	Internal Energy Market
LNG	liquid natural gas
NTB	non-tariff barrier
SEM	Single Electricity Market
UK	United Kingdom
UN	United Nations
WTO	World Trade Organisation

EXECUTIVE SUMMARY

The UK accounts for 25.7% of total Irish goods imports, making it a considerably larger source of imports than it is a destination for exports, where it makes up 13.8% of the total. The effects of Brexit on Irish goods imports are therefore of potentially considerable importance, particularly as many imported products are used as intermediate inputs for further processing within Ireland and thereby contribute to the export performance of Irish firms. This report examines the structure of Irish imports from the UK using detailed firm- and product-level data to explore the level of reliance, particularly of Irish-owned firms, on UK goods imports and the relationship between imported inputs and exports. Throughout the report, we focus largely on imports of intermediate products, as the key policy motivation in undertaking this analysis is to examine whether, and to what extent, the export activity of Irish-owned firms is exposed to disruptions in the supply chain coming from a negative effect of Brexit on their inputs from the UK. The key findings of the report are summarised below.

Firm-level findings

- Foreign-owned firms are more dependent on imported inputs overall but Irish-owned firms are more dependent on the UK as the source of imports.
- Irish-owned companies are therefore more exposed to potential disruptions to import trade arising from the UK exit from the EU.
- More than half of imports from the UK by Irish-owned firms are intermediate inputs, with another third being food products.
- Over 20 per cent of imports of Irish-owned firms are either completely or very highly reliant on imports coming from the UK.
- Over half of total imports used by Irish-owned firms are sourced in the UK.
- Larger firms tend to import a wider variety of products, both overall and of intermediates.
- The vast majority of foreign-owned firms have a low reliance on the UK as an input source.

Product-level findings

- A number of sectors have almost a total reliance on the UK market for their imports.
- The minerals sector (which includes petrol and other fuel oils) contributes close to 20 per cent of total Irish imports from the UK, and within this sector a number of products are imported exclusively from the UK.

- Just under half of total imports are found to have a medium reliance on the UK, with some sectors, such as pharmaceuticals, having a low reliance on imports from the UK.

Contribution of imports to export performance

- Our analysis of firms with importing activity shows that firm performance, in terms of export sales and diversification, is positively affected by increased import activity and scope.
- Imports are important drivers of export performance; overall it was found that 10 per cent more imports is associated with 4.6 per cent higher exports.
- This suggests that restrictions arising from a Hard Brexit may have a negative impact on these firms' export activities.

Exposure to tariffs and non-tariff costs

- Due to the composition of UK-sourced imports for Irish intermediate products, the potential negative impact of tariffs on imports from the UK, while significant, is lower than the potential impact on Irish exports to the UK.
- The average tariff on intermediate inputs in a WTO scenario would be 2 per cent, whereas tariffs on food products can be many multiples of this, with an average rate of 18 per cent.
- For example, Ireland exports large volumes of beef, which has a very high WTO tariff, while there is almost no tariff on third-country fuel imports.
- The import tariff exposure of Irish-owned firms is considerably larger than that of foreign-owned firms due to the different patterns of their imported products.
- Non-tariff barriers pose a potentially significant further cost to doing business with the UK post-Brexit. International evidence on non-tariff barriers suggests that they would be highest in the same sectors as are exposed to the highest tariff rates.

CHAPTER 1

Introduction

This research aims to provide empirical evidence on the import content of Irish-owned firms' exports of manufactured goods and how these firms may be exposed to changes in the trading environment after Brexit. Although a number of papers have examined the effect of Brexit on goods exports from Ireland to the UK by applying WTO-level tariffs, none to date have examined the extent to which goods exports may also incorporate imported intermediates or examined how the effects of Brexit could differ across firms. The focus on imports of intermediate products in this report comes from their contribution to the export competitiveness of Irish firms. The key policy motivation in undertaking this analysis therefore is to examine whether, and to what extent, the export activity of Irish-owned firms could potentially be exposed to disruptions in the supply chain coming from a negative effect of Brexit on their inputs from the UK.

To investigate these issues, this report provides an in-depth analysis using firm-level information on both importing and exporting from the CSO customs-level data to examine at a very granular level how much firms import, what types of products are involved and how imported goods inputs contribute to firm-level exporting activity.[1] Crucially, in terms of understanding the distribution of any impact, we are also able to examine how these patterns vary depending on whether the firm is Irish-owned or foreign-owned and across firm size groups. We also examine at a product level the areas where total Irish goods imports are particularly reliant on the UK as a source country.

Overall, we find considerable reliance on the UK as a source of total goods imports and of intermediate inputs by Irish-owned firms, whereas foreign-owned firms tend to have quite low levels of reliance on the UK in sourcing their goods imports. In addition to goods being imported in order to be sold on the domestic market, we find that imports play a considerable and statistically significant role in firm export performance. This finding applies both in terms of overall export levels and in expanding export product ranges. In this context, we continue to find that UK-sourced imports play a larger role for Irish-owned firms than for foreign-owned firms.

Turning to how Brexit could impact some of these supply linkages, we calculate the exposure of Irish importers, both domestically and foreign-owned, to possible tariffs. This shows an average rate on Irish imports from the UK that would be

[1] The firm-level trade data are drawn from customs records which do not record services imports, so the focus of this report is on intermediate inputs of goods only.

approximately 6 per cent in the event of WTO-level tariffs being applied, but with considerable variation around this rate. Food imports would be affected by the highest tariffs and those on intermediate inputs would be close to 2 per cent.

The paper is structured as follows. Chapter 2 introduces the firm-level data and details the extent to which different firm types import from the UK. Chapter 3 uses a regression analysis to examine the links between importing and exporting at a firm level. Chapter 4 moves from firm data to customs records at a product level to measure the distribution of reliance on the UK in total trade. Chapter 5 examines the tariff exposure of Irish importers. Chapter 6 concludes with some policy discussion.

CHAPTER 2

Firm-level reliance on UK products

2.1 BACKGROUND

This chapter presents evidence on the extent to which firms in Ireland, and in particular Irish-owned exporters, source their goods imports from the UK. This allows us to develop an indicator of the exposure firms might have to disruptions coming from the UK's exit from the EU and how this might vary across firms depending on the structure of their inputs. In order to do this, we use firm-level customs record data from the CSO and examine the extent to which different types of firm use imported intermediates from the UK, distinguishing between the reliance on the UK of Irish-owned firms and that of foreign-owned firms.

The structure of total Irish goods exports in terms of their domination by foreign-owned firms is well documented, with domestically owned firms accounting for a modest share of total exports and being considerably more reliant on the UK as a destination market (Lawless et al., 2017, provide an extensive decomposition of the export activities of Irish-owned manufacturing firms). While no previous work has looked in detail on the import market participation of firms in Ireland, it is highly probable that some considerable differences between domestic and foreign-owned firms would also be evident and that the aggregate trade statistics may mask this heterogeneity.

In the context of potential disruption to trade patterns or additional costs following the UK's exit from the EU, the import side of the trade relationship is important to consider, although the main focus of analysis thus far has been on the exposure of exporters. Overall, the share of the UK in goods imports into Ireland is significant, with approximately one-quarter of total goods imports being sourced in the UK.[2] The distribution across products in the aggregate data is described in detail in Chapter 4 of this report.

First, however, this chapter looks at the role that imported goods from the UK play at a firm level. We begin by placing the focus on imports in context by presenting evidence on the share of inputs that are imported by different types of firm. The next section looks at import values and the share of the UK in imports across broad product categories. We then calculate the distribution of reliance on

[2] www.cso.ie

the UK as an import source across firms and, in the final section, examine some findings on the range of different varieties of product imported by firms in Ireland, focusing particularly on those likely to be used as intermediates for further manufacturing.

2.2 CONTRIBUTION OF IMPORTS TO FIRM PRODUCTION

Before examining the contribution of the UK to firm-level imports, we first establish the context for the importance of import usage by firms by looking at the share of total purchases accounted for by imports. Across all size groups of Irish-owned firms, Table 1 shows that imports make up between one-quarter and 42 per cent of total inputs and if we consider only firms that have some imports, these contributions increase to between one-third and one-half. For foreign-owned firms, well over half and up to three-quarters of their total purchases are accounted for by imports. The sourcing of imports and extent of reliance on any individual supply source is therefore an important consideration for total firm activities.

TABLE 1 IMPORTED GOODS PURCHASES AS SHARE OF TOTAL INPUTS

	Small	Medium	Large
All firms			
Irish	24%	42%	30%
Foreign	51%	67%	71%
Importing firms only			
Irish	36%	48%	39%
Foreign	63%	71%	74%

Source: Author's calculations from CSO data.

Key Finding 1 *Foreign-owned firms use a higher share of imported goods as inputs than Irish firms.*

2.3 IMPORT VALUES AND UK RELIANCE BY BROAD PRODUCT TYPE

Looking in more detail at how the structure of import activity differs between Irish-owned and foreign-owned firms, Table 2 shows the distribution across firm sizes and the product types separately by ownership. It distinguishes between total imports and imported intermediate goods, which are identified as a subset of imports defined using the UN Broad Economic Categories (BEC) classification. This classification groups products according to their usual end use and distinguishes between three main categories of goods: capital goods (durable

inputs to production such as machinery and transport equipment); intermediate goods (inputs used in further manufacturing by firms); and consumer goods (final products consumed by households).

Due to the important share of the food sector in Irish manufacturing, we have further disaggregated the consumer product category of the BEC grouping to distinguish between food products (which can be destined either for final consumption or as inputs for further processing[3]) and other final consumer goods. Throughout this report, we focus largely on the shares of intermediate inputs in imports as the key policy motivation in undertaking this analysis is to examine whether, and to what extent, Irish firms' export activity is exposed to disruptions in the supply chain coming from a negative effect of Brexit on their inputs from the UK.

The top panel of Table 2 looks at the distribution of imports from the UK; the bottom panel compares this to total imports. This shows that for Irish-owned firms, more than half of imports (56%) from the UK are in intermediate inputs with another third being food products. Capital and pure consumer products (excluding food) make up the remaining 11%. The contribution of firm size groups to total imports from the UK is relatively even between medium (39%) and large firms (42%), with small firms accounting for 19% of import purchases from the UK.[4]

Intermediate inputs are the largest share of imports for each size category, but food imports are less important for small firms than for medium and large firms. Foreign-owned firms import considerably more capital from the UK than Irish firms and also a higher percentage of consumer products. When we look at how these UK import patterns compare to total imports, we see that the total imports of Irish firms have a lower food share and slightly higher contributions from the other categories compared to their imports from the UK, but that the broad patterns are reasonably similar.

[3] The standard BEC classification treats most food products as final consumption goods.
[4] To place these in context, of total imports into Ireland from the UK, approximately 40% are imported by Irish-owned firms and the remaining 60% by foreign-owned firms.

TABLE 2 IMPORTS BY BROAD ECONOMIC CATEGORY AND FIRM TYPE

Imports from UK

	Irish-owned				*Foreign-owned*			
	Small	*Medium*	*Large*	*Row total*	*Small*	*Medium*	*Large*	*Row total*
Capital	2%	3%	0%	5%	0%	1%	36%	37%
Intermediates	15%	21%	21%	57%	3%	9%	24%	36%
Consumer	1%	4%	2%	7%	0%	1%	14%	16%
Food	2%	12%	19%	32%	0%	7%	5%	12%
Column total	19%	39%	42%	100%	4%	18%	79%	100%

Total imports

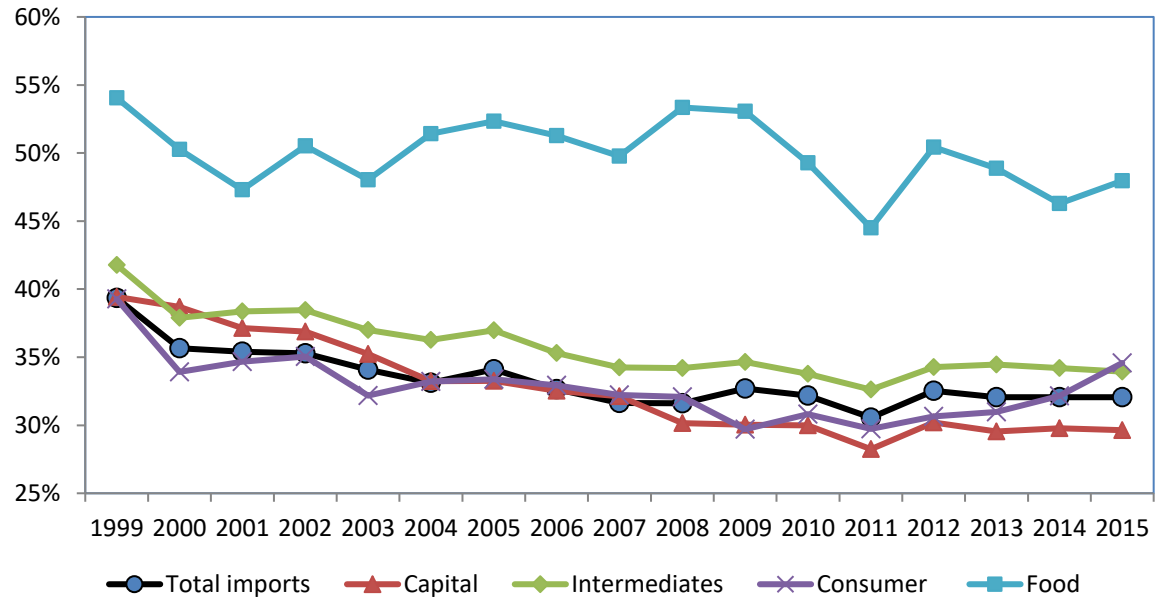
	Irish-owned				*Foreign-owned*			
	Small	*Medium*	*Large*	*Row total*	*Small*	*Medium*	*Large*	*Row total*
Capital	2%	6%	1%	10%	0%	4%	20%	24%
Intermediates	16%	24%	20%	59%	1%	22%	29%	52%
Consumer	2%	5%	2%	8%	0%	9%	11%	20%
Food	2%	9%	12%	23%	0%	3%	1%	4%
Column total	22%	43%	35%	100%	2%	37%	61%	100%

Source: Author's calculations from CSO customs data, 2015.

Key Finding 2	*More than half of the imports of Irish-owned firms coming from the UK are intermediate inputs for further processing.*
Key Finding 3	*One-third of Irish firm imports from the UK are food products, comprising both those for final consumption and for use as intermediate inputs to further processing.*

While most of our analysis will focus on the current structure of imports in the most recently available data, it is useful to set these in context by looking at the overall evolution of the UK import share over time, which is graphed in Figure 1. This shows that overall reliance on the UK has been gradually declining across all of the broad product groups over time, with the exception of a recent increase in consumer products coming from the UK. The pattern does not show any particular effect of the 2008 financial crisis on the composition of UK imports or their overall share.

FIGURE 1 UK IMPORT SHARE BY PRODUCT TYPE, 1999–2015



Source: Author's calculations from CSO import data, 2015.

Key Finding 4	*Overall reliance on the UK as an import source has been gradually declining over time.*

2.4 UK IMPORT RELIANCE ACROSS FIRMS

Having established the overall shares of imports for Irish-owned firms coming from the UK, we now look at how many of the firms and how much of their imports are reliant on the UK. To do this, we divide firm reliance on the UK into five categories and then examine how many firms fall into each group. The firm groupings are: low reliance (less than 25% of imports from UK, including those with zero UK imports), medium (between 25% and 75% of imports from UK), high (75% to 90%), very high (over 90% but less than 100%) and complete reliance (all imports from the UK).

Table 3 shows how the numbers of firms are distributed across the different levels of reliance on the UK as their main source of imports – calculated separately for all imports and for imported intermediates. This calculation shows that 5% of Irish-owned firms source all of their imports from the UK and a further 10% source over 90% from the UK. In contrast, 2% of foreign-owned firms source all of their imports from the UK and a further 3% source over 90% from the UK.

TABLE 3 DISTRIBUTION OF FIRMS BY UK IMPORT RELIANCE – PERCENTAGE OF FIRMS

	All imports		Intermediates	
	Irish	*Foreign*	*Irish*	*Foreign*
Complete	5%	2%	7%	2%
Very high	10%	3%	11%	3%
High	7%	4%	9%	3%
Medium	22%	24%	22%	20%
Low	55%	67%	51%	71%

Source: Author's calculations from CSO import data, 2015.

Key Finding 5	*Of Irish-owned importing firms, 5 per cent rely completely on the UK as their import source; 22% of Irish-owned firms rely on the UK for over 75% of imports.*
Key Finding 6	*Although they import more, foreign firms are much less reliant on the UK as the source of their inputs, with 9% relying on the UK for over 75% of imports.*

Different patterns can emerge from looking at values rather than numbers of firms, particularly if larger firms that account for a greater share of import values have a different reliance pattern than smaller firms. Looking at import values in Table 4, we see over 20 per cent of the value of goods imports by Irish-owned firms being either completely or very highly reliant on coming from the UK, and over half of total imports used by these firms being sourced in the UK. Note that the columns in Table 4 sum to the overall share of the UK in Irish-owned or foreign-owned firms (not to 100 as in Table 3). A total of 29 per cent of the value of imported intermediate inputs by Irish-owned firms has a high, very high or complete reliance on the UK for intermediate inputs of goods. In contrast, foreign-owned firms source just under 14 per cent of their goods imports and under 10 per cent of intermediate inputs from the UK. The intermediate imports that foreign-owned firms do source in the UK are mainly of medium reliance, with just 2 per cent having a high reliance or greater.

The firm-level data in Table 4 also show that there is a considerable difference in how this reliance is allocated between domestic and foreign-owned firms, with 53 per cent of Irish firm imports coming from the UK. In contrast, 14 per cent of imports for foreign-owned firms come from the UK, despite these firms' much higher reliance on imported inputs overall, as shown in Section 2.1.

TABLE 4 DISTRIBUTION OF IMPORT VALUES BY UK IMPORT RELIANCE AND OWNER

	All imports		Intermediates	
	Irish share	*Foreign share*	*Irish share*	*Foreign share*
Complete	4%	0%	3%	0%
Very high	17%	0%	18%	1%
High	10%	2%	9%	1%
Medium	18%	11%	19%	6%
Low	3%	1%	3%	1%
Total UK share	53%	14%	51%	9%

Source: Author's calculations from CSO import data, 2015.

Key Finding 7	*Irish-owned firms are more dependent on the UK as the source of goods imports than foreign-owned firms, with over half of Irish firm goods imports coming from the UK.*
Key Finding 8	*In terms of import values, 29 per cent of Irish-owned firms have a high, very high or complete reliance on the UK for intermediate inputs.*

2.5 RANGE OF IMPORTED PRODUCT VARIETIES

When considering reliance on a particular market, the share of total value is obviously the dominant concern. The potential costs of searching for and changing supplier could also be related to the number of product lines being imported. Table 5 looks at the number of imported products (on average) used by each firm and how many of these come from the UK. It distinguishes between total goods imports and imported intermediate goods, which are identified as a subset of imports defined using the UN Broad Economic Categories classification described earlier in this chapter. We see that across all firms, on average 24 product varieties are imported and 8 of these come from the UK. For Irish-owned firms, the average number of varieties is slightly lower at 17 but the share of these coming from the UK is 7. Imported intermediate inputs account for 11 of the 17 products for Irish firms overall, but imported intermediates are more important for exporting firms, who import 17 intermediate inputs out of total imports of 26 products.

The share of intermediates imported from the UK by exporting firms is similar to the total. Across firm size groups, it is unsurprising to see that larger firms tend to import a wider variety of products, both overall and of intermediates. Larger Irish-owned firms source more individual products from the UK than smaller Irish-owned firms.

TABLE 5 AVERAGE NUMBER OF IMPORTED PRODUCTS

	From UK	All imports	UK intermediates	All intermediates
All firms	8	24	5	16
Irish	7	17	5	11
Foreign	11	53	8	36
Irish importing only	5	9	3	5
Irish exporters	10	26	7	17
Irish micro firms	1	6	1	4
Irish small firms	7	16	5	10
Irish medium firms	13	32	9	21
Irish large firms	19	43	13	27

Source: Author's calculations from CSO import data, 2015.

Key Finding 9	*Irish-owned firms import on average 17 product varieties and 7 of these come from the UK.*
Key Finding 10	*This could have implications for potential costs of searching and changing supplier if Brexit results in changes to supply relationships.*

CHAPTER 3

Firm-level links between imports and exports

This chapter uses the firm-level data described in the previous chapter to look more deeply into the links between imports and exports. As we do not have full production costs with detailed information on domestic inputs for all of the firms that are included in the customs data, we do not estimate a direct import content of exports calculation but instead use the detailed information that we have on imported and exported products and values in a regression approach to examine how importing is related to export activity at firm level, taking account of differences by firm ownership and size.[5]

This approach is related to research by Bas and Strauss-Kahn (2014) on French firms and Feng et al. (2012) using Chinese firms to investigate the links between importing and export performance. These papers found that importing more inputs (in terms of levels and number of varieties) is associated with higher firm export levels and also more firm export variety. The interpretation of the impact is that by importing intermediate inputs the firms are increasing the range of varieties they are able to produce, but also that there is a technology transfer element to importing varieties that may not be available domestically and that this improves the firms' overall productivity, which then feeds into better performance on the export market.

Using Irish customs information at the firm level, we examine how total exports and export scope (number of products) vary with importing activity. We use a range of measures of importing to distinguish the relative impacts of total imports, imported intermediate products and numbers of imported varieties. We also investigate if there are differences in the contributions to export performance depending on whether the imports come from the UK or from non-UK sources. In each case, the combined effect for all firms is estimated first and then the sample is split into Irish-owned and foreign-owned firms to examine if there is a systematic difference in the impact of imports, which the different levels of activity described earlier might imply.[6]

[5] Appendix 3 presents some cross-country comparisons of the contribution of imports to export value added.
[6] It should be noted that this analysis focuses on the relationships between imported inputs and export activity of exporting firms – in other words, it is analysing firms with importing activity. It does not directly estimate productivity differences between traders and non-traders (either exporters or importers).

Firm size categories are included in each specification – the reference category is micro firms so each of the reported coefficients on size (for small, medium and large firms) should be interpreted as differences relative to this omitted category. The regressions are run using the full range of data available, which spans 1996 to 2015, so we also control for aggregate trends through the inclusion of year dummies. The import measures are all lagged one year to control for potential endogeneity and have a clearer interpretation of the imports driving the exports.[7]

Table 6 shows the baseline specification relating import values to total exports. The overall effect shown in Column 1 is that 10 per cent more imports are associated with 4.6 per cent higher exports. In the specifications for total exports (columns 1 and 4), the coefficient on the indicator of foreign ownership is positive as would be expected, capturing the higher export-orientation of foreign-owned firms. The size groups across all of the columns show steadily increasing coefficients capturing higher export sales associated with larger firm sizes.

TABLE 6 CONTRIBUTION OF IMPORTS TO FIRM EXPORTS

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln exports	*Ln exports – Irish*	*Ln exports – foreign*	*Ln exports*	*Ln exports – Irish*	*Ln exports – foreign*
Ln total imports	0.461***	0.407***	0.576***			
	(0.008)	(0.011)	(0.011)			
Ln UK imports				0.163***	0.220***	0.100***
				(0.011)	(0.018)	(0.012)
Ln non-UK imports				0.346***	0.244***	0.508***
				(0.011)	(0.016)	(0.014)
Foreign-owned	0.707***			0.693***		
	(0.040)			(0.051)		
Small firms	0.999***	1.044***	1.044***	1.090***	1.138***	0.998***
	(0.069)	(0.085)	(0.124)	(0.117)	(0.153)	(0.175)
Medium firms	2.269***	2.605***	1.719***	2.343***	2.591***	1.740***
	(0.075)	(0.095)	(0.125)	(0.121)	(0.161)	(0.174)
Large firms	3.230***	3.613***	2.539***	3.422***	3.575***	2.656***
	(0.092)	(0.136)	(0.137)	(0.140)	(0.200)	(0.190)
Constant	6.612***	5.954***	5.194***	5.194***	5.516***	5.316***
	(0.142)	(0.177)	(0.206)	(0.206)	(0.308)	(0.285)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20,219	12,725	7,494	12,434	7,631	4,803
R-squared	0.459	0.301	0.478	0.419	0.239	0.485

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Explanatory variables lagged one year. Firm size groups are relative to the omitted base category of micro firms. Ln: natural logarithm.

[7] The number of observations differs slightly between tables due to changes to the sample being used from values to counts and because the use of lagged variables results in some missing observations.

To examine if the relationship between imports and exports differs by firm ownership, we run separate specifications for Irish-owned and foreign-owned firms, reported in Columns 2 and 3 respectively. These show that the relationship between imports and exports is higher for foreign than for Irish firms, as might have been expected from their higher overall import share of purchases described in Chapter 2. The next step is to distinguish between imports from the UK and non-UK sources in the next three columns of Table 6. This shows that the total impact is broadly split into UK imports having a 1.6 per cent impact and non-UK having an effect of 3.5 per cent (column 4). This roughly one-third to two-thirds impact is in line with the descriptive import distributions. The importance of UK-sourced inputs is quite a bit larger for Irish firms than for foreign firms, with a division closer to half of the overall impact on export activity.

Key Finding 11	*Imports contribute significantly to export performance: 10 per cent more imports are associated with 4.6 per cent more exports.*
Key finding 12	*UK-sourced imports play a larger role for Irish than for foreign firms.*

In considering the impact of imports on exporting firms, it may be more appropriate to restrict the import measures to intermediate imports and exclude products that are more likely to be destined for final sale within Ireland. Table 7 therefore examines the relationship between exports and imported intermediate goods only. The overall impact in the first column is an increase of 3.9 per cent in exports for each 10 per cent increase in imported intermediates.

Comparing the size of the coefficients for imports in Table 6 and Table 7, we see that almost all of the impact of total imports on exports identified in Table 6 is accounted for by intermediate goods imports. The split between Irish-owned and foreign-owned firms shows again that there is a stronger link between imports and exports for foreign firms but that less of this comes from importing intermediates from the UK.

Key Finding 13	*Most of the positive effect of imports on exporting comes from the role of intermediate inputs.*

TABLE 7 CONTRIBUTION OF INTERMEDIATE IMPORTS TO FIRM EXPORTS

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln exports	*Ln exports – Irish*	*Ln exports – foreign*	*Ln exports*	*Ln exports – Irish*	*Ln exports foreign*
Ln intermediate imports	0.394***	0.352***	0.476***			
	(0.008)	(0.011)	(0.011)			
Ln UK intermediate imports				0.117***	0.153***	0.077***
				(0.012)	(0.018)	(0.014)
Ln non-UK intermediate imports				0.272***	0.164***	0.446***
				(0.011)	(0.016)	(0.014)
Foreign-owned	0.731***			0.709***		
	(0.041)			(0.053)		
Small firms	1.128***	1.155***	1.186***	1.353***	1.407***	1.271***
	(0.074)	(0.091)	(0.131)	(0.126)	(0.163)	(0.192)
Medium firms	2.540***	2.838***	2.072***	2.791***	3.099***	2.145***
	(0.078)	(0.100)	(0.131)	(0.129)	(0.170)	(0.191)
Large firms	3.721***	4.028***	3.202***	4.223***	4.358***	3.464***
	(0.094)	(0.139)	(0.141)	(0.144)	(0.204)	(0.203)
Constant	7.555***	6.634***	6.665***	7.815***	7.215***	6.456***
	(0.144)	(0.183)	(0.205)	(0.225)	(0.300)	(0.291)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,371	11,963	7,408	11,683	7,083	4,600
R-squared	0.439	0.280	0.439	0.406	0.226	0.459

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Explanatory variables lagged one year. Firm size groups are relative to the omitted base category of micro firms. Ln: natural logarithm.

The results above suggest that importing intermediate products has a significant positive relationship with higher firm export sales. We next turn to examining if the relationship between a greater range of imported intermediate varieties is associated with better export performance as identified by Bas and Strauss-Kahn (2014) and Feng et al. (2012). In Table 8, we therefore replace the level of imported intermediates as an explanatory variable with a count of the product lines imported at the firm level. Importing more varieties is found to have a significantly positive impact on total export sales, with very similar magnitudes of the effect for Irish-owned and foreign-owned firms. Each additional variety imported increases overall exports by 2 percentage points. There is little difference in terms of effect on exports according to whether this additional import variety comes from the UK or elsewhere.

TABLE 8 CONTRIBUTION OF INTERMEDIATE IMPORT VARIETY TO FIRM EXPORTS

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln exports	*Ln exports – Irish*	*Ln exports – foreign*	*Ln exports*	*Ln exports – Irish*	*Ln exports – foreign*
Intermediate inputs count	0.022***	0.023***	0.023***			
	(0.001)	(0.001)	(0.001)			
UK intermediates count				0.023***	0.025***	0.021***
				(0.002)	(0.003)	(0.002)
Non-UK intermediates count				0.022***	0.022***	0.024***
				(0.001)	(0.002)	(0.001)
Foreign-owned	0.793***			0.794***		
	(0.041)			(0.042)		
Small firms	1.695***	1.657***	1.685***	1.693***	1.655***	1.688***
	(0.064)	(0.075)	(0.132)	(0.064)	(0.075)	(0.132)
Medium firms	3.564***	3.804***	2.944***	3.561***	3.802***	2.951***
	(0.067)	(0.082)	(0.130)	(0.067)	(0.082)	(0.130)
Large firms	4.701***	4.867***	4.225***	4.699***	4.859***	4.225***
	(0.088)	(0.131)	(0.141)	(0.088)	(0.131)	(0.141)
Constant	11.730***	10.084***	12.051***	11.740***	10.097***	12.033***
	(0.105)	(0.130)	(0.165)	(0.107)	(0.132)	(0.166)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,013	14,370	7,643	22,013	14,370	7,643
R-squared	0.394	0.242	0.362	0.394	0.242	0.362

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Explanatory variables lagged one year. Firm size groups are relative to the omitted base category of micro firms. Ln: natural logarithm.

Key Finding 14 *Importing a greater range of intermediate varieties is associated with better export performance, with each additional variety imported increasing overall exports by 2 percentage points.*

The final set of regression results links the variety of intermediate imports with the range of products that the firm exports. This is an important consideration, as the decomposition of export growth for Irish-owned firms undertaken by Lawless et al. (2017) showed that product diversification is an important contributor to overall export growth. The dependent variable in Table 9 replaces total exports with the count of export products and relates this to the imported product count. This shows again that imports play an important role in exports, with a positive and significant increase in exported varieties associated with an increase in imported varieties. Each additional import variety is associated with increasing export scope by 0.25 of a product. This effect is slightly stronger for foreign-owned firms. This suggests imports can provide inputs not available domestically or can provide opportunities for technology transfer that enhances firm performance.

TABLE 9 CONTRIBUTION OF INTERMEDIATE IMPORT VARIETY TO FIRM EXPORT SCOPE

	(1)	(2)	(3)	(4)	(5)	(6)
	Products	*Products – Irish*	*Products – foreign*	*Products*	*Products – Irish*	*Products – foreign*
Intermediate inputs count	0.258***	0.219***	0.272***			
	(0.003)	(0.003)	(0.005)			
UK intermediates count				0.061***	0.097***	0.022
				(0.006)	(0.006)	(0.016)
Non-UK intermediates count				0.318***	0.298***	0.317***
				(0.061)	(0.004)	(0.006)
Foreign-owned	0.981***			0.956***		
	(0.136)			(0.136)		
Small firms	0.859***	0.876***	2.869***	1.259***	1.039***	3.106***
	(0.156)	(0.117)	(0.778)	(0.154)	(0.116)	(0.766)
Medium firms	2.725***	3.152***	4.674***	3.407***	3.313***	5.286***
	(0.176)	(0.140)	(0.763)	(0.174)	(0.138)	(0.753)
Large firms	7.614***	4.737***	11.409***	7.931***	5.280***	11.397***
	(0.265)	(0.261)	(0.851)	(0.261)	(0.258)	(0.838)
Constant	3.663***	0.229	0.569	1.627***	-0.801***	-1.120
	(0.304)	(0.224)	(1.028)	(0.304)	(0.224)	(1.018)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,315	25,143	8,172	33,315	25,143	8,172
R-squared	0.433	0.257	0.388	0.453	0.276	0.407

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Explanatory variables lagged one year. Firm size groups are relative to the omitted base category of micro firms.

Key Finding 15 *Importing a greater range of intermediate varieties is also associated with exporting a wider range of products.*

Unlike the previous results, the findings for export scope show considerable differences in the magnitude of the effects between adding products from the UK and adding non-UK product varieties. In this case, we find that increasing import varieties from outside the UK has a considerably greater impact than increasing UK-sourced varieties. This is particularly the case for foreign-owned firms, where UK varieties do not have any statistically significant impact on export scope. The impact of UK varieties is significantly positive for Irish firms but the effect is just one-third the size of adding inputs from outside the UK.

There are two possible interpretations of this result. The first rationale is that the number of products imported by Irish firms from the UK is already a large share of their imported varieties so there may be decreasing returns to adding more products from the same origin. The second possible reason relates to the

technology transfer hypothesis of Bas and Strauss-Kahn (2014), as it is possible that greater learning opportunities are embedded in importing from more distant and less familiar markets. This suggests there is potential value to be gained from diversification of import sources as well as broadening of the import varieties used by the firm.

Key Finding 16	*Number of inputs sourced from UK has lower impact on export scope than non-UK inputs, suggesting benefits to diversification of imports.*
Key Finding 17	*All results show that firm performance is positively affected by increased import activity and scope.*

The overall message of this chapter is that imports play an important role in firm export performance, in terms of both overall export levels and export scope. These effects can be identified though channels of import values and also of broader import varieties. On all of the metrics, the UK-sourced imports play a stronger role for Irish-owned firm exports than for those of foreign-owned firms.

CHAPTER 4

Economy-level import shares of UK products

Having looked in the previous chapters at the extent of reliance of firms in Ireland on UK-sourced inputs, we look in this chapter at the product dimension to provide insight into which particular goods inputs are most frequently imported from the UK. Looking at UK import reliance from this product perspective gives important additional information on how concentrated the UK contribution to total imports is in certain sectors and product types and also gives indicative evidence on the level of difficulty that firms might face in finding alternative, competitive supply sources if this becomes an objective – if a particular product is imported solely from the UK, it is likely to be more challenging to find alternatives.

This chapter begins by describing the overall structure of goods trade between Ireland and the UK and how the levels of trade and share of the UK as a source or destination vary across sectors. The data used in this chapter are based on the product-level trade flows published by the UN in its Comtrade database, converted from US dollars to euros at the average exchange rate.[8] Table 10 shows total imports and exports between Ireland and the UK. There is a slight negative trade balance, with Ireland importing almost €18 billion worth of goods from the UK and exporting €15.5 billion. Comparing these figures to total Irish trade in goods published by the CSO, imports from the UK account for 25.7 per cent of total Irish imports while exports to the UK account for 13.8 per cent of the total.

Looking across product groups, the largest contributing factor to this difference comes from mineral products (including petrol and other fuel oils), which account for close to 20 per cent of imports from the UK. The next largest import products are machinery (which includes electronic machinery) and the product category 'miscellaneous', which includes a wide range of consumer articles such as watches, reading glasses, toys and furniture as well as photographic equipment and some surgical instruments. Food is a substantial contributor to goods trade flows in both directions between Ireland and the UK, with the food product groups detailed in Table 10 adding up to almost one-quarter of imports from the UK, and processed products such as sweets and flour being the largest

[8] The UN ComTrade database is based on customs data originally collected by the Central Statistics Office. The reason for using the ComTrade source rather than the original CSO data is to compare the UK–Irish trade flows with the UK's trade to the rest of Europe, which ComTrade allows us to do on a consistent basis.

contributor at close to 8 per cent of the total. On the export side, almost 36 per cent of trade with the UK comes from agricultural and food products, particularly meat products. A substantial fraction of trade is not assigned to any specific product code, generally related to the lower reporting requirements on small traders.

TABLE 10 IRISH–UK TRADE STRUCTURE

	Imports (€m)	Exports (€m)	Import share	Export share
Live animals	237	340	1%	2%
Meat and fish	400	1,326	2%	9%
Dairy	442	764	3%	5%
Products of animal origin	279	225	2%	1%
Products of milling industry	440	725	2%	5%
Sweets, nuts, flour	1,404	969	8%	6%
Beverages	318	319	2%	2%
Residues of food & tobacco	288	243	2%	2%
Minerals	3,553	1,693	20%	11%
Pharmaceutical products	492	1,494	3%	10%
Non-organic chemicals	266	369	2%	2%
Plastic and rubber	856	574	5%	4%
Leather	52	63	0%	0%
Wood and paper	839	528	5%	3%
Textiles	39	63	0%	0%
Carpets, footwear	743	184	4%	1%
Cement, glass, ceramic	258	268	1%	2%
Machinery	2,359	1,991	13%	13%
Transport equipment	820	856	5%	6%
Miscellaneous	1,446	809	8%	5%
Unclassified	2,462	1,750	14%	11%
Total	**17,993**	**15,553**	**100%**	**100%**

Source: Author's calculations from UN Comtrade and CSO, 2015.

Key Finding 18	*The UK is a more important partner for imports than for exports: imports from the UK account for 25.7 per cent of total Irish imports, while exports to the UK account for 13.8 per cent of all exports.*
Key finding 19	*Almost one-fifth of imports from the UK are in the minerals (including fuels) sector.*

While trade, and particularly imports, with the UK therefore accounts for a substantial share of the total, the extent of disruption in the event of significant

changes to the trading regime post-Brexit is likely to also be affected by the extent of alternative supply avenues. We therefore need to look not just at how much trade is coming from the UK but at how reliant each product is on the UK as a source relative to total imports of each product. To do this, we calculate the extent of import reliance on the UK for each group of products by dividing trade in each product group into those for which the UK is one supply source out of many compared to where the UK is the largest or only source of individual products.

To examine how reliance on the UK is distributed across each product group, we take the product-level data in the UN Comtrade database and for each product we calculate the share of the UK in total imports for that product. We then divide the products into five categories according to the share of the UK in total imports of that product. The five categories are low reliance (products where less than 25 per cent of imports are from UK), medium reliance (between 25% and 75% of imports from UK), high reliance (75% to 90%), very high reliance (over 90% but less than 100%) and complete reliance (all imports of the product come from the UK).

For this calculation, we exclude the unclassified trade so the total import values add up to a slightly lower total of €15.5 billion. Table 11 shows how trade in each group of products is allocated across the different reliance categories. This involves adding up the imports for products in each reliance category to present the results at a more aggregated level. The left-hand panel of Table 11 gives the value of the imported products in each reliance group. The right-hand panel of the table then expresses each reliance group as a share of the total imports of each product group (each row therefore sums to 100 per cent).

Looking first at the totals in the final row, we find that just under half (48 per cent) of total imports are grouped as having a medium reliance on the UK. In other words, for approximately half of Irish imports, the UK represents between 25 per cent and 75 per cent of import value. Seven per cent of import value is in products that are imported only from the UK and a further 6 per cent is in products where over 90 per cent of imports come from the UK.

There is considerable variation across products in terms of UK reliance. Although in many cases, the majority of imported products fall into the medium reliance group, there are several noteworthy exceptions. The largest in terms of its contribution to total import levels is minerals products (which includes motor fuels). For this group of products, 32 per cent of imports are in individual products sourced solely from the UK and another 60 per cent of import values are in the high or very high reliance groups. Textiles form another group where a relatively large percentage of imports are reliant on the UK, although this group

of products is quite small in absolute terms. Conversely, pharmaceutical imports are almost entirely in the low reliance category.[9]

[9] Note that the definition of the pharmaceuticals sector used here is narrower than the 'PharmaChem' sector referred to in the report by Copenhagen Economics (2018).

TABLE 11 UK IMPORT RELIANCE BY BROAD PRODUCT TYPE

		Product imports by reliance category (€m)					Share of reliance category in product group total (row %)				
	Total trade	*Low*	*Medium*	*High*	*Very high*	*Complete*	*Low*	*Medium*	*High*	*Very high*	*Complete*
Live animals	236.8	0.0	188.5	40.6	6.5	1.3	0%	80%	17%	3%	1%
Meat and fish	399.8	10.4	209.8	88.4	72.9	18.3	3%	52%	22%	18%	5%
Dairy	442.2	10.3	210.5	21.4	199.9	0.0	2%	48%	5%	45%	0%
Products of animal origin	279.4	68.1	185.5	5.4	20.3	0.1	24%	66%	2%	7%	0%
Products of milling industry	440.1	44.5	230.0	117.6	47.8	0.2	10%	52%	27%	11%	0%
Sweets, nuts, flour	1,404.3	45.1	802.2	523.1	33.9	0.0	3%	57%	37%	2%	0%
Beverages	318.2	59.7	57.9	200.5	0.0	0.0	19%	18%	63%	0%	0%
Residues of food & tobacco	288.4	34.8	233.0	13.8	6.7	0.0	12%	81%	5%	2%	0%
Minerals	3,552.6	186.1	135.7	1877.9	224.7	1128.3	5%	4%	53%	6%	32%
Pharmaceutical products	492.3	399.4	49.4	43.5	0.0	0.0	81%	10%	9%	0%	0%
Non-organic chemicals	266.3	63.2	183.9	16.9	1.9	0.4	24%	69%	6%	1%	0%
Plastic and rubber	855.7	166.1	611.0	60.2	18.2	0.1	19%	71%	7%	2%	0%
Leather	52.2	12.3	38.8	0.6	0.6	0.0	24%	74%	1%	1%	0%
Wood and paper	838.9	34.5	444.6	160.0	199.8	0.0	4%	53%	19%	24%	0%
Textiles	39.4	8.7	19.5	4.4	3.0	3.7	22%	50%	11%	8%	10%
Carpets, footwear	743.1	248.0	440.7	28.6	25.7	0.0	33%	59%	4%	3%	0%
Cement, glass, ceramic	258.2	38.9	194.0	17.1	8.3	0.0	15%	75%	7%	3%	0%
Machinery	2,359.0	772.3	1409.6	112.1	63.8	1.2	33%	60%	5%	3%	0%
Transport equipment	819.5	299.0	428.4	69.8	21.7	0.6	36%	52%	9%	3%	0%
Miscellaneous	1,445.7	41.6	1358.3	30.8	15.1	0.0	3%	94%	2%	1%	0%
Total imports (excl. unclassified)	15,532.1	2543.0	7431.2	3432.8	970.9	1154.3	16%	48%	22%	6%	7%

Source: Author's calculations from UN Comtrade, 2015.

Key Finding 20	*Reliance on the UK varies quite widely across product types, with minerals highly reliant on the UK market for imports.*
Key Finding 21	*Dairy and meat have many products reliant on the UK but the amounts in value terms are lower than those of mineral products.*

One market of particular interest in terms of its continued smooth operation after Brexit is the energy market. The UK is the only country with which Ireland has gas and electricity connections and, in particular, the electricity market has existed on an all-island basis since 2007. Table 12 shows that natural gas imports from the UK were in the region of €1.1 billion in 2015, accounting for all imports of this product. Barrett et al. (2015) note that, as this Single Electricity Market (SEM) was established by legislation in both Ireland and the UK, it should continue to operate as it currently does after Brexit. Although both governments have confirmed that the SEM should remain in place, Lynch (2017) points to potential complications for its smooth running unless the UK also remains a member of the EU Internal Energy Markets (IEM). This would particularly be the case if there were divergences between the two countries in terms of energy policy in the future.

In the event of an exit of the UK from the IEM, Lynch raises some concerns regarding reductions in the efficiency of trading over interconnectors and of maintaining security of supply in the event of a drop in energy production for any reason. She recommends investigating diversification options, particularly in regard to liquefied natural gas (LNG) and renewable energy sources, as avenues that could reduce these risks. A final risk to energy supply raised by Barrett et al. (2015) and Lynch (2017) is that Ireland currently stores much of its oil reserves in the UK but that it is an EU requirement that any such reserves are stored within the EU. Costs may therefore be incurred if it becomes necessary to switch to alternative storage locations, whether that is within Ireland or by moving them to another Member State. An alternative, in the short term at least, may be that Ireland seeks derogation from this particular requirement to maintain supply reserves within the UK.

Key Finding 22	*Energy markets are closely connected and the UK is the sole import source – continued close integration will be important for efficiency and supply security.*

While the preceding discussion aggregated the product reliance to broad groups of products to examine the broad distribution of reliance, it is clear that most groups contain individual products at all levels of reliance. Precise identification of which products are exclusively sourced from the UK and the availability of alternative suppliers if necessary will be a key input into Brexit contingency planning. To provide evidence on where the highest reliance is found at a more granular level, Table 12 gives examples of products with the highest import values that are highly reliant on the UK. The table gives the five largest products in the categories of capital inputs, intermediate inputs and food products. This is expanded in the tables in Appendix A, which present a fuller list of products that account for the highest reliance levels, divided into capital inputs (Table A1), intermediates (Table A2) and food (Table A3).

These also show the share of the UK in total EU trade (i.e. UK exports divided by total EU exports of each product) to indicate the ease or difficulty of finding alternative supply options for these products that are currently mainly sourced in the UK. UK gas imports stand out as being of particularly high value, reinforcing the previous discussion on the implications for the energy market. The UK share of EU trade is a useful starting indicator for the extent of alternative supply channels – for example, although Ireland currently imports the bulk of tanker trailer inputs from the UK, the UK's exports of this product represent a relatively small (3.8 per cent) share of total trade in this product, suggesting that switching supply may be reasonably straightforward. On the other hand, when the UK represents over 60 per cent of total EU trade, as it does in raw beet sugar, finding alternative supply sources may prove more challenging.

TABLE 12 EXAMPLES OF PRODUCTS WITH HIGH UK RELIANCE

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Capital goods			
Self-propelled bulldozers and angle-dozers	10%	23,600	98%
Engines and motors	4%	5,323	95%
Tanker trailers and semi-trailers	4%	4,795	93%
Presses, crushers and similar machinery	1%	1,951	90%
Offset printing machinery, reel-fed	17%	1,913	98%
Intermediate inputs			
Natural gas in gaseous state	10%	1,110,000	100%
Petroleum oils	3%	78,100	100%
Vitamins and their derivatives	7%	74,500	94%
Pro-vitamins and mixtures of vitamins	16%	31,000	90%
Lead waste and scrap	22%	18,100	95%
Food products			
Milk & cream with fat >1% but ≤ 6%	6%	163,000	99%
Raw beet sugar	63%	25,800	99%
Carcases of bovine animals, fresh or chilled	2%	18,100	96%
Prepared or preserved meat of bovine animals	4%	15,700	90%
Fresh or chilled lamb carcases	46%	13,300	100%

Notes: Five highest value products for each group where the UK is the source of over 90% of the Irish imports for each product and where the import value was over €500,000. Source: Author's calculations from UN Comtrade, 2015.

CHAPTER 5

Tariff exposure for Irish imports

This chapter looks at how firms importing into Ireland from the UK might be exposed to a hard Brexit scenario resulting in the imposition of WTO schedule tariff rates. In the absence of a trade deal being finalised before the end of a transition period, the existing schedule of tariffs that the EU applies to other countries (those that it does not have a separate specific trade agreement with) would be the default position. As such, this set of tariffs represents the maximum that could be applied in the extreme scenario of no deal being reached. Previous work such as Lawless and Morgenroth (2017) has combined tariffs with aggregate trade data to examine how exports might be affected, and this chapter complements that by combining the firm-level import data with WTO tariff schedules and further breaking down the tariff exposure by firm type.

The extent to which firms would incur tariffs on their imports is strongly driven by the type of goods and, in particular, the share of food products imported, as Figure 2 and Table 13 both show. It has already been emphasised in other work such as Barrett et al. (2015) and Lawless and Morgenroth (2016) that the food sector is the most exposed to a hard Brexit scenario as these are the products where the highest tariffs apply in the scenario of moving to WTO tariff rates.[10] However, it should be noted that these reported tariff rates do not take account of tariff-rate quotas on some food items, where specified volumes may be imported without tariffs. We do not include quotas in this analysis as they are set at an EU level and it is not possible to allocate them across Member States or determine how they might be set as part of a post-Brexit trade agreement between the EU and UK.

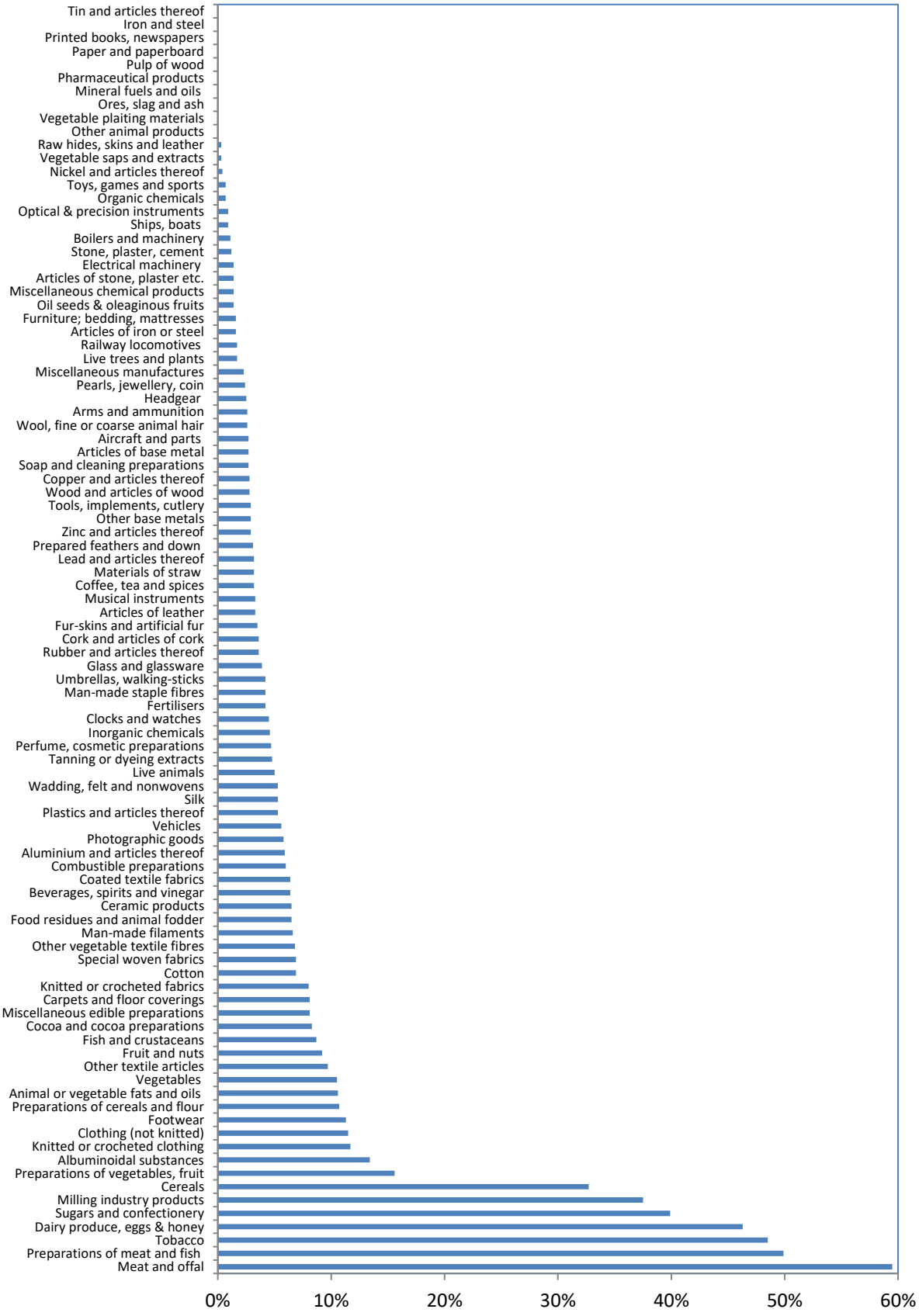
Table 13 also presents some evidence on the extent of possible non-tariff barriers, reporting the sector average based on analysis of international trade data by Kee et al. (2009) but reducing the impact to one-quarter to take account of the current levels of integration and harmonisation of standards, an approach also taken in Dhingra et al. (2016). The rationale for this scaling down comes from the cross-country patterns identified by Kee et al. (2009) showing a negative relationship between the restrictiveness of trade and level of development (as measured by GDP per capita), meaning that trade between pairs of more

[10] Note that the tariff rates in Figure 3 and Table 14 differ slightly from those in Lawless and Morgenroth (2016) due to the application of different trade weights (Irish import weights in this instance compared to EU weights in Lawless and Morgenroth). The overall pattern across sectors is, however, almost identical.

developed countries tends to have lower barriers relative to the global average.

Compared to tariffs, where we have a clearly defined measure of the upper limit coming from the listed WTO schedule of tariffs, estimating the effect of non-tariff barriers is much less certain as their impact will derive to a large extent from regulatory requirements which may evolve over time. The term 'non-tariff barriers' is an extremely broad one that effectively covers any and all policies that restrict international trade flows apart from direct tariffs. These can include quantity limits (quotas) and a wide variety of technical requirements such as licensing, labelling, standards and rules designed to protect health and food safety. They also cover requirements on customs inspections and documentation and measures to restrict competition from imports to protect domestic firms. Unlike with tariffs, there may be a time dimension to some of the impact of non-tariff barriers, with an initial learning or adaptation phase when costs may be incurred as exporters learn about the new procedures. These may then become less onerous as the regulations, customs routines and documentation become more familiar. There is some evidence to suggest that trade in intermediate inputs is quite sensitive to the presence of non-tariff barriers (e.g. Hummels, 2013; Bailey et al., 2018; Byrne and Rice, forthcoming), potentially due to tight delivery times as a result of 'just-in-time' inventory management in manufacturing.

FIGURE 2 WTO-REGISTERED TARIFFS BY PRODUCT TYPE



Source: Author's calculations using WTO tariff data and trade weights from UN Comtrade.

TABLE 13 NON-TARIFF BARRIERS AND IMPORT TARIFFS BY SECTOR

	NTB	Av. tariff		NTB	Av. tariff
Live animals	5%	5%	Printed books, newspapers	0%	0%
Meat and offal	34%	60%	Silk	12%	5%
Fish and crustaceans	10%	9%	Wool, fine or coarse animal hair	8%	3%
Dairy produce, eggs & honey	34%	46%	Cotton	10%	7%
Other animal products	1%	0%	Other vegetable textile fibres	14%	7%
Live trees and plants	4%	2%	Man-made filaments	15%	7%
Vegetables	13%	11%	Man-made staple fibres	15%	4%
Fruit and nuts	16%	9%	Wadding, felt and nonwovens	18%	5%
Coffee, tea and spices	13%	3%	Carpets and floor coverings	20%	8%
Cereals	17%	33%	Special woven fabrics	16%	7%
Milling industry products	24%	38%	Coated textile fabrics	21%	6%
Oil seeds & oleaginous fruits	13%	1%	Knitted or crocheted fabrics	14%	8%
Vegetable saps and extracts	4%	0%	Knitted or crocheted clothing	7%	12%
Vegetable plaiting materials	13%	0%	Clothing (not knitted)	7%	12%
Animal or vegetable fats and oils	20%	11%	Other textile articles	9%	10%
Preparations of meat and fish	21%	50%	Footwear	15%	11%
Sugars and confectionery	27%	40%	Headgear	9%	3%
Cocoa and cocoa preparations	26%	8%	Umbrellas, walking-sticks	1%	4%
Preparations of cereals and flour	21%	11%	Prepared feathers and down	0%	3%
Preparations of vegetables, fruit	20%	16%	Articles of stone, plaster etc.	0%	1%
Miscellaneous edible preparations	19%	8%	Ceramic products	1%	7%
Beverages, spirits and vinegar	8%	6%	Glass and glassware	0%	4%
Food residues and animal fodder	12%	7%	Pearls, jewellery, coin	0%	2%
Tobacco	16%	49%	Iron and steel	2%	0%
Stone, plaster, cement	0%	1%	Articles of iron or steel	0%	2%
Ores, slag and ash	0%	0%	Copper and articles thereof	0%	3%
Mineral fuels and oils	0%	0%	Nickel and articles thereof	0%	0%
Inorganic chemicals	1%	5%	Aluminium and articles thereof	0%	6%
Organic chemicals	0%	1%	Lead and articles thereof	0%	3%
Pharmaceutical products	0%	0%	Zinc and articles thereof	0%	3%
Fertilisers	1%	4%	Tin and articles thereof	0%	0%
Tanning or dyeing extracts	0%	5%	Other base metals	0%	3%
Perfume, cosmetic preparations	0%	5%	Tools, implements, cutlery	0%	3%
Soap and cleaning preparations	0%	3%	Articles of base metal	0%	3%
Albuminoidal substances	1%	13%	Boilers and machinery	0%	1%
Combustible preparations	1%	6%	Electrical machinery	0%	1%
Photographic goods	0%	6%	Railway locomotives	0%	2%
Miscellaneous chemical products	1%	1%	Vehicles	1%	6%
Plastics and articles thereof	0%	5%	Aircraft and parts	0%	3%
Rubber and articles thereof	0%	4%	Ships, boats	0%	1%
Raw hides, skins and leather	0%	0%	Optical & precision instruments	0%	1%
Articles of leather	0%	3%	Clocks and watches	0%	5%
Fur-skins and artificial fur	0%	4%	Musical instruments	0%	3%
Wood and articles of wood	0%	3%	Arms and ammunition	0%	3%
Cork and articles of cork	0%	4%	Furniture; bedding, mattresses	0%	2%
Materials of straw	0%	3%	Toys, games and sports	0%	1%
Pulp of wood	0%	0%	Miscellaneous manufactures	0%	2%
Paper and paperboard	0%	0%			

Source: Average tariffs are author calculations from UN Comtrade and WTO. Non-tariff barriers are one-quarter of the estimates published in Kee et al. (2009) aggregated to sector level.

Notes: Tariffs and non-tariff barriers by sector are weighted by trade composition and may differ from export equivalents.

FIGURE 3 RELATIONSHIP BETWEEN SECTOR-LEVEL AVERAGE TARIFFS AND ESTIMATED NON-TARIFF BARRIERS

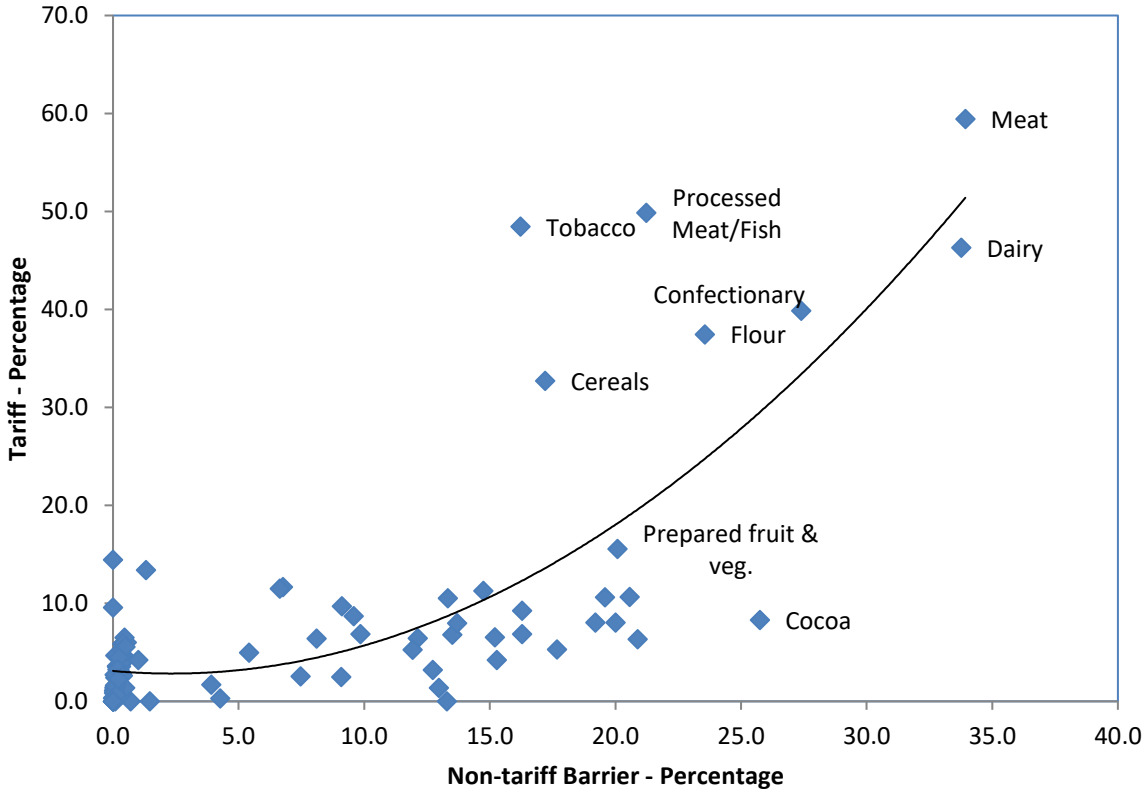


Table 13 shows that in many instances the impact of non-tariff barriers is not dissimilar to the tariff impact and Figure 3 shows there is a strong correlation between tariffs and non-tariff barriers at a sector level, suggesting double exposures for firms within those sectors. This is in line with the findings of the report by Copenhagen Economics (2018), which found that regulatory divergence had the potential to play a greater role than tariffs in driving the long-term negative impact of Brexit on Irish goods trade.

Key Finding 23	*Maximum (WTO) level tariffs vary widely across sectors, with food traders most exposed.*
Key Finding 24	*Estimates of non-tariff barriers suggest potentially large increases in cost of trading, with high correlation between sectors most exposed to tariffs and non-tariff costs.*

These averages hide a considerable amount of variation across products within sectors. All sectors have products where zero tariffs would apply while also containing products where the import tariff could be many multiples of the average calculated in Table 13. Table 14 gives examples from a range of broad

sectors of the individual product with the highest effective tariff rate on imports from the UK (i.e. also taking account of tariffs charged by weight and assuming no change in the tonnage of trade).

TABLE 14 HIGHEST IMPORT TARIFF BY BROAD PRODUCT GROUP

Sector	Product with highest tariff	Tariff
Live animals	Live fowls of the species Gallus domesticus, weighing >185	41%
Meat and fish	Frozen edible bovine offal (excl. tongues and livers)	697%
Dairy	Dairy spreads of a fat content, by weight, of ≥39% but <80%	113%
Vegetable products	Seed of wheat and meslin, for sowing (excl. durum)	62%
Foodstuffs	Mushrooms of the genus 'Agaricus', prepared or preserved otherwise than by vinegar or acetic acid	192%
Products of milling industry	Wheat starch	47%
Tobacco & food residue	Smoking tobacco	75%
Beverages	Non-alcoholic beverages (excl. water, fruit or vegetable juices and milk)	14%
Mineral products	Waste oils containing mainly petroleum or bituminous minerals	4%
Pharmaceuticals	Mannitol	35%
Other chemicals	Egg albumin, dried 'e.g. in sheets, scales, flakes, powder'	93%
Other organic chemicals	Mixtures of odoriferous substances and mixtures used in the food and drink industry	9%
Plastic and rubber	Polyethylene with a specific gravity of <0,94, in primary forms	7%
Skins, leather, & furs	Specially designed gloves for use in sport, of leather or composition leather	9%
Wood and wood products	Plywood, veneered panel and similar laminated wood	10%
Textiles	Binder or baler twine, of sisal or other textile fibres of the genus Agave	12%
Carpets, footwear	Carpets and other textile floor coverings of wool or fine animal hair	28%
Stone, glass	Tableware and kitchenware of porcelain or china	12%
Metals	Sets of assorted articles of knives	9%
Machinery, electrical	Cathode-ray tube monitors, not incorporating television reception apparatus	14%
Transportation	Road tractors for semi-trailers	16%
Miscellaneous	Slide fasteners (excl. fitted with chain scoops of base metal)	8%

Source: Author's calculations from UN Comtrade, WTO.

Key Finding 25 *Wide tariff variation exists within broad product groups.*

Aggregating the tariff effect up to broader categories in Table 15 reinforces this point regarding the importance of trade composition in determining overall tariff exposure. The aggregate tariff rate on all Irish imports from the UK would be approximately 6 per cent if WTO tariffs were applied and no change in trade structure occurred in response. This is higher than the average tariff of 4.1 per cent that Lawless and Morgenroth calculated for UK to EU trade, reflecting the higher share of food in trade between the UK and Ireland compared to the UK trade structure with other EU partners. It is also notably lower than the total tariff calculated for Irish exports to the UK of around 11 per cent, again driven by the impact of the share of food products. The average tariff rate on food imports from the UK shown in Table 15 is 18 per cent, three times the average rate, while tariffs on all other broad product categories are well under this average figure.

Also of note is that this import tariff on food is lower than estimated for Irish exporter exposure to the UK as there is also considerable variation in the level of tariffs within the food sector and the particularly high tariff sectors such as beef make up a greater share of exports than imports. Tariffs on intermediate inputs are by contrast relatively modest at 2 per cent of product value. Translating this into total tariff exposure suggests that tariff revenues would be overwhelmingly drawn from food imports (comprising food for final consumption and food for further processing), which would be liable for 70 per cent of tariffs despite accounting for less than one-quarter of trade.

TABLE 15 TRADE AND AVERAGE TARIFFS BY BROAD ECONOMIC CATEGORY

	Tariff Rate	Share of trade	Share of total tariff revenues
Food	18%	24%	70%
Consumer goods	4%	22%	13%
Intermediate goods	2%	42%	12%
Capital goods	3%	12%	5%
Totals	6%	100%	100%

Source: Author's calculations from UN Comtrade and WTO.

Key Finding 26

Food imports account for most tariff exposure, contributing 70 per cent of hypothetical tariff revenues.

Tariff rates on pure intermediates are on average around 2 per cent and would account for approximately 12 per cent of tariff revenues (assuming no change in trade patterns).

Applying a similar calculation across firms by combining the WTO tariff schedules with products imported and exported by different firm types, Table 16 shows the contrast between tariff rates on imports and exports that would be faced by foreign-owned firms and the considerably higher average and median tariff rates that would be encountered by Irish-owned firms. Note that in calculating tariffs for exporters, we assume that the UK maintains the same set of tariffs as the EU, whereas once it has exited, it would be free under WTO rules to reduce these tariffs provided that it does so in a non-discriminatory way across all WTO member countries.

Consistent with the variation across products, this shows a very large gap between the average import tariff and the median tariff, driven by the skewed nature of the tariff schedule with a few extremely high rates and then a large number of products with a comparatively low rate applied. This calculation also shows that the import tariffs firms would face on purchases from the UK are in general much lower than the potential export tariffs. As shown above, the high correlation between tariffs and possible non-tariff barriers mean that the distribution of exposure across firms is likely to be extremely similar for both.

TABLE 16 TARIFF RATES BY FIRM SIZE GROUP AND OWNERSHIP

	Small	Medium	Large
Irish			
Average import tariff	4%	6%	11%
Median import tariff	3%	3%	4%
Average export tariff	6%	11%	25%
Median export tariff	3%	3%	17%
Foreign			
Average import tariff	3%	4%	3%
Median import tariff	2%	2%	2%
Average export tariff	4%	5%	1%
Median export tariff	2%	2%	0%

Source: *Author's calculations from CSO import data, 2015 and WTO.*

Notes: *Small firms are those with under 20 employees, medium firms have 20 to 49 employees and large firms have 50 employees or more.*

Key Finding 27	*The potential negative impact of tariffs on imports from the UK, while significant, is lower than the potential impact on exports from Ireland to the UK.*
Key Finding 28	*The import tariff exposure of Irish-owned firms is considerably larger than that of foreign-owned firms due to the different patterns of their imported products.*

There are a number of caveats on these calculations, the first of which is that the export tariffs assume that the UK would apply the same WTO schedule as the EU (initially at least), whereas it would be possible for it to unilaterally lower the rates. To comply with WTO rules, however, this unilateral reduction in the absence of a specific trade agreement would have to apply to all countries, which could change the broader competitive environment within the UK market.

A second consideration is that with the UK being the main trading partner both for Irish-owned firm imports and exports, many firms may find themselves in a position to utilise the EU's inward and outward processing arrangements where tariffs on inputs that are processed into goods to be exported outside the EU may not be liable for import tariffs (although they would face whatever tariffs would be applied by their destination market). A brief description of this process is included in Appendix B. Table 17 shows how this might affect firms importing for export production by adjusting the import tariffs they would pay by the share of their exports that are destined for non-EU markets, treating the UK in this instance as being outside the EU so exports to the UK also can fall into the inward processing arrangements. In other words, it applies the WTO tariff to imports only for the share of the firm's goods that are sold onward to the EU. This reduces the average import tariff by up to 40 per cent for Irish-owned firms. It should be noted, however, that while availing of arrangements like this would reduce the tariff exposure, there would be some degree of administrative cost.

TABLE 17 HYPOTHETICAL EFFECTIVE IMPORT TARIFF FOR EXPORTING FIRMS

	Small	Medium	Large
Irish-owned			
Mean	3%	5%	7%
Median	2%	2%	4%
Foreign-owned			
Mean	2%	2%	2%
Median	1%	1%	1%

Source: Author's calculations from CSO import data, 2015 and WTO.

Notes: Excludes imports for processing into exports for non-EU markets from tariff liability.

Key Finding 29 *Two-way traders (importing and exporting) with the UK may have lessened tariff exposure, although concern regarding non-tariff barriers may remain.*

CHAPTER 6

Summary and policy implications

This paper examines the patterns of firm-level goods imports into Ireland from the UK, focusing in particular on the role that intermediate inputs from the UK play in the exporting activity of these firms and the extent to which this could be exposed to changes in the trading environment after Brexit. A number of key findings emerge, which will be summarised in this chapter together with their policy impact.

The first empirical fact of note is that the UK accounts for 25.7% of total Irish goods imports and therefore is a considerably larger source of goods imports than it is a destination for goods exports, where it makes up 13.8% of the total.

This report looked in detail into how imported goods inputs are used across firms, particularly in terms of differences between domestically owned and foreign-owned firms, and examined how firm importing affects export performance. The first finding from the firm-level data relates to the distribution of UK imports across broad product types. More than half of goods imports from the UK by Irish-owned firms are intermediate inputs, with another third being food products. We find that 5 per cent of Irish-owned firms source all of their goods imports from the UK and a further 10 per cent source over 90 per cent from the UK. In contrast, the vast majority of foreign-owned firms have a low reliance on the UK as an input source. This reinforces the consideration above that supply diversification may be important and that this implication applies more strongly to Irish-owned firms, where reliance on the UK as an input source is typically much greater than for foreign-owned firms.

The next research question was to what extent these imported products are contributing to Irish export activity. We investigate at the firm level how imports affect export performance, taking account of differences by firm ownership and size. The key finding of the regression analysis is that imports are associated positively with firm export performance. This finding applies in terms of overall export levels and also in expanding export product ranges. Likewise we find that the positive effect of importing operates both through overall import amounts and through importing a wide range of inputs. Looking specifically at UK-sourced imports, we found that they made a much larger contribution to exports by Irish-owned firms than to those of foreign-owned firms. Any change in import flows could therefore have potential knock-on effects on firm export activity, suggesting that in the analysis of Brexit impacts, it is important to include this factor in any risk assessment.

Across sectors, we find that mineral products (such as petrol) contribute close to 20 per cent of total Irish imports from the UK and that within this sector, the component products in several instances are imported exclusively from the UK. More broadly, just under half of total imports are found to have a medium reliance on the UK, while some product groups, such as pharmaceuticals, have a low reliance on imports from the UK. This suggests that supply of inputs may be exposed to some disruption or additional costs in the event of a hard Brexit and consideration should be given to examining the availability of alternative sources and diversifying input reliance.

Finally, we look at the extent of exposure of Irish importers to the imposition of a WTO tariff schedule, discussed in previous work such as Lawless and Morgenroth (2016) and Bergin et al. (2016) as the fall-back scenario of a hard Brexit. Using the firm-level data to match imported inputs with WTO tariff rates, we calculate that the aggregate tariff rate on Irish imports from the UK would be approximately 6 per cent, with the highest rates impacting on food products, while tariffs on intermediate inputs would be quite a bit lower than the average at approximately 2 per cent of product value. We show that the import tariff exposure of Irish-owned firms is considerably larger than that of foreign-owned firms due to the different patterns of their imported products. Even for Irish-owned firms, the calculations in this paper show that import tariffs on goods coming from the UK are in general lower than the potential exposure to export tariffs. This is largely due to the higher share of high-tariff products such as food in Irish exports compared to imports.

For firms that are both importing and exporting to the UK, we note that tariffs may not be due in both directions but that there may be some administrative costs in availing of exemptions such as inward-processing arrangements. We also show the extent to which non-tariff barriers could impact on firms and that the sectors most exposed to non-tariff barrier cost increases are largely the same as those on which the highest tariffs fall, with the main concentration of risk being for firms importing and exporting food products.

While the tariff rates on many of the imported intermediates discussed in this paper are lower than the average tariff, any increase in a firm's cost base in a competitive environment may be an issue of concern. Additionally, depending on the final trading arrangements made, other new costs to both importing and exporting with the UK could emerge. Customs and administrative costs, along with other sources of non-tariff barriers such as technical requirements and regulations, have been shown in international analysis by Kee et al. (2009) to be potentially considerably larger than tariff barriers. In terms of how these costs impact on firms, Lawless (2010) shows that the main channel through which customs procedures affect total trade was reducing numbers of firms. Keeping

these costs as low as possible and providing education on how to operate any new procedures will be important to mitigate any negative effects of Brexit on Irish traders.

Pulling together the different sources of evidence in this report generates a conclusion that the exposure across firms and sectors from an importing (supply chain) perspective to a hard Brexit varies quite considerably. Food products (whether for final consumption or as inputs for further processing) stand out as being particularly exposed, with a relatively high dependence on the UK market as import source and high tariffs and potential rates of non-tariff barriers on certain products. Mineral fuels and energy are also exposed as these have effectively a total dependence on UK market as an import source. In other instances, the rate of tariffs on many imported intermediates is relatively low and the uncertainty and learning challenge of dealing with regulatory divergence and new non-tariff barriers could be of more widespread concern for the majority of firms trading with the UK after Brexit.

From a firm perspective, undertaking an assessment of exposure in terms of the extent of UK imports in their supply chain, and the worst-case scenario exposure these might have to tariffs, would be a first step in planning on how best to take action to mitigate negative effects of Brexit. Identification of alternative supply sources either domestically or from another import market could be investigated and switching costs assessed as more certainty develops about how the trade environment will be affected. Although the level of uncertainty on the outcome and timing may make it rational for firms to delay action until more clarity emerges, undertaking research to establish what options are available from an input supply perspective in the event of a 'hard' Brexit, and what costs switching might involve, would put firms in a position to act quickly and effectively should it become necessary. From a policy perspective, the provision of information to support firms in this Brexit preparedness assessment would be of importance. As new requirements become clearer, particular effort should go into providing information to aid the learning process on dealing with non-tariff barriers in order to facilitate the continued close trading relationship between Ireland and the UK.

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APPENDIX A

Product-level import reliance on UK

This appendix gives detail on the products identified at the six-digit classification level in Comtrade records of Irish trade as having high reliance on the UK (i.e. the UK is the source of over 90 per cent of the Irish imports for each product) and where the import value was over €500,000 (in 2015).

The tables are divided by broad product type into capital inputs (Table A1), intermediate inputs (Table A2) and food products (Table A3). For reference, they also include the UK share of overall EU trade for each product, which will give an indication of the extent of alternative supplier countries within the EU.

TABLE A1 CAPITAL INPUTS WITH HIGH UK RELIANCE

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Self-propelled bulldozers and angle-dozers	10%	23,600	98%
Engines and motors	4%	5,323	95%
Tanker trailers and semi-trailers	4%	4,795	93%
Presses, crushers and similar machinery	1%	1,951	90%
Offset printing machinery, reel fed	17%	1,913	98%
Machinery for preparing or making printing components	17%	1,811	95%
Mobile lifting frames on tyres and straddle carriers	3%	1,314	92%
Machinery for making or repairing leather products	2%	1,153	99%
Producer gas or water gas generators	17%	997	94%
Constant weight scales	19%	850	98%
Overhead travelling cranes on fixed support	11%	723	97%

TABLE A2 INTERMEDIATE INPUTS WITH HIGH UK RELIANCE

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Natural gas in gaseous state	10%	1,110,000	100%
Petroleum oils	3%	78,100	100%
Vitamins and their derivatives	7%	74,500	94%
Provitamins and mixtures of vitamins	16%	31,000	90%
Lead waste and scrap	22%	18,100	95%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm & thickness of ≥0,5 mm	15%	17,800	97%
Ephedrines and their salts	0%	11,900	100%
Pebbles, gravel, broken or crushed stone	11%	11,100	97%
Corrugated paper and paperboard	6%	11,100	91%
Tubes, pipes and hollow profiles of iron or non-alloy steel	2%	10,200	92%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm & thickness of <0,5 mm	4%	9,853	100%
Bodies for motor cars	1%	9,143	96%
Automatic circuit breakers voltage ≥72,5 kV	3%	8,614	97%
Cortisone, hydrocortisone	1%	8,359	91%
Unwrought nickel alloys	36%	7,905	97%
Phenolic resins, in primary forms	12%	6,702	94%
Bars and rods of iron or non-alloy steel (circular cross-section <14 mm)	11%	6,619	99%
Testliner 'recycled liner board', uncoated	3%	6,455	100%
Unwrought lead, refined	22%	4,927	91%
Flat-rolled products of iron or steel, of a width of ≥600 mm, further worked	4%	4,778	97%
Flat-rolled products of iron or non-alloy steel in coils of a thickness of ≥4,75 mm but <10 mm	6%	4,680	92%
Glass staple fibres	18%	4,555	97%
Urea resins and thiourea resins	4%	4,273	99%
Flat-rolled products of iron or non-alloy steel, in coils of ≥3 mm but <4,75 mm	4%	4,136	98%
Flat-rolled products of iron or steel, of a width ≥600 mm, hot-rolled and further worked	1%	3,846	94%
Watch movements, complete and assembled	14%	3,813	99%
Greasy shorn wool	15%	3,608	100%
Flat-rolled products of iron or non-alloy steel with patterns in relief	1%	3,389	99%
Plasters consisting of calcined gypsum or calcium sulphate	6%	3,100	98%
Bars and rods, of non-alloy free-cutting steel	14%	3,086	95%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm, in coils, simply cold-rolled of a thickness of ≥3 mm	0%	3,063	98%
Natural gas, liquefied	6%	2,956	100%
Lead sheets, strip and foil, thickness ≤0,2 mm	5%	2,912	91%

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Hypochlorites, chlorites and hypobromites	7%	2,910	97%
Flat-rolled products of stainless steel, of a width of ≥600 mm, in coils, of a thickness of <3 mm	0%	2,654	92%
Angles, shapes and sections, of iron or non-alloy steel	2%	2,606	96%
Pile fabrics, knitted or crocheted	19%	2,515	100%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm, not in coils, thickness of ≥3 mm but <4.75 mm	1%	2,338	92%
Kraft paper and paperboard	25%	2,271	100%
Argon	2%	2,261	90%
Tarred macadam	14%	2,194	100%
Uncoated paper and paperboard	3%	2,126	100%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm, in coils, simply cold-rolled of a thickness of >1 mm but <3 mm	5%	2,118	90%
Plates, sheets and strip, of copper-tin base alloys	2%	1,992	99%
Pile fabrics of man-made fibres	12%	1,906	96%
Mineral or chemical nitrogen fertilisers	14%	1,833	94%
Peat, incl. peat litter	1%	1,808	97%
Lead sheets, strip and foil, of a thickness of >0.2 mm	26%	1,794	96%
Kaolin and other kaolinic clays	32%	1,785	98%
Bars and rods, of iron or non-alloy steel, not further worked	5%	1,774	100%
Mineral or chemical fertilisers containing nitrates and phosphates	2%	1,757	99%
Endless transmission belts of trapezoidal cross-section 'V-belts'	0%	1,679	97%
Flat-rolled products of iron or non-alloy steel, painted, varnished or coated with plastics	12%	1,623	96%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm, in coils, hot-rolled of a thickness of <3 mm	2%	1,608	98%
Semi-finished products of iron or non-alloy steel	5%	1,546	92%
Building bricks	2%	1,510	95%
Carbon	1%	1,494	92%
Colour lakes	37%	1,428	90%
Flat-rolled products of stainless steel, of a width of <600 mm, hot-rolled, thickness of ≥4,75 mm	3%	1,419	91%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm, not in coils, simply cold-rolled of a thickness of ≥0,5 mm but ≤1 mm	0%	1,380	98%
Unwrought tin, not alloyed	4%	1,374	97%
Flat-rolled products of iron or non-alloy steel, of a width of ≥600 mm, in coils, simply hot-rolled of a thickness of <3 mm	6%	1,285	100%

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Butanes, liquefied	25%	1,228	97%
Bridges and bridge-sections, of iron or steel	16%	1,078	93%
Flat-rolled products of iron or non-alloy steel, of a width of <600 mm, electrolytically plated or coated with zinc	1%	995	99%
Tubes, pipes and hollow profiles of alloy steel other than stainless	3%	943	93%
Waste and scrap of alloy steel	24%	939	93%
Plywood, veneered panel and similar laminated wood	8%	925	97%
Long pile fabrics, knitted or crocheted	8%	912	99%
Television camera tubes	10%	880	94%
Chlorine	3%	824	97%
Nitrites	5%	810	92%
Flat-rolled products of alloy steel other than stainless, hot- or cold-rolled and further worked	0%	792	91%
Hydrocarbons, acyclic, unsaturated	23%	780	97%
Flat-rolled products of silicon-electrical steel	0%	777	98%
Parts of railway or tramway locomotives	5%	729	98%
Pneumatic tyres	1%	711	95%
Parts of metal-rolling mills	3%	661	99%
Non-agglomerated iron ores and concentrates	2%	656	92%
Shorn wool, degreased	59%	651	95%
Embroidery of cotton on a textile fabric ground	5%	648	91%
Terry towelling and similar woven terry fabrics	21%	624	97%
Boards, sheets, panels, tiles and similar articles, of plaster	1%	623	95%
Turnings, shavings, trimmings and stampings of iron or steel	10%	592	94%
Waste and scrap, of aluminium	12%	590	97%
Mica powder	18%	589	96%
Sacks and bags, for the packing of goods	46%	586	91%
Multiple ‘folded’ or cabled filament yarn of polyester	1%	569	91%
Drill pipe, seamless, of stainless steel	57%	560	100%
Oxygen	4%	552	99%
Base metals, silver or gold, clad with platinum	6%	522	99%
Double salts and mixtures of calcium nitrate and ammonium nitrate	1%	510	99%
Synthetic organic products of a kind used as luminophores	12%	506	90%
Waste oils containing PCBs, PCT or PBBs	14%	505	100%
Carnallite, sylvite and other crude natural potassium salts	34%	500	98%

TABLE A3: FOOD PRODUCTS WITH HIGH UK RELIANCE

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Milk & cream with fat >1% but ≤6%	6%	163,000	99%
Raw beet sugar	63%	25,800	99%
Carcases of bovine animals, fresh or chilled	2%	18,100	96%
Prepared or preserved meat of bovine animals	4%	15,700	90%
Fresh or chilled lamb carcases	46%	13,300	100%
Black fermented tea	23%	11,400	94%
Milk and cream with fat ≤1%	3%	11,000	94%
Frozen, boneless meat of bovine animals	5%	10,700	91%
Soya bean flour and meal	2%	9,303	91%
Low erucic acid rape or colza oil	4%	8,458	100%
Shelled beans	13%	8,123	91%
Milk and cream, concentrated but unsweetened	2%	7,435	96%
Frozen Norway lobsters	43%	7,310	95%
Barley (excl. seed for sowing)	8%	5,728	100%
Live chickens, weighing ≤185g	12%	5,703	93%
Milk and cream with fat >10%	3%	5,587	95%
Flour, meal and powder of potatoes	5%	4,718	98%
Fresh or chilled Pacific salmon	26%	4,634	94%
Fresh birds' eggs, in shell	0%	3,948	99%
Bran, sharps and other residues of maize	0%	3,880	100%
Grated or powdered cheese	2%	3,813	90%
Frozen chicken, not cut in pieces	0%	3,420	92%
Birds' eggs, not in shell	0%	3,356	97%
Live, fresh or chilled, scallops	63%	3,007	97%
Homogenised prepared meat for infant or dietetic food	9%	2,894	95%
Frozen trout	1%	2,842	92%
Crustaceans	9%	2,801	98%
Fresh or chilled turbot	2%	2,768	100%
Frozen salmonidae	22%	2,605	94%
Prepared or preserved sardines	4%	2,589	92%
Fresh or chilled sheep carcases	52%	2,389	100%
Flours, meals and pellets of fish or crustaceans	11%	2,155	93%
Fresh or chilled carcases of swine	2%	1,939	96%
Fresh or chilled fish livers and roes	2%	1,724	94%
Smoked fish, incl. fillets	4%	1,619	90%
Fish fillets, dried, salted or in brine, but not smoked	3%	1,514	93%
Oats (excl. seed for sowing)	8%	1,214	94%
Live sheep	6%	1,182	100%
Pig fat, free of lean meat	2%	1,023	100%

	UK share of EU trade	Value (€'000s)	UK share of Irish imports
Linseed oil	2%	1,019	98%
Fresh or chilled boneless cuts of sheep	21%	1,011	98%
Frozen flat fish	1%	805	94%
Frozen mackerel	14%	781	96%
Sugar cane	17%	765	100%
Dairy spreads of fat ≥39% but <80%	10%	709	92%
Fillets, dried, salted or in brine of other fish	6%	703	91%
Fresh or chilled haddock	1%	672	99%
Live cattle (excl. pure-bred for breeding)	0%	665	99%
Fertilised birds' eggs for incubation	4%	652	100%
Fresh or dried citrus fruit	1%	630	93%
Frozen Nile perch	24%	561	100%
Frozen fillets of haddock	15%	536	100%

APPENDIX B

Inward and outward processing and tariffs[11]

A company based in any Member State can apply for an Inward Processing authorisation which allows products imported from a non-EU country to be processed within the Union.

In this case the Customs Duty and VAT on importation of product to be processed is suspended until an end product is produced. If the end product is re-exported to another non-EU country then no duties or VAT are paid in the EU but the exported end product may be subject to duties in the destination country.

If the end product is not re-exported but is released for free circulation within the EU, then duties are charged on the value of the end product (The company may opt to be charged on the value of the imported component part but the norm is that the value of the end product is used. A company must state its preference at the time of application.)

The end product cannot be re-imported to the EU within 12 months of being exported – if the product is re-imported within that time frame all original import charges will be applied. Inward processing authorisations can be granted in relation to agricultural products/food stuffs but there are additional requirements, including that the goods may be subject to additional agricultural regulations or standards.

A further restriction is that for a set of 'sensitive products' the company applying for the authorisation must be able to prove one of the following:

- unavailability of the same product, including commercial quality and technical characteristics, at 8-digit CN code level within the EU;
- differences in price between goods produced in the EU and those intended to be imported, where the price of the comparable EU goods would not make the proposed commercial operation economically viable;
- contractual obligations where comparable goods do not conform to the contractual requirements of the third country purchaser of the end product;

[11] Reproduced from InterTradeIreland (2017).

- the aggregate value of the goods to be placed under the inward processing procedure per applicant and calendar year for each 8-digit CN code does not exceed €150,000.

Sensitive products include meat, eggs, cereals, rice, sugar, olive oil, milk, wine, ethyl alcohol, unmanufactured tobacco and any fishery products subject to an autonomous quota.

Tariff exceptions can also apply to outward trade flows: a company based in the EU can apply for an Outward Processing authorisation allowing goods to be exported to a non-EU country to be processed there. Import duties are charged once the processed product is re-imported to the EU – duties/VAT are levied on the cost of the processing operations carried out in the third country, i.e. the value of the end product less the value of the component part exported under the Outward Processing regime. The end product must be re-imported within the time limits set down in the authorisation (the standard period is 6 months but the period can be more or less).[12]

[12] https://www.revenue.ie/en/customs-traders-and-agents/processing-goods-enduse-and-warehousing/index.aspx

APPENDIX C

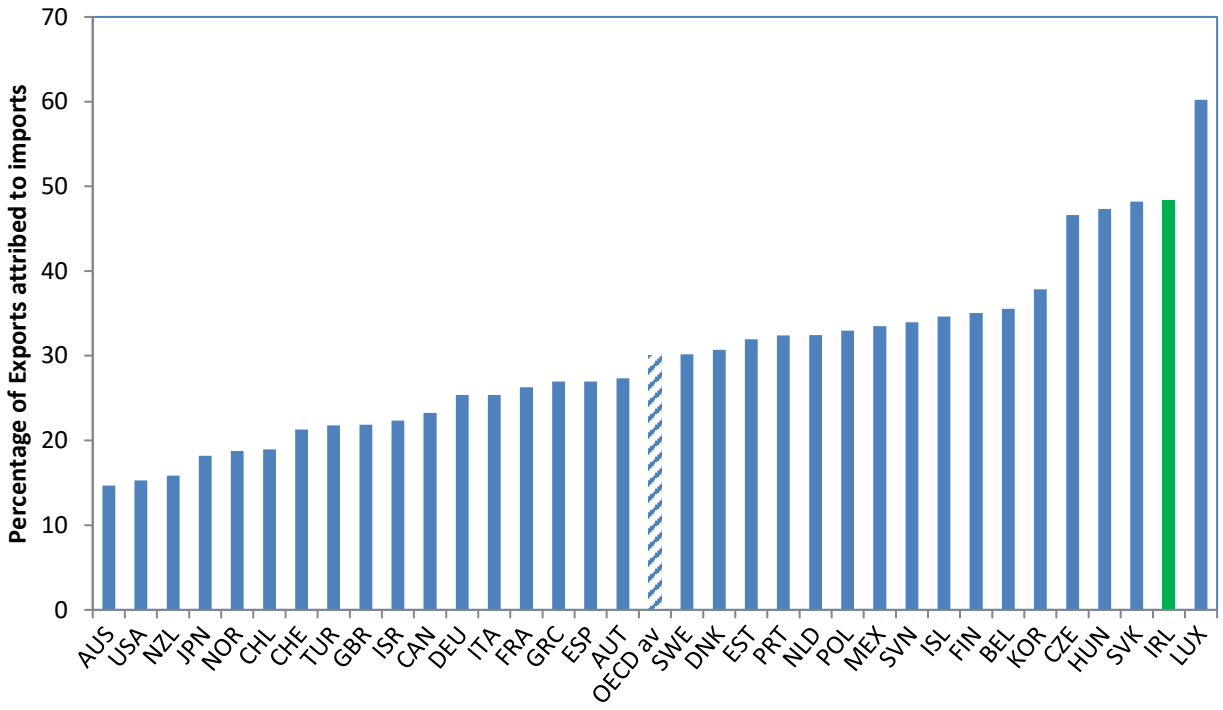
OECD measures of import content of exports

This report examines the contribution of products from the UK in overall Irish imports and in imports by Irish-owned firms to help understand the contribution these imports make to Irish goods exports. At a more aggregate sectoral level, the OECD has developed a database on Trade in Value Added to explore the link between imports and exports internationally and to distinguish trade flows in value-added terms from the standard measures based on gross export values. This appendix shows how the import content of export value added in Ireland compares to other countries using this metric.

The OECD defines its measure of the import content of exports as 'the share of imported inputs in the overall exports of a country and [it] reflects the extent to which a country is a user of foreign inputs'. The trade in value added approach attempts to divide the total value added of a final product across the contributions made by different countries and industries to capture the working of global value chains and take account of the significant contributions of intermediate imports into country exports. This approach gets rid of the double-counting that can occur when using total export flows across countries, which can incorporate some value that had actually been imported rather than generated by the exporting country. The measurement is based on input–output tables generated for the world to capture how intermediate inputs are used across different sectors (OECD, 2017).

The calculations on the import content of exports measured in this way are shown for a range of OECD countries in Figure A1. Overall, Ireland has one of the highest import shares of exports in the OECD, considerably above the average and second only to Luxembourg. Across countries, this import content of exports appears to be reasonably strongly correlated with overall economic openness and, as a result, tends to be higher in smaller countries than in larger ones.

FIGURE A1 OECD IMPORT CONTENT OF EXPORTS (2014)



Source: OECD (2017).

The OECD database also examines the foreign value added share of exports across sectors. For each sector, this takes account of inputs coming from all other economic sectors (e.g. the foreign value-added share of a sector like Food or Basic Metals could include foreign provision of equipment, fuel or business services as well as inputs within the sector itself). Combining this with the share of the UK in Irish imports, we calculated the UK share of Irish exports across each sector as shown in Table A4.

The foreign value added share of exports varies across sectors from approximately one-third to almost 70%, but for most is in the same range as the overall effect of approximately one-half of value-added. Taking the UK share of gross imports as the weight for its contribution to export value added, the most significant sectors where the UK plays a role in export values are agriculture, food and services sectors such as transport services and telecommunications.

TABLE A4 TOTAL FOREIGN AND UK SHARE OF VALUE ADDED IN IRISH EXPORTS

	Foreign value added share of exports	Estimated UK value added share
Coal and petrol	69%	42%
Basic metals	59%	11%
Recycling	59%	0%
Computer, electronic & optical	53%	10%
Vehicles	53%	3%
Computer & related services	52%	8%
Construction	51%	n.a.
Paper and publishing	50%	25%
Non-metallic minerals	50%	9%
Fabricated metal products	49%	9%
Rubber and plastics	49%	16%
Other transport equipment	49%	2%
Wood and cork	48%	24%
Textiles	46%	14%
Mining	46%	0%
Chemicals	46%	13%
Agriculture	46%	34%
Machinery	45%	8%
Rental of machinery	45%	5%
Food & beverages	41%	19%
Electricity, gas & water	41%	9%
Electrical machinery	41%	7%
Real estate	40%	5%
Transport & storage	39%	12%
Post & telecommunications	36%	20%
Wholesale & retail	36%	n.a
R&D and business services	34%	2%
Financial intermediation	34%	4%
Hotels & restaurants	33%	6%

Source: OECD Trade in Value Added 2011 and Comtrade.

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