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EXPANDING AND DIVERSIFYING THE MANUFACTURED EXPORTS OF IRISH-OWNED ENTERPRISES

MARTINA LAWLESS, IULIA SIEDSCHLAG AND ZUZANNA STUDNICKA

An Roinn Post, Fiontar agus Nuálaíochta
Department of Jobs, Enterprise and Innovation

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EXECUTIVE SUMMARY

OVERVIEW

Given the key role that openness to international trade has played in driving Irish economic growth for several decades, understanding the contributors to export success – particularly for domestically-owned firms – has an important role to play in ensuring that the policy environment continues to be supportive of export participation, expansion and diversification. The extent to which Ireland's exports can continue to grow depends on whether Ireland is exporting products whose export demand is increasing and to growing geographic markets. For the indigenous sector (Irish-owned firms), the challenge is to secure greater investment growth in dynamic products, to promote enterprise innovation and to support export expansion into expanding markets.

This report examines detailed information at the product and destination level for exported goods combined with enterprise characteristics to give a highly detailed picture of Irish exporting firms. The primary objective of this report is to deepen our understanding of the factors that drive the product and destination mix of exports. We explore the potential range of growth strategies that successful enterprises can use and the contributions to growth coming from entering new market destinations, launching new products, growing existing markets and products or combinations of all of these elements.

By delving into the detailed export data, we are able to assess the extent of concentration in terms of products and destination markets for manufacturing exporters overall and also for different types of firms. This can then feed into an examination of the appropriateness of the current concentration structure in comparison with growth opportunities at the international level. We also measure the dynamism and flexibility that firms exhibit in changing the composition of their exports, both in terms of adjustments to their product mix and also in their ability to move from declining to expanding destination markets. This measurement of the dynamism of firms along the product and destination dimensions helps to indicate the extent to which they are likely to prove resilient to economic shocks.

This summary provides a brief overview of the results contained in the report and links them to potential areas where policy intervention may have a role to play.

MAIN FINDINGS

1. Exporting is highly skewed:

   - Most exporting firms are quite small, exporting few products to a small number of destinations.
   - Export values are dominated by a relatively small group of export 'superstars': the largest proportions of exporting firms are Irish-owned and small and medium-sized but most export value is accounted for by large, foreign-owned firms.

2. Most exporters sell a small number of products to few markets:

   - Over time, for Irish-owned as well as foreign-owned firms, a pattern of gradual growth in product diversification emerges, apart from a dip in 2008.
   - Exports by Irish firms are concentrated in a small number of top destination markets, with one-third of exports going to the UK.
   - Irish-owned firms are less diversified (in terms of products and markets) than foreign-owned firms.
   - Most of Irish firms export a single product to one market, with very few firms exporting many products to just one or two markets.
   - Eleven per cent of Irish-owned firms export more than 20 products to over 20 market destinations.
   - Forty per cent of foreign-owned firms export more than 20 products to over 20 destinations.
   - Eleven per cent of highly globalised Irish-owned firms (exporting more than 20 products to over 20 destinations) account for 46 per cent of total exports.
   - The corresponding figure for foreign-owned firms is much higher, 80 per cent.

3. Exporting activity has a high risk of exit:

   - Export survival is less likely in the case of Irish-owned firms.
   - The majority of exporters export more than one year.
   - The survival probability in the first year of export activity is 60 per cent for Irish exporters while for foreign-owned firms is around 80 per cent.
   - Over time, the export survival probabilities for medium-sized and large firms are relatively similar. In contrast, small exporting firms have lower export survival rates.

- On average, over the analysed period, 78 per cent of Irish-owned and 92 per cent of foreign-owned exporters were continuing exporters (exported continuously for at least three years).
- On average, over the analysed period, the product mix of Irish-owned exporters was made up of 37 per cent existing products, 35 per cent single-year exported products, 15 per cent new products, 13 per cent dropped products (that stopped being exported).

4. Export growth is largely driven by product and market changes:
   - Exporting firms continually adjust product and market mixes.
   - Over the analysed period, on average, the increase in exports by Irish-owned exporters was mainly explained by export changes at the extensive margin (export changes due to export entries and exits).
   - The pattern is different for foreign-owned exporters, with exports by continuing exporters driving export growth while the contribution of the extensive margin is slightly negative.

POLICY IMPLICATIONS

- High levels of specialisation amongst exporters can be a positive strategy if the specialisation is in areas of high current demand and future growth prospects.
- Looking at the manufactured products and destinations most exported to by Irish-owned firms, we find that almost all are exhibiting growth (in terms of the size of exports for products and in terms of the GDP for destinations).
- This provides some indicative evidence that the current concentration patterns of Irish firms are well chosen but in a constantly changing world market.
- However, concentration in a relatively narrow range of products and/or markets also brings exposure to risk.
- Ongoing monitoring of global trends and changes in comparative advantage for Irish-owned firms is crucial in ensuring that firms are well positioned to take advantage of opportunities in new markets or new products and also that risks associated with exogenous declines in product demand internationally are mitigated.
- The pattern of many firms exporting a small number of products to few destinations also shows that there are ongoing hurdles or fixed costs associated with each new product introduced and each new export market entered.

- It demonstrates a need for ongoing support for firms beyond their initial move into exporting.
- The main challenge is to secure greater investment growth in dynamic products (with high rate of entry/exit but also of growth), to promote enterprise innovation and to support export expansion into dynamic markets.
- The support for innovation and for ongoing adjustment and experimentation is therefore a key policy takeaway.
- Identifying barriers to exporting, particularly in terms of information about potential export markets, and facilitating firm engagement and expansion into new destinations could help in enabling firms to extend their export coverage and support the continuous cycle of product turnover that appears to be such a central component of export growth.

CHAPTER 1

Introduction

Expanding and diversifying manufacturing exports is a key component of Ireland's sustainable economic growth. The extent to which Ireland's exports can continue to grow depends on whether Ireland is exporting products whose export demand is increasing and to growing geographic markets. For the indigenous sector (Irish-owned firms), the challenge is to secure greater investment growth in dynamic products (with high rate of entry/exit but also of growth), to promote enterprise innovation and to support export expansion into expanding markets.

This report examines extremely granular records on exported products in manufacturing and their destination markets combined with enterprise characteristics to give a highly detailed picture of Irish manufacturing exporting firms.[1] This in-depth analysis is intended to deepen our understanding of the factors that drive the product and destination mix of exports. We explore the potential range of growth strategies that successful enterprises can use and the contributions to growth coming from entering new market destinations, launching new products, growing existing markets and products or combinations of all of these elements.

A key contribution of the dissection of the detailed export data is that it allows us to accurately measure the extent of concentration in terms of products and destination markets for manufacturing exporters overall and also for different types of firms. This can then feed into an examination of the appropriateness of the current concentration structure in comparison with growth opportunities at the international level.

High levels of specialisation amongst exporters can be a positive finding if the specialisation is in areas of high current demand and future growth prospects. However, concentration in a relatively narrow range of products and/or markets can also bring exposure to risk. Consideration also needs to be given to the level of flexibility that firms exhibit in changing the composition of their exports, both in terms of adjustments to their product mix and also in their ability to move from declining to expanding destination markets. Examining the dynamism of firms along the product and destination dimensions can indicate the extent to which they are likely to prove resilient to economic shocks.

[1] The contribution of the services sector is an important and growing component of exports, both internationally and from Ireland. However, as the data gathered on services are quite different in nature to those available for manufacturing firms, a separate analysis is warranted.

This research aims to uncover the factors that drive the product and destination mix of exports by Irish-owned enterprises. The following research questions are addressed:

a. How concentrated are Irish-owned manufacturing enterprises currently in terms of products and destination markets?

b. How flexible are manufacturing enterprises in their ability to move from declining to expanding destination markets?

c. How dynamic are they in changing the composition of their exports and how does this impact the enterprise's ability to react to economic shocks?

d. Is the current concentration in products and destinations with future growth opportunities?

e. What mix of export growth strategies do successful manufacturing enterprises use and what are the sequences of steps in their successful export growth; entering new market destinations, launching new products, growing existing markets and products, or combinations of all types of expansion?

f. Do existing (long-standing) exporters have different exporting strategies compared to new exporters (increasing sales of old products versus exporting new products) and does this vary systematically by sector?

This research report is structured as follows. Chapter 2 summarises key empirical facts from existing international and Irish evidence on firms' export behaviour and export performance. To contextualise the Irish evidence, a particular focus in this chapter is on evidence from European small open economies. Chapter 3 provides a brief description of the dataset and sources used for this analysis. Next, Chapter 4 describes export patterns and trends by firm, product and destination markets. This analysis identifies and discusses concentration and specialisation patterns in terms of products and destination markets for Irish-owned as well as foreign-owned manufacturing firms. A key feature of this analysis is the distinction between Irish-owned exporters of food and non-food products. On the basis of trends in world demand, this chapter also assesses the future growth opportunities for Irish-owned exporters. Chapter 5 examines exports dynamics in terms of firms' decisions to enter/continue/exit exporting; to add/continue/drop products; and to enter/stay/exit export markets. On the basis of these results, firms' exporting strategies are identified and compared for different types of exporters by ownership, experience, and product categories. This chapter also analyses the sensitivity of export growth to changes in economic growth in export markets. Taken together, these research results provide useful information for enterprise strategy and policies aimed to enable Irish-owned firms to expand and diversify their merchandise exports.

CHAPTER 2

Firm heterogeneity and exporting: existing evidence

2.1 INTERNATIONAL EVIDENCE

As microdata have become increasingly available, empirical analysis of international trade has highlighted the extremely concentrated nature of trade, driven by a small number of firms. Furthermore these firms differ systematically from non-trading firms. Previous reviews of international trade[2] established that firms engaged in international trade are larger, more capital-intensive, more skills-intensive, more productive and that they pay higher wages than firms that do not either export or import. More recently, Wagner (2016) has analysed more disaggregated transaction-level trade data by firm, product and country. A number of new stylised facts have emerged with respect to the number of trading firms, goods traded and countries traded with. The key features that emerged from firm-level studies are:

Exporting is highly concentrated. For example, evidence from the US provided by Bernard et al. (2009) indicates that the top 1 per cent of exporters account for 90 per cent of the value of US total exports. Furthermore, the evidence indicates that these few large firms export many products to many export markets. A similar high degree of concentration has been found for Germany (Wagner, 2012a), other EU countries (Mayer and Ottaviano, 2007), as well as developing economies (Freund and Pierola, 2012).

The largest proportion of firms export a small number of goods to a small number of destinations. This empirical fact is documented for several EU countries including Belgium (Muûls and Pisu, 2009), Denmark (Eriksson et al., 2009), France (Eaton et al., 2004), Germany (Wagner, 2012b), and also the US (Bernard et al., 2009). Arkolakis and Muendler (2013) provide additional evidence for Brazil, Chile, Denmark, and Norway.

The export dynamics in the short run is driven by changes in export sales while new exporters and export exiters have a less important impact. This empirical fact emerges from evidence provided for several EU countries including France (Bricogne et al., 2010), Portugal (Amador and Opromolla, 2013), Spain (De Lucio et al., 2011), Germany (Wagner, 2014), Hungary (Muraközy, 2012), as well as the US (Bernard et al., 2009), Chile (Álvarez and Fuentes, 2011; Álvarez and Sáez, 2014), and Turkey (Cebeci and Fernandes, 2015).

[2] For recent reviews of this literature see Redding (2011) and Bernard et al. (2012).

Exporting relationships are very dynamic with frequent product and export destination switching by firms. This fact is supported by evidence for EU countries including France (Buono and Fadinger, 2012), Estonia (Rahu, 2015), Hungary (Békés and Muraközy, 2012), Portugal (Amador and Opromolla, 2013), Slovenia (Damijan et al., 2014), and Spain (Esteve-Pérez et al., 2013). Álvarez et al. (2010) and Blum et al. (2013) provide evidence for Chile.

Export survival is short. The empirical evidence on export survival indicates that export activity is extremely short (median duration of an export flow is one year regardless the level of analysis). Volpe-Martincus and Carballo (2008) study the duration of Peruvian firms' exports; Görg et al. (2012), as well as Békés and Muraközy (2012) study the duration of exports by Hungarian firms; and Esteve-Pérez et al. (2013) look at Spanish firms.

Multi-product exporters export many products to many destinations and they export more per product and per destination than single product exporters. This empirical fact is supported by evidence for Germany (Wagner, 2012a) and the US (Bernard et al., 2011).

Table A.1 in the Appendix summarises relevant evidence on export patterns and export dynamics from selected European small open economies. Notwithstanding Ireland's unique position with respect to different export behaviour by indigenous and foreign-owned firms, this evidence is useful in the context of similarities Ireland shares with these countries, in particular to the importance of foreign demand for its economic growth and exposure to external economic shocks. The selected countries include Belgium, Denmark, Estonia, Hungary, Luxembourg, the Netherlands, Norway, Portugal, Slovenia, and Sweden.

Many of the key features of export behaviour and export performance discussed above are also present in small open economies. However, in comparison to larger economies, export concentration patterns and export dynamism appear to be more pronounced. Furthermore, export premia (i.e. the higher performance associated with exporters relative to non-exporters) associated with features such as firm size, capital and skills intensity, productivity and wages are found to be significantly bigger than in large economies like the US. The evidence suggests that exporters in small open economies generally start with small export values but they tend to grow faster than the average exporter. This fast export growth is explained by a growing number of transactions while average export values per transaction decrease over time.

In the short to medium run, export dynamics across countries have been driven by changes of exports at the intensive margin (by existing exporters). In most selected European small open economies, export adjustment following the recent economic crisis has taken place mainly at the intensive margin through the reduction of export sales (due to smaller quantities exported and price charged) while entry and exits of firms and products played a less important role. However, the export adjustment in Luxembourg has taken place at the extensive margin. Substantial dynamics of exports at the extensive margin, mostly among small and young exporters, has been also found in the Netherlands. Further evidence indicates that young exporters tend to grow by expanding their market destinations.

Export growth in the selected European small open economies appears to be very sensitive to economic growth in destination markets, particularly in the case of exports of capital and durable consumer goods. Evidence from Norway indicates that the responsiveness of firms' exports to demand shocks tends to be amplified in export markets with less buyer dispersion.

2.2 EVIDENCE FROM IRELAND

Survey data gathered by Enterprise Ireland have provided extremely valuable information on documenting and explaining the activities of exporting firms, demonstrating how empirical evidence on the exporting behaviour of individual firms can provide significant insights about international trade (Lawless, 2009; 2013; Lawless and Whelan, 2014). This survey was used in some of the earliest internationally published work investigating how firms operate across export markets. This showed that firm involvement in individual export markets is extremely dynamic with high levels of market entry and exit. This was then expanded to examine barriers to entering export markets and how they are affected by firm and sector characteristics. Further work showed how the relationship between existing export markets of the firm could impact the likelihood of entering and successfully exporting in new markets.

Existing evidence on Ireland's export performance in terms of product and market specialisation over the past decade (Ruane et al., 2013) highlights Ireland's export specialisation in high skill and technology-intensive manufactures and knowledge-intensive services.[3] This pattern of export specialisation reflects the presence of multinational enterprises in these sectors. Further, this empirical analysis finds that Ireland's comparative advantage in high skill and technology-

[3] Manufactures with high skill and technology intensity include goods produced in pharmaceuticals, chemicals, medical devices, and ICT; knowledge-intensive services include market services in communications, ICT, transport, financial services, insurance and other business services.

intensive manufactures has declined over time. However, over the analysed period, Ireland has gained relative comparative advantage in high-tech knowledge intensive services, one of the most dynamic export sectors worldwide.[4]

In terms of export market specialisation, the empirical results indicate that Ireland had a revealed comparative advantage for exports to four geographical areas: the UK, the Euro Area, the rest of Europe and the US. This pattern of export market specialisation reflects the traditional trade relationships with the UK and the focus of Irish and multinational exports on Europe. As these export markets are mature markets with sluggish growth, the authors point out that to grow its goods exports, Ireland would need to expand and diversify its exports into high-growth markets such as BRICS[5] and Central and Eastern European countries.[6]

4 High-tech knowledge intensive services include communication and ICT services.

5 Brazil, the Russian Federation, India, China, South Africa.

6 Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Romania, Hungary, Poland, Slovakia, Slovenia.

CHAPTER 3

Data sources

An important input into the research is the availability of highly detailed trade data. The Central Statistics Office (CSO) collects statistics on merchandise exports of manufacturing enterprises in Ireland broken down by product and market destinations and this can be matched with enterprise accounting variables (collected via the Census of Industrial Production). This linked dataset covers the period from 1996 to 2012 on enterprise characteristics and the period up to 2015 on trade statistics. This dataset is unique in allowing analysis of a complete set of enterprise exports and imports at product-destination levels of granularity and to match these to enterprise characteristics and performance. The availability of data at the enterprise-product-country level provides a significant degree of additional information on export activity and performance which has not been available in the past.

In common with other European countries, the Irish trade data are collected through two different systems. The *Extrastat* survey collects extra-European trade and the Intrastat survey gathers data for intra-European trade. The threshold for reporting of exports differs between the two systems, with *Intrastat* requiring an exporting volume of above €635,000 per annum whereas the *Extrastat* threshold is considerably lower and collects information on all transactions above €254. Customs data are collected on a monthly basis, but were aggregated to annual amounts by the Central Statistics Office. The data collected include the VAT registration number of the firm, the product-level code at HS-6 level, the destination of the exports, and the value and weight of the goods being exported. Changes in HS-6 codes over time were corrected for using the concordance files made available by Eurostat. This ensures that the codes and product counts are consistent over time, although it may therefore underestimate the level of innovation in new product categories. This is because products will be classified as belonging to the long-established code rather than a newly introduced separate category. We present trade summary statistics for Intrastat and Extrastat exports in Table A.2 in the Appendix. It shows that the threshold particularly affects firms exporting one product. The average value of exports per firm for firms exporting only to the EU is ten times higher than for firms exporting outside the EU.

Using the firm identifiers collected in the Customs files allows the detailed product-destination information to be matched to firm characteristics collected through the annual Census of Industrial Production (CIP) which surveys firms in manufacturing, mining and utilities. The level of detail in the CIP survey depends on the size of the firm with a short form sent to firms with three or more

employees and a more detailed survey being collected for firms with more than 20 employees. Both versions of the survey collect information on firm employment levels, nationality of ownership, and investment and costs. Table A.3 in the Appendix presents summary statistics for employment based on the CIP data. Here again, we see that firms exporting only one product to the EU markets are larger than firms exporting one product outside the EU.

CHAPTER 4

Export patterns and trends

4.1 CHARACTERISTICS OF EXPORTING FIRMS

Matching the Customs data on export values by product and destination to the firm characteristics from the Census of Industrial Production gives us between 1,000 and 1,400 firms per year across a 20-year horizon. Our sample of firms covers around 47 per cent of firms, accounting for 99 per cent of total trade (see Table 4.3 for more details).

In order to examine the patterns of export activity across a range of dimensions, we divide the firms in the sample according to a number of important criteria that ex ante might be expected to influence the scope of their export market involvement. These are nationality of ownership (although we focus primarily on Irish firms we will use some evidence from the foreign-owned exporters as a comparator), firm size and a categorisation based on product type.

The product categories are based on potentially different market scopes and outlooks for food as compared to non-food exporters. We implement this breakdown by defining all products in the HS-2 classification codes 0 to 24 as food products. We then classify firms into three groups; those that export only food products, those that export both food and non-food products and non-food exporters.[7]

Table 4.1 shows the total number of firms in each year of the sample, the number of Irish-owned firms and the breakdown of our sample of firms according to the food/non-food categories. The largest numbers of exporting firms are Irish-owned (906 out of 1,244 firms or 72 per cent in the most recent year). The majority of these, around 80 per cent per year, export exclusively non-food products. This is slightly higher for the total sample than for Irish firms, who are somewhat more likely to export food products.

The size distribution described in Table 4.2 is one of the first major differences we see between Irish and foreign firms: among Irish firms 61 per cent are small, 24 per cent are medium and five per cent are large, whereas among foreign companies 30 per cent are small, 46 per cent are medium and 23 per cent are large. Overall, most exporters are small and medium sized (90 per cent of

[7] The food and non-food breakdown is one driven primarily by policy concerns and was a comparison of some importance to the funding bodies.

exporting firms). An average Irish-owned exporter has 75 employees, whereas an average non-Irish exporter has 210 employees. Moreover, there is a large difference in firm size when we distinguish between type of exports. Food-and-non-food exporters employ on average 232 people whereas the average for all firms is 119 employees.

TABLE 4.1 NUMBER OF FIRMS AND PERCENTAGE EXPORTING FOOD, NON-FOOD AND BOTH PRODUCT TYPES

	All Firms				Irish Firms			
	Number	% Food	% Both	% Non-Food	Number	% Food	% Both	% Non-Food
1996	1,076	0.10	0.11	0.80	680	0.14	0.09	0.77
1997	1,148	0.06	0.13	0.81	731	0.09	0.14	0.78
1998	1,216	0.06	0.13	0.81	777	0.09	0.13	0.77
1999	1,318	0.05	0.15	0.80	851	0.08	0.15	0.78
2000	1,377	0.05	0.15	0.80	901	0.07	0.15	0.78
2001	1,407	0.06	0.14	0.80	900	0.09	0.14	0.77
2002	1,389	0.06	0.14	0.80	881	0.08	0.14	0.77
2003	1,373	0.06	0.14	0.80	890	0.09	0.15	0.76
2004	1,353	0.06	0.15	0.79	890	0.08	0.16	0.76
2005	1,264	0.06	0.15	0.79	811	0.08	0.15	0.77
2006	1,277	0.06	0.13	0.81	857	0.08	0.14	0.78
2007	1,231	0.07	0.14	0.79	834	0.09	0.15	0.76
2008	1,156	0.07	0.13	0.80	785	0.09	0.14	0.77
2009	1,198	0.06	0.15	0.79	819	0.08	0.15	0.76
2010	1,212	0.07	0.15	0.78	837	0.10	0.15	0.75
2011	1,309	0.07	0.15	0.78	930	0.09	0.14	0.77
2012	1,275	0.08	0.14	0.79	910	0.10	0.13	0.77
2013	1,293	0.08	0.14	0.78	928	0.10	0.13	0.77
2014	1,277	0.09	0.14	0.77	923	0.11	0.13	0.76
2015	1,244	0.09	0.14	0.77	906	0.11	0.14	0.75

Source: Authors' analysis of CSO export data.

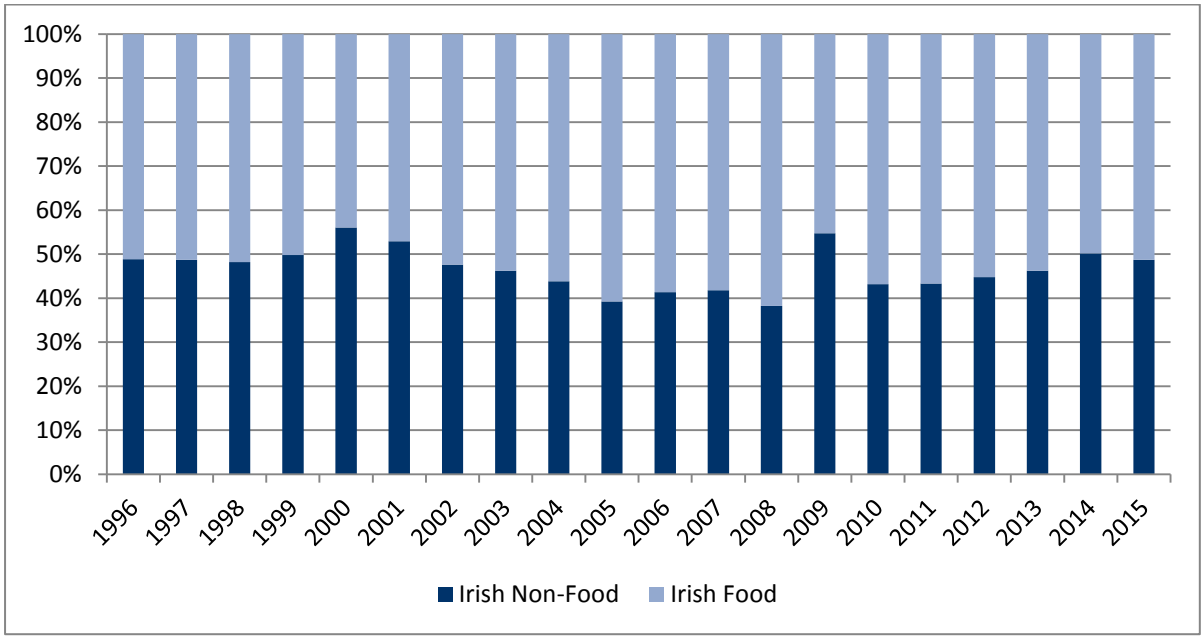
TABLE 4.2 FIRM SIZE DISTRIBUTION AND AVERAGE EMPLOYMENT

	%	Irish	Non-Irish
Small	57	61	30
Medium	32	24	46
Large	11	5	23
	All firms	**Irish**	**Non-Irish**
All	119.3	75.1	210.2
Food	75.7	72.1	124.1
Both	232.3	153.0	404.6
Non-food	103.2	61.9	180.7

Source: Authors' analysis of CSO export data.

Switching from the firm to the product perspective, Figure 4.1 shows that food and non-food products contribute approximately equally to the total value of exports by Irish-owned firms. This again indicates that the food-only and both food-and-non-food exporting firms are generally larger than the non-food-only Irish exporters that account for a larger fraction of exporting firms.

FIGURE 4.1 FOOD AND NON-FOOD EXPORTS BY IRISH FIRMS



Source: Authors' analysis of CSO export data.

TABLE 4.3 CIP FIRMS BELOW AND ABOVE THE INTRASTAT REPORTING THRESHOLD

	CIP Firms	% Firms below	% Firms above	% Trade below	% Trade above
2001	2,630	0.53	0.47	0.003	0.997
2002	2,629	0.53	0.47	0.003	0.997
2003	2,616	0.54	0.46	0.003	0.997
2004	2,412	0.52	0.48	0.002	0.998
2005	2,199	0.49	0.51	0.002	0.998
2006	2,327	0.50	0.50	0.002	0.998
2007	2,778	0.55	0.45	0.003	0.997
2008	2,809	0.57	0.43	0.004	0.996
2009	2,508	0.57	0.43	0.004	0.996
2010	3,080	0.67	0.33	0.004	0.996
2011	3,602	0.68	0.32	0.005	0.995
2012	2,951	0.69	0.31	0.003	0.997

Source: Authors' analysis of CSO export data.

One caveat in using Customs data collected under the Intrastat system (i.e. the within EU export records) is that, in order to reduce the reporting burden on firms, there is a threshold level of exports and/or imports that must be reached before the firm is required to provide the detailed information on products and destinations (along with other related information) that we utilise in this analysis. In order to examine the extent to which this reporting threshold limits our potential analysis, Table 4.3 takes the broad export information from the full sample of firms in the Census of Industrial Production and calculates how many firms and how much export value fall below the Intrastat threshold. This shows that there is a considerable number of firms that export amounts below the threshold and the percentage of these small exporters have increased over time. However, the average export values of these firms are very small so the Customs records provided detail on the vast majority of export values, notwithstanding the presence of the recording threshold.

4.2 PRODUCT CONCENTRATION

We begin the presentation of export patterns by looking at the level of diversification of manufactured products exported, measured by a count of firm products as defined at the HS-6 level Customs nomenclature. We present the median and average (mean) number of products exports exported in each year, with Table 4.4 presenting a breakdown by firm nationality and Table 4.5 looking in more detail at Irish-owned firms by presenting the product coverage measures separately for food, non-food and firms that export both food and non-food products.

Over the time period 1996-2015, we find consistently that Irish-owned manufacturers are less diversified in terms of their export product coverage compared to exports by foreign-owned firms. Over the analysed period, the median Irish-owned firm exported four to five products while the corresponding number of exported products by foreign-owned firms ranges between ten and 12. The average number of products is consistently higher than the median, giving us an early indicator of the importance of larger multi-product firms in determining the overall patterns of exports. The greater diversification of foreign firms holds for both the mean and median measures.

TABLE 4.4 NUMBER OF PRODUCTS EXPORTED EACH YEAR – IRISH AND FOREIGN

	Average			Median		
	All	Irish	Foreign	All	Irish	Foreign
1996	10.0	7.0	15.2	6	4	10
1997	10.4	7.5	15.5	7	5	11
1998	10.4	7.3	15.9	7	4	11
1999	11.2	7.7	17.7	7	5	12
2000	11.5	8.0	18.0	7	5	13
2001	11.4	8.0	17.4	7	4	12
2002	11.6	8.1	17.7	7	4	13
2003	11.4	7.9	17.7	6	4	12
2004	11.2	7.9	17.6	6	4	12
2005	11.2	7.4	18.0	6	4	11
2006	11.0	7.3	18.6	5	3	11
2007	10.2	7.0	16.8	5	4	11
2008	9.1	6.2	15.0	5	4	10
2009	9.9	7.1	16.0	5	4	10
2010	10.9	7.5	18.5	5	4	11
2011	10.8	7.4	19.2	6	4	12
2012	11.7	8.0	20.9	5	4	12
2013	11.8	8.3	20.6	5	4	12
2014	11.7	8.4	20.2	5	4	12
2015	11.1	8.1	19.0	5	4	11

Source: Authors' analysis of CSO export data.

We see some impact on the product extensive margin of exports of the experience of the international financial crisis. For Irish-owned firms as well as foreign-owned firms the average number of exported products per firm fell to its lowest level in 2008. This recovered rapidly and the average products exported per firm by 2010 were back to slightly above 2007 levels. Overall the pattern is one of relatively stable, gradual growth in diversification of products over time, apart from the dip in 2008. The average number of exported products per Irish-owned firm increased from 7.0 in 1996 to 8.1 in 2015 while foreign-owned firms increased the average number of exported products from 15.2 to 19.0. The highest number of exported products for both Irish-owned and foreign-owned firms was recorded in 2014. Irish firms did demonstrate more diversification in exporting in the early 2000s that then subsided slightly, corresponding perhaps with the rapid domestic growth providing other opportunities for firms.

TABLE 4.5 NUMBER OF PRODUCTS EXPORTED EACH YEAR – IRISH FIRMS BY FOOD GROUP

	Food Only		Both		Non-Food	
	Average	Median	Average	Median	Average	Median
1996	4.63	3	12.23	9	6.80	4
1997	2.91	2	11.55	10	7.36	4
1998	3.36	2	11.40	10	7.04	4
1999	3.21	2	11.94	11	7.35	4
2000	2.95	2	12.50	10	7.62	4
2001	3.05	2	12.93	11	7.65	4
2002	2.88	2	13.54	11	7.69	4
2003	2.78	2	13.05	11	7.52	4
2004	2.61	2	13.24	11	7.26	4
2005	2.89	2	11.61	9	7.00	4
2006	3.04	2	11.47	9	6.96	3
2007	2.73	2	11.48	9	6.69	3
2008	2.60	1	11.69	10	5.70	3
2009	2.49	1	12.20	9	6.56	4
2010	2.89	2	11.62	10	7.31	4
2011	2.41	1	10.77	8	7.42	4
2012	2.40	1	12.73	9	7.97	4
2013	2.43	2	13.92	10	8.09	4
2014	2.51	2	14.23	10	8.31	4
2015	2.24	1	14.02	9	7.89	4

Source: Authors' analysis of CSO export data.

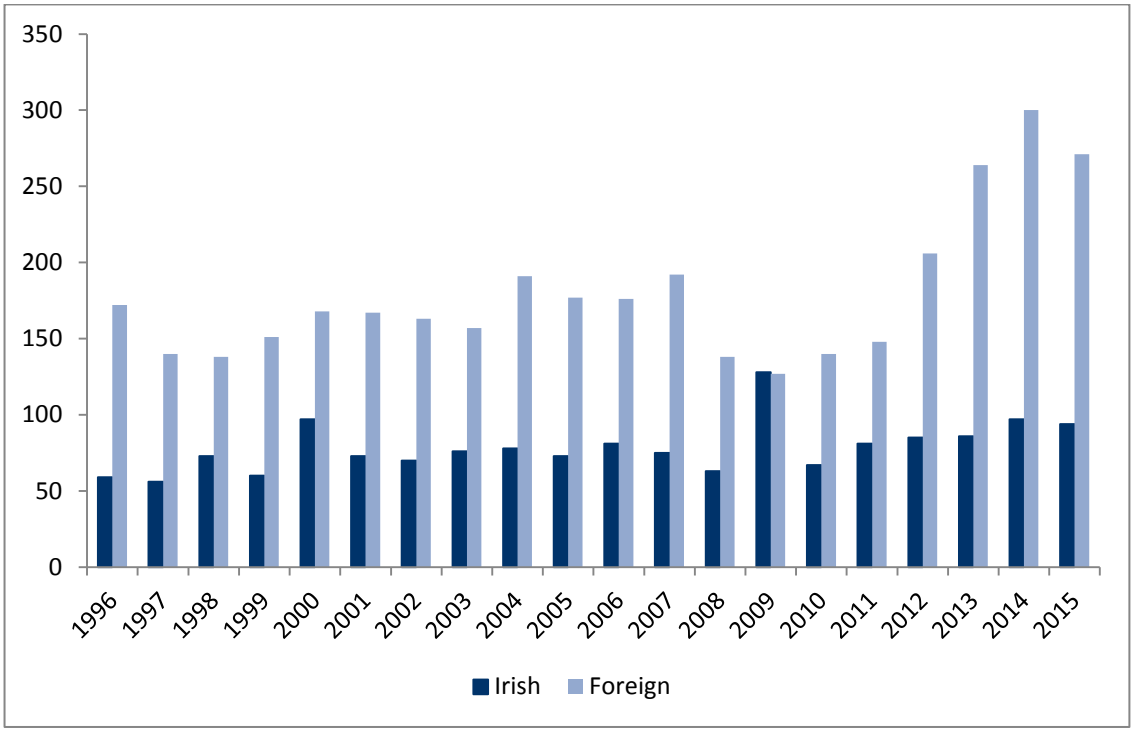
Amongst the Irish exporters, we see considerable differences in product diversification across the broad food categories. Firms that export solely food products are the most specialised, with the median number of products varying between one and two, and the average rarely exceeding three. Food products are however important to the largest exporters as the most diversified category is not those that export non-food products exclusively, but rather the group of firms that export both. Exporters having both food and non-food products as part of their portfolio have a median of nine or ten products. The average number of products of these exporters has increased over time from 12 to 14, whereas there has been relatively little change in the average number of products exported by either the food-only or the non-food-only groups.

The non-food-only exporters fall between the two other firm types, with a more diversified range of products than food-only firms but fewer than those of the combined exporters. The non-food exporters show the most evidence of having been hit by the 2008 fall in world trade noted on the previous table with the average product count falling to its lowest level of the 20-year data span in 2008

and 2009, although there was a rapid recovery to previous levels by the following year.

Along with looking at the average performance per firm, it is perhaps interesting to observe how the product count of the largest, most diversified exporters evolved over time. Figure 4.2 shows the maximum number of exported products per destination in each year for Irish and foreign manufacturing firms, showing an increase in the product range of the largest foreign exporters towards the end of the data period. A very small increase can also be observed for Irish firms but even at the largest end of the scale, Irish exporters appear to have a narrower product base than foreign firms.

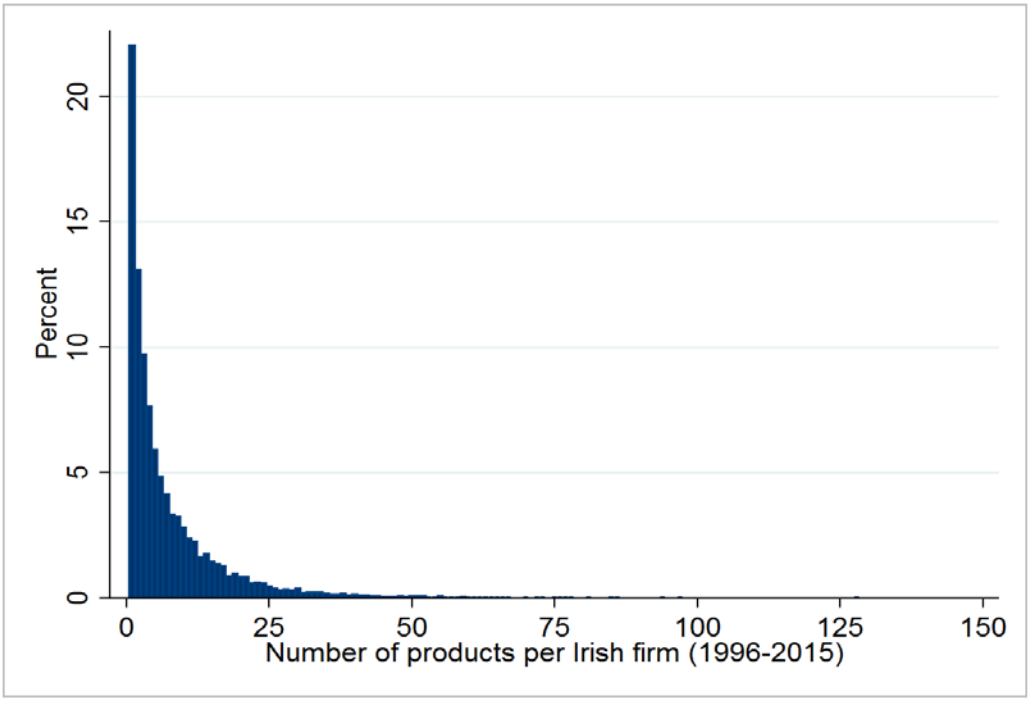
FIGURE 4.2 MAXIMUM NUMBER OF PRODUCTS PER DESTINATION



Source: Authors' analysis of CSO export data.

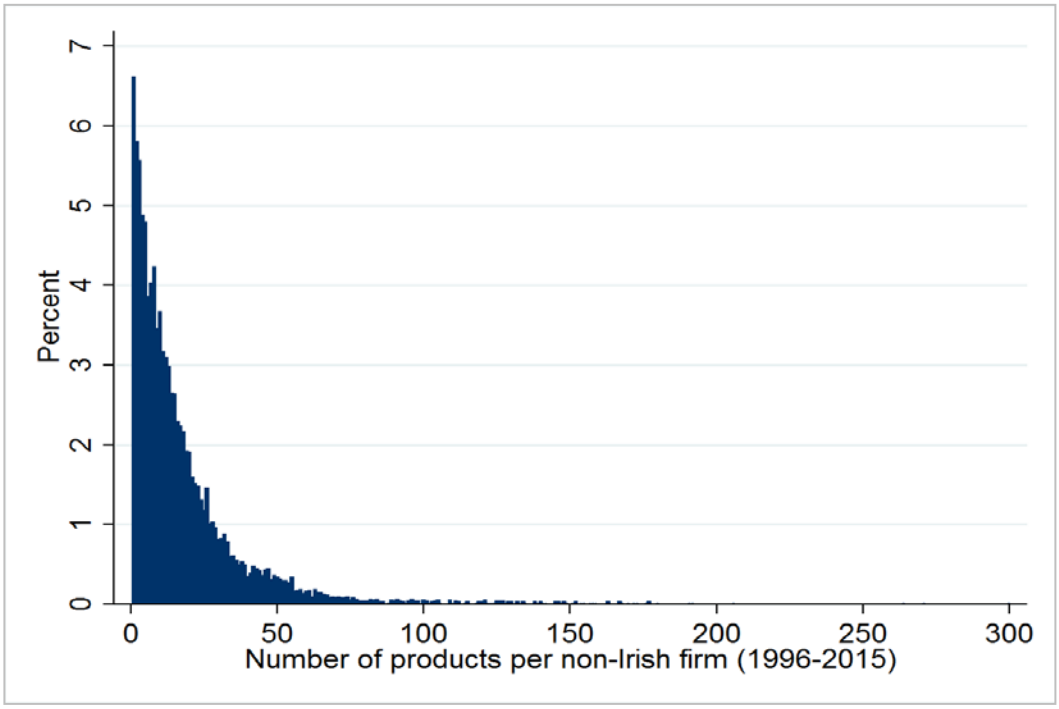
This can also be seen from Figures 4.3 and 4.4 which show the total distribution of product coverage for Irish and foreign firms, averaged over the period from 1996 to 2015. The pattern of both distributions is very similar with a strong skew to the right, indicating that a considerable percentage of firms have exports in the smallest grouping of product count per firm. Where the graphs differ is in terms of the scale; the foreign-owned firms are substantially more diversified than the Irish firms so the maximum number of products per firm on the Irish graph is 150, whereas the firm with the highest product count amongst foreign-owned firms comes close to exporting 300 products.

FIGURE 4.3 DISTRIBUTION OF PRODUCTS PER FIRM (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

FIGURE 4.4 DISTRIBUTION OF PRODUCTS PER FIRM (PERCENTAGE OF FOREIGN FIRMS)



Source: Authors' analysis of CSO export data.

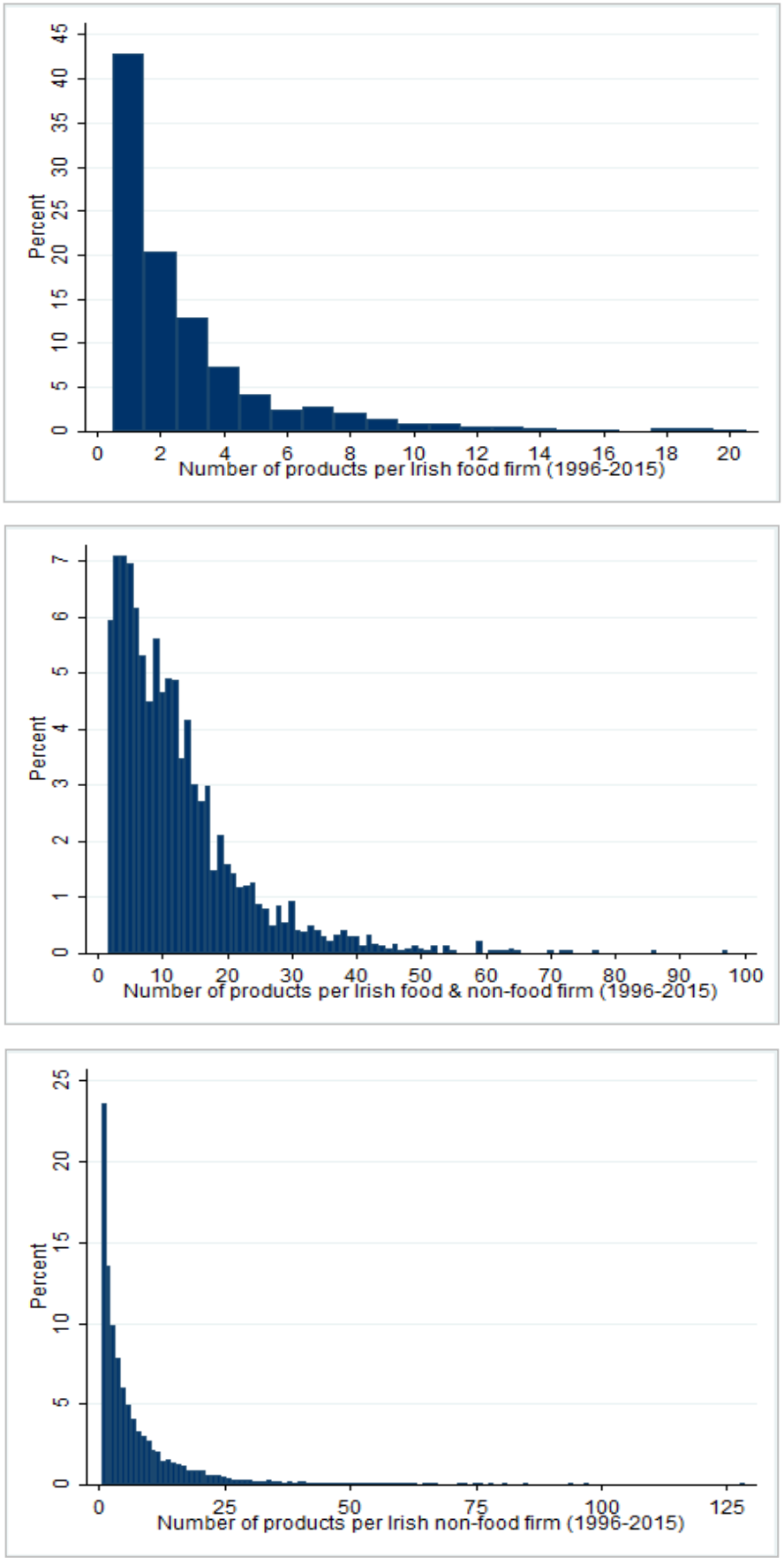
The percentage of firms exporting a single product is over 20 per cent for Irish firms and 6.5 per cent for foreign firms. Comparing this to Figure 4.2 which shows the maximum products per destination also tells us that the largest exporters

have different product mixes across destinations and are not necessarily selling every product in every export market.

The highly skewed nature of the product distribution across firms, with close to half of Irish firms exporting fewer than five products and around one-sixth exporting between six and ten products is largely in keeping with the international evidence described earlier. Most exporters are small in terms of product and destination coverage, but export volumes overall are dominated by the few extremely large exporters with wide product and market scope. We present more detail on this when we look at export volumes across both products and destinations later in this report.

Figure 4.5 presents the distributions of product counts for Irish firms in each of the three food export categories. Although all three show the same broad pattern of a right-skewed shape, the concentration is quite different for the groups. The food-only exporters are shown to be the most specialised, with somewhat over 40 per cent of firms exporting a single product and the range of products even for the largest exporters is relatively limited with the scale ending at 20 products. In the bottom chart, the non-food-only exporters have the broadest range of possible export products, but are still quite tightly concentrated with close to a quarter of them exporting a single product. The middle group, where firms export both food and non-food products shows the least evidence of skewness – although one should not lose sight of the fact that, by definition, these firms must be exporting at least two products (one food, one non-food). Even taking this into account, the distribution is more dispersed that the other two groups.

FIGURE 4.5 DISTRIBUTION OF PRODUCTS FOR IRISH FIRMS BY FOOD AND NON-FOOD (PERCENTAGE OF FIRMS)



Source: Authors' analysis of CSO export data.

We next look at the type of products exported and present the top non-food (Table 4.6) and food (Table 4.7) products for Irish firms averaged over the most recent 2011-2015 period.[8] The concentration noted above for food-only exporters in particular is mirrored in the contribution of the top food products to total food exports, with the largest product accounting for a substantial 23 per cent of total export value and the top 50 products listed representing close to the total export value of food products (87.5 per cent). Non-food products are less heavily concentrated, with the top product accounting for just 5 per cent of export value in this group and the top 50 together contributing 60 per cent of the total non-food export value. A top ten product list for foreign firms is also included for comparison in Table 4.8. We would note that the product names as classified by the international HS-6 codes have been harmonised to give consistency over the timespan of our data and are not therefore a measure of technological development.

The tables also include information on the growth rates of world exports, the Irish share in the global export total and the growth rate of the Irish exports between 2010 and 2014 corresponding to each of the top Irish products; these are discussed further in the next section.

8 See Tables A.4 and A.5 in the Appendix for a more aggregated list of exported products.

TABLE 4.6 TOP EXPORTED NON-FOOD PRODUCTS BY IRISH-OWNED FIRMS

HS-6	% Share of product in total Irish Non-Food Exports	% World Growth in Product 2011-14	% Irish Market Share in Product World Exports	% Growth of Irish Export Sales 2011-14	Product name
350110	4.90	9.58	14.32(-)	-2.1	Casein
300490	4.50	-0.53	0.15(+)	1413.9	Other Medicaments (Put up in Packings for Retail Sale)
842720	2.80	12.17	1.17(+)	53.3	Other Self-Propelled Trucks
853110	2.70	4.10	2.02(+)	517.7	Burglar or Fire Alarms and Similar Apparatus
852530	2.60	1.41	0(-)	new	Television Cameras
330690	1.90	4.72	6.67(-)	-20.4	Preparations for Oral or Dental Hygiene
390950	1.90	2.94	1.11(+)	34.6	Polyurethanes
440710	1.70	4.88	0.37(+)	11.7	Coniferous
330610	1.70	6.62	2.98(-)	-24.9	Dentifrices
841221	1.70	10.07	1.46(+)	24.4	Hydraulic Power Engines and Motors, Linear Acting
843340	1.60	8.85	3.97(+)	4143.6	Straw or Fodder Balers, Including Pick-up Balers
870899	1.40	1.28	0.05(+)	26.4	Other Parts and Accessories
380830	1.30	12.09	0.45(+)	25.8	Herbicides, Anti-sprouting Products, Plant-growth Regulators
730890	1.30	8.70	0.12(+)	23.8	Other Structures and Parts of Structures, of Iron or Steel
840310	1.20	1.04	1.1(+)	5.6	Central Heating Boilers
441011	1.20	5.51	1.17(+)	1251	Waferboard
252329	1.10	-0.35	0.62(+)	44.7	Other Portland Cement
410121	1.10	9.89	1.11(+)	31.2	Whole Hides and Skins of Bovine Animals (Fresh or Wet-salted)
851629	1.10	5.10	1.79(-)	-2.5	Other Electric Space Heating Apparatus, Electric Soil Heating Apparatus
843610	1.00	10.28	4.93(-)	5.2	Machinery for Preparing Animal Feeding Stuffs
560392	1.00	5.10	2.2(-)	1.2	Heavy Non-woven Wadding or Felt
392690	1.00	7.59	0.07(+)	24.9	Other Articles of Plastics
901839	1.00	5.83	0.16(+)	86.5	Syringes, Needles, Catheters
681091	0.90	13.30	2.23(+)	69.6	Prefabricated Structural Components for Building or Civil Engineering
392590	0.90	6.98	0.89(+)	10.8	Other Builders' Ware of Plastics
300390	0.90	0.78	0.23(+)	13.7	Other Medicaments
382200	0.80	3.82	3.45(-)	22.3	Composite Diagnostic or Laboratory Reagents
382490	0.80	4.75	0.04(-)	-8.7	Other Prepared Foundry Core Binders
290614	0.80	n.a.	n.a.	n.a.	Terpineols
390330	0.80	-4.38	0.35(+)	6.7	Acrylonitrile-butadiene-styrene (Abs) Copolymers
852540	0.80	-5.10	0.1(-)	-24.2	Still Image and Other Video Cameras
290919	0.80	1.31	n.a.	new	Other Acyclic Ethers
					Contd.

TABLE 4.6 ***CONTD.***

HS-6	% Share of product in total Irish Non-Food Exports	% World Growth in Product 2011-14	% Irish Market Share in Product World Exports	% Growth of Irish Export Sales 2011-14	Product name
441111	0.80	-25.00	0(-)	7.4	Fibreboard – Not Mechanically Worked or Surface Covered
902710	0.70	9.18	0.72(+)	34.2	Gas or Smoke Analysis Apparatus
850880	0.70	5.62	0.17(+)	459.2	Other Tools for Working in the Hand, With Self-contained Electric Motor
350790	0.70	3.95	0.61(-)	-2.1	Other Enzymes, Other Prepared Enzymes
730900	0.70	5.47	0.59(+)	68.0	Reservoirs, Tanks, Vats and Similar Containers for any Material
350400	0.70	10.20	1.43(-)	-1.4	Peptones and Other Protein Substances; Their Derivatives; Hide Powder
270300	0.70	2.86	2.92(-)	-20.1	Peat (Including Peat Litter)
901920	0.60	4.17	0.46(+)	46.4	Ozone/oxygen/Aerosol Therapy, Artificial Respiration Apparatus
350220	0.60	29.91	3.45(-)	22.3	Milk Albumin
392330	0.60	3.71	0.24(+)	8.1	Carboys, Bottles, Flask and Similar Articles, of Plastics
441019	0.60	4.27	1.08(-)	-14.8	Particle board
680690	0.60	3.39	1(+)	54.9	Other: Articles of Heat-insulating, Sound-insulating Mineral Materials
392010	0.60	4.78	0.15(+)	21.4	Other Plates, Sheets, Film, Foil, Tape, Strip of Polymers of Ethylene
842710	0.50	15.84	0.5(-)	-0.5	Self-propelled Trucks Powered By an Electric Motor
901831	0.50	8.68	0.46(-)	5.2	Syringes, with or without Needles; Parts and Accessories Thereof:
410110	0.50	-4.95	1.67(+)	39.9	Whole Hides and Skins of Bovine Animals
720430	0.50	1.18	2.79(-)	-22.1	Waste and Scrap of Tinned Iron or Steel
880330	0.50	15.73	0.02(+)	629.5	Other Parts of Airplanes or Helicopters
Total	**60.30**				

Source: Authors' analysis of CSO export data.
Note: Growth rates and shares are based on 2010-2014 exports. Market share (+) or (-) indicates growing or declining shares between 2010 and 2014.

TABLE 4.7 TOP EXPORTED FOOD PRODUCTS BY IRISH-OWNED FIRMS

HS-6	% Share of product in total Irish Food Exports	% World Growth in Product 2011-14	% Irish Market Share in Product World Exports	% Growth of Irish Export Sales 2011-14	Product name
20130	23.3	6.34	8.32(-)	3.8	Bovine Meat – Boneless: Processed & Other
40690	4.4	3.12	0.9(+)	23.0	Other Cheese: Cheddar Cheese, Colby
40510	4.0	3.69	3.78(-)	3.2	Butter
160250	3.4	3.44	7.42(-)	-0.2	Meat, Offal Meat, Blood of Bovine Animals (Prepared or Preserved)
20610	2.8	4.25	24.62(-)	-8.9	Edible Offal of Bovine Animals, Fresh or Chilled of Bovine Animals, Frozen
230910	2.7	7.26	1.23(-)	-1.5	Dog or Cat Food, Put up for Retail Sale
20110	2.5	-1.54	5.69(+)	6.1	Carcasses and Half-carcasses, Veal, Other
190190	2.4	12.70	2.0(-)	-18.4	Other Food Preparations of Malt Extract, Flour, Starch, Milk, Cream
20230	2.3	14.08	0.53(-)	5.7	Bovine animals – Boneless, Processed
20329	2.1	5.79	0.9(+)	16.1	Meat of Swine (Frozen) – Processed & Other
20319	2.0	4.16	0.91(+)	32.7	Meat of Swine (Fresh) – Processed & Other
20120	2.0	0.33	2.23(+)	2.5	Bovine Meat -Other Cuts With Bone In
160241	1.9	3.57	8.52(+)	6.5	Hams and Cuts of Swine (Prepared or Preserved)
40410	1.9	12.81	0(-)	8.6	Whey and Modified Whey
40210	1.4	16.64	0.97(-)	5.3	Milk and Cream – in Powder, Granules or Other Solid Forms
220600	1.4	5.61	9.73(-)	-17.4	Fermented Beverages (Cider, Perry, Mead etc.)
220210	1.4	3.76	0.89(+)	19.9	Waters (Containing Added Sugar or Flavour)
30374	1.4	6.90	3.34(+)	36.8	Mackerel
230990	1.4	7.97	0.47(+)	9.3	Other Preparations of a Kind Used in Animal Feeding
210690	1.3	9.01	0.25(-)	-9.4	Other Food Preparations
20410	1.3	2.63	9.24(-)	-4.4	Carcasses and Half-carcasses of Lamb, Fresh or Chilled
20423	1.3	0.28	10.77(+)	4.7	Boneless Meat of Sheep
40221	1.3	11.56	0.55(-)	-10.6	Milk or Cream – Not Containing Added Sugar or Other Sweetening Matter
190590	1.1	7.07	0(-)	21.8	Other Bakers' Wares, Communion Wafers, Empty Capsules, Sealing Wafers
160232	1.1	6.64	0.95(-)	4.8	Preserved Meat or Offal of Poultry
40120	1.1	7.01	0.96(-)	-8.3	Milk or Cream of a Fat Content Exceeding 1% but Not Exceeding 6% Litres
30379	1.1	4.90	0.8(-)	-3.1	Tilapia, Mullet, Monkfish, Butterfish, Sablefish

Contd.

TABLE 4.7 ***CONTD.***

HS-6	% Share of product in total Irish Food Exports	% World Growth in Product 2011-14	% Irish Market Share in Product World Exports	% Growth of Irish Export Sales 2011-14	Product name
20422	1.1	5.09	4.51(+)	17.3	Other Cuts With Bone In
210120	1.0	5.24	4.2(+)	18.4	Extracts, Essences, Concentrates of Tea or Mate, Thereof Preparations
20629	0.9	16.98	1.99(+)	121.4	Other Edible Offal of Bovine Animals (Frozen)
20312	0.8	2.33	0.89(+)	8.2	Hams, Shoulders and Cuts Thereof, With Bone in Processed
160290	0.7	2.58	11.44(+)	35.9	Meat, Offal, Blood of Other Animals (Prepared or Preserved)
20322	0.6	8.95	2.78(+)	45.8	Hams, Shoulders and Cuts Thereof, With Bone In
30619	0.6	3.28	7.08(+)	20.0	Frozen Crustaceans
20311	0.6	1.66	0.91(+)	18.0	Carcasses and Half-carcasses
160249	0.6	9.22	2.42(-)	-17.6	Prepared or Preserved Other Meat, Blood of Swine (Including Mixtures)
190520	0.6	3.09	9.08(+)	55.1	Ginger Bread, Other Similar Bakers' Wares
160239	0.6	2.06	5.24(-)	-14.3	Prepared or Preserved Meat, Blood of Poultry (Excluding Turkeys)
180690	0.5	7.63	0.21(+)	15.1	Cocoa Preparations (In Containers, Packings, in Liquid, Powder, Granular Form)
30269	0.5	-2.73	0.61(+)	16.7	Sablefish, Lingcod, Monkfish
180610	0.5	n.a.	n.a.	n.a.	Cocoa Powder (Containing Added Sugar or Other Sweetening Matter)
40590	0.4	5.69	0.18(-)	-23.6	Other Dairy Spreads
220830	0.4	5.88	0.18(+)	18.6	Whiskies
40620	0.4	5.83	1.25(+)	8.0	Grated or Powdered Cheese, of All Kinds
20443	0.4	0.52	1.78(+)	44.5	Boneless, Frozen Meat of Sheep
20713	0.4	10.39	0.46(-)	4.7	Chicken Meat, Fresh or Chilled
20421	0.4	4.27	4.32(+)	106.7	Carcasses and Half-carcasses of Sheep
210500	0.4	2.71	0.51(+)	12.8	Ice Cream, Other Edible Ice
170490	0.4	6.27	0.17(+)	18.4	Other Sugar Confectionery, Not Containing Cocoa
20711	0.4	4.04	1.46(+)	18.3	Whole-Chicken Meat – Fresh or Chilled
Total	**87.5**				

Source: Authors' analysis of CSO export data.
Note: Growth rates and shares are based on 2010-2014 exports. Market share (+) or (-) indicates growing or declining shares between 2010 and 2014.

In addition, given the importance of food-and-non-food Irish exporters we look at the top ten products exported by this type of firm and look at the evolution of their exports (Table A.5 in the Appendix). This table shows that most of the top ten products exported by these firms are food products and food derivatives and

that the composition of their exports is relatively stable over time. However, these firms are the most diversified in terms of the number of products exported, and therefore when we look at non-food products exported by them we can identify sectors such as aluminium (HS 76), machinery and mechanical appliances (HS 84), vehicles (HS 87) and electrical machinery (HS 85).

TABLE 4.8 TOP EXPORTED PRODUCTS OF FOREIGN FIRMS

	Product name (HS-6)	% Average share 2011-2015
1	Medicaments containing hormones, packaged	12.50
2	Heterocyclic compounds	7.11
3	Vaccines for human medicine	5.21
4	Nucleic or other heterocyclic compounds	5.00
5	Compounds containing an unfused pyridine ring	4.29
6	Other hormones and their derivatives; other steroids	4.15
7	Sulphonamides	3.91
8	Other heterocyclic compounds	2.72
9	Spectacle lenses not made of glass	2.44
10	Compounds containing a quinoline or isoquinoline ring	2.21
	Share of top 10 in total exports	**49.52**

Source: Authors' analysis of CSO export data.

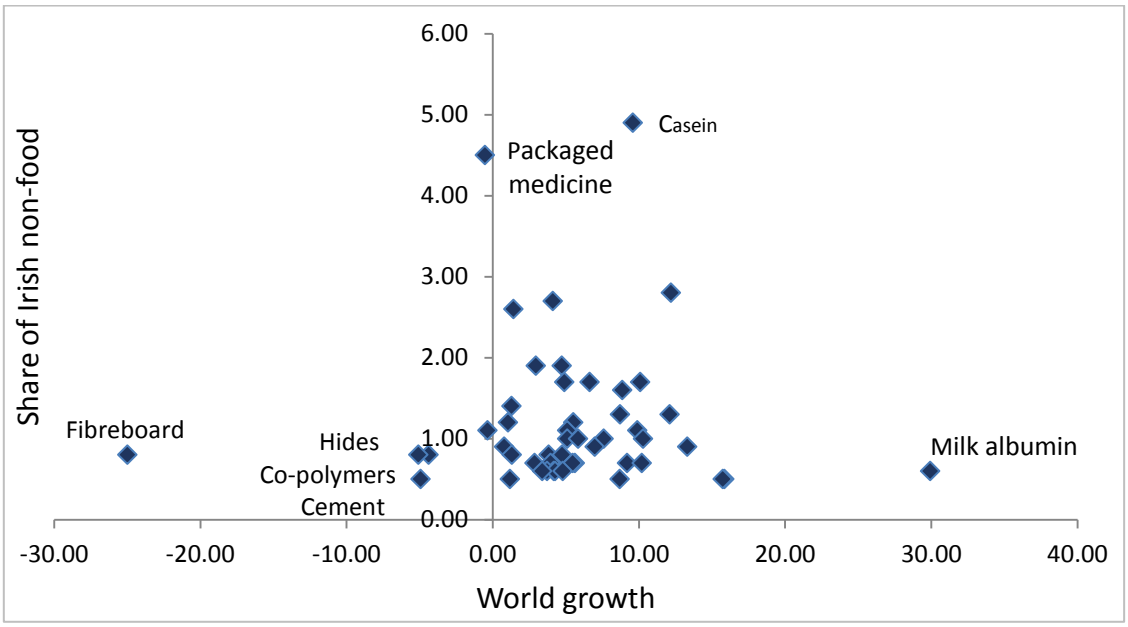
4.2 IRISH FIRM EXPORTS AND WORLD DEMAND GROWTH

An interesting question to ask of the list of top products in both the food and non-food groupings is how they relate to evolving product growth in the world export market. In other words, can we identify whether Irish firms are concentrated in products that are growing or declining internationally as this could be a strong indicator of continuing strong export performance or an early warning indicator depending on the result. We take the list of largest Irish products and use the product codes to draw down growth rates from United Nations Comtrade Database. These are based on world trade totals showing cumulative growth from 2010 to 2014.

Tables 4.6 and 4.7 show how Irish non-food and food products stack up against the overall growth rates of these products in the world export market. Taking these detailed growth rates, Figures 4.6 and 4.7 graph the share of each product in Irish food or non-food exports against its world growth. In both cases, the picture is positive for Irish exports with the vast majority of top export products being ones that are growing strongly internationally. The graphs highlight the very small number of outliers, with either very high growth rates and trade shares, such as those in casein and milk albumin, and those where global growth is declining in a product with a significant Irish share, such as fibreboard. Of the

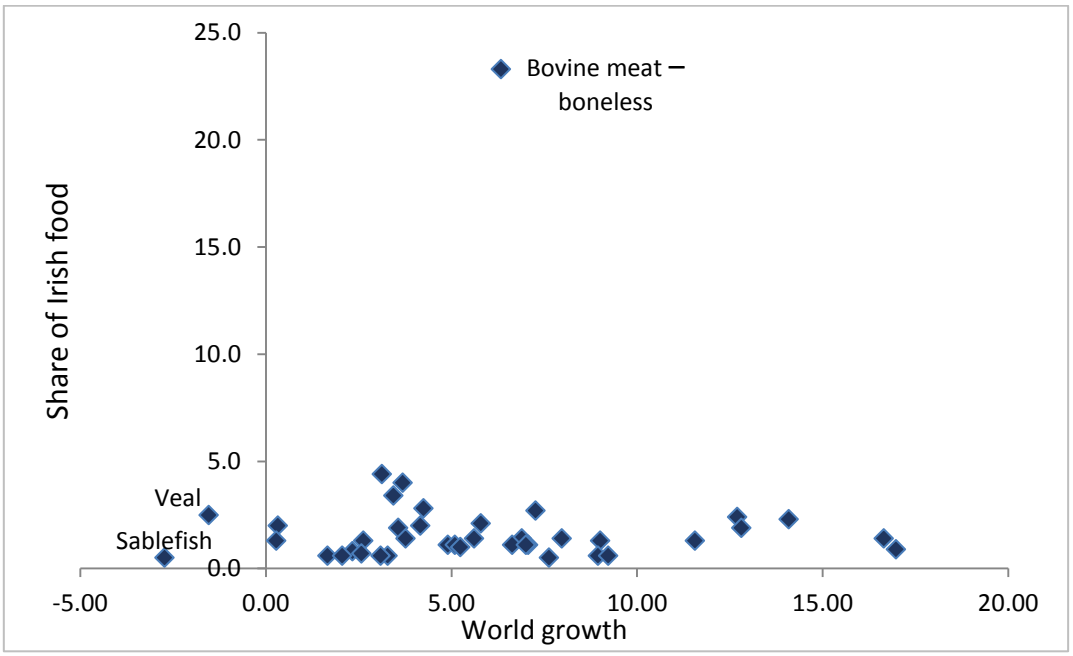
one hundred top products between food and non-food, the global growth rate is negative in only seven cases over the 2010 to 2014 period.

FIGURE 4.6 IRISH FIRM EXPORTS AND WORLD DEMAND



Source: Authors' analysis of United Nations Comtrade export data.

FIGURE 4.7 IRISH FIRM EXPORTS AND WORLD DEMAND



Source: Central Statistics Office.

Tables 4.6 and 4.7 in addition present calculations of the share of Irish-owned exports in the world market by comparing the totals from the CSO export data for Irish firms to the world total. It should be noted that the market share for total

exports from Ireland includes exports from multinational companies. The market shares presented are averaged over the 2010 to 2014 period to smooth out temporary fluctuations. We also include an indicator for whether the market share of Irish-owned exports grew (+) or declined (-) between 2010 and 2014. Finally the growth rate of the Irish exports themselves is included for completeness.

Although, in general, growth in Irish export sales occurs in parallel with increases in market share, there are exceptions where world growth is outstripping Irish growth and market share is declining even while sales are increasing; the product category of machinery for preparing animal foodstuffs is an example of this. For non-food products, the world market share increases in 29 products and declines in 18 (two new products could not be measured in this way as they were starting from a zero base, and world data for one other was not available).

Most of the individual product categories recorded large growth rates, although in such narrowly defined products, care should be taken in drawing strong conclusions about future performance from this as a high growth rate may be partially due to switching from another similar product. In general, market shares tend to be higher for food products than for non-food, although casein is a notable exception. As with non-food products, in the food table we see a positive pattern of increasing market share in more products than we see a decline, although one of the declining shares is in the top product of boneless bovine meat. This product is however growing its export sales at a fairly impressive 3.8 per cent annual average, so the decline in market share is an indication of the rapid world growth rather than an actual decline in Irish sales.

4.3 DESTINATION DISTRIBUTION

Turning to destination coverage, we present similar calculations on the distribution of the number of export markets manufacturing firms sell to. We first present the average (mean) and median number of markets per firm across time, first dividing the firms by nationality (Table 4.9) and then looking at Irish firms by their food category (Table 4.10). We then look at the full distribution and the shares of the most important markets by export value.

TABLE 4.9 NUMBER OF DESTINATIONS PER FIRM

	Average			Median		
	All Firms	Irish	Foreign	All Firms	Irish	Foreign
1996	9.2	5.3	16.0	4	2	10
1997	9.5	5.5	16.6	4	3	11
1998	9.6	5.6	16.6	4	3	11
1999	9.9	5.8	17.3	4	3	12
2000	9.9	6.0	17.3	4	3	11
2001	9.8	5.8	17.1	4	2	12
2002	10.0	6.0	16.8	4	2	11
2003	10.2	6.3	17.4	4	3	11
2004	10.1	6.3	17.3	4	2	11
2005	10.2	6.3	17.2	4	3	11
2006	9.7	6.2	16.7	4	2	10
2007	9.9	6.5	16.9	4	3	9
2008	9.5	6.2	16.4	4	3	10
2009	9.9	6.6	17.1	4	3	10
2010	10.4	7.0	18.1	4	3	11
2011	10.4	7.1	18.6	4	3	11
2012	10.6	7.4	18.6	4	3	13
2013	10.4	7.5	17.7	4	3	13
2014	10.5	7.7	17.7	4	3	12
2015	10.4	7.7	17.7	4	3	12

Source: Authors' analysis of CSO export data.

Table 4.9 shows that the median number of export markets is four consistently over time, although there is evidence of an increase in market coverage when looking the average number of markets, which increases from 9.2 in 1996 to 10.4 in 2015. As with product coverage, there is some evidence of a decline around the time of the financial crisis but the magnitude is very small and the return to the longer-run average happens rapidly. There is greater diversification across markets of foreign firms with an average of 17.7 destinations for foreign firms in 2015, compared to 7.7 for Irish firms. We see a similar gap if we use the median measure to avoid the very largest firms from driving the results.

Looking in depth at the Irish exporters categorised by their food product orientation, Table 4.10 shows that food-only and non-food-only exporting firms have a median number of two export destinations, although non-food exporters have a higher average number of destinations. Firms that export both product types are considerably more diversified in terms of market coverage, with a median of 13 destinations in 2015.

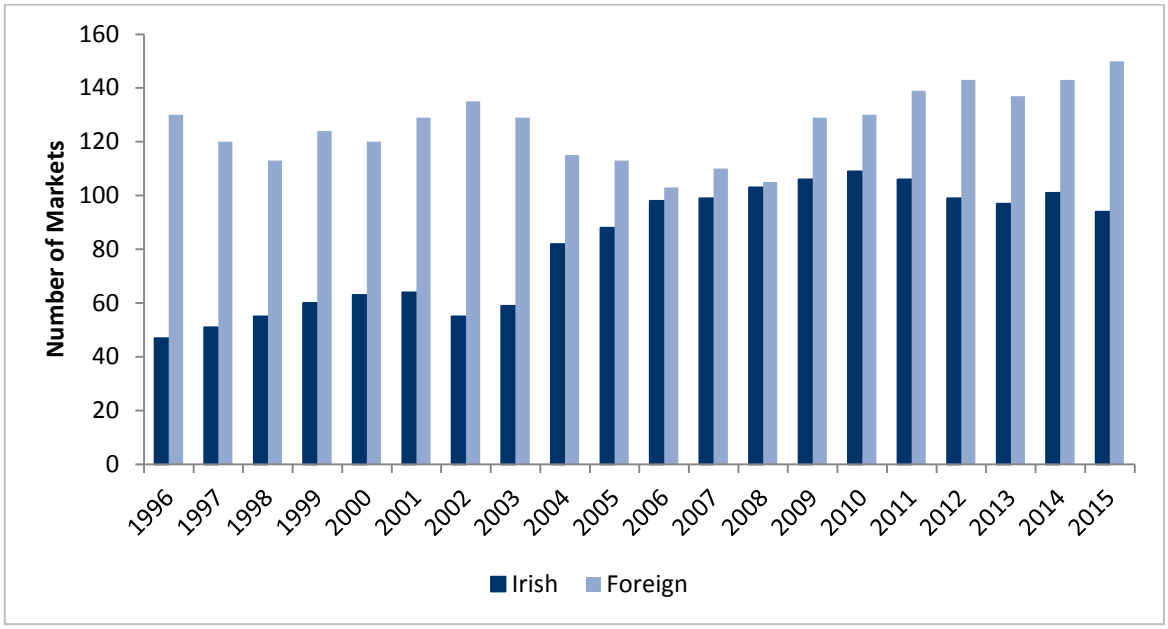
TABLE 4.10 NUMBER OF DESTINATIONS FOR IRISH FIRMS BY FOOD GROUP

	Food Only		Both		Non-Food	
	Average	Median	Average	Median	Average	Median
1996	5.14	3	8.88	6	4.86	2
1997	3.42	2	9.28	8	5.05	2
1998	4.19	2	9.71	7	5.02	2
1999	3.67	2	9.07	7	5.35	2
2000	3.57	2	10.43	9	5.37	2
2001	3.80	2	9.71	7	5.28	2
2002	3.41	2	10.18	8	5.54	2
2003	3.44	2	11.23	9	5.70	2
2004	3.28	1	12.34	9	5.33	2
2005	3.69	2	10.30	8	5.76	2
2006	3.63	2	11.13	8	5.61	2
2007	3.40	2	12.07	9	5.83	2
2008	3.50	2	12.14	10	5.52	2
2009	3.19	2	12.66	9	5.76	2
2010	3.70	2	12.79	10	6.31	2
2011	3.34	1	12.63	8	6.53	3
2012	4.50	2	14.47	10	6.58	3
2013	4.17	2	15.25	13	6.70	3
2014	4.31	2	16.38	15	6.76	3
2015	4.20	2	14.77	13	6.94	3

Source: Authors' analysis of CSO export data.

The number of destinations that the top products are exported to gives an idea of the maximum range and how this also differs across Irish and foreign firms (Figure 4.8). Here there is less of a marked gap compared to the similar calculation at the product level. The largest number of markets that an Irish firm's product is exported to is 94 in 2015, with the corresponding number for foreign-owned firms at 150. In terms of evolution over time, the maximum number of markets per product has increased for both groups, although more rapidly for Irish-owned firms.

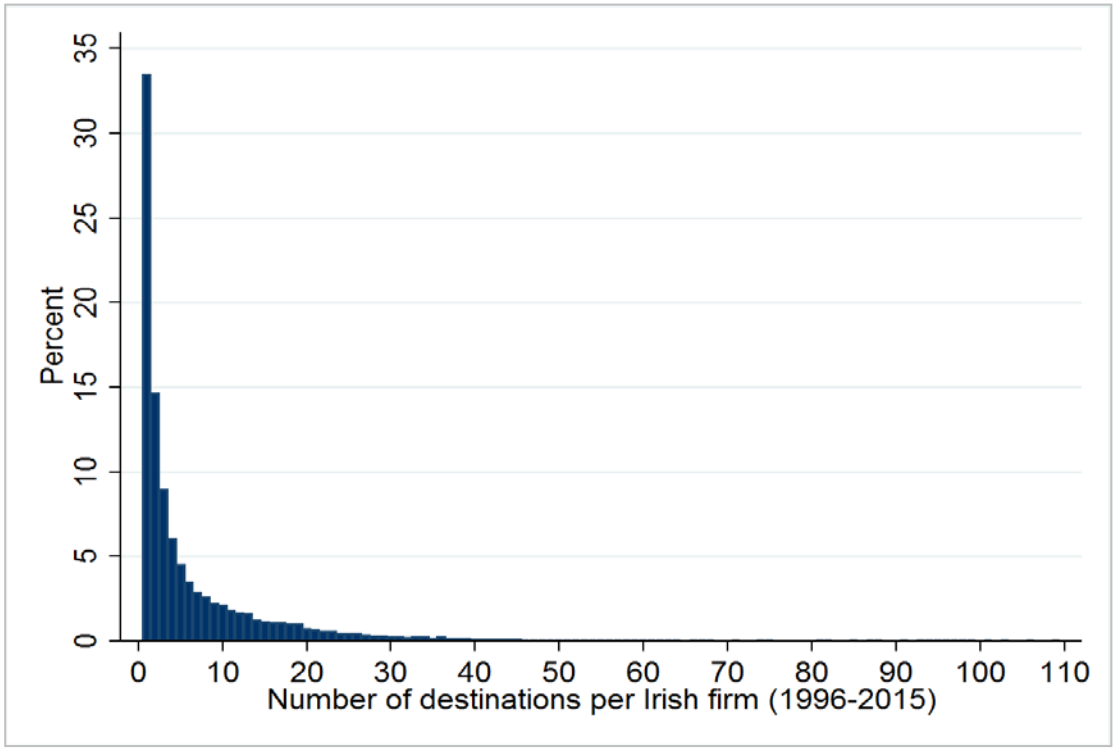
FIGURE 4.8 MAXIMUM NUMBER OF MARKETS BY PRODUCT



Source: Authors' analysis of CSO export data.

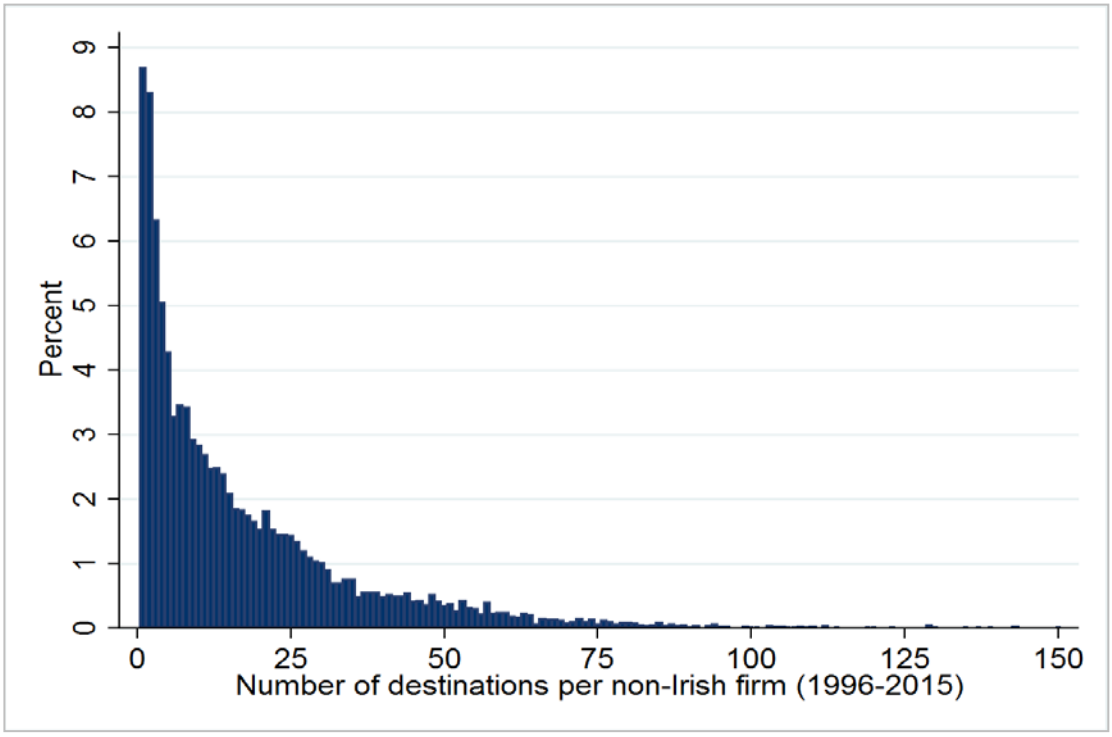
Having looked at the averages and top performance, the next two graphs (Figures 4.9 and 4.10) present the full distribution of number of export markets served by Irish and foreign-owned firms. As with products, we see a sharp skew to the right with the largest share of exporters selling to very few markets. This is a particularly strong pattern amongst the Irish-owned firms, with approximately one-third of exporters selling to a single market followed by a steep drop off to around 14 per cent selling to two markets (accounted for by the second bar of the graph relative to the first bar). As expected the distribution for foreign-owned firms shows both less dominance of the first category and also a greater spread of market coverage groups across firms.

FIGURE 4.9 DISTRIBUTION OF DESTINATIONS PER FIRM (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

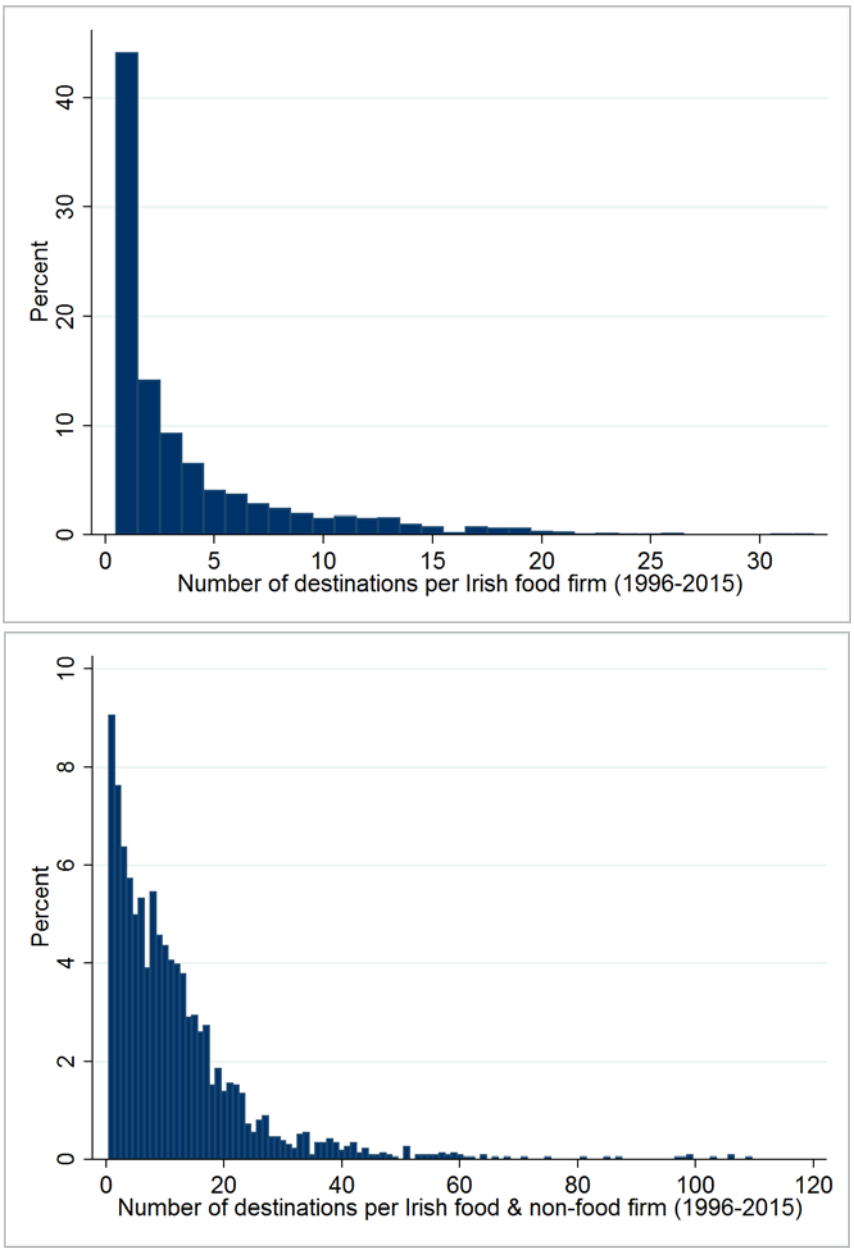
FIGURE 4.10 DISTRIBUTION OF DESTINATIONS PER FIRM (PERCENTAGE OF FOREIGN FIRMS)



Source: Authors' analysis of CSO export data.

Returning to the more detailed breakdown of Irish firms by food export type, Figure 4.11 shows the distribution of markets for each of the three firm groups. Both food and non-food-only exporters have a high concentration in a single destination followed by a sharp reduction in the percentage of firms exporting to higher numbers of markets. Firms exporting both food-and-non-food products are also more diversified in terms of market coverage, with just 9 per cent exporting to one market and a much more even spread over market counts up to almost 20 destinations.

FIGURE 4.11 DISTRIBUTION OF DESTINATIONS FOR IRISH FOOD AND NON-FOOD EXPORTERS (PERCENTAGE OF FIRMS)



Source: Authors' analysis of CSO export data.

TABLE 4.11 RANKING OF IRISH FIRMS' DESTINATION MARKETS BY PRODUCT TYPE 2011-2015

	Non-Food			Food		
		% Share of Irish Non-Food Exports	% Average GDP growth 2011-14		% Share of Irish Food Exports	% Average GDP growth 2011-14
1	United Kingdom	41.5	2.04	United Kingdom	49	2.04
2	US	12.7	2.11	France	9.8	0.77
3	Germany	9.3	1.47	Netherlands	7.1	0.27
4	France	4.8	0.77	Germany	5.2	1.47
5	Italy	3.4	-1.12	Italy	4.6	-1.12
6	Netherlands	3.2	0.27	Sweden	3	1.47
7	Belgium	1.8	0.82	Spain	2.8	-1.00
8	Japan	1.8	0.70	China	2.2	7.74
9	Spain	1.6	-1.00	Belgium	2	0.82
10	China	1.5	7.74	Denmark	1.9	0.27
11	Poland	1.4	2.74	Nigeria	1.3	5.08
12	Australia	1.1	2.70	US	1.1	2.11
13	Sweden	1	1.47	Russia	0.9	2.37
14	Canada	0.8	2.30	Japan	0.7	0.70
15	Russia	0.8	2.37	Switzerland	0.7	1.63
16	Norway	0.7	1.65	Poland	0.5	2.74
17	United Arab Emirates	0.7	5.11	Hong Kong	0.5	2.97
18	Switzerland	0.6	1.63	Korea	0.5	3.00
19	Denmark	0.6	0.27	Portugal	0.4	-1.55
20	Czech Republic	0.6	0.62	Senegal	0.4	3.55
21	Austria	0.6	1.05	Czech Republic	0.4	0.62
22	US Outlying Islands	0.6	n.a.	Australia	0.3	2.70
23	Turkey	0.5	4.37	Egypt	0.3	2.06
24	New Zealand	0.5	2.44	Austria	0.3	1.05
25	South Africa	0.4	2.26	Indonesia	0.3	5.54
26	Korea	0.4	3.00	Iraq	0.2	6.14
27	Brazil	0.4	2.11	Saudi Arabia	0.2	5.20
28	Mexico	0.4	2.85	Malaysia	0.2	5.23
29	Hong Kong	0.4	2.97	Mexico	0.2	2.85
30	Finland	0.3	-0.11	Finland	0.2	-0.11
31	Hungary	0.3	1.38	Malta	0.2	1.78
32	Singapore	0.3	4.15	Bahrain	0.1	3.81
33	Portugal	0.3	-1.55	UAE	0.1	5.11
34	India	0.3	6.27	Cameroon	0.1	4.93
35	Saudi Arabia	0.3	5.20	South Africa	0.1	2.26
36	Greece	0.2	-4.94	Mali	0.1	2.84
37	Qatar	0.2	6.42	Canada	0.1	2.30
38	Malaysia	0.2	5.23	Vietnam	0.1	5.56
39	Romania	0.2	1.97	Togo	0.1	5.26
40	Egypt	0.2	2.06	Ghana	0.1	8.25

Source: Authors' analysis of CSO export data.

The top export markets by food and non-food product (Table 4.11) show that Irish products have a significant share of their exports going to a single destination, primarily the UK. The importance of the UK market is more pronounced for food exports than for non-food products. Although the top destination is the same for food and non-food products, the subsequent ranking of destinations shows a bit more variation; in particular the US is a considerably more important market for non-food products than for food products.

Referring back to the importance for the continued overall growth in markets in which Irish manufacturing exporters are present, Table 4.11 includes the average GDP growth rates of each of the top destinations (averaged over the 2010-2014 period). With the exception of some European markets still negatively affected by the aftermath of the financial crisis (Italy, Spain and Greece in particular), the growth performance of the top destinations are all reasonably robust and feature a number of rapidly growing economies in the Middle East and Africa in particular.

The very large and rapidly growing Chinese economy is an important destination for Irish exporters in both the food and non-food sectors and has moved up in importance over the years showing Irish firms' flexibility in exploiting new opportunities. This should not be overplayed however as the share of exports being sold to China remains modest relative to the more traditional destination markets that are mainly situated in Europe.

4.4 EXPORT SPECIALISATION – COMBINING PRODUCT AND DESTINATION DIMENSIONS

Having looked separately at the distributions of firm product and destination coverage, this section combines the two dimensions to give a more in-depth picture of the pattern of contributions to overall manufacturing exporting. The product and market count variables are grouped into six categories each: 1, 2, 3 to 5, 6 to 10, 11 to 20 and more than 20. Combining the two dimensions gives us a 6x6 matrix into which we can allocate the frequency of exporting firms, the distribution of total export values and calculate the median export value for all exporters or for different subgroups. The tables presented in this section focus on the most recent time period (2011-2015) and therefore may differ slightly from the numbers discussed in the overall distribution in the previous section which were calculated over the entire 1996-2015 period.

We begin by presenting the distribution across product-market categories of the number of firms, calculated separately for Irish (Table 4.12) and foreign-owned

companies (Table 4.13). The final column presents the total for the percentage of firms in each market group and the bottom row likewise sums over the percentage of firms in each product group. Just under 27 per cent of Irish firms export to a single market, consistent with the skewed distribution we saw in the earlier histogram. This table allows us to see that, of these firms, most are exporting a single product (16.9 per cent of firms are in the cell representing the one-product/one-market combination).

Most of the manufacturing firms that export a single product do so to just one market. As we move up the count categories, we see firms appear to increase both margins together with very few firms exporting many products to just one or two markets. Eleven per cent of firms have more than 20 products to over 20 destinations.

The corresponding table for foreign-owned firms presents a much less dispersed allocation of firms across the different possible combination of categories. Instead we see that 40 per cent are concentrated in the group of exporters with greater than 20 products to over 20 destinations. Unlike the Irish firms, the cells in the upper left of the table representing combinations of small numbers of products to few destinations are relatively unpopulated. This reflects the larger size and the export-platform[9] motivation of most foreign-owned firms located in Ireland.

TABLE 4.12 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	16.93	3.90	3.51	1.64	0.86	0.08	26.91
2 Markets	1.09	3.98	5.07	2.03	1.25	0.39	13.81
3-5 Markets	0.70	0.94	5.07	5.62	3.28	2.26	17.86
6-10 Markets	0.31	0.47	2.18	4.21	3.43	3.35	13.96
11-20 Markets	0.00	0.16	0.86	2.89	4.06	4.76	12.71
20+ Markets	0.00	0.08	0.00	0.78	2.89	11.00	14.74
Total	19.03	9.52	16.69	17.16	15.76	21.84	100.00

Source: Authors' analysis of CSO export data.

[9] Export-platform foreign direct investment can be defined as investment in which the affiliate's output is exported to third markets rather than sold in the parent or host markets.

TABLE 4.13 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – FOREIGN

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	2.00	1.25	0.50	0.50	0.00	0.00	4.25
2 Markets	1.00	1.00	1.75	1.25	0.25	0.25	5.50
3-5 Markets	0.00	1.25	3.50	2.50	2.50	1.50	11.25
6-10 Markets	0.25	0.25	1.25	2.50	4.25	5.25	13.75
11-20 Markets	0.00	0.00	0.75	3.25	3.00	11.00	18.00
20+ Markets	0.00	0.00	0.00	2.25	4.50	40.50	47.25
Total	3.25	3.75	7.75	12.25	14.50	58.50	100.00

Source: Authors' analysis of CSO export data.

The next set of tables (Tables 4.14 and 4.15) presents the distributions across the same product-market categories but examines the shares accounted for by each combination of total export volume rather than the share of firms. As has typically been found in other countries, these calculations are consistent with a picture of overall exporting being dominated by a relatively small set of large exporters.

Taking the results for Irish-owned firms first, we see that the category of most highly globalised manufacturing firms, as captured by those exporting more than 20 products to over 20 markets, accounts for over 46 per cent of the total export value despite comprising just 11 per cent of firms. The category of firms exporting one product to one market contained over 16 per cent of firms; however, when we look at export values, we see that these are very small exporters in terms of volumes and account for 1.38 per cent of export value.

TABLE 4.14 EXPORT VALUE BY PRODUCT AND MARKET – IRISH

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	1.38	0.34	0.43	1.21	0.22	0.00	3.58
2 Markets	0.02	0.31	1.18	0.18	0.33	0.05	2.07
3-5 Markets	1.23	0.09	0.98	1.09	0.78	1.51	5.70
6-10 Markets	0.33	0.30	0.93	3.95	1.18	1.44	8.14
11-20 Markets	0.00	0.01	1.02	2.46	11.45	5.76	20.68
20+ Markets	0.00	0.37	0.00	3.83	9.17	46.46	59.84
Total	2.96	1.42	4.54	12.72	23.14	55.23	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.15 EXPORT VALUE BY PRODUCT AND MARKET – FOREIGN

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	0.01	0.00	0.00	0.00	0.00	0.00	0.01
2 Markets	0.01	0.00	0.00	0.01	0.01	0.01	0.04
3-5 Markets	0.00	0.06	0.27	0.05	1.29	0.15	1.83
6-10 Markets	0.00	0.01	0.10	0.03	1.36	1.99	3.48
11-20 Markets	0.00	0.00	0.04	0.29	0.44	12.37	13.13
20+ Markets	0.00	0.00	0.00	1.12	0.92	79.47	81.51
Total	0.01	0.07	0.41	1.49	4.03	93.99	100.00

Source: Authors' analysis of CSO export data.

The picture for foreign firms is similar, with export volumes strongly concentrated in the largest product-market category at close to 80 per cent. The firms with over 20 products accounted for 94 per cent of total exports amongst the foreign-owned firms. Irish firm export value was not quite as concentrated amongst the most diversified exporters, although 55 per cent of trade was accounted for by firms with more than 20 products.

We can look in some more detail at the distributions of product and market coverage amongst Irish manufacturing firms by dividing the firms into different size categories and examining how the patterns differ across the size groups. Tables 4.16, 4.17 and 4.18 show the distribution of firms across product-market categories for large, medium and small firms respectively. In terms of the distribution of firms, larger firms tend to be more likely to have a wider range of product and market coverage than median or small firms. For example, 20 per cent of small firms export a single product and 29 per cent export to one market. For large firms, these figures are both 9 per cent. Over one-third of large firms export more than 20 products to 20 markets, whereas only 7.6 per cent of small firms do so. Medium sized firms come between the two extremes.

TABLE 4.16 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH LARGE FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	5.45	0.00	1.82	1.82	0.00	0.00	9.09
2 Markets	1.82	0.00	1.82	0.00	0.00	0.00	3.64
3-5 Markets	0.00	0.00	5.45	5.45	1.82	5.45	18.18
6-10 Markets	1.82	0.00	1.82	7.27	3.64	0.00	14.55
11-20 Markets	0.00	0.00	0.00	0.00	9.09	3.64	12.73
20+ Markets	0.00	0.00	0.00	1.82	3.64	36.36	41.82
Total	9.09	0.00	10.91	16.36	18.18	45.45	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.17 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH MEDIUM FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	9.46	2.36	4.05	2.36	0.34	0.34	18.92
2 Markets	0.68	2.36	3.04	0.68	0.68	0.34	7.77
3-5 Markets	0.68	0.34	4.39	1.69	3.38	2.03	12.50
6-10 Markets	0.34	1.01	2.36	5.07	3.04	4.39	16.22
11-20 Markets	0.00	0.00	1.69	2.70	7.77	7.43	19.59
20+ Markets	0.00	0.00	0.00	1.01	5.41	18.58	25.00
Total	11.15	6.08	15.54	13.51	20.61	33.11	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.18 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH SMALL FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	17.48	4.75	3.47	1.50	0.93	0.00	28.13
2 Markets	1.16	4.63	5.56	2.66	1.62	0.46	16.09
3-5 Markets	0.81	1.04	5.21	7.29	3.47	2.31	20.14
6-10 Markets	0.23	0.35	2.31	3.82	3.82	3.36	13.89
11-20 Markets	0.00	0.23	0.69	3.24	2.78	4.17	11.11
20+ Markets	0.00	0.12	0.00	0.69	2.20	7.64	10.65
Total	19.68	11.11	17.25	19.21	14.81	17.94	100.00

Source: Authors' analysis of CSO export data.

We repeat the same exercise as above but this time for export values and Tables 4.19, 4.20 and 4.21 present the patterns for large, medium and small firms. Export values are mostly concentrated amongst the large firms, suggesting that there exists a small number of extremely large manufacturing exporters dominating performance. Over 72 per cent of the export value of large firms is accounted for by the 36 per cent of firms in the largest product-market combination. Understanding how firms expand their market and product portfolios is therefore clearly the key to understanding overall trade patterns.

TABLE 4.19 EXPORTS BY PRODUCT AND MARKET – IRISH LARGE FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	0.00	0.00	0.00	2.83	0.00	0.00	2.84
2 Markets	0.01	0.00	0.94	0.00	0.00	0.00	0.94
3-5 Markets	0.00	0.00	0.04	0.17	0.36	1.18	1.75
6-10 Markets	0.00	0.00	0.24	1.63	0.13	0.00	2.01
11-20 Markets	0.00	0.00	0.00	0.00	14.97	1.74	16.71
20+ Markets	0.00	0.00	0.00	2.26	0.97	72.53	75.76
Total	0.01	0.00	1.21	6.90	16.43	75.45	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.20 EXPORTS BY PRODUCT AND MARKET – IRISH MEDIUM FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	1.86	0.38	0.64	0.18	0.23	0.00	3.29
2 Markets	0.01	0.31	1.25	0.02	0.34	0.07	2.00
3-5 Markets	2.35	0.01	0.75	0.64	0.39	1.18	5.30
6-10 Markets	0.55	0.60	1.01	5.05	1.59	1.95	10.75
11-20 Markets	0.00	0.00	1.32	3.16	11.34	7.91	23.73
20+ Markets	0.00	0.00	0.00	5.19	14.69	35.05	54.92
Total	4.77	1.30	4.96	14.23	28.58	46.15	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.21 EXPORTS BY PRODUCT AND MARKET – IRISH SMALL FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	2.80	0.98	0.80	0.71	0.64	0.00	5.92
2 Markets	0.07	1.00	1.51	1.08	1.07	0.12	4.86
3-5 Markets	0.68	0.57	3.91	4.66	3.02	3.36	16.20
6-10 Markets	0.39	0.09	2.35	5.93	2.39	3.28	14.41
11-20 Markets	0.00	0.04	2.44	5.25	4.07	8.03	19.82
20+ Markets	0.00	2.42	0.00	3.40	11.25	21.71	38.78
Total	3.94	5.09	11.00	21.03	22.44	36.50	100.00

Source: Authors' analysis of CSO export data.

The final sets of tables in this chapter make the distinction between food-only, food-and-non-food and non-food-only exporters. Tables 4.22, 4.23 and 4.24 present the distributions of firms across product and market count combinations for each of the three food categories and Tables 4.25, 4.26 and 4.27 complete this stage of the analysis by calculating the distributions of export value for each of the firm groups.

The distributions of firms across product-market combinations show some similarities for the food-only and non-food-only firms (Tables 4.22 and 4.24) with a relatively large percentage concentrated in the one-product/one-market cell of the tables; 23 per cent of food exporters and 18 per cent of non-food exporters fall into this category. The food exporters are somewhat more concentrated in terms of product coverage however with over 35 per cent exporting a single product compared to just under 20 per cent of non-food-only exporters. On the other end of the scale, however, we see more divergence; the non-food exporters are considerably more likely to have firms exporting multiple products to many destinations with 10 per cent of firms in the 20-plus category for both products and markets. Food-only exporters essentially never reach this level of diversification.

TABLE 4.22 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH FOOD FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	23.35	4.79	2.99	1.20	0.00	0.00	32.34
2 Markets	4.19	8.98	5.39	0.00	0.00	0.00	18.56
3-5 Markets	4.19	3.59	7.19	1.80	1.20	0.00	17.96
6-10 Markets	3.59	1.80	6.59	2.40	0.00	0.00	14.37
11-20 Markets	0.00	1.80	4.79	5.39	0.00	0.60	12.57
20+ Markets	0.00	0.00	0.60	2.99	0.60	0.00	4.19
Total	35.33	20.96	27.54	13.77	1.80	0.60	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.23 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH FOOD AND NON-FOOD FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	-	1.33	1.78	0.00	3.56	1.78	8.44
2 Markets	-	0.00	0.00	0.44	3.56	3.11	7.11
3-5 Markets	-	2.67	1.78	3.11	4.44	4.00	16.00
6-10 Markets	-	0.89	0.00	1.78	4.89	7.56	15.11
11-20 Markets	-	8.44	0.00	3.11	2.22	6.67	20.44
20+ Markets	-	8.89	0.00	20.89	0.44	2.67	32.89
Total	-	22.22	3.56	29.33	19.11	25.78	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.24 DISTRIBUTION OF FIRMS BY PRODUCT AND MARKET – IRISH NON-FOOD FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	18.14	4.32	3.74	1.73	0.77	0.10	28.79
2 Markets	0.86	4.22	5.57	1.92	1.44	0.48	14.49
3-5 Markets	0.48	0.96	5.66	5.85	3.93	2.30	19.19
6-10 Markets	0.10	0.38	1.44	3.93	4.13	3.74	13.72
11-20 Markets	0.00	0.19	0.48	2.21	3.17	5.18	11.23
20+ Markets	0.00	0.10	0.10	0.19	1.92	10.27	12.57
Total	19.58	10.17	16.99	15.83	15.36	22.07	100.00

Source: Authors' analysis of CSO export data.

The firms that are the most diversified across markets are those exporting both food and non-food products with close to one-third reaching more than 20 destinations. On the other hand, they are less likely than non-food exporters to export many products to many destinations. In a pattern that was not seen in other breakdowns of the data, there is a large grouping of firms with a middling range of products (6 to 10) exporting to over 20 markets. This accounts for 21 per cent of the exporting firms in the food and non-food category, whereas in most other breakdowns the expansion of market and product counts tended to occur more closely in parallel.

As with previous results across different breakdowns by nationality and size, when we look at the distribution of manufacturing export value across the product-market count combinations, there is a strong concentration of exports in the most diversified group of firms. There is something of an exception for food-only exporters, where the limited numbers of firms exporting more than ten products results in the peak concentration of export value occurring for firms exporting between six and ten products to a wide range of markets. Overall, the export values for food-only exporters are more dispersed across the product-market combinations than was seen for other breakdowns of the data.

TABLE 4.25 DISTRIBUTION OF EXPORT VALUE BY PRODUCT AND MARKET – IRISH FOOD FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	6.32	3.74	3.04	2.84	0.00	0.00	15.94
2 Markets	0.36	3.16	5.14	0.00	0.00	0.00	8.65
3-5 Markets	5.56	0.47	3.74	1.25	0.28	0.00	11.30
6-10 Markets	7.93	4.89	6.35	6.51	0.00	0.00	25.69
11-20 Markets	0.00	0.43	5.78	11.10	0.00	1.18	18.47
20+ Markets	0.00	0.00	1.52	17.48	0.94	0.00	19.94
Total	20.18	12.69	25.56	39.17	1.22	1.18	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.26 DISTRIBUTION OF EXPORT VALUE BY PRODUCT AND MARKET – IRISH FOOD AND NON-FOOD FIRMS

	Number of Products						
2011-15	**1.00**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	-	0.11	0.12	0.06	0.35	0.00	0.65
2 Markets	-	0.00	0.12	0.26	0.00	0.00	0.37
3-5 Markets	-	0.10	0.20	0.43	0.13	1.11	1.96
6-10 Markets	-	0.00	0.77	4.24	0.03	0.36	5.40
11-20 Markets	-	0.00	0.47	1.48	11.57	5.65	19.17
20+ Markets	-	0.00	0.09	1.56	10.63	60.16	72.44
Total	-	0.21	1.77	8.02	22.71	67.29	100.00

Source: Authors' analysis of CSO export data.

TABLE 4.27 DISTRIBUTION OF EXPORT VALUE BY PRODUCT AND MARKET – IRISH NON-FOOD FIRMS

	Number of Products						
2011-15	**1**	**2**	**3-5**	**6-10**	**11-20**	**20+**	**Total**
1 Market	1.93	0.36	0.62	0.83	0.22	0.00	3.96
2 Markets	0.02	0.26	1.90	0.42	0.33	0.16	3.09
3-5 Markets	1.87	0.06	2.28	1.12	1.60	2.54	9.47
6-10 Markets	0.00	0.14	1.21	5.10	3.90	4.89	15.24
11-20 Markets	0.00	0.01	0.71	2.92	3.05	10.64	17.32
20+ Markets	0.00	0.59	0.23	0.07	9.94	40.09	50.92
Total	3.82	1.42	6.95	10.46	19.04	58.32	100.00

Source: Authors' analysis of CSO export data.

For both non-food-only and firms exporting both food and non-food products, the more standard clustering in the top value cells is apparent. For firms exporting both food and non-food products, the highest count of over 20 products to over 20 destinations accounts for 60 per cent of export value. For non-food exporters, the comparable cell accounts for 40 per cent with a further 10 per cent being contributed by firms with more than 20 products exported to between 11 and 20 markets.

CHAPTER 5

Export dynamics

5.1 EXPORT ENTRY AND EXIT

This chapter examines export dynamics at firm, firm-product and firm-destination level. To this purpose, we analyse exporting firms' entry and exit rates as well as their export survival over time. Over the period 1996-2015 we observe export flows by 3,104 firms. The average number of exporters per year was 1,269 (of which 417 were foreign-owned firms and 852 were Irish-owned firms). These numbers indicate that export flows are not stable over time and that each year some firms started and some stopped export activities. Table 5.1 shows the number of firms entering and exiting export activities.

To better understand Ireland's export dynamics we decompose the export growth over the analysed period into the contributions of changes/switching at firm, product and destinations levels. Table 5.1 shows for each year *t* the decomposition of the total number of exporters into four categories defined following Eaton et al. (2007):

- *Export entrants*: those firms that exported in year *t* and did not export in the previous year, *t-1*;
- *Export exiters*: those firms that exported in year *t*, exported in the previous year, *t-1*, but did not export in the next year, *t+1*;
- *Continuing exporters*: those firms that exported in year *t*, exported in the previous year, *t-1*, and exported in the next year, *t+1*;
- *One-year exporters*: those firms that exported in year *t*, did not export in the previous year, *t-1*, and did not export in the next year, *t+1*.

As shown in Table 5.1, the majority of exporters continue to export more than one year. Over the analysed period, on average 78 per cent of Irish-owned and 92 per cent of foreign-owned exporters continued to export. Only a small fraction of the exporters were single-year exporters (on average 2.7 per cent of Irish-owned exporters and 0.2 per cent in the case of foreign-owned exporters). In the case of Irish-owned exporters, export entry rates tend to be higher than exit rates (on average 11 per cent compared to 9 per cent, respectively) while foreign exporters were more likely to exit rather than enter export (on average 3 per cent compared to 5 per cent respectively). Care should be taken in comparing the entry and exit rates to exporting of Irish firms vis-à-vis foreign firms, as Irish firms entering exporting may have been producing for the domestic market for some years whereas foreign firms are more likely to set up an establishment with exporting activity as its immediate aim. The drop-off in entry rates for foreign

firms in more recent years is potentially due to a shift towards services, particularly as a number of activities in information technology were recently reclassified by statistical agencies as services rather than manufacturing.

TABLE 5.1 ENTRY AND EXIT OF EXPORTERS

	Irish				Non-Irish			
	Entry	Exit	One Year	Continue	Entry	Exit	One Year	Continue
1996		23		657		1		395
1997	141	23	15	582	23	0	0	394
1998	118	28	19	650	19	1	0	419
1999	117	46	20	708	28	4	0	435
2000	118	57	22	748	11	13	1	453
2001	86	97	33	750	10	27	2	472
2002	94	80	25	732	21	34	1	454
2003	95	102	23	716	12	37	0	434
2004	98	112	34	714	13	32	0	418
2005	74	99	26	664	7	40	3	409
2006	130	111	27	643	16	40	5	369
2007	117	104	35	648	17	38	2	344
2008	94	68	24	647	8	15	1	349
2009	82	78	19	678	11	23	1	346
2010	83	69	23	708	6	17	0	352
2011	119	107	31	735	13	30	1	337
2012	90	66	22	776	10	2	0	353
2013	61	79	21	809	1	15	0	349
2014	46	114	30	793	1	25	0	328
2015	31			875	4			334

Source: Authors' analysis of CSO export data.

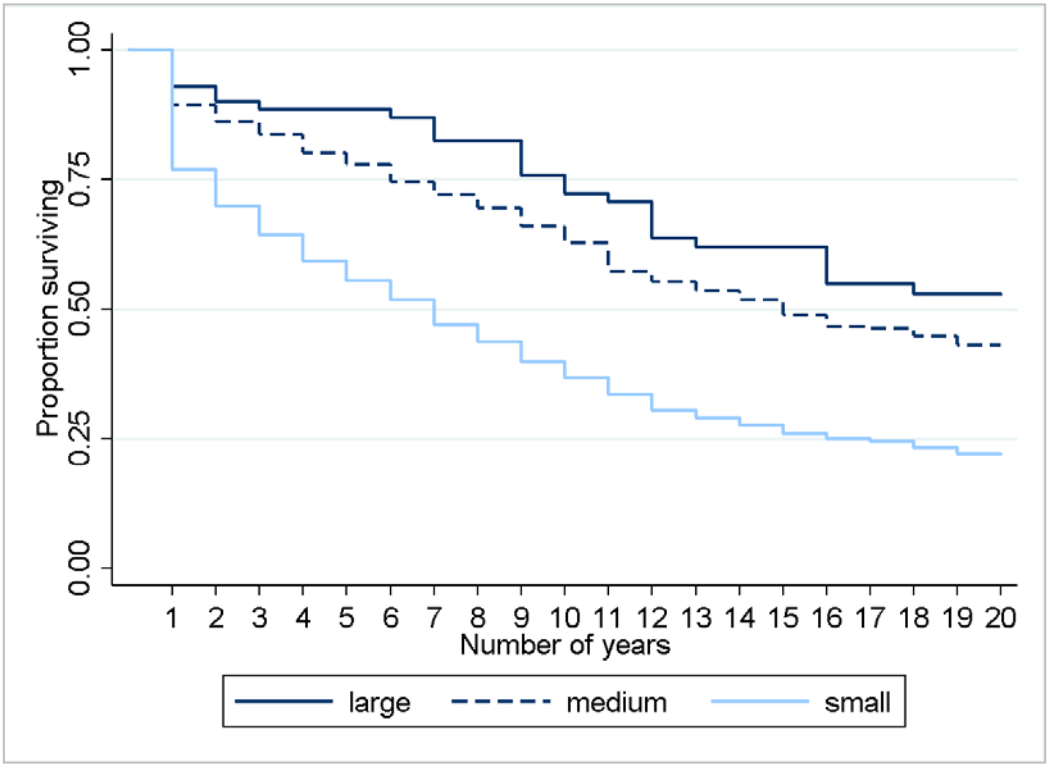
In general, entry and exit were higher for Irish firms than for foreign-owned firms. However, as indicated before, their total number was also higher. Therefore, it is useful to examine firms' export survival probabilities after entering export activity.[10] To do that we plot the Kaplan-Meier[11] estimator of the survival function distinguishing between Irish and foreign-owned companies respectively. This shows the percentage of firms still active in the export market X number of years after they began exporting.

10 Note that at this stage we do not control for left censoring.

11 Kaplan-Meier procedure estimates the survival probability for each of the *t* time periods (except the first), as a compound conditional probability of surviving up to time *t-1*. In survival analysis, a terminological distinction is made between a trade 'relationship' and a trade 'spell'. Each export relationship may consist of a single spell or of multiple spells. The latter occur when exports are stopped and restarted later on. In our plots we calculate the survival probabilities of each particular trade spell.

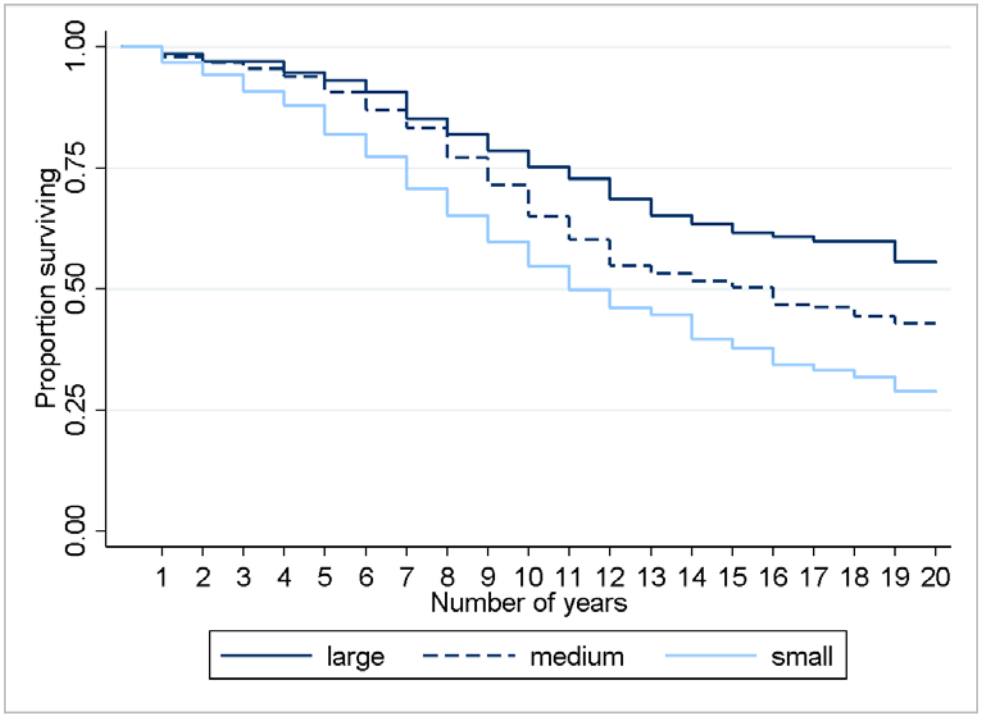
Figures 5.1 and 5.2 decompose the export survival functions by company size for Irish and non-Irish firms. In general, the probability of survival is lower for Irish firms than for foreign firms. After the first year 75 per cent of small and around 90 per cent of medium and large Irish exporters are still active. However, the survival rate after the first year is close to 100 per cent for foreign companies regardless of their size. We must recall however that size is measured according to the size of operations in Ireland; a 'small' foreign firm may be part of a much larger global enterprise. After 20 years, around 50 per cent of large and medium and only 25 per cent of small Irish companies continue to export. These survival rates are only slightly higher for non-Irish companies, indicating that surviving the first few years is more challenging for Irish than for foreign firms.

FIGURE 5.1 IRISH FIRM SURVIVAL OVER TIME (BY FIRM SIZE GROUP)



Source: Authors' analysis of CSO export data.

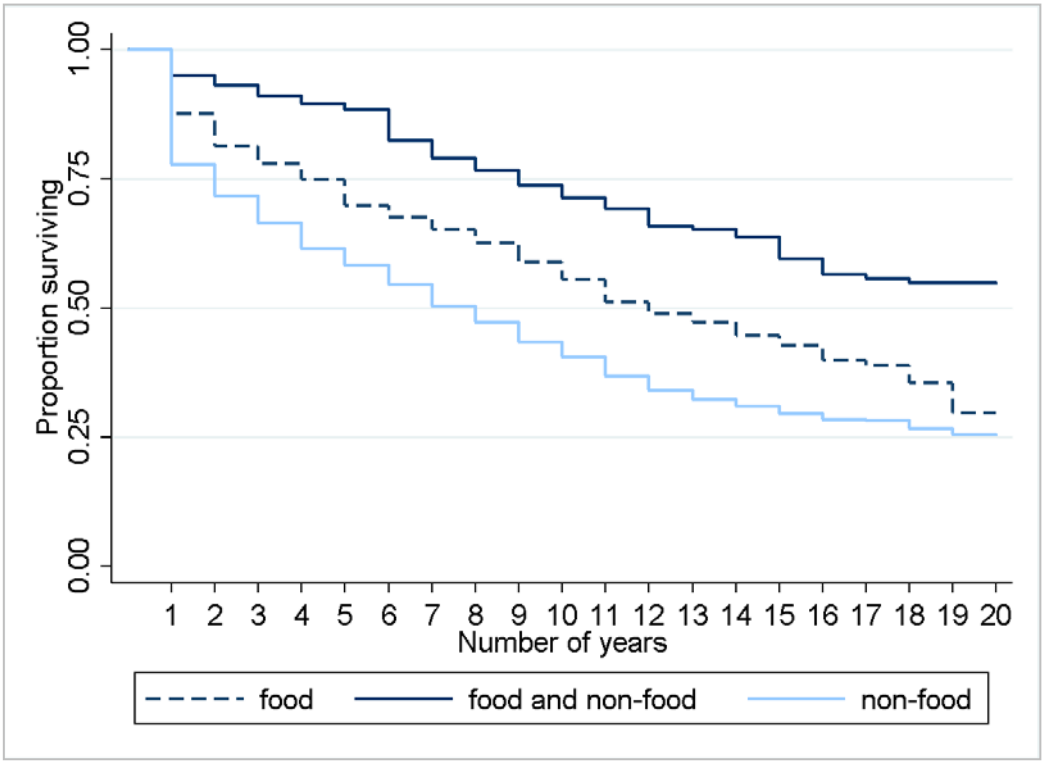
FIGURE 5.2 FOREIGN FIRM SURVIVAL OVER TIME (BY FIRM SIZE GROUP)



Source: Authors' analysis of CSO export data.

We further decompose survival rates for Irish manufacturing firms by export group type (Figure 5.3). Among the three groups defined earlier, food-and-non-food exporters have the highest, and the non-food exporters the lowest, survival rates. The probability of survival after one year ranges from around 75 per cent for non-food exporters to around 95 per cent for food and non-food exporters. After 20 years more than 50 per cent of exporters from the food and non-food group and 25 per cent from the two other groups are still active.

FIGURE 5.3 IRISH FIRM SURVIVAL OVER TIME (BY FOOD EXPORT GROUP)



Source: Authors' analysis of CSO export data.

5.2 PRODUCT MIX CHANGES

Now we turn to analysing changes in the product mix. We start with product entry and exit. During the analysed period, around 7,000 products were introduced and dropped each year. Irish firms introduced and dropped around 3,200 products each year, whereas foreign firms around 3,700 products.

Table 5.2 shows for each year *t* the decomposition of the total number of exported products into four categories defined similarly as for the case of exporters in Table 5.1:

- *New products*: products exported in year *t* and not exported in the previous year, *t-1;*
- *Dropped products*: products exported in year *t*, exported in the previous year, *t-1*, but not exported in the next year, *t+1;*
- *Continued products*: products exported in year *t*, exported in the previous year, *t-1*, and exported in the next year, *t+1;*
- *One-year exported products*: those products exported in year *t*, not exported in the previous year, *t-1*, and not exported in the next year, *t+1.*

The numbers reported in Table 5.2 indicate that exporters combine exports of existing products with new products and there is a lot of product experimentation with many products exported one year only while a large number of products are dropped. On average, the product mix of Irish-owned exporters was composed as follows: 37 per cent same products, 35 per cent single-year exported products, 15 per cent new products, and 13 per cent dropped products. The pattern of product mix is similar in the case of foreign-owned exporters.

TABLE 5.2 PRODUCT TURNOVER – NUMBER OF 6-DIGIT PRODUCTS

	Irish				Non-Irish			
	New	Dropped	1-Year	Continue	New	Dropped	1-Year	Continue
1996		2,227		2,516		3,131		2,869
1997	984	648	2,013	1,859	1,173	800	2,419	2,078
1998	872	742	1,964	2,071	1,056	856	2,658	2,425
1999	1,140	721	2,471	2,224	1,444	877	3,338	2,603
2000	1,262	858	2,657	2,473	1,332	1,175	3,156	2,907
2001	997	1,007	2,607	2,587	1,262	1,367	3,170	3,012
2002	1,021	897	2,615	2,630	1,311	1,286	3,326	3,044
2003	945	1,013	2,446	2,653	1,140	1,399	3,049	2,943
2004	856	1,062	2,539	2,533	1,072	1,156	2,976	2,937
2005	730	915	1,970	2,360	1,132	1,202	2,896	2,919
2006	857	897	2,233	2,235	846	1,563	2,914	2,472
2007	727	988	2,056	2,094	937	1,173	2,432	2,133
2008	751	638	1,419	2,095	790	859	1,624	2,291
2009	1,108	673	1,817	2,203	1,241	804	1,761	2,244
2010	986	748	2,147	2,417	1,049	976	2,250	2,655
2011	1,097	873	2,462	2,492	1,137	1,071	2,392	2,671
2012	1,237	832	2,511	2,734	1,219	976	2,591	2,855
2013	1,109	938	2,598	3,033	987	1,024	2,476	3,050
2014	1,009	1,004	2,647	3,138	771	1,051	2,330	2,986
2015	3,175			4,147	2,669			3,757

Source: Authors' analysis of CSO export data.

Table 5.3 reports the numbers of exporters changing the product mix following a similar classification of firms in four categories:

- *Firms adding new products*: products exported in year *t* and not exported in the previous year, *t-1;*
- *Firms dropping products*: products exported in year *t*, exported in the previous year, *t-1*, but not exported in the next year, *t+1;*
- *Firms with continued products*: products exported in year *t*, exported in the previous year, *t-1*, and exported in the next year, *t+1;*

- *Firms with single year exported products*: those products exported in year *t*, not exported in the previous year, *t-1,* and not exported in the next year, *t+1.*

The numbers in Table 5.3 indicate again a high degree of product experimentation. On average, 30 per cent of Irish-owned firms exported the same products, while 32 per cent of firms reported single-year exported products. On average, 19 per cent of Irish-owned firms exported new products, while 18 per cent dropped products (some of these products may be continuously produced by the firm for the domestic market – we measure exported products only). The figures for foreign-owned exporters suggest a higher degree of product churn with 21 per cent of firms exporting new products. On average, 29 per cent of foreign exporters continued to export the same products, 29 per cent exported products for one year only while 21 per cent of exporters dropped products. Two points should be made on this high level of product turnover; the first is to note the very narrowly defined product definitions, which mean small changes to a product by a firm may result in a change in product code. The second is to suggest that some very short-lived one-year products may result from bespoke orders and therefore be a deliberate part of the firm's production strategy.

TABLE 5.3 FIRMS CHANGING PRODUCT MIX – NUMBER OF FIRMS

	Irish				Non-Irish			
	Adding	Dropping	1-Year	Continue	Adding	Dropping	1-Year	Continue
1996		612		561		405		394
1997	453	315	621	496	354	270	391	384
1998	377	350	633	566	313	284	410	417
1999	475	345	734	596	373	295	465	436
2000	469	404	795	644	345	341	462	460
2001	412	424	754	650	351	364	498	467
2002	415	400	745	665	355	365	479	461
2003	431	435	735	645	313	342	455	452
2004	365	453	751	625	302	345	431	421
2005	351	393	645	602	287	327	421	410
2006	369	391	651	570	259	318	392	368
2007	335	402	669	578	257	283	366	337
2008	342	314	555	591	231	244	307	362
2009	404	322	601	609	269	232	344	344
2010	398	331	637	651	255	257	344	360
2011	434	399	727	655	249	270	355	342
2012	450	381	678	697	246	253	330	366
2013	433	408	689	732	237	263	338	355
2014	410	427	674	747	224	244	326	343
2015	742			838	330			357

Source: Authors' analysis of CSO export data.

Table 5.4 breaks down the product dynamics analysed above by food and non-food Irish-owned firms. In general, it appears that non-food exporters had more dynamic product mix patterns. On average, nearly 40 per cent of food exporters exported the same products while the respective figure is 28 per cent for non-food products.

Relative to food exporters, a higher share of non-food exporters added new products (on average 20 per cent compared to 17 per cent, respectively). Over the period, on average 34 per cent of non-food exporters exported products for one year only. The corresponding figure for food exporters is 26 per cent. The shares of exporters with dropped products are more similar, 18 per cent in the case of non-food exporters and 17 per cent in the case of food exporters.

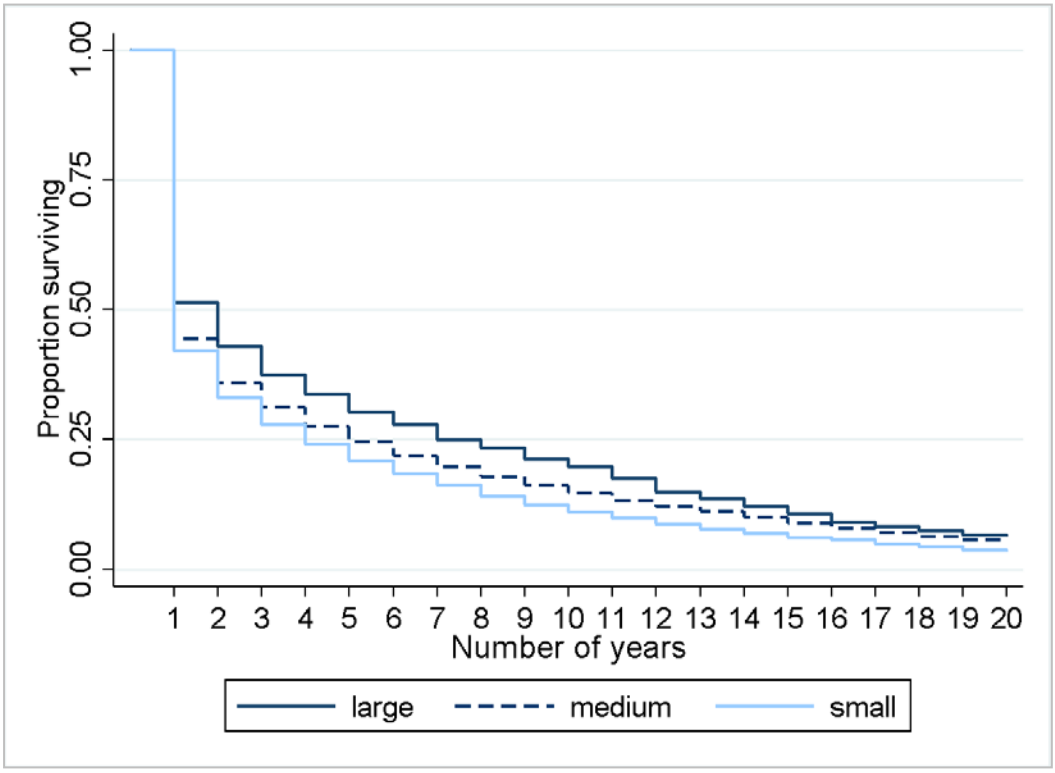
TABLE 5.4 PRODUCT DYNAMICS BY FOOD AND NON-FOOD – NUMBER OF IRISH FIRMS

	Food				Non-Food			
	Adding	Dropping	1-Year	Continue	Adding	Dropping	1-Year	Continue
1996	0	109	0	132	0	503	0	429
1997	71	48	99	125	382	267	522	371
1998	55	72	90	130	322	278	543	436
1999	72	51	117	138	403	294	617	458
2000	85	63	124	147	384	341	671	497
2001	66	73	121	154	346	351	633	496
2002	73	66	106	163	342	334	639	502
2003	80	85	121	157	351	350	614	488
2004	61	95	130	152	304	358	621	473
2005	57	69	101	148	294	324	544	454
2006	73	69	90	143	296	322	561	427
2007	58	70	100	149	277	332	569	429
2008	58	62	73	149	284	252	482	442
2009	64	59	84	153	340	263	517	456
2010	62	55	98	149	336	276	539	502
2011	54	73	78	149	380	326	649	506
2012	63	38	84	160	387	343	594	537
2013	71	59	87	161	362	349	602	571
2014	67	63	79	175	343	364	595	572
2015	109	0	0	197	633	0	0	641

Source: Authors' analysis of CSO export data.

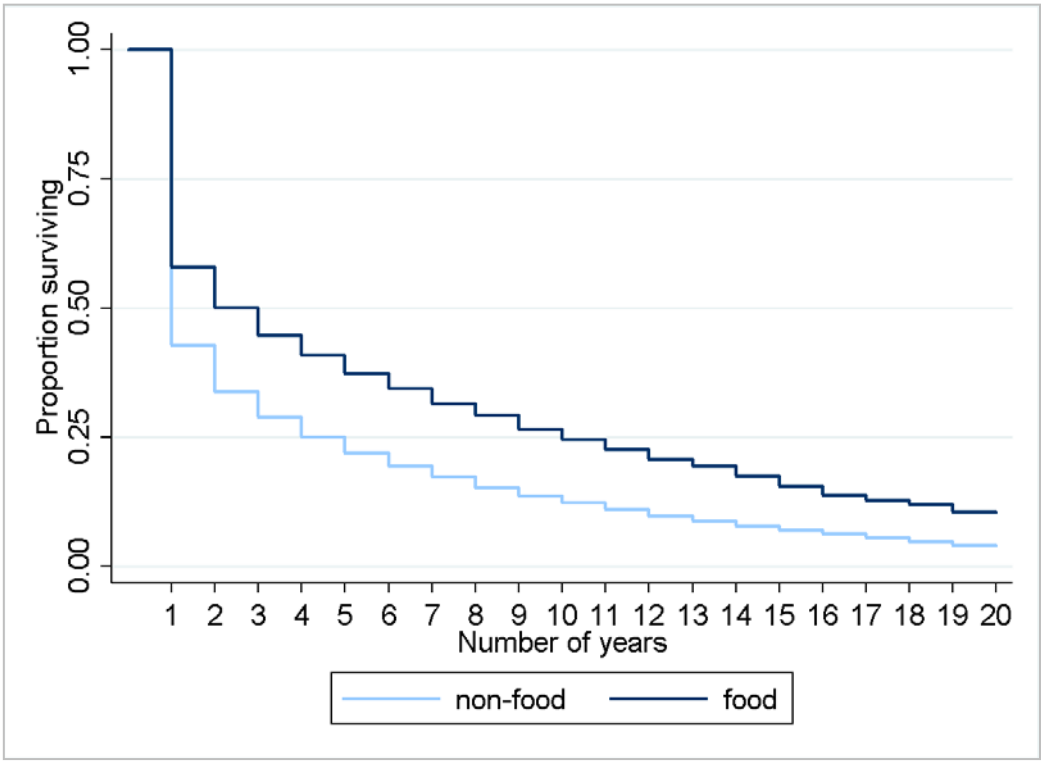
Figures 5.4 and 5.5 plot the survival functions for Irish manufacturing firm by size and by the type of exported product. Figure 5.4 shows that around 50 per cent of products are dropped after one year regardless of the size of exporting company. When we look at the product type (Figure 5.5), food products survive longer than non-food products. After 20 years, only around 10 per cent of products are still exported.

FIGURE 5.4 PRODUCT SURVIVAL RATES BY SIZE (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

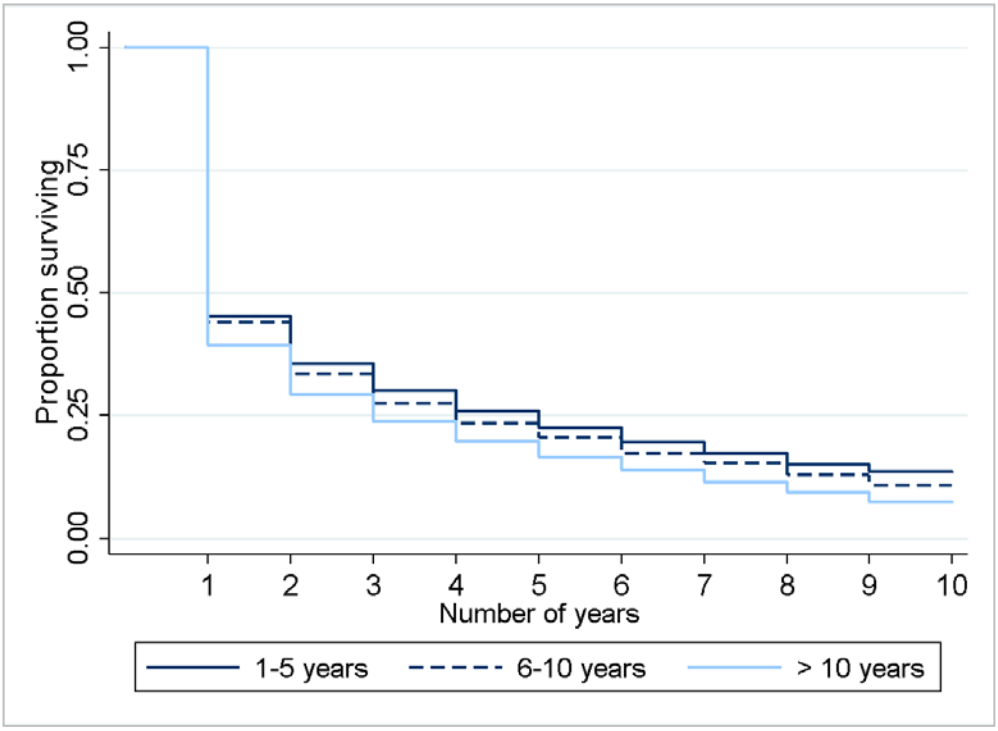
FIGURE 5.5 PRODUCT SURVIVAL BY FOOD AND NON-FOOD (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

It is important to note, that these low survival rates are in line with the findings for other countries (see for example Görg et al., 2012). In general, most authors find that the median survival of exports at the product level is around one to two years. One might expect product survival rates to be higher as exporters gain in experience. However, Figure 5.6 shows little difference in survival probabilities when firms are divided into groups based on their number of years as exporters (one to five years, six to ten years and more than ten years).[12] This shows the level of risk involved in launching new products remains high even for firms which have been successfully exporting for many years.

FIGURE 5.6 PRODUCT SURVIVAL BY YEARS OF EXPORT EXPERIENCE (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

5.3 MARKET ENTRY AND EXIT

Now we turn to analysing changes in the destination markets. We start with destination entry and exit. Table 5.5 reports the numbers of manufacturing exporters broken down in four categories defined with respect to changes in destination markets.

- *Firms with new markets*: market destinations with exports in year *t* and no exports in the previous year, *t-1;*

[12] In our calculation of firm export experience we need to exclude first ten years of data. Hence, we calculate firm experience from 1996 on, and export duration from 2006 on. It means that our maximum firm experience is 20 years whereas our maximum spell length is ten years.

- *Firms with exiting markets*: market destinations with exports in year *t*, exports in the previous year, *t-1*, but no exports in the next year, *t+1;*
- *Firms with continued markets*: market destinations with exports in year *t*, exports in the previous year, *t-1*, and exports in the next year, *t+1;*
- *Firms with single year markets*: market destinations with exports in year *t*, no exports in the previous year, *t-1*, and no exports in the next year, *t+1.*

TABLE 5.5 FIRMS CHANGING DESTINATIONS – NUMBER OF FIRMS

	Irish				Non-Irish			
	Enters	Exits	1-Year	Continue	Enters	Exits	1-Year	Continue
1996		421		573		308		382
1997	325	232	363	525	266	211	277	381
1998	305	256	378	573	281	235	294	408
1999	396	285	427	586	338	247	312	423
2000	399	305	453	637	291	276	313	443
2001	340	333	477	637	292	309	351	456
2002	336	300	461	641	301	315	341	439
2003	352	329	446	621	284	294	326	422
2004	315	373	465	597	264	289	322	405
2005	293	314	405	580	238	265	289	392
2006	313	343	433	549	208	265	260	356
2007	311	321	433	547	201	242	269	325
2008	297	284	358	559	202	198	217	342
2009	368	269	405	579	222	204	250	326
2010	383	241	448	611	237	189	247	339
2011	430	303	505	623	220	225	255	321
2012	400	330	480	681	216	207	257	345
2013	411	352	491	697	202	233	233	335
2014	405	356	497	723	194	228	228	320
2015	576			784	264			324

Source: Authors' analysis of CSO export data.
Note: Firms may be counted in multiple categories (e.g. entering one destination and exiting another).

The numbers in Table 5.5 suggest that relative to foreign-owned exporters, a higher share of Irish-owned manufacturing exporters tend to export to the same markets. Over the period, on average 36 per cent of Irish-owned exporters exported to the same markets, while the corresponding share for foreign-owned exporters is 33 per cent. The patterns of single-year exporting and of exporting to new markets are similar for Irish- and foreign-owned exporters. On average, 26 per cent of Irish-owned and 24 per cent of foreign-owned exporters had single-year markets. On average, 22 per cent of Irish-owned and 21 per cent of foreign-owned added new market destinations. Twenty-six per cent of Irish-owned

exporters and 24 per cent of foreign-owned exporters dropped market destinations.

TABLE 5.6 DESTINATION CHANGES OF IRISH FIRMS BY PRODUCT TYPE

	Food Exporters				Both				Non-Food Exporters			
	Enters	Exits	1-Yr	Continue	Enters	Exits	1-Yr	Continue	Enters	Exits	1-Yr	Continue
1996		62		86		38		57		321		430
1997	23	11	24	48	60	46	60	93	242	175	279	384
1998	26	26	21	60	58	45	64	89	221	185	293	424
1999	23	18	27	46	81	51	71	117	292	216	329	423
2000	23	12	24	45	74	70	81	121	302	223	348	471
2001	29	25	36	55	65	63	69	115	246	245	372	467
2002	18	15	21	60	73	64	70	116	245	221	370	465
2003	24	21	24	58	78	69	84	115	250	239	338	448
2004	14	25	16	47	79	86	89	130	222	262	360	420
2005	18	21	18	48	60	60	69	110	215	233	318	422
2006	22	24	23	51	60	66	59	107	231	253	351	391
2007	19	25	18	52	70	55	74	108	222	241	341	387
2008	16	16	18	59	53	56	53	99	228	212	287	401
2009	23	11	19	52	75	58	68	116	270	200	318	411
2010	26	17	27	60	78	49	75	112	279	175	346	439
2011	28	23	21	55	79	64	78	111	323	216	406	457
2012	34	21	34	71	69	58	80	107	297	251	366	503
2013	37	22	33	67	70	71	79	112	304	259	379	518
2014	41	20	34	78	79	71	79	116	285	265	384	529
2015	49			88	92			120	435			576

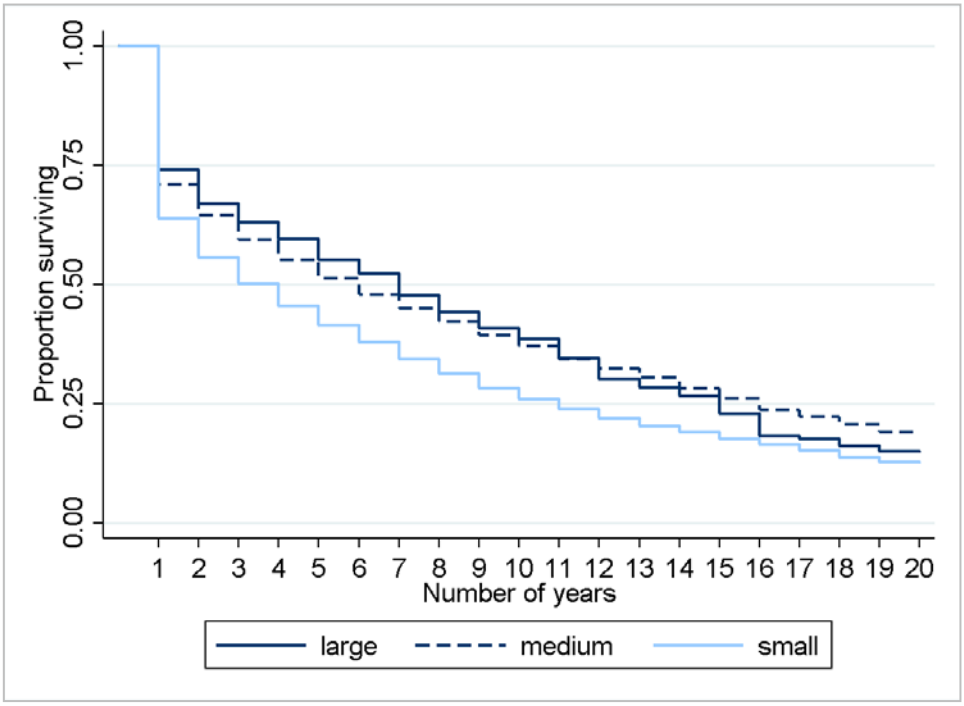
Source: Authors' analysis of CSO export data.

Figures 5.7, 5.8 and 5.9 repeat the same type of survival analysis we ran for products in the previous section now applied to destinations. They show the probability of survival of Irish firms by size, firm type and experience level respectively. Not surprisingly, as in the previous section, medium and large firms outperform small companies and the difference in survival rates between medium and large companies is insignificant. In addition, food and non-food exporters survive longer than two other groups. Destination survival probabilities after one year vary between 65 per cent and 75 per cent and between 15 per cent and 20 per cent after 20 years. These findings are in line the evidence for other countries (see for example Esteve-Pérez et al., 2013).

Once again, we find little divergence by experience, showing that significant costs and risks are associated with market entry, even for established exporters. This finding has important implications indicating that policy support should be

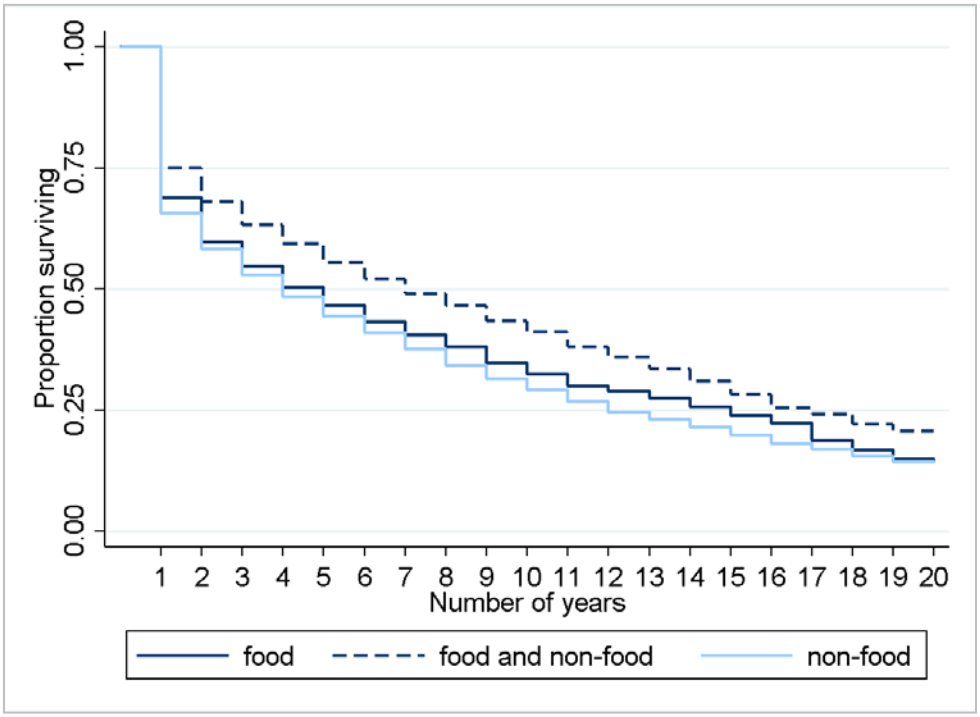
maintained for exporters to expand their market coverage beyond the initial entry into exporting.

FIGURE 5.7 DESTINATION SURVIVAL RATES BY SIZE (PERCENTAGE OF IRISH FIRMS)



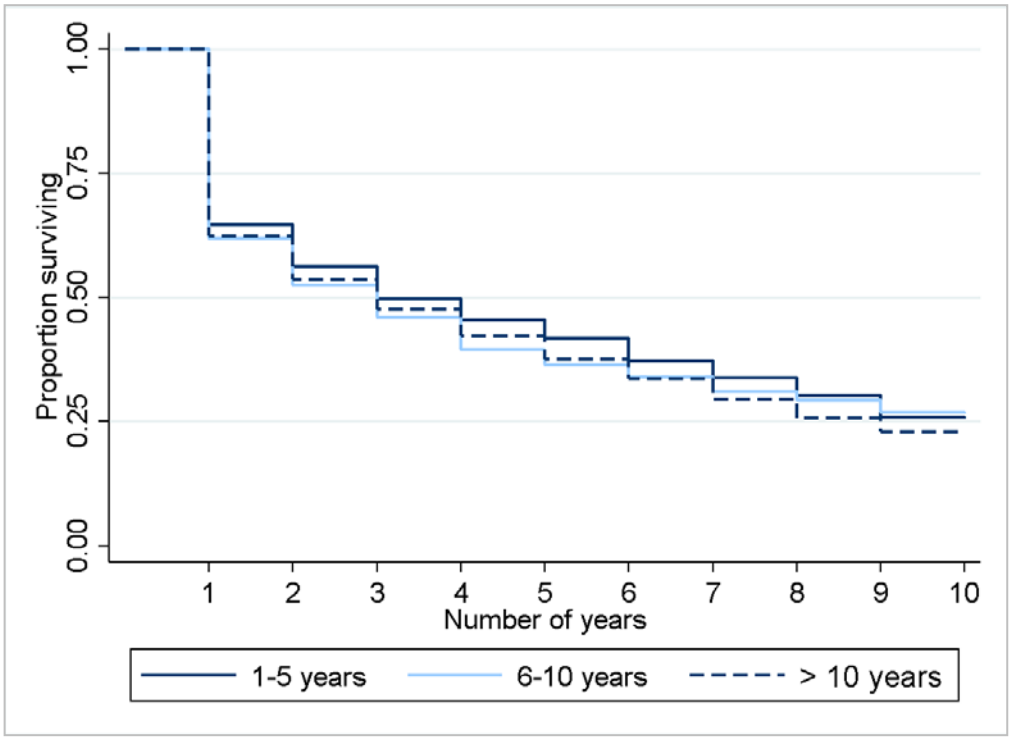
Source: Authors' analysis of CSO export data.

FIGURE 5.8 DESTINATION SURVIVAL BY FOOD AND NON-FOOD (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

FIGURE 5.9 DESTINATION SURVIVAL BY YEARS OF EXPORTING EXPERIENCE (PERCENTAGE OF IRISH FIRMS)



Source: Authors' analysis of CSO export data.

5.4 FIRMS' EXPORTS BY EXTENSIVE AND INTENSIVE MARGINS

International evidence has found a great deal of variation of firms' exports by product and market destinations.[13] To understand this variation, firms' exports can be broken down by the number of products exported (extensive margin) and the average export sales per product (intensive margin). In a similar way, firms' exports can be explained by the contributions of the number of destinations and the average export sales per destination.

Following on from this evidence, we examine how Irish manufacturing exports are linked to product and destination patterns across firms. Table 5.7 shows the results of regression decompositions of Irish-owned firms' exports along the extensive and intensive margins. This regression analysis identifies the proportional contributions of the extensive and intensive margins to the variation of firms' exports for different groups of exporters.

[13] Recent evidence is reviewed by Bernard et al. (2012).

The regression decomposition of exports by product margins is based on the following model specification:

$$\ln x_{it} = \ln p_{it} + \ln \overline{x_{it}} + \varepsilon_{it}$$

Where x_{it} = total exports of firm *i* in year *t*, p_{it} = number of products exported by firm *i* in year *t*, $\overline{x_{it}}$ = the average export sales per firm-product in year *t* and ε_{it} = error term. The results reported in Table 5.7 are obtained by regressing each export margin ($\ln p_{it}$, $\ln \overline{x_{it}}$) on total exports ($\ln x_{it}$). A similar model specification is used for the decomposition of exports by destination margins.

The structure of these regressions result in an easily interpretable outcome where the total export levels are divided into the proportion explained by the variation in the number of products or destinations and the proportion explained by the average sales. Thus, when we look at the first two rows where exports from all Irish-owned firms are decomposed by products, we find that 17.8 per cent of the variation in export sales comes from the number of products exported by a firm and the other 82.2 per cent is accounted for by the average sales per product at the firm level. Likewise, when we look at destinations, we find that this extensive margin – the number of destinations exported to – contributes 15.3 per cent to the variation in total exports across firms with the bulk of the variation coming from average sales per destination.

TABLE 5.7 REGRESSION DECOMPOSITION OF IRISH FIRMS' EXPORTS INTO EXTENSIVE AND INTENSIVE MARGINS

All Exporters	Share
Number of products	0.178***
Average exports per product	0.822***
Number of destinations	0.153***
Average exports per destination	0.847***
Food Exporters	**% Share**
Number of products	0.13***
Average exports per product	0.87***
Number of destinations	0.208***
Average exports per destination	0.792***
Non-Food Exporters	**% Share**
Number of products	0.168***
Average exports per product	0.832***
Number of destinations	0.133***
Average exports per destination	0.867***

Source: Authors' analysis of CSO export data.
Note: *** Indicates statistical significance at the 1 per cent level.

Overall, exports across firms are explained to a large extent by the intensive margins for both product and destination decompositions. The results indicate that manufacturing firms with larger exports sell more products and export to more destinations but also shows that most of their larger size is accounted for the fact that they sell more per each product. The analysis was also carried out for foreign-owned firms and the general pattern of results are very similar, with a slightly higher contribution for the number of destinations relative to sales per destination when compared to Irish firms.

These results are similar to evidence from other small open economies such as Portugal (Amador and Opromolla, 2010; 2013), and the Netherlands (Creusen and Lejour, 2011; Creusen et al., 2011). Looking in more detail at food and non-food exporters, we notice that they tend to have different product and destination export margin patterns. In the case of food exporters, the product intensive margin appears to be more important than the destination intensive margin, while the opposite appears to be the case for non-food exporters.

5.5 ENTERPRISE STRATEGIES FOR EXPORT GROWTH

Following on from existing international evidence (Bernard et al., 2010; Amador and Opromolla, 2013), export dynamics can be decomposed into the contributions of three export decisions:

- entry/stay/exit exporting;
- add/continue/drop products;
- enter/stay/exit export markets.

Table 5.8 shows the results of the decomposition of Ireland's total manufacturing export growth over the period 1996-2015 for Irish- and foreign-owned exporters along the three dimensions mentioned above.

Over the analysed period, on average, Irish-owned manufacturing exporters increased their exports annually by 6.8 per cent. New exporters contributed the most to this export growth rate, by 4.8 per cent, while continuing exporters contributed by 3.8 per cent. Taken together, the extensive margin explains 3 per cent of the export growth rate of Irish-owned exporters. The export decline due to exiting firms was -1.8 per cent. The pattern is different for foreign-owned exporters, with a higher contribution of the intensive margin (exports by continuing exporters) of 6.9 per cent, while the contribution of the extensive margin (export entrants and export exiters) was slightly negative at -0.3 per cent. This difference could be linked to the larger size of existing foreign-owned exporters compared to the existing Irish-owned exporters.

With respect to product changes, the export growth in the case of Irish-owned manufacturing exporters appears again driven by the extensive margin (3.8 per cent), while at the intensive margin, exports of same products contributed 3.1 per cent. Exports of new products contributed 9.3 per cent to overall growth while the export decline due to dropped products was also substantial at 5.5 per cent. Again in the case of foreign-owned exporters, the export growth rate was mainly driven by the exports of existing products at 5.1 per cent, while the extensive margin contributed 1.5 per cent.

TABLE 5.8 PERCENTAGE CONTRIBUTIONS TO EXPORT GROWTH (AVERAGE 1996-2015)

	Total Growth	Continuers	Entry	Exit
Firm Changes				
Irish	0.068	0.038	0.048	-0.018
Foreign	0.066	0.069	0.027	-0.030
Product Changes				
Irish	0.068	0.031	0.093	-0.055
Foreign	0.066	0.051	0.071	-0.056
Food	0.064	0.055	0.049	-0.039
Non-Food	0.086	0.009	0.151	-0.074
Experience 1-5 years	0.251	-0.135	0.475	-0.089
Experience 6-10 years	-0.068	-0.060	0.028	-0.036
Experience >10 years	0.035	0.052	0.033	-0.050
Destination Changes				
Irish	0.068	0.038	0.079	-0.048
Foreign	0.066	0.055	0.056	-0.046
Food	0.092	0.089	0.066	-0.064
Both	0.097	0.087	0.051	-0.042
Non-Food	0.066	-0.008	0.129	-0.055
Experience 1-5 years	0.251	-0.151	0.465	-0.063
Experience 6-10 years	-0.068	-0.033	0.024	-0.060
Experience >10 years	0.035	0.064	0.023	-0.053

Source: Authors' analysis of CSO export data.
Note: Food and experience breakdowns are for Irish firms only. Experience groups refer to 2005-2015 period.

Similar to the foreign-owned exporters, in the case of Irish-owned food exporters, export growth was driven by exports of the same products that contributed 5.5 per cent while the extensive margin contributed 1 per cent to export growth. The

pattern is different for Irish-owned non-food exporters. Their 8.6 per cent export growth is explained by the contribution of the extensive margin of 7.7 per cent, while exports of the same products contributed 0.9 per cent. Exports of new products by non-food Irish-owned exporters contributed substantially to their export growth, namely 15.1 per cent.

With respect to market destination changes, in the case of Irish-owned manufacturing exporters; exports to the same market destinations explain 3.8 per cent of the export growth, while exports to new markets contributed substantially to the export growth at 7.9 per cent. However, export stopped due to market exits reduced the exports by 4.8 per cent. Exports by foreign-owned firms to the same markets explained the largest part of export growth, at 5.5 per cent, while the net contribution at the extensive margin was 1 per cent. Exports to new markets increased exports by 5.6 per cent while the export decline due to lost export markets was 4.6 per cent. These results are consistent with international evidence which finds that in the long run, export growth is driven by the product and destination extensive markets (Eaton et al., 2007; Amador and Opromolla, 2013).

One of the most dramatic results to emerge from the decomposition of export growth in Table 5.6 is the importance of the launch of new products and entry to new markets of the youngest group of exporters. Manufacturing firms that have been exporting less than five years have a total growth rate of 25 per cent, driven almost entirely by the new entry margins in markets and products.

Taken together these results provide an interesting contrast to the decomposition of variation in export levels presented in the previous section. Although total export levels are mainly driven by the intensive margin – firms exporting higher amounts – the decomposition of export growth shows that the extensive margin – introducing new products and entering new markets – is extremely important. The finding that manufacturing export growth is driven predominantly by the extensive margin suggests that continuous churning of products and markets is a crucial underpinning of this process. At the firm level, this indicates that organic change is required for successful exporters to keep up with the dynamic nature of the global export market.

5.6 THE SENSITIVITY OF EXPORTS TO ECONOMIC SHOCKS

To assess the sensitivity of firms' exports to economic shocks, Table 5.9 reports the estimated sensitivity of Ireland's export growth to economic growth in export markets.

The estimates are obtained from the following empirical model which isolates the effect of destination GDP growth on export growth, holding fixed all other destination characteristics that are less likely to vary over time:

$$\Delta \ln Y_{dt} = \alpha_0 + \beta \Delta \ln GDP_{dt} + M_i + T_j + \omega_{dt}$$

where $\Delta \ln Y_{dt}$ = annual export growth measure to destination *d* in year *t*. We consider the following export growth measures:

- Export sales growth to destination *d*;
- The growth in the number of products exported to destination *d*;
- The growth of the number of exporters to destination *d*;
- $\Delta \ln GDP_{dt}$ = annual GDP growth at destination *d* in year *t*;

where M_i = country fixed effects which control for unobserved time invariant country-specific effects that affect export growth and T_j = unobserved time-specific effects.

The parameter of interest is β which quantifies the average change in export growth due to changes in economic growth in market destinations.

The results shown in Table 5.9 indicate that Ireland's export growth is sensitive to changes in economic growth in export markets, over and above country and time-specific economic shocks. The magnitude and significance of these effects vary depending on the export growth measure, ownership and export product category. These results are consistent with evidence on the sensitivity of exports to changes in GDP growth found for other small open economies such as Belgium (Behrens et al., 2013), Norway (Bernard et al., 2013) and Hungary (Muraközy, 2012).

TABLE 5.9 EFFECTS OF GDP GROWTH ON MEASURES OF EXPORT GROWTH

	GDP growth	(Std. err.)	Observations	R-sq.
Exporters (all)	0.157	(0.146)	2,993	0.057
Exporters (food)	0.390	(0.947)	782	0.180
Exporters (non-food)	0.352**	(0.174)	2,769	0.066
Exporters (both)	0.185	(0.186)	2,726	0.137
Exporters (Irish)	0.495**	(0.205)	2,486	0.054
Exporters (Irish food)	0.113	(0.950)	762	0.181
Exporters (Irish non-food)	0.613***	(0.218)	2,162	0.062
Exporters (both)	0.645**	(0.267)	1,900	0.154
Product count (all)	0.348**	(0.167)	2,993	0.058
Product count (food)	0.213	(0.248)	2,155	0.060
Product count (non-food)	0.429**	(0.176)	2,959	0.057
Product count (Irish)	0.576**	(0.232)	2,486	0.063
Product count (Irish food)	0.612**	(0.289)	1,607	0.068
Product count (Irish non-food)	0.553**	(0.236)	2,340	0.062
Export sales (all)	0.532	(0.451)	2,993	0.047
Export sales (food)	1.784***	(0.677)	2,153	0.087
Export sales (non-food)	0.943*	(0.499)	2,959	0.045
Export sales (Irish)	1.086	(0.712)	2,486	0.050
Export sales (Irish food)	2.551***	(0.922)	1,607	0.095
Export sales (Irish non-food)	0.998	(0.725)	2,340	0.057

Source: Authors' analysis of CSO export data.
Notes: Results from separate OLS regressions of each export growth measure on GDP growth. All regressions control for unobserved time invariant destination country-specific and year-specific effects that affect exporting. Standard errors are in parentheses. ***, **, *, denote statistical significance at 1, 5 and 10 per cent, respectively.

Exports by Irish-owned manufacturing firms responded to changes in economic growth in market destinations particularly at the extensive margin: on average, GDP growth higher by 1 per cent was associated with increases of the number of exporters by 0.5 per cent and of the number of exported products by 0.6 per cent. Export sales growth by Irish-owned exporters was not significantly affected by changes in economic growth in market destinations.

Over the analysed period, export sales growth has been particularly sensitive to economic growth in destination markets in the case of food exports, especially by Irish-owned exporters. On average, an increase by 1 per cent in GDP growth led to an increase by 2.5 per cent of the food export sales by Irish-owned exporters. Export sales growth for non-food products was less sensitive to economic growth in market destinations.

Given the importance of the UK as a market destination, we further analyse the sensitivity of Ireland's export growth to changes in economic growth in the UK. The estimates are shown in Table 5.10. The results indicate that, controlling for

country- and year-specific economic shocks, the responsiveness of Ireland's export growth to economic growth in the UK was not significantly different than the case of changes in economic growth in other market destinations. These results deserve further investigation.

TABLE 5.10 EFFECTS OF GDP GROWTH ON MEASURES OF EXPORT PERFORMANCE, ADDING UK EFFECT

	GDP growth	(Std. Err.)	UK	(Std. Err)	UK*GDP growth	(Std. Err.)	Obs.	R-sq.
Exporters (all)	0.157	(0.146)	-0.0656	(0.174)	0.718	(5.035)	2,993	0.057
Exporters (food)	0.386	(0.948)	0.405	(0.649)	0.948	(7.884)	782	0.180
Exporters (non-food)	0.352**	(0.174)	-0.0285	(0.201)	1.004	(5.812)	2,769	0.066
Exporters (both)	0.185	(0.187)	0.0766	(0.231)	-0.0310	(5.565)	2,726	0.137
Exporters (Irish)	0.495**	(0.205)	0.0167	(0.258)	0.0242	(5.898)	2,486	0.054
Exporters (Irish food)	0.105	(0.951)	0.361	(0.645)	1.761	(7.829)	762	0.181
Exporters (Irish non-food)	0.613***	(0.218)	-0.0788	(0.357)	-0.0142	(5.903)	2,162	0.062
Exporters (Irish both)	0.645**	(0.267)	0.206	(0.513)	0.321	(6.318)	1,900	0.154
Product count (all)	0.347**	(0.167)	-0.0798	(0.200)	0.776	(5.783)	2,993	0.058
Product count (food)	0.213	(0.249)	-0.116	(0.292)	0.524	(6.223)	2,155	0.060
Product count (non-food)	0.428**	(0.176)	-0.0284	(0.210)	0.775	(6.062)	2,959	0.057
Product count (Irish)	0.576**	(0.232)	-0.134	(0.291)	0.258	(6.664)	2,486	0.063
Product count (Irish food)	0.612**	(0.290)	-0.296	(0.395)	-0.105	(6.517)	1,607	0.068
Product count (Irish non-food)	0.552**	(0.236)	-0.0590	(0.398)	0.203	(6.583)	2,340	0.062
Export sales (all)	0.532	(0.451)	0.260	(0.540)	0.114	(15.60)	2,993	0.047
Export sales (food)	1.783***	(0.678)	1.095	(0.797)	1.387	(16.96)	2,153	0.087
Export sales (non-food)	0.943*	(0.499)	0.286	(0.596)	0.186	(17.23)	2,959	0.045
Export sales (Irish)	1.085	(0.712)	2.185**	(0.895)	2.496	(20.48)	2,486	0.050
Export sales (Irish food)	2.551***	(0.922)	5.700***	(1.257)	-0.189	(20.76)	1,607	0.095
Export sales (Irish non-food)	0.996	(0.725)	-0.0173	(1.222)	2.895	(20.21)	2,340	0.057

Source: Authors' analysis of CSO export data.

Notes: Results from separate OLS regressions of each performance measure on GDP growth, UK dummy and interaction effect for UK growth. All regressions control for unobserved time invariant destination country-specific and year-specific effects that affect exporting. Standard errors are in parentheses. ***, **, *, denote statistical significance at 1, 5 and 10 per cent, respectively.

CHAPTER 6

Conclusions

This research report provides novel empirical evidence on the patterns and dynamics of manufactured exports by Irish-owned firms over the past two decades. A key feature of this analysis is the comparison of the export behaviour and export performance of exporters of food and non-food products. By using a highly detailed dataset of manufacturing export records at the transaction level by firm, product and destination markets, the analysis firstly identifies patterns of export concentration and specialisation and how these evolved over time. These patterns are assessed in connection with global export patterns and trends. Secondly, on the basis of decompositions of the variation of export growth across manufacturing firms the analysis identifies and compares firms' strategies for export growth along product and destination markets mixes. Finally, this report examines the responsiveness of export growth to changes in economic growth in destination markets.

A number of key policy relevant messages emerge from this analysis.

Most exporting firms in manufacturing are quite small, selling a few products to a small number of destinations while export values are dominated by a relatively small group of highly globalised large firms selling many products to many destinations. Comparisons with international evidence shows that exporters across a wide range of countries have a very similar structure to many relatively small firms, but a high concentration of total export values attributed to just a few extremely large firms. For this reason, examining the product and market diversification patterns of firms provides useful information in understanding how these top players emerged.

The distributions of product coverage for Irish and foreign-owned firms are very similar in shape, showing that a large proportion of manufacturing firms export a small number of products per firm. Nearly half of Irish firms export fewer than five products and around one-sixth export between six and ten products. Over time, for Irish-owned as well as foreign-owned firms, a pattern of gradual growth in product diversification emerges, apart from a dip in 2008.

Food products account for close to half of Irish export value. The largest and most diversified exporters sell both food and non-food products. Food-only exporters have the smallest average product range while the most diversified exporters in terms of product count are those exporting both food and non-food products.

Across market destinations, Irish firms are less diversified than foreign firms and the UK remains the single largest market. Firms exporting both food and non-food products are also the most diversified in terms of number of destinations.

The balance between specialisation and diversification presents policy challenges. On the one hand, high levels of specialisation amongst exporters can be a positive strategy if the specialisation is in areas of high current demand and future growth prospects. However, concentration in a relatively narrow range of products and/or markets also brings exposure to risk. Looking at the manufactured products and destinations most exported to by Irish firms, we find that almost all are exhibiting growth (in terms of the size of exports for products and in terms of GDP for destinations). This provides some indicative evidence that the current concentration patterns of Irish firms are well chosen but in a constantly changing world market.

The high percentage of manufacturing firms exporting few products and in few markets suggests a need for ongoing support to facilitate export expansion as well as entry. The pattern of many firms exporting a small number of products to few destinations also shows that there are ongoing hurdles or fixed costs associated with each new product introduced and each new export market entered. Previous research on export participation appeared to suggest that overcoming the initial hurdle to start exporting was the priority. However, it is now clear from many more detailed international studies and the information presented here on Irish exporters, that there are significant fixed costs to be encountered even for established exporters if they wish to expand.

Exporting firms need to be flexible in their ability to change product and destination portfolios in the face of changing market conditions. Examining the dynamism of firms along the product and destination dimensions can indicate the extent to which they are likely to prove resilient to economic shocks.

Exporting is risky, with a high probability of exit in the first year. This applies particularly strongly to small firms. The analysis points to a higher dynamism of export activities by Irish-owned firms over the analysed period relative to foreign-owned firms.

Continuing exporters frequently introduce new products, drop products and enter and exit markets. For continuously exporting manufacturing firms we find considerable evidence of product and destination experimentation with many one-year relationships and high levels of entry and exit at the product and

destination level. The majority of exporters export more than one year. On average, over the analysed period, 78 per cent of Irish-owned and 92 per cent of foreign-owned exporters were continuing exporters.

Exports sales in each year are largely dominated by exports from existing product-market combinations. While in the short and medium run manufacturing export volumes may be largely explained by the sales of existing products to their current markets; in the long run the drivers of export growth are expansion of market and product portfolios. Over the analysed period, on average, the increase in manufactured exports by Irish-owned exporters was mainly explained by export changes at the extensive margin (export changes due to export entries and exits).

However, in the long run, the main contributors to export growth in manufacturing are entry of new firms and movement of exporters into new products and new destination markets. With respect to product changes, the export growth in the case of Irish-owned exporters appears again driven by the extensive margin. With respect to market destination changes, in the case of Irish-owned exporters, export growth was driven mainly by exports to new markets.

The contribution of diversification and expansion to manufacturing export growth demonstrates the importance of ongoing support for firms moving into new product and market areas, particularly as these can be potentially risky strategies. Even for experienced exporters, the probability of a new product becoming established is not very high and, recognising that this dynamic pattern will have a high rate of product exit as well as growth is important, as adjustment of product portfolios is an expected feature of the process and the significance of individual product 'failures' should not necessarily be overstated.

Economic growth in destination markets is an important factor for market entry and export sales. The top 50 Irish exported products in both the food and non-food categories are compared to their world trade growth rates; these are largely positive giving some indicative evidence of specialisation of Irish exporters in well-performing global products. Over the analysed period, export sales growth has been sensitive to economic growth in market destinations particularly in the case of food exports and food exports by Irish-owned exporters. Export sales growth for non-food products were less sensitive to economic growth in market destinations. Exports by Irish-owned firms responded to changes in economic growth in market destinations particularly at the extensive margin.

Support for innovation and ongoing adjustment and experimentation is a key policy takeaway for success of exporting firms in manufacturing. For the indigenous sector, the challenge is to secure greater investment growth in dynamic products, to promote enterprise innovation and to support export expansion into dynamic markets. This report shows a number of areas where the patterns of firm export coverage and growth can be linked to policy priorities – in particular noting the core contribution to export growth of ongoing product and market entry while also drawing attention to the challenges this brings with relatively high risks of exit at the product and market level even for experienced exporters.

Identifying barriers to exporting, particularly in terms of information about potential export markets, and facilitating firm engagement and expansion into new destinations could help in enabling firms to extend their export coverage and support the continuous cycle of product turnover that appears to be such a central component of export growth.

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APPENDIX

TABLE A.1 SUMMARY OF EMPIRICAL EVIDENCE ON EXPORT PATTERNS AND EXPORT DYNAMICS FROM SMALL OPEN EU ECONOMIES

Country studies/ Time period analysed	Firm, product and destination patterns	Export dynamics	Policy implications
Belgium **Muûls and Pisu (2009) 1996-2004** **Bernard et al., (2010; 2014) 1998-2004** **Ariu (2012) 1995-2010** **Behrens et al., (2013) 2007-2009**	Exports concentrated among largest and most productive firms. Most firms export a small number of products to a small number of countries. More productive firms export more products to more countries and have higher average product-country export flows.	Exporters start with small export values (two to three times smaller than the average exporter) and grow fast over time (after nine years export sales are six times larger than the average exporter). Exports grow fast over time – mainly due to a larger number of transactions while average transaction values decrease over time. The trade collapse occurred at the intensive margin because of smaller quantities sold and unit price charged. The main factor explaining changes in export was the GDP growth in the destination country; most sensitive to the fall in demand were exports of durables and capital goods.	Export expansion depends on learning about foreign partners and about potential clients. The importance of learning about potential clients appears to be higher in the case of exports of services.
Denmark **Eriksson et al., (2009) 1993-2003** **Meinen (2011) 1995-2006** **Abreha et al., (2013) 2000-2010**	Exporters represent a small fraction of the total number of firms; this fraction is higher than in large countries such as the US. Largest exporters have a high share in total exports. Most firms export a small number of products to a small number of countries. The importance of multi-product firms exporting to many export destinations has increased over time. Most exporter premia – firm size, capital and skills intensity, productivity, wages – are significantly larger than in the US. The EU Single Market Programme and the adoption of the Euro had led to a higher number and average value of export transactions; no effect on the number of exporters.	Trade adjustment has taken place at the intensive margin, while entry and exits of firms or products played a less important role. Firm-level product or product-destination switching played an important role in mitigating the native economic shocks.	Trade promotion policies should target firms below top performers. Policy should pay more attention to remaining fixed trade costs.

Contd.

TABLE A.1 ***CONTD.***

Country studies/ Time period analysed	Firm, product and destination patterns	Export dynamics	Policy implications
Estonia **Rahu (2015) 1995-2011**		Half of exporters change their export portfolio every year; the duration of average export flows is short at two years. Large initial export shares and differentiated products increase the probability of export survival.	Export success is conditioned by good knowledge about foreign markets. Previous export experience in foreign markets increase chances for export survival.
Hungary **Békés et al., (2011) 1992-2003** **Halpern and Muraközy (2011) 1992-2003** **Békés and Muraközy (2012) 1992-2003** **Muraközy (2012) 2008-2009**	Higher export concentration than in most European countries. Foreign ownership is important in export patterns.	Most small exporters have a short export duration, however survivors grow faster than large exporters. Export growth was affected by macroeconomic shocks (transition, and the Russian crisis), destination markets and product heterogeneity. Firms exporting the largest number of products reduced the number of their product lines. In the long run, export growth has been driven by new exporters. Over the period 2008-2009, the reduction of exports by existing exporters explains 80 per cent of the export fall. Export decline was larger for foreign-owned firms than domestic firms. Exports of intermediate goods declined more than exports of consumer goods.	
Luxembourg **Mangiarotti and Schuller (2010) 2004**	High export concentration: 10 per cent of exporters account for 91 per cent of the export value. Multi-product firms exporting to many destinations account for a large share of the total export value. In comparison to Belgium, on average firms export a higher number of products to few destinations.	Aggregate export adjustment in response to changes in macroeconomic conditions has taken place at the extensive margin.	

Contd.

TABLE A.1 ***CONTD.***

Country studies/ Time period analysed	Firm, product and destination patterns	Export dynamics	Policy implications
The Netherlands **Creusen et al., (2011) 2002-2007** **Creusen and Lejour (2011) 2002-2008**	Large exporters account for the largest share of export volumes. Highly skewed distribution of firms: firms exported on average to 11 destinations, five products (the median firm exports to six countries, two products).	Changes at the intensive margin (existing exporters) matter more in the short to medium term than changes at the extensive margin (new entrants). Substantial dynamics at the extensive margin, mostly among small exporters (their combined export sales account for 2 per cent of total exports) and young exporters: about one-tenth of all exporters enter or exit every year; many export relationships end within a few years; young exporters tend to grow by expanding their market destinations. Sunk entry costs at the extensive product margin are lower than those for the extensive country margin. Multi-product firms account for the bulk of exports. A high degree of product churning, possibly reflecting the flexibility and adaptability of exporting firm and suggesting a higher survival exporting probability.	Appropriate policies are needed to facilitate/create conditions that enable firms to adjust product lines to changing economic conditions in foreign markets.
Norway **Bernard et al., (2013)**	Exports and imports are highly concentrated. Larger firms dominate trade patterns.	The responsiveness of aggregate exports to shocks is determined by demand-side characteristics. An increase in foreign demand leads to higher firm-level exports. The firm-level export response to demand shocks is amplified in export markets with less buyer dispersion. More buyer dispersion in an export market is associated with less export dispersion in that market. The growth and stability of exporter-importer networks and the sources of heterogeneity in buyer expenditure are important.	
Portugal **Amador and Opromolla (2010) 1995-2005** **Amador and Opromolla (2013) 1995-2005**	Multi-product firms exporting to many destinations dominate total exports.	Products and destinations switching are very frequent. Most of yearly changes in exports is explained by the intensive margin; sales by continuing exporters of continuing products in continuing markets. Gross contribution of destination and product extensive margins and gross contribution of entering and exiting firms are equally important. Continuing exporters enter new markets mainly by exporting existing products, while new exporters enter new destinations by exporting new products.	

Contd.

TABLE A.1 ***CONTD.***

Country studies/ Time period analysed	Firm, product and destination patterns	Export dynamics	Policy implications
Slovenia **Damijan et al., (2011) 1994-2003** **Damijan et al., (2014) 1994-2008**		The average firm changes about 25 per cent of exported and imported product-markets every year. Gross churning in terms of added and dropped product-markets is three times higher. Access to finance explains to a large extent differences in the extensive margins of exports between continuing and new exporters. Firms with better access to finance are more likely to continue to export and to expand the number of products and destination markets. The rate of return to assets is a better predictor of export decisions than revenue-based total factor productivity.	
Sweden **Andersson et al., (2008) 1997-2004**	High productivity firms export to markets with high productivity thresholds. The export productivity of firms increases in the number of products and destination markets. Firms that both export and import are more productive than firms that only export or only import.		

Source: This summary draws on the survey of empirical studies discussed by Wagner (2015).

TABLE A.2 CROSS-SECTION SUMMARY STATISTICS (€ MILLION, 2015)

	All firms			Irish firms		
Firm category	Number of firms	Av. exports by firm	Total exports	Number of firms	Av. exports by firm	Total exports
1 product	232	2.19	507.16	207	2.12	439.46
2 products	166	7.39	1,225.94	135	2.13	287.06
3-5 products	254	6.37	1,617.06	205	3.9	800.25
6-10 products	211	16.72	3,527.68	150	8.25	1,237.98
11-20 products	207	66.48	13,760.69	128	15.58	1,993.91
20+ products	174	191.93	33,395.61	81	28.44	2,303.92
Total	1,244	43.44	54,034.14	906	7.80	7,062.58
			Intrastat			
1 product	71	5.94	421.41	61	6.13	373.78
2 products	69	6.47	446.36	54	3.56	192.03
3-5 products	116	7.34	851.01	87	5.64	491.07
6-10 products	109	17.71	1,930.76	82	12.01	984.74
11-20 products	88	28.81	2,535.22	58	25.13	1,457.39
20+ products	62	46.34	2,872.93	32	28.47	910.96
Total	515	17.59	9,057.68	374	11.79	4,409.97
			Extrastat			
1 product	161	0.53	85.75	146	0.45	65.67
2 products	97	8.04	779.58	81	1.17	95.03
3-5 products	138	5.55	766.05	118	2.62	309.18
6-10 products	102	15.66	1,596.92	68	3.72	253.24
11-20 products	119	94.33	11,225.47	70	7.66	536.53
20+ products	112	272.52	30,522.68	49	28.43	1,392.96
Total	729	61.70	44,976.46	532	4.986	2,652.61

Source: Authors' analysis of CSO export data.

TABLE A.3 AVERAGE EMPLOYMENT

	All firms		Irish firms	
Firm category	**Number of firms**	**Av. employment**	**Number of firms**	**Av. employment**
1 product	232	33.27	207	31
2 products	166	68.3	135	52.41
3-5 products	254	63.51	205	45.5
6-10 products	211	84.3	150	62.16
11-20 products	207	121.4	128	82.83
20+ products	174	305.6	81	211.1
		Intrastat		
1 product	71	42.65	61	42.41
2 products	69	66.61	54	59.7
3-5 products	116	60.61	87	61.1
6-10 products	109	83.77	82	81.07
11-20 products	88	123	58	110.5
20+ products	62	284.9	32	367.9
		Extrastat		
1 product	161	29.14	146	26.24
2 products	97	69.51	81	47.54
3-5 products	138	65.94	118	33.99
6-10 products	102	84.86	68	39.35
11-20 products	119	120.1	70	59.87
20+ products	112	317	49	108.6

Source: Authors' analysis of CSO export data.

TABLE A.4 TOP EXPORTED PRODUCTS BY IRISH FIRMS, HS-4

HS-4	Share of Irish non-food exports	Product name	HS-4	Share of Irish food exports	Product name
3004	5.3%	Medicaments (not Elsewhere Specified)	0201	27.7%	Meat of Bovine Animals, Fresh or Chilled
3501	5.0%	Casein	1602	8.7%	Prepared or Preserved Meat, Meat Offal & Blood
3306	3.6%	Preparations for Oral or Dental Hygiene	0203	6.1%	Meat of Swine (Pork), Fresh, Chilled or Frozen
8427	3.5%	Fork-lift and Other Trucks	0406	5.3%	Cheese and Curd
8525	3.4%	Trans Apparatus for Radiotelephony etc., TV Cameras Cordless Telephones	0204	4.7%	Meat of Sheep or Goats, Fresh, Chilled or frozen
8531	2.9%	Electric Sound or Visual Signalling Apparatus	0405	4.2%	Butter and Other Fats and Oils Derived from Milk
9018	2.4%	Medical, Surgical, Dental or Vet Instruments	0206	4.1%	Edible Offal, Bovine, Swine, Sheep, Goat, Horse
8433	1.9%	Harvest etc. Machines, Cleaning Eggs	2309	4.0%	Preparations Used in Animal Feeding
3909	1.9%	Amino resins, Phenolics & Polyurethanes	0303	2.9%	Fish, Frozen (No Fish Fillets or Other Fish Meat)
8412	1.8%	Engines and Motors	0402	2.7%	Milk and Cream, Concentrated or Sweetened
Total:	31.8%			70.4%	

Source: Authors' analysis of CSO export data.

TABLE A.5 TOP EXPORTED PRODUCTS BY IRISH FOOD AND NON-FOOD EXPORTERS IN 1996, 2005 AND 2015

	HS-4	Product name	% of exports (1996)	HS-4	Product name	% of exports (2005)	HS-4	Product name	% of exports (2015)
1	0201	Meat of Bovine Animals, Fresh or Chilled	14%	0201	Meat of Bovine Animals, Fresh Or Chilled	29%	0201	Meat of Bovine Animals, Fresh or Chilled	23%
2	0406	Cheese and Curd	9%	1602	Prepared or Preserved Meat, Meat Offal & Blood	9%	1602	Prepared or Preserved Meat, Meat Offal & Blood	8%
3	1602	Prepared or Preserved Meat, Meat Offal & Blood	8%	0204	Meat of Sheep or Goats, Fresh, Chilled or Frozen	6%	8525	Trans Apparatus for Radiotelephony etc., TV Cameras Cordless Telephones	5%
4	0204	Meat of Sheep or Goats, Fresh, Chilled or Frozen	8%	3501	Casein	5%	0204	Meat of Sheep or Goats, Fresh, Chilled or Frozen	4%
5	0203	Meat of Swine (Pork), Fresh, Chilled or Frozen	6%	0406	Cheese and curd	4%	0203	Meat of Swine (Pork), Fresh, Chilled or Frozen	4%
6	0202	Meat of Bovine Animals, Frozen	6%	0405	Butter and Other Fats and Oils Derived from Milk	4%	2309	Preparations Used in Animal Feeding	4%
7	3501	Casein	4%	0203	Meat of Swine (Pork), Fresh, Chilled or Frozen	4%	0406	Cheese and Curd	4%
8	2106	Food Preparations nesoi	4%	1901	Malt Ext, Food Prep of Flour etc. un 50% Cocoa etc.	4%	3501	Casein	4%
9	0405	Butter and Other Fats and Oils Derived from Milk	4%	2309	Preparations Used in Animal Feeding	3%	0206	Edible Offal, Bovine, Swine, Sheep, Goat, Horse	4%
10	0401	Milk and Cream, Not Concentrated or Sweetened	3%	0202	Meat of Bovine Animals, Frozen	3%	0405	Butter and Other Fats and Oils Derived from Milk	4%
Total			**66%**			**70%**			**64%**

Source: Authors' analysis of CSO export data.

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