

The Changing Nature of Irish Exports: Context, Causes and Consequences

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Abstract

Since the beginning of the century there have been some notable structural shifts in the composition of Irish exports: services exports have become more prevalent; the export basket has become more concentrated; and the importance of trade in intermediate goods and services has risen. At the same time there is the continuing and relatively large role of foreign-owned and export-oriented multi-national enterprises in Ireland, and some evidence of changes in the dynamics of international trade globally in recent years. These shifts pose challenges for our understanding of how Irish export growth responds to changes in demand in our main trading partners, as well as the ultimate benefit of that export growth in terms of national income. Drawing on a number of relevant data sources, this Article explores these issues in more detail, highlighting the increasing complexity of analysing the prospects and benefits of external trade in the Irish case.

¹ Irish Economic Analysis Division, Central Bank of Ireland. The views expressed in this Article are those of the authors only and do not necessarily reflect the views of the Central Bank of Ireland or the ESCB. We are grateful to Diarmaid Addison-Smyth, John Flynn and Reamonn Lydon for helpful comments on previous drafts of the Article.

1. Introduction

Ireland's relatively high level of openness to international trade means that developments in external demand and export growth are crucial for our projections of the Irish economy. Sustained export growth, mostly in tandem with significant reliance on foreign direct investment, has been a feature of most sustainable economic recoveries in the history of the State, and in particular the rapid growth seen in the 1990s.

While maintaining relative price competitiveness can help maximise export growth arising from demand in Ireland's main trading partners (United Kingdom, United States and the euro area), there are other global and domestic structural issues which are of relevance. These include the import content of final demand in our trading partners, the product mix of that import demand, how the Irish export basket of goods and services matches that import demand and the growth in national income that ultimately accrues from Irish exports. Alongside these are the trends towards fragmentation in the production of final goods and services across borders, or the rise of global value chains (GVCs) which as we discuss in detail below have particular relevance for the Irish economy.

All of these factors appear to have undergone some change over the past decade. In this Article we examine these changes in more detail and draw out the implications for our understanding of how Ireland's international trade is currently responding, and potentially will respond to anticipated changes in the global economy. Given the particular structure of Irish exporting industries and the relative position of Ireland in GVCs, these changes may have implications for the ultimate benefit of export growth in terms of national income. As we note below, robust growth in exports may overstate the ultimate benefit without considering the role of imported intermediate consumption. To identify these implications we analyse CSO National Accounts data as well

as an internationally comparable dataset on trade in value added compiled by the OECD.

The remainder of this Article is organised as follows: section 2 summarises the main developments in the composition of Irish exports between goods and services over time and compares this with developments in import demand in our main trading partners; section 3 examines the responsiveness and intensity of imports to income growth globally and in our main trading partners, how this has changed through time and the potential implications for Irish exports given the compositional changes discussed in section 2; section 4 highlights the role of global value chains in explaining some of the structural changes in global trade intensity in recent years; section 5 looks at the importance of GVCs in the Irish context, and one element of it in particular, namely contract manufacturing; section 6 examines the implications of Ireland's participation in GVCs in terms of the ultimate benefit to national income that Ireland accrues for being highly open to trade and a hub for foreign direct investment; and section 7 concludes.

2. The composition of exports

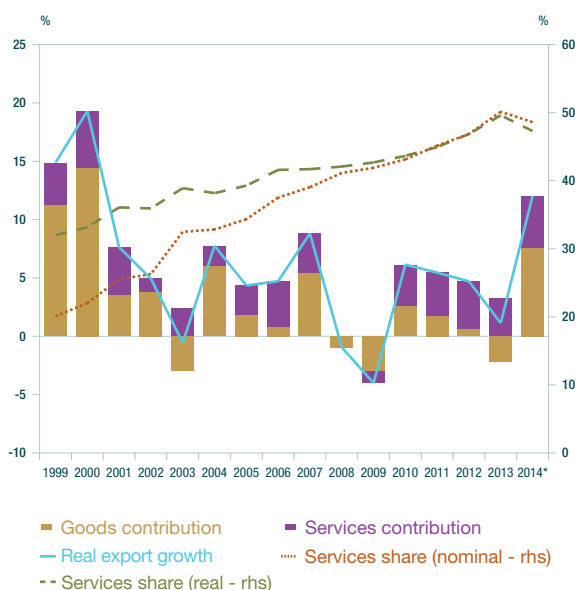
The period of strong export growth which epitomised the decade up to 2001 established Ireland's position as one of the most open economies in the world.² Double-digit rates of export growth at the start of this century soon gave way to more moderate increases over the period 2002-2007, as the relative competitiveness position of the economy was eroded during the credit-fuelled construction boom (Figure 1).³ The collapse in global demand during the onset of the Great Recession (2008-2009) contributed to the contraction in exports for those years.

Two notable features of exports, while in part evident in earlier years, since 2010 developments have been the relative persistence and importance of services in driving overall export growth, and the relative volatility in goods export growth (Figure 1). Understanding both of these developments is

² By 2000, the average of exports and imports as a percentage of GDP in Ireland was 91.4 per cent, with the equivalent measure for the OECD being 42.4 per cent.

³ Some decline in competitiveness was probably to be expected at this juncture as Ireland was considered to be "super-competitive" at the time. For a more detailed discussion of this development see Cassidy and O'Brien (2005) and (2007) and Fitz Gerald (2012).

Figure 1: Real export growth with goods and services contributions



Source: CSO and authors' calculations.

Note: *2014 figure covers the first three quarters of the year with comparison to the same period in 2013.

important in evaluating how the Irish economy now responds to growth in global demand.

Services now account for approximately half of total Irish exports, and the shift to services has been more rapid in Ireland than for global services trade as a whole (Table 1). In nominal terms, services accounted for 20.7 per cent of global exports in 2000, rising to just 21.2 per cent in 2013 (the latest available comparable data). The equivalent change from an Irish perspective was from 22 per cent in 2000 to 50.1 per cent in 2012. At the same time, Ireland's export market share as a percentage of total global exports has declined from 1.2 to 1 per cent over the period. This has masked significant differences across goods and services, with the goods export market share falling from 1.2 to 0.6 per cent and the services share rising from 1.1 to 2.6 per cent.

Large changes in the composition of Irish exports since the start of the century reflect the emergence of pharmaceutical goods, computer and information services and insurance and financial services as major contributors, at

the expense of office machinery and other electrical goods (mostly computer hardware). These compositional shifts in Irish exports are proportionately larger than changes in the composition of global exports, and are also typically larger than the change in the composition of imports in our main trading partners between 2000 and 2013 (Table 1). For example, the share of chemicals and pharmaceuticals in total Irish goods exports rose by a factor of 1.7 over the period, whereas the increase in the share of these goods in the imports of our main trading partners was proportionately lower at approximately 1.3 times. On the services side, the relative importance of computer and information services in Irish services exports has always been higher than the respective import content in the euro area, UK and the US.

In contrast to their rising share in Ireland's exports, the relative importance of services in total imports of Ireland's main trading partners has not increased to the same proportion since 2000. All of these factors imply that, to date, the shift to services exports in Ireland has not been driven by a significant shift in the import composition of our main trading partners brought about by changing preferences or technologies.

At the same time there has been an increasing concentration in both Irish goods and services exports, in contrast to the global trend (normalised Herfindahl Hirschmann Index (HHI) concentration in Table 1). On the services side this is due to higher shares for computer and information activities as well as business services.⁴ Both of these have some relevance for the increasing concentration that is also seen in goods exports. The latter is due to the fall in office machinery and electrical goods exports, mostly computer hardware, while pharmaceutical exports became the main driver of overall goods export growth. However in many cases, firms which had been engaged in computer hardware production, which were predominantly foreign-owned, have continued their presence in Ireland providing services to both other parts of their organisation and to final customers.⁵

⁴ Business services is a wide category which would include, among others, the exports of sectors such as professional scientific and technical activities and administrative and support service activities.

⁵ See Barry and Van Egeraat (2008).

Table 1: Share of nominal exports (World and Ireland) and imports (euro area, UK, US)

	Exports				Imports					
	2000		2013		2000			2013		
	World	Ireland	World	Ireland	euro area	UK	US	euro area	UK	US
Goods*	79.3	78.0	78.8	49.9	77.7	76.7	85.0	75.7	76.7	83.1
<i>of which:</i>										
Agricultural and food	9.0	9.21	9.9	12.3	10.4	9.8	5.7	11.4	11.4	6.5
Chemicals and pharmaceuticals	9.6	34.5	11.4	59.0	11.4	9.7	6.3	14.6	12.1	8.9
Office machinery and electrical	15.8	34.5	9.9	6.5	12.5	18.4	17.9	7.3	9.2	13.7
Other	65.5	21.9	68.8	22.2	65.6	62.1	70.1	66.6	67.3	70.8
Goods HHI concentration**	0.19	0.10	0.16	0.29						
Services*	20.7	22.0	21.2	50.1	22.3	23.3	15.0	24.3	23.3	16.9
<i>of which:</i>										
Computer and information	5.3	34.5	8.6	41.7	4.9	4.1	5.5	5.6	7.5	7.6
Insurance and other financial	8.2	19.0	9.3	16.7	6.6	5.3	10.1	1.2	9.2	15.0
Business services	21.4	17.9	26.4	28.6	7.0	16.8	11.1	7.3	25.3	20.4
Other	65.1	28.7	55.7	13.0	81.5	73.8	73.2	85.9	58.0	57.0
Services HHI concentration**	0.22	0.09	0.15	0.15						

Source: CSO, OECD and World Trade Organisation.

* National Accounts basis

** Merchandise trade (goods) and balance of payments basis (services). HHI calculation covers more categories than presented in the table.

Also the attraction of foreign direct investment (FDI) in the software and business services sectors has been perhaps one of the more successful in terms of spill-overs to domestic activity.⁶ According to data in the Annual Services Inquiry (CSO), the export intensity (exports as a share of turnover) for Irish firms in business service activities was as high as that reported for foreign-owned firms. It is likely that this relates to an increasing tendency for Irish operations to provide administration and support services to affiliates in other countries in various sectors as part of the process of bringing final goods and services through increasingly fragmented stages of production.

We discuss the relevance and implications of Irish entities being part of cross-border production chains in Sections 4 and 5. A key question is the extent to which the shift to

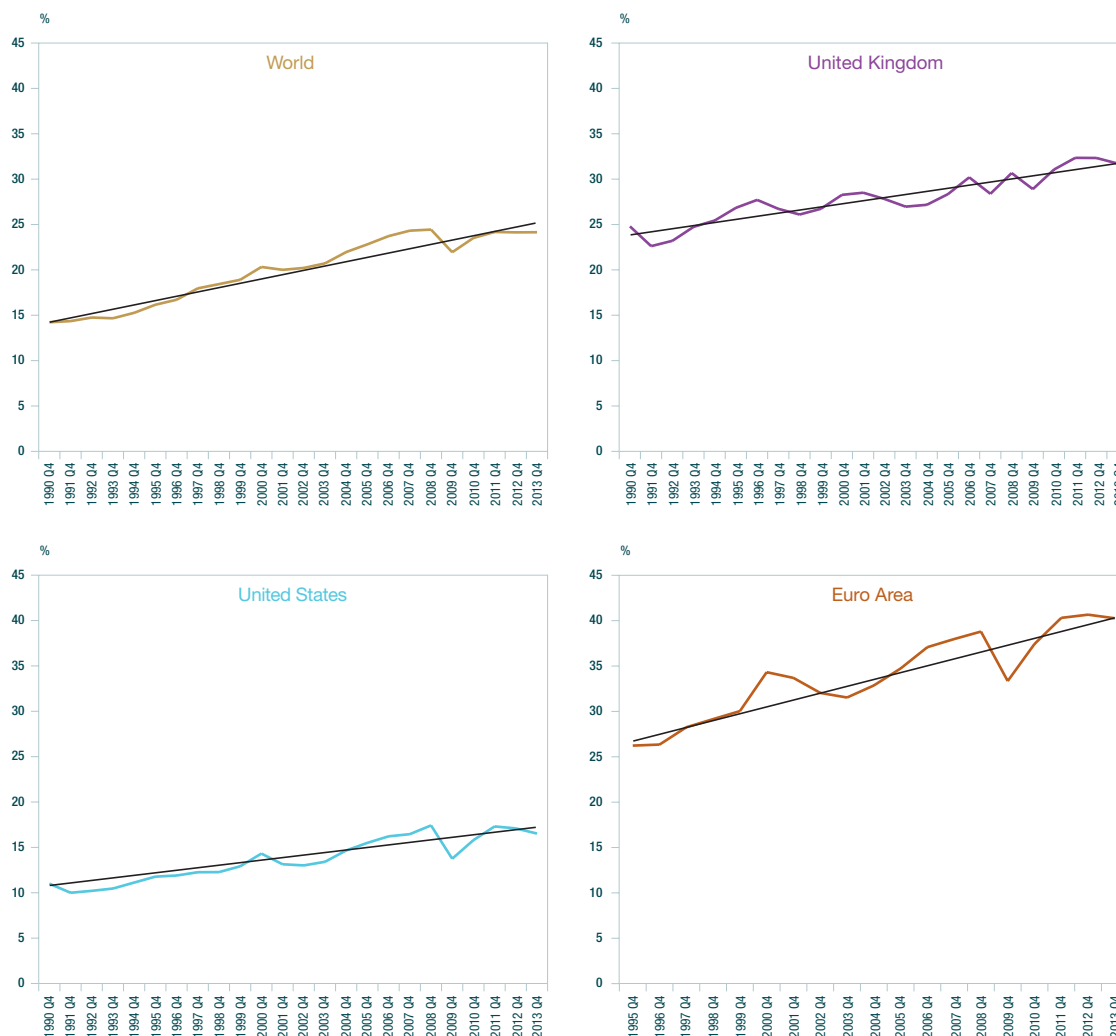
services, and the increasing specialisation and participation in global value chains of Irish exports could affect the relationship between export growth and other outcomes of interest, such as employment and national income growth. The compositional shift in exports also suggests that the response of exports to changes in demand in our main trading partners may be undergoing some adjustment. This is coming at the same time as there are suggestions that trade globally has gone through some structural shift following the Great Recession. We expand on these issues in Section 3.

3. Import elasticity in Ireland's main trading partners

In order to understand how Irish exports are responding to changes in global demand

⁶ See Barry (2004) for an overview of Ireland's experience of FDI and Barry (2008) for a discussion on the emergence of an indigenous software service sector in part due to spill-overs from FDI.

Figure 2: Import Intensity



Source: OECD and authors' calculations.

for Irish goods and services, it is useful to highlight the main factors driving that global demand in the context of overall trends in international trade. During the global financial crisis of 2008-09 international trade contracted approximately 16 times more than global GDP (as a proxy for income).⁷ Despite a rebound in 2010, international trade has in more recent years grown slower than, or on a par with, global GDP. This is contrary to trends since the 1960's in which trade has typically grown at twice the rate of global GDP. The import intensity of global GDP growth since 2009 has been below trend (Figure 2). A number of hypotheses have been put forward for

the recent sluggish response of international trade, focusing on whether it is merely cyclical in nature or have the characteristics of the Great Recession led to a fundamentally lower elasticity of trade to GDP growth.⁸

On the cyclical side it has been noted that the relatively more import intensive components of GDP, namely investment and exports, have been particularly badly hit in many countries during the crisis and are recovering slowly compared with personal and government consumption. As a consequence with a recovery of investment in particular, the

⁷ Global trade contracted by 10.5 per cent in 2009, whereas global GDP fell by 0.6 per cent (OECD). For a detailed examination of the issues see Baldwin (2009).

⁸ See, for example, Bussière et al (2013), and OECD (2014).

responsiveness of international trade to global GDP growth should revert towards its historical average. More fundamentally the responsiveness of international trade to global GDP was higher than historical averages in the decade prior to the Great Recession and the factors underpinning this performance may no longer hold to the same degree. The rapid convergence of certain emerging market economies over the period prior to the crisis is unlikely to re-occur, for example. Protectionism is marginally higher in the major economies than prior to the crisis and the rapid increase in global value chains in final goods and services production in the years prior to the crisis may now ease.⁹ Finally, increased financing constraints may not have just altered the capital stock level during the crisis but also contributed to a lower investment rate in the recovery and beyond.

It is likely that at a global level the medium term elasticity of trade to GDP growth will be lower than that seen through to the 2000s. These global trends also appear relevant in the responsiveness of imports to GDP growth in Ireland's main trading partners the United States, the United Kingdom and the euro area, but probably to a lesser extent. The import intensity of recent GDP growth in these trading partners has not fallen as much below trend as that for the world as a whole (Figure 2). This is due to the particular contraction in trade for emerging market economies in recent years.

However some changes in the import response to GDP growth in our main trading partners is evident. In Figure 3, a simple long-run elasticity of annual import growth to annual GDP growth is presented, along with this elasticity estimated over a five year rolling window and the estimate from the last four quarters of National Accounts for each of these markets.¹⁰ The long-run elasticity ranges from 1.8 (UK) to 2.6 (euro area). In all three instances, the rolling 5 year estimates are above the long run averages in most recent years, which is due to the relatively large fall in imports when GDP contracted in

2009. As the impact of that year falls out of the rolling estimate, the 5-year average has now begun to turn lower. Similarly the most recent point estimate of the elasticity (shown by the dots in the chart) is significantly below the long-run value, indicating that the import response to GDP growth in Ireland's main trading partners may be lower over the medium term than in the years preceding the crisis.

Clear differences are also evident in the responsiveness of goods and services imports to GDP growth in the UK, US and euro area. The services import elasticity is lower than that of goods in all three markets at between 0.8 and 1.6 compared to 1.9 to 2.9 for goods. The services import elasticity has generally been declining on a 5 year rolling average basis since 2008, and the most recent point estimates suggest that this decline will continue over the medium term.

Putting together the compositional shift to services exports for Ireland, the fact that this has not been accompanied by major changes in the import composition of our main trading partners and the typically lower response of services imports to GDP growth in the UK, US and euro area, it is reasonable to expect that the response of Irish exports to rising global demand may be lower in the coming years than had previously been the case.

However most recent data for 2014, with export growth estimated at 10.7 per cent – a multiple of weighted import growth in our main trading partners – would contradict this expectation. The increased concentration of Irish exports by product, and in particular their role at various stages of the production chain for final goods and services, may be lending itself to a more acyclical, but no less volatile response to changes in demand. Understanding the importance of global value chains in cross-border trade and Ireland's role in these GVCs is therefore important in evaluating the potential response of Irish exports to global demand.

⁹ OECD/WTO/UNCTAD (2013a) and (2013b).

¹⁰ The import elasticity is estimated by regressing the annual difference in real imports (expressed in logs) on the annual difference in real GDP (expressed in logs). The long-run estimate is based on all available quarterly data from the Bureau of Economic Analysis, the Office for National Statistics and Eurostat for the US (1947q1-2014q3), UK (1955q1-2014q3) and euro area (1995q1-2014q3), respectively.

Figure 3: Elasticity of imports to GDP growth, rolling 5-year estimates, long run averages (---) and most recent annual out-turn (◆)



Source: Authors' calculations.

4. The role of global value chains in international trade

Increasingly, many of the goods and services we consume are comprised of inputs from different countries, even when produced within the same firm. Attempts by large global goods and services producers to optimise production has given rise to growth in cross-border production processes and the dispersion across countries of value chain activities, such as design, research and development,

production, distribution etc. The development of these Global Value Chains has become an increasingly important feature of global trade.

Global Value Chains describe the array of activities that bring a product from concept to consumer. Globally, more than half of world manufactured imports are intermediate goods – raw materials or part-finished goods. Trade theory primarily focuses on countries' comparative advantage in particular goods and services. Within the GVC framework, however,

Box A: The OECD Trade in Value Added Data

To illustrate the concepts underlying the TiVa database, it is useful to consider a simple example: a car which may be exported by a company in Germany, is made up of constituent parts that may be imported from other countries such as wheels, seats, and seatbelts. In turn, companies who produce these parts may also import parts from third countries such as rubber, and various metals.

In a model of S sectors and N countries, where $N=1\dots i$, assume the gross value of the output exported in sector S in country i is $y_i(s)$ ¹¹. Let the value of final goods from sector S in country i exported to destination j be $C_{ij}(s)$ and the quantity of intermediates from sector S in country i used to produce output in sector t in country j be $M_{ij}(s,t)$, such that:

$$y_i(s) = \sum_j C_{ij}(s) + \sum_j \sum_s M_{ij}(s,t)$$

On the input side

$$y_i(s) = \sum_s D_{is} + \sum_j \sum_s I_{ij} + \sum_t D_{it} + \sum_j \sum_t I_{ij}$$

Where D_{is} is domestic value added in sector S exports, I_{ij} is the use of sector s inputs from country j used in producing sector S exports in country i , D_{it} is the domestic value added input from sector t , where $t \neq s$, in sector S exports, and the final term denotes the use of sector t goods and services as intermediate inputs imported from country j . In the context of our intuitive example, we could see this as being the quantity of plastic (t) imported by Germany (i) from China (j) used in the production of cars (s).

Combining the $y_i(s)$ identities, the difference between gross exports and the domestic value added is the use of imported inputs during production:

$$\sum_s D_{is} + \sum_t D_{it} = \sum_j C_{ij}(s) + \sum_j \sum_s m_{ij}(s,t) - \sum_j \sum_s I_{ij} - \sum_j \sum_t I_{ij}$$

Aggregating at the country level, the net domestic value added of gross exports is:

$$\sum_s \sum_t D_i = \sum_j \sum_s y_i - \sum_t \sum_s \sum_j I_i$$

Given this framework, we use two TiVa measures in our analysis. Domestic Value Added Embodied in Gross Exports and the Participation Index. The former describes the value added in the domestic economy for a given amount of exports ($\sum_s \sum_t D_i / \sum_j \sum_s Y_i$). The lower this ratio, the more important foreign imports are as an input to producing the goods and services that a country exports. The participation indices measure a country's relative participation in global value chains. A country can participate backwards, that is, utilise imports in the production of its exports ($\sum_t \sum_s \sum_j I_i / \sum_j \sum_s Y_i$); and forwards, produce exports that are used as inputs in the exports of a third country ($\sum_j \sum_s Y_i / \sum_t \sum_s \sum_j I_i / \sum_i \sum_s Y_i$).

¹¹ A more detailed mathematical derivation of a multi-country, multi-sector model is available in Johnson & Noguera (2012).

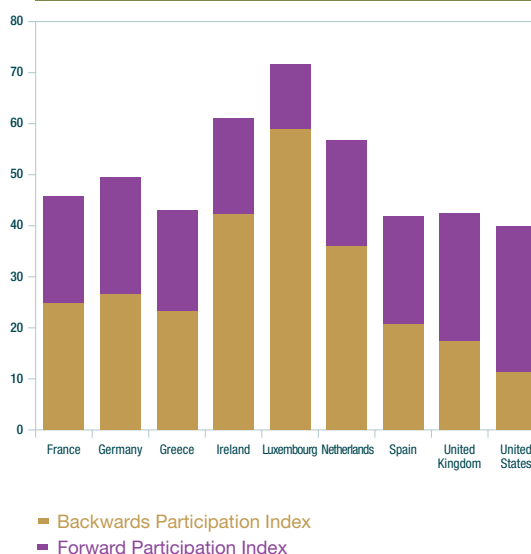
countries can be specialists in creating a component that is just part of the product that will eventually reach the hands of the end user, or provide the necessary administrative services to coordinate the production of that final good or service. This is likely to be even more prevalent for countries, such as Ireland which have a large foreign owned multinational sector.

Each stage of production can add markedly different amounts of Value add many sectors, such as information and communication technology (ICT) and pharmaceuticals. Often a large portion of the value added derives from intellectual property. An excellent example of this can be found in the declaration printed on Apple hardware that the product was “Designed by Apple in California – Assembled in China”¹², which - though more descriptive than many labels - merely reflects the beginning and end of the process. The reality of modern production is that goods and services are usually made up of inputs from many countries. Conventional national accounts trade data measure the gross value of goods and services at each transaction between countries, rather than the value that is added by the particular stage of production undertaken in a particular country. This tends to overstate the aggregate value of international trade, as well as the actual value added in particular countries (Koopman et al, 2008). As GVCs have become more prevalent, this overstatement has also risen and has implications for the relationship between the growth in trade and second round domestic economic outcomes, such as employment and national income growth.

Given these issues, it is informative to use measures of value added that take account of the fragmentation in production of final goods and services across borders. The OECD provides an alternative to conventional trade data in the Trade in Value Added (TiVa) database to allow for such analysis (see Box A).

Johnson and Nogeura (2012) illustrate that richer countries tend to have a lower value added to export ratio mainly as a result of the

Figure 4: Global Value Chain Participation Index – 2009



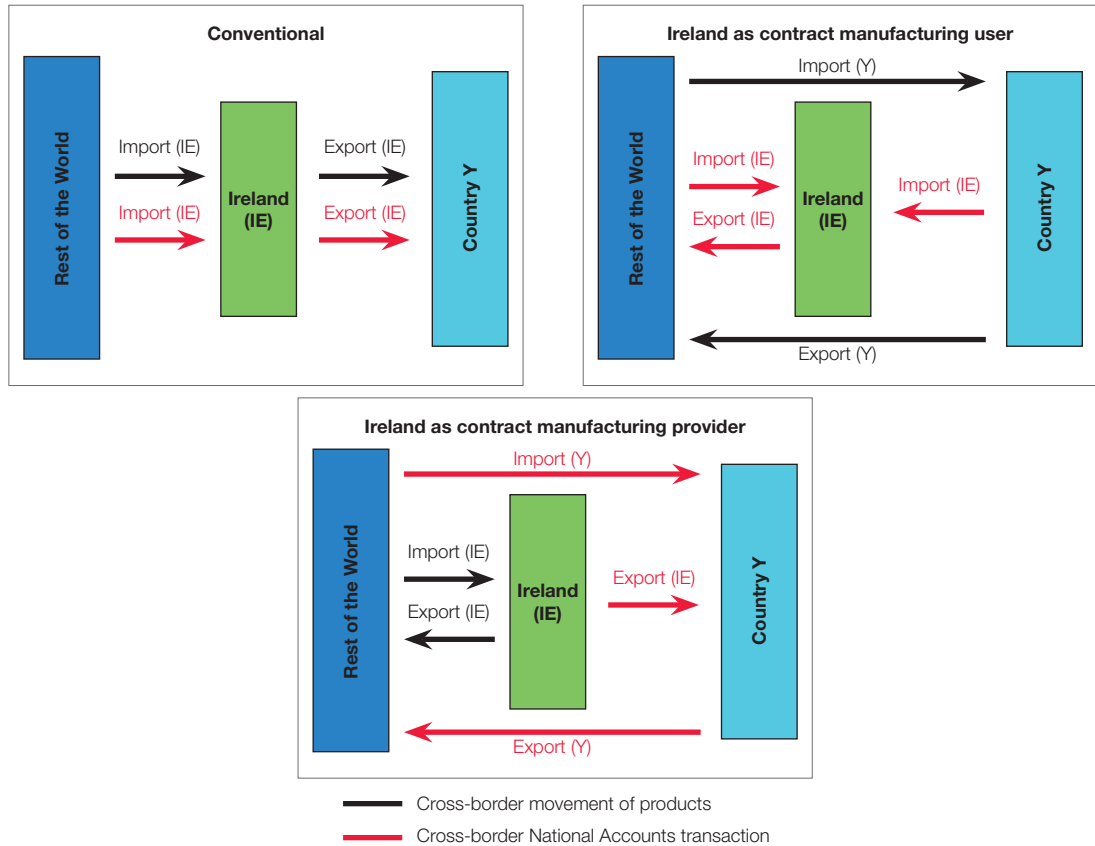
Source: OECD and authors' calculations.

content of their export basket being made up of more goods and services with fragmented value chains. As such, the important issue is a country's participation and relative position in Global Value Chains. In this regard Backer and Miroudot (2013) propose measures of the use of foreign inputs in exports (backwards participation) and the use of a country's exports in another country's exports (forward participation). This data has important uses for policymakers when assessing the responsiveness of a country's exports to world demand and the ultimate benefit in national income accrued to the country for engaging in international trade.

Trade in Value Added (TiVa) describes the statistical methodology used to estimate the sources of value added by country and industry in the production of goods and services for export and import. It includes a set of indicators which, taken together, can be used to derive a clearer picture of the production of a good or service, such as the value added to a good or service export domestically (i.e. excluding foreign imported inputs), and the extent of intermediate exports used in other countries' production and export processes.

¹² Dedrick et al (2012) show that only 10 per cent of the factory gate price of an iPod contributed to Chinese value added – the bulk of the components being imported from Japan.

Figure 5: Cross-border National Accounts transaction



The cornerstone of the TiVa methodology is a full set of cross-country input-output tables covering a number of sectors. These capture the bilateral exchanges between countries of intermediate goods and services that are used in production to meet final demand of a given country (including its exports), as well as the cross-border trade in goods and services for final consumption.

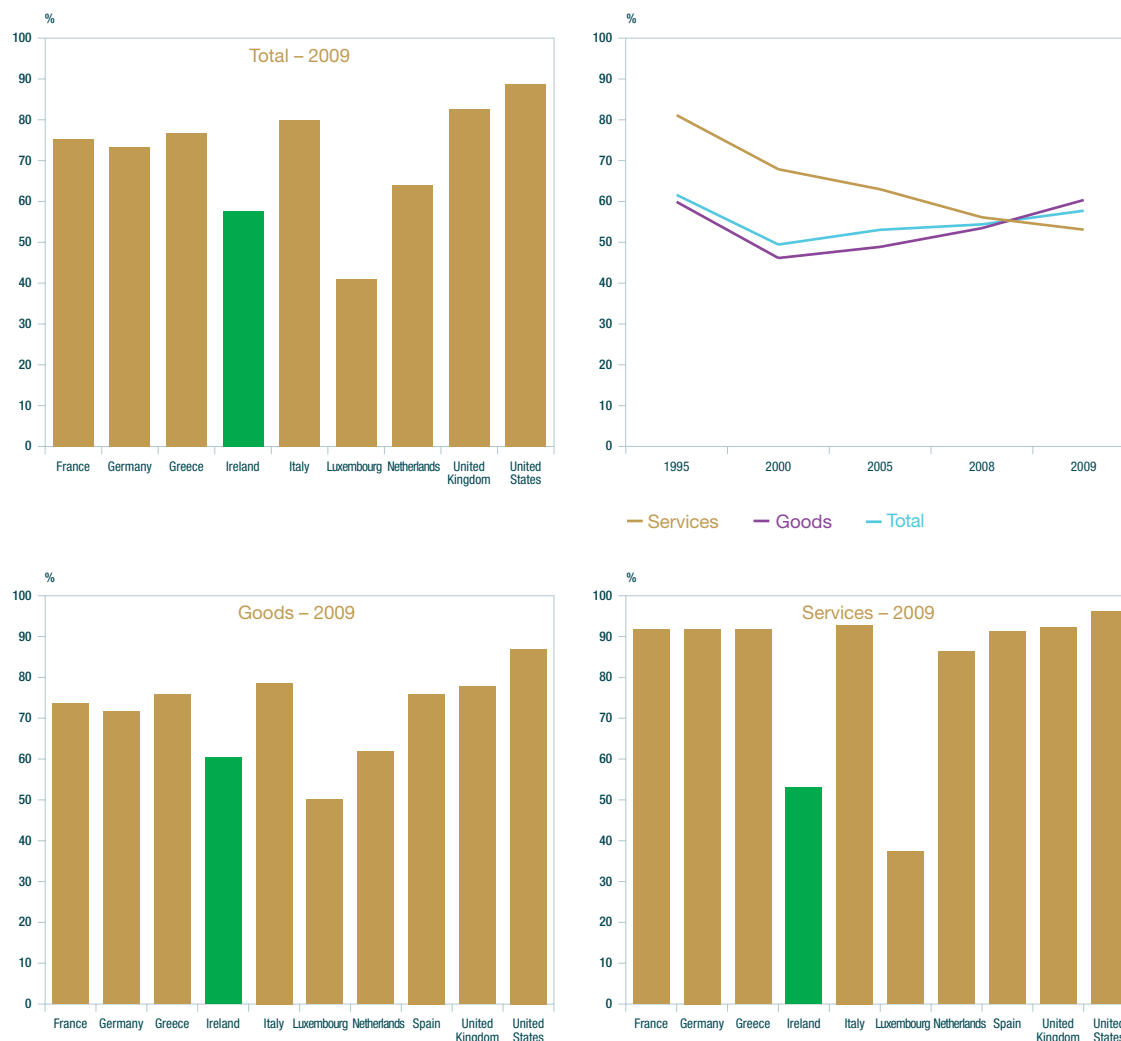
5. Irish participation in global value chains

We use the TiVa Participation index in order to assess the extent of Ireland’s involvement in GVCs. This is illustrated in Figure 4, which shows that Ireland has a high level of participation both forward and backwards. This means that we import intermediates for use in producing our own exports (backwards) but also export intermediates for use in a third country’s respective export basket. Looking more closely, relative to a selection of other OECD countries, Ireland has very high degree of participation in GVCs, with just over 40 per cent of our exports

in 2009 utilising contributions from foreign industries. Meanwhile as a proportion of our total participation in GVCs our forward participation was relatively low. This is in contrast to countries such as the US and UK which had lower levels of participation in GVCs as a proportion of their total export bundle. Moreover their participation is largely characterised by forward participation. Ireland’s high degree of participation would suggest a lower level of domestic value added content embodied in our gross exports, an idea that is explored in greater detail in the next section.

One feature of international trade that is in part reflected in the participation index is contract manufacturing. This phenomenon is where goods are produced on behalf of a foreign entity which retains ownership of the inputs to the production until the product is finally sold to the final customer. Due to the concept of economic ownership which prevails in international standards for National Accounts this can lead to the inclusion of a significant amount of trade in National Accounts which are not included in trade data

Figure 6: Domestic Value Added, Goods and Services Breakdown



Source: OECD and authors' calculations.

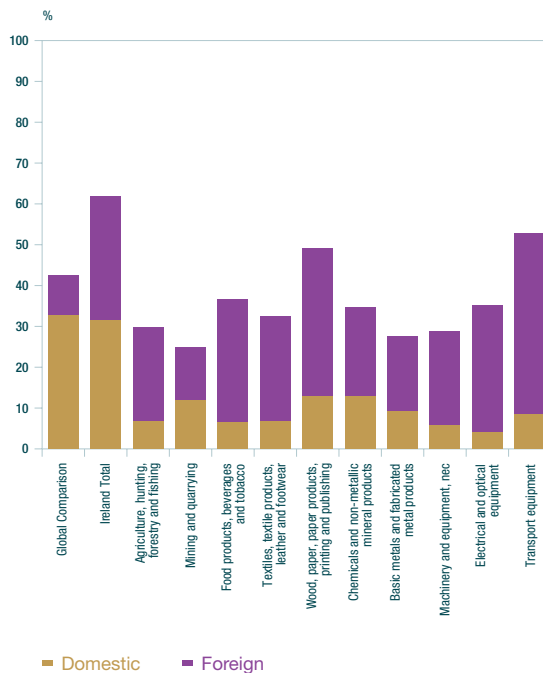
based on customs information of physical goods crossing borders. Figure 5 illustrates the process at a high level for Ireland, in contrast to conventional trade flows.

In the conventional case, the inputs to production of Irish exports to country Y are imported into Ireland from the rest of the world. In the second case, where Ireland is a contract manufacturing user, the Irish entity hires a firm in country Y to combine the various inputs in the production process of a good for export back to the rest of the world. While none of the inputs crosses the Irish border, they are still reflected as imports in the Irish National Accounts as the Irish entity retains economic ownership of them until the final product is sold. The export of the final product is also

included in the Irish National Accounts for the same reason. However, there is now a further import for Ireland, namely the contract manufacturing service provided by the entity in country Y. In the third case an entity in country Y hires a firm in Ireland to manufacture a product for export on their behalf. In this case Ireland exports the contract manufacturing service to country Y.

The dominant feature of export growth in 2014 was Ireland emerging as a net contract manufacturing user, with export growth outstripping conventional benchmarks of world demand and higher frequency indicators based on customs data. While a complete set of input-output tables to enable an update of the participation index for 2014 will not be

Figure 7: Services Share of goods, exports, as percentage of gross exports, 2009



Source: OECD and authors' calculations.

available for a number of years, it is likely that this would have increased Ireland's backward GVC participation. This is due to the fact that the service import content of gross exports would be higher. There will also be implications in terms of the actual benefit accruing to Ireland from its export activity, as there will be no direct employment growth as a result of this higher export growth driven by contract manufacturing. Overall, Ireland's participation in GVCs leads to a complex interpretation of the outlook for export growth in terms of prospects for demand in our main trading partners, as well as understanding the ultimate benefit of that export growth to Ireland.

6. The implications of Irish participation in GVCs

The main implication of the high level of GVC participation in Ireland is the actual value added by firms in Ireland during the production process for final goods and services. Using the OECD TiVa data, we derive the percentage of domestic value added in total gross exports

in Ireland. This is illustrated in Figure 6. As a consequence of the relatively high backwards GVC participation noted above, Ireland's domestic value added to export ratio is lower than most other countries. Indeed, reflecting the changed structure of the export activity of a number of Irish multinationals noted in this article, the domestic value added embodied in gross exports of services has fallen by a significant magnitude between 1995 and 2009.

It must be noted that these developments in domestic value added services exports happened at a time of robust growth in the gross volume of services exports. As a consequence, the overall contribution of that export growth to national income growth continued to be significant, but to a lesser extent at the margin.

Disaggregating total exports into goods and services, Figure 6 shows that the domestic value added content of gross exports in Ireland is among the lowest in a selected group of our trading partners, with this disparity being most prevalent in the services sector. Within the services sector itself there is evidence of a downward trend in the value added ratio in Ireland, falling from 81 per cent in 1995 to 53 per cent in 2009. This is due to the large portion of Irish services exports in software and other ICT whose underlying intellectual property are held outside Ireland and are necessary to import through royalties, licences and research and development. Indeed this tendency for a relatively low domestic value added for service exports is more pronounced in those sectors which tend to be foreign dominated, highlighting the role of FDI.

Although the domestic value added in Ireland's goods exports has risen somewhat in recent years, compared to other countries it remains relatively low (Figure 6). Again, this is most prevalent for sectors which have both a high FDI component and significant reliance on foreign owned intellectual property, such as pharmaceuticals. Conventional trade data do not take into account the value added by services generally in the production of goods. Figure 7 illustrates that the services

Table 2: Total output, intermediate consumption, gross value added and exports by sector, 2011, €million

	Domestic dominated	Foreign dominated*	Whole economy
Gross output	234,892	98,134	333,026
Intermediate consumption	115,193	59,988	175,181
Imports	52,498	49,219	101,717
Gross value added	119,699	38,146	157,845
Compensation of employees	62,512	7,564	70,076
Gross operating surplus	57,720	30,346	88,066
Net taxes on production	-533	236	-297
Exports (product basis)	85,671	81,415	167,086

Source: Authors calculations based on CSO data from National Income and Expenditure Accounts and Supply and Use and Input-Output Tables.

*Foreign dominated sectors match as close as possible those identified in Table 3 of the CSO release on Gross Value Added for Foreign-owned Multinational Enterprises and Other Sectors Annual Results 2013. Sectors included as foreign dominated in this table are (with respective NACE Rev.2 codes) Printing and reproduction of recorded media (18), Petroleum and chemical products (19, 20), Basic pharmaceutical products and preparations (21), Computer, electronic and optical products (26), Electrical equipment (27), Publishing activities (58), Audiovisual and broadcasting services (59, 60), Telecommunications (61), Computer programming, consultancy and information service activities (62, 63).

sector contributed just over 40 per cent of the value added in goods exports globally in 2009. In Ireland this figure was over 60 per cent. Globally, approximately three-quarters of this value added derived from domestic services whereas in Ireland this is only half. Within Ireland, foreign-dominated sectors are characterised by a high level of foreign services contribution to their goods exports – reflecting issues such as royalties and patents as well as other factors.

Using CSO data for 2011 it is possible to highlight the role of foreign ownership in more detail (Table 2). Gross output is the value of all goods and services produced. In order to get an estimate of gross value added (GVA) it is necessary to remove those goods and services which are used in the production process (intermediate consumption), which includes imports used. Comparing domestic and foreign dominated sectors it can be seen that intermediate consumption, and in particular imported intermediates are a higher proportion of gross output for foreign dominated sectors (61 per cent and 50 per cent) than domestic dominated sectors (49 per cent and 22 per cent). As a consequence GVA is a much lower proportion of gross output for foreign

dominated sectors due to their higher reliance on imported intermediates, or alternatively their higher backward participation in GVCs.

A further disaggregation of GVA in Table 2 shows the impact of the higher labour intensity of domestic dominated sectors, with most GVA being accounted for by employee compensation. This is in contrast to the foreign dominated sectors, where the bulk of GVA relates to the gross operating surplus, in essence the income which accrues to the owners of the capital in the sector which ultimately flow out in profit repatriation. While the total value of exports from both domestic and foreign dominated sectors is similar, the share of the ultimate income that accrues to Ireland is much smaller in aggregate due to the high level of imported intermediates and the relatively high returns to capital of foreign dominated sectors.

7. Conclusions

As a small open economy, sustainable increases in Irish standards of living are driven by steady export growth. Given the structural changes evident in global trade, in our main trading partners and particularly in the composition

of Irish exports over the past decade, our understanding of the channels through which export growth is determined is also changing. This comes at a time of increasing specialisation for Irish exports, as well as a higher tendency for those exports to be part of wider global value chains for final goods and services. The related high share of foreign owned-multinationals involved in export activity in Ireland also has implications for the ultimate benefit in terms of national income from our relative openness to international trade.

Arising from these structural changes is a great deal of uncertainty around future drivers and prospects for export growth, as well as the role of exports in contributing to wider increases in Irish standards of living. If current and future export growth has differential drivers versus the past, then the channels through which this growth affects the domestic economy will also be different. Having highlighted these issues however, further examining them in a more analytical framework is a next step in re-appraising our understanding of how Irish exports respond to changes in world demand and the role of exports in generating national income

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