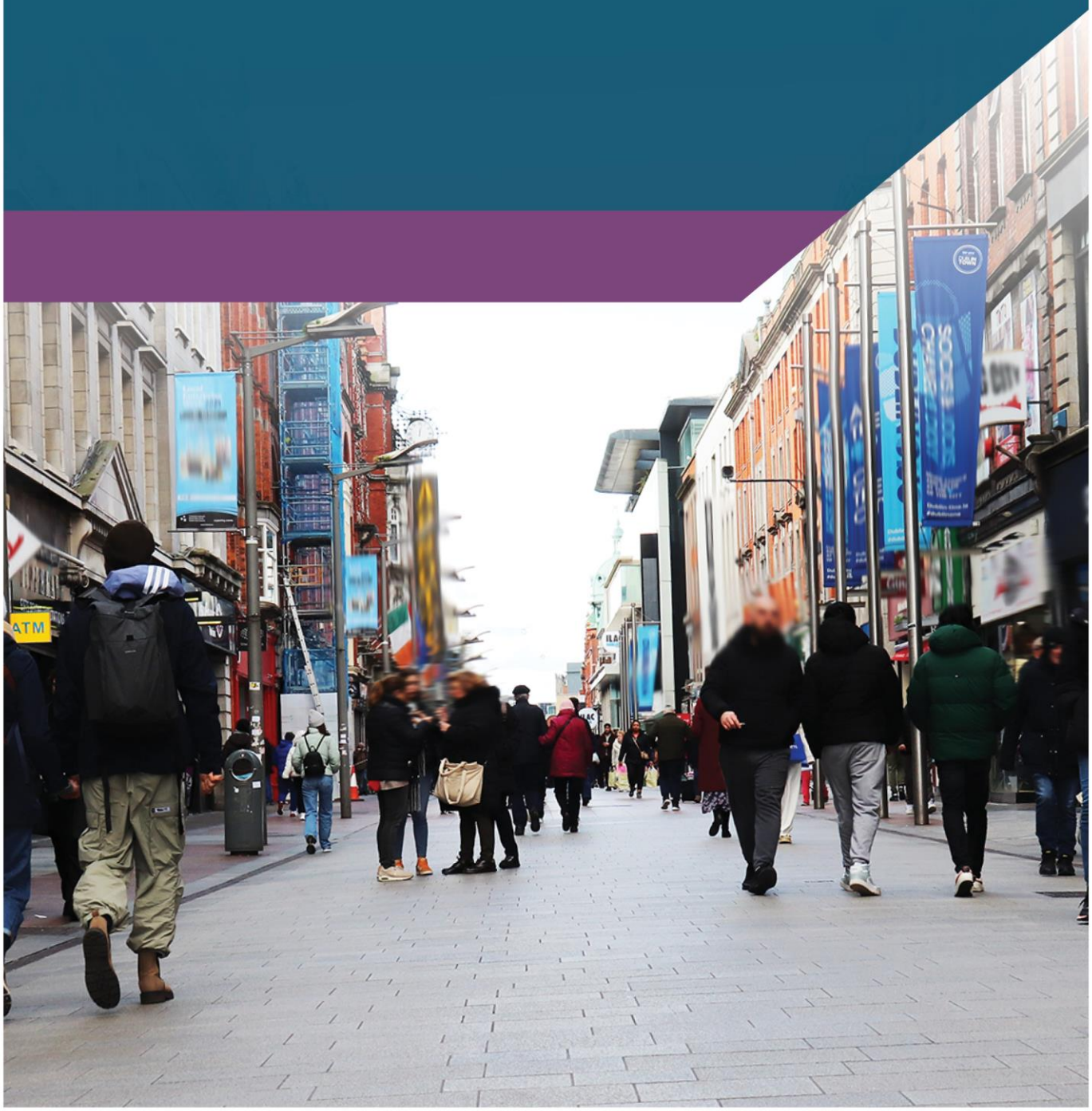
Banc Ceannais na hÉireann
Central Bank of Ireland
Eurosystem

Signed Article

Vol. 2025 No. 3



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[1] A Central Bank of Ireland *Signed Article* produced by the Central Bank's Firms and Productivity Working Group. Corresponding authors: Cian Ruane and Fergal McCann. Contributing authors: Katie Bourke, James Carroll, Wendy Disch, Matija Lozej, Elizaveta Lukmanova, Boryana Madzharova, Michael Mahony, Paraic O'Gorman and Michael O'Grady. Special thanks to Prof. Xiao Ma and Prof. Natalia Ramondo for helpful discussions and contributing a Box based on the model in Garetto, Ma, Oldenski and Ramondo (2025). Thanks also to IDA Ireland for having shared data on inward FDI activities in Ireland. We also thank Gerard Brady, Fiona Collier, Ronald B. Davies, Doireann Fitzgerald, Martina Lawless, Shane McCullough and Alexa Toomey, for helpful discussions and comments, in addition to Thomas Conefrey, Robert Kelly, Niall McGeever and Martin O'Brien. Some results are based on analysis of strictly controlled Research Microdata Files provided by the Central Statistics Office (CSO). The CSO does not take any responsibility for the views expressed or the outputs generated from this research. The views expressed in this Article are those of the authors and do not necessarily reflect the official position of the Central Bank of Ireland or the European System of Central Banks.

Executive Summary

The international economy has been fragmenting along geopolitical lines for close to a decade, with changes in US policy posing a particular risk to Ireland. Following Brexit, the 2018 US-China trade war, and sanctions relating to Russia's invasion of Ukraine, the US administration's imposition of the highest tariff levels in almost 100 years is the most recent example of the process of "geoeconomic fragmentation". Ireland's strong trade and FDI linkages with the US make it uniquely exposed.

There are exposures through both the indigenous and multinational side of Ireland's globalised economy. Ireland is one of the most open economies in the EU. Foreign-owned Multinational Enterprises (MNEs) dominate headline metrics of activity, accounting for 87 per cent of exports. Moreover, these MNEs account for around 27 per cent of business employment. While not as export and import intensive as foreign MNEs, over 80 per cent of workers in Irish-owned firms in manufacturing, wholesale and retail participate in international trade.

Indigenous exporters are more likely to serve the EU and UK than the US market. In contrast to foreign-owned MNEs, two thirds of goods exports of indigenous businesses are to the UK and EU, with only 12 per cent to the USA. While not as reliant on international value chains as foreign-owned MNEs, indigenous exporters also have exposure to fragmentation through the imports of intermediate inputs.

Indigenous businesses that export to the US are among the most productive and geographically diversified Irish firms. Indigenous exporters to the US tend to be larger and pay higher wages than other exporters. Their export base is more diversified than other Irish firms, increasing their capability to adapt to the US tariff shock. Close to 10,000 workers in indigenous exporters are estimated to be directly exposed to US tariffs, when weighting by US exports as a share of total sales.

Firms were already taking steps to diversify away from the US before the July 2025 US-EU trade deal. New survey evidence shows that one third of exporters to the US sought to diversify their export markets in the last year, even before the implementation of tariffs. A majority of firms importing from the US report that they would diversify input sourcing across foreign suppliers, were reciprocal tariffs to be introduced.

MNEs are not homogenous, with many MNE workers employed in non-tradable sectors, not directly affected by US policy. Approximately half of the 623,000 workers in MNEs are estimated to be in sectors largely serving the local economy such as retail and accommodation. This type of "horizontal" FDI is relatively insensitive to US-EU tariffs.

A more material risk is the potential loss of Ireland's attractiveness for export platform FDI. Around 300,000 employees work in IDA-client MNEs using Ireland as an export platform, serving the EU as well as the US market. These firms are concentrated in sectors such as pharmaceuticals and ICT, directly exposed to tariffs and other US industrial policy choices. US-owned firms account for 70 per cent of employment in these firms and over 80 per cent of capital investment.

The substantial sunk costs of setting up a facility, together with the usage of Ireland as an export platform to the EU, make sudden MNE exits in response to current levels of US tariffs unlikely. US tariffs do not diminish Ireland's attractiveness as an export platform to the EU or other non-US destinations. The analysis in this Article also suggests that, for industries with large up-front physical capital investments (e.g. pharmaceuticals), current tariff levels in isolation are unlikely to lead to closures of existing operations in Ireland. Over the longer-term, however, a more fragmented geoeconomic order will make inward FDI harder to attract.

While the Irish economy has important direct and indirect trade exposures to US tariffs, there are opportunities as well as threats as the global economy readjusts. The effect of trade fragmentation will transmit to Ireland not only through the economy's exposure to the US but also via its impact on global economic growth more generally. Further, MNEs, particularly in pharmaceuticals and ICT, are heavily integrated into global value chains, where indirect linkages may mean that US tariffs on third countries transmit back to Irish operations. By contrast, opportunities will emerge where changing trade policy makes Irish exporters relatively more competitive.

Current US-EU tariffs are expected to moderately reduce Irish growth in the medium-to-long run, driven by activity in MNE-dominated sectors. Across two models used for this assessment, current tariffs lead to a moderate reduction over the long-term of around 1 per cent in Irish economic output relative to a no-tariff scenario. The reduction in consumption is greater at 2 per cent, with a larger impact again on investment. The aggregate effects are driven by the pharmaceuticals and chemicals sectors, and would be more severe if these sectors receive any sector-specific additional tariffs. The analysis also shows the important role that reallocation across sectors will play in the global economy absorbing and responding to these shocks.

The Irish economy enters this shock in a position of relative strength, which policymakers can harness in supporting the economy to adapt over both the short and long run. Ireland has benefitted from decades of FDI-led growth, and its interconnections with the US economy have led to greater productivity, investment and human capital. This, along with Ireland's open, flexible and skilled labour force, creates strong conditions to adapt to geoeconomic shifts. Nonetheless, a slowdown in inward FDI would reduce Ireland's long-run growth potential. Global fragmentation could affect other long-term goals, such as the transition to net zero, by restricting the supply of critical inputs.

In the short run, the most salient economic risk relates to a reduction in corporate tax receipts. Exchequer receipts could fall rapidly in an adverse scenario, both due to tariffs as well as broader shifts in the US tax or industrial policy stance. Firstly, even absent any change in MNE activity in Ireland, "excess" corporation tax receipts could unwind. Secondly, the real economic effects of US policy changes could lead to lower activity in Ireland than would otherwise be the case.

Due to risks relating to corporation tax, the tax base should be broadened to help ensure sufficient fiscal and economic headroom to respond to public infrastructure needs and any future downturns. While government capital spending is growing quickly, restraint in current expenditure and measures to broaden the tax base are paramount. These would enable a fiscal

response to larger future downturns were they to materialise, and would help ensure that the necessary rise in capital expenditure to address infrastructure gaps is sustainably accommodated.

For affected exporters, policy should focus on facilitating market expansion rather than direct fiscal support. With Irish exporters to the US among the most productive and well-diversified businesses in Ireland, they are – in aggregate - well positioned to adapt. Practical measures to facilitate adjustments and entry to new markets are preferable to direct fiscal transfers.

Longer-term economic policymaking faces a less-integrated global economy. In a less-integrated world economy, in which competition to attract FDI will become fiercer, it is imperative that Ireland remains an attractive FDI location, enabled through improvements in key infrastructure and the business environment.

Strengthening the contribution of the indigenous economy to overall growth should be facilitated by important policy steps. The Irish economy will face threats from a more fragmented world in which inward FDI may slow, as well as technological changes such as automation and AI. These structural changes will create opportunities for some sectors and challenges for others, with the ideal policy focus being on the reallocation of capital and labour to their most productive uses. Growth-oriented policy should focus on young local firms with high potential, with a particular focus on the incentives facing entrepreneurs and export expansion, given Ireland's small and open nature. The allocation of financial capital appropriate to high-growth businesses, likely requiring financing sources within and outside the banking sector, will be key.

In a less certain geoeconomic context, there may be unlocked potential benefits for Ireland within the EU. The EU gives Irish business access to the world's largest zero-tariff regime, which can support growth of new and existing local exporters. A stronger and more integrated EU-wide capital market and payments system will make it easier for Irish businesses to raise financing from a vast pool of untapped savings across Europe, and to reach new customers. Irish authorities should continue to advocate for, and play a key role in, the advancement of a stronger Single Market in Europe. This includes more integrated European financial markets through initiatives related to the Savings and Investment Union and integration of the payments system.

On the fault line? The Irish economy in a time of geoeconomic fragmentation

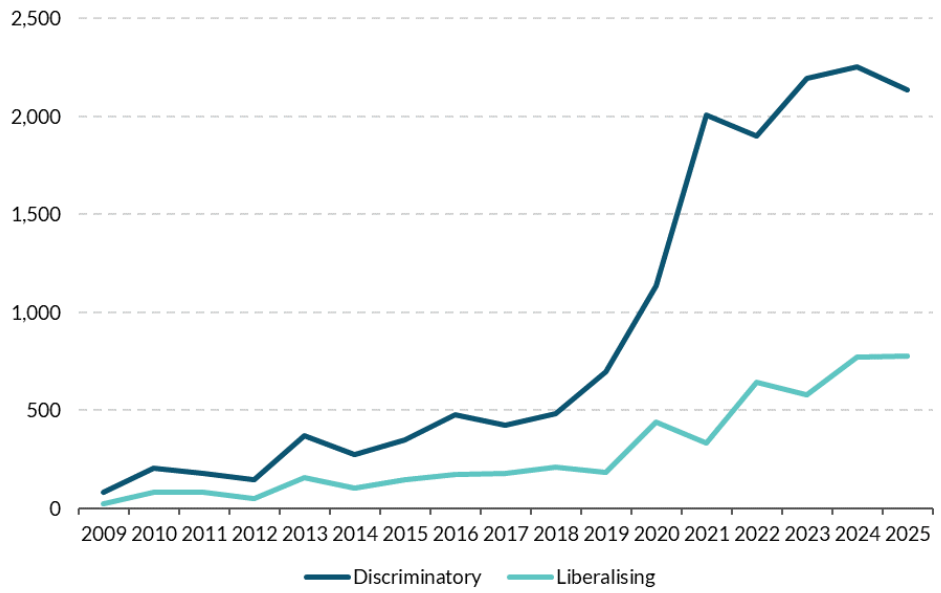
1. Introduction

The Irish economy has been a chief beneficiary from economic globalisation. During the period 1960 to 2008, international trade grew as a share of global GDP from around 20 to 50 per cent. In particular, during the 'Liberalisation era' stretching from 1980-2008, trade barriers fell in large emerging markets, and international cooperation improved with ex-Soviet bloc countries becoming embedded into the global trading system (IMF, 2023; Baldwin and Ruta, 2025). The information and communication technology (ICT) revolution also enabled the rise of intricate global value chains, which became central to the operations of Multinational Enterprises (MNEs) (Antras and Chor, 2022) and enabled greater global flows of capital. During this period of heightened integration, Ireland benefitted substantially from foreign investment and an expansion of trade. These supported a dramatic economic convergence that brought the country from relative poverty to among the higher-income nations in the world (Honohan and Walsh, 2002).

Over much of the past decade, amid rising geopolitical tension, concerns have risen that the world economy may fragment into geopolitically aligned blocs, with knock-on frictions to the free movement of goods, capital and labour. Globalisation slowed following the Global Financial Crisis (GFC), amidst rising discontent about the distributional impacts of international trade (IMF, 2023). At the same time, rising geopolitical tensions have manifested in hegemonic rivalry between the US and China escalating notably with the 2018 trade war, Brexit, conflict in the Middle East, and Russia's invasion of Ukraine. In addition, many countries re-evaluated their reliance on complex and highly globalised supply chains following the pandemic due to the risks of relying on foreign production for strategically important goods and services. This process of geoeconomic fragmentation is visible through a rising number of trade restrictions imposed (Figure 1). In this context, recently imposed US tariffs are the starkest example of a tendency that has been building for close to ten years.

Protectionist policy measures have increased more than four-fold since the middle of the last decade

Figure 1: Liberalising and discriminatory trade and industrial policies over time, number of policy measures

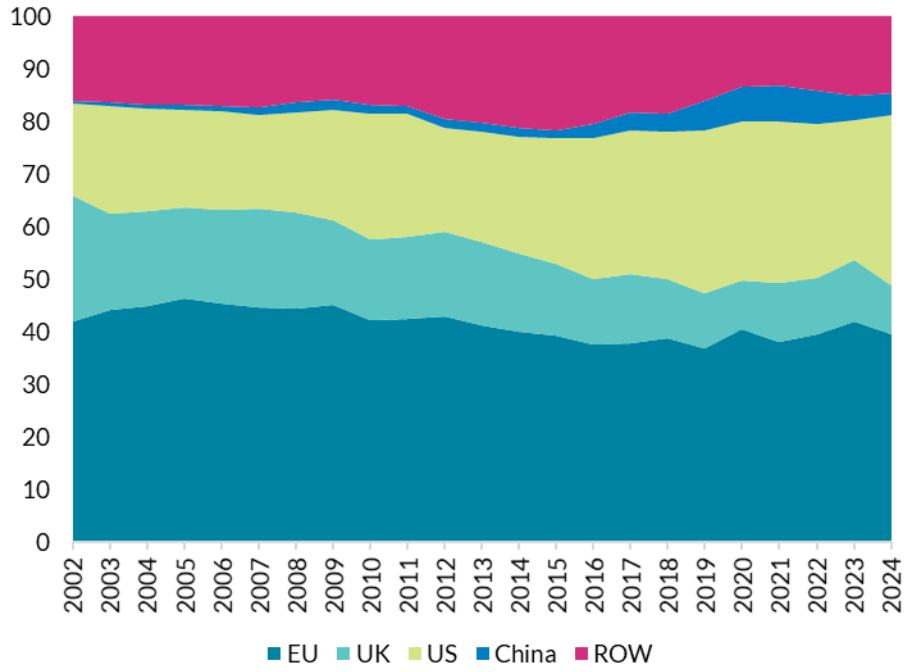


Source: https://globaltradealert.org/.

Amidst this broader global fragmentation, Ireland is particularly exposed to recent US policy changes. Rising global protectionism and changing industrial policy will have both direct and indirect effects, via global value chains, on the Irish economy. Changing US policy approaches to tariffs, foreign investment, and the re-shoring of domestic industry create the potential for a retrenchment in integration between the US and the rest of the world. Ireland is particularly exposed to these shifts. Having doubled since the early 2000s, Irish goods exports to the USA are now almost the same size as exports to the EU; each accounting for 30-40 per cent of total export value (Figure 2). Ireland's deep integration in global value chains in sectors such as pharmaceuticals and ICT also means that trade wars between the US and third countries, such as China, can indirectly affect the Irish economy. Most significantly, the US has also been the predominant source of high-productivity, high-wage inward FDI to Ireland for many decades. Any changes in Ireland's attractiveness to US MNEs would have major implications for Ireland's long-term growth prospects.

The US share of Irish goods exports has doubled since the early 2000s

Figure 2: Share of goods exports over time, per cent



Source: Eurostat and authors' calculations.
Notes: ROW corresponds to 'Rest of World'.

In this *Signed Article*, we conduct an in-depth assessment of the structure of the Irish economy, in light of ongoing geoeconomic fragmentation, and changing ties between the EU and USA. Our focus in this *Article* is on structural features of the Irish economy, which shape its exposure to global policy developments. The overarching context is one in which the immediate impact of the 15 per cent tariffs on EU-US exports must be assessed, along with the longer-running implications of a broader fragmentation of the global economy. We place heightened emphasis throughout on the distinction between the importance of the US in macroeconomic aggregates, and the more nuanced picture that emerges when studying activity across the broad spectrum of businesses operating in the Irish economy. We study the export and import exposures of indigenous Irish businesses, the patterns of US and other inward FDI, the regional distribution of employment, and Ireland's position within global value chains, drawing lessons from economic research on the likely impact of the structural changes currently underway. We also draw on a rich macroeconomic modelling toolkit to conduct general equilibrium assessments of the potential economic impact of various scenarios for US

tariffs, separating short and long-term effects. We conclude the *Article* with implications for domestic economic policy.

2. International trade in the Irish economy

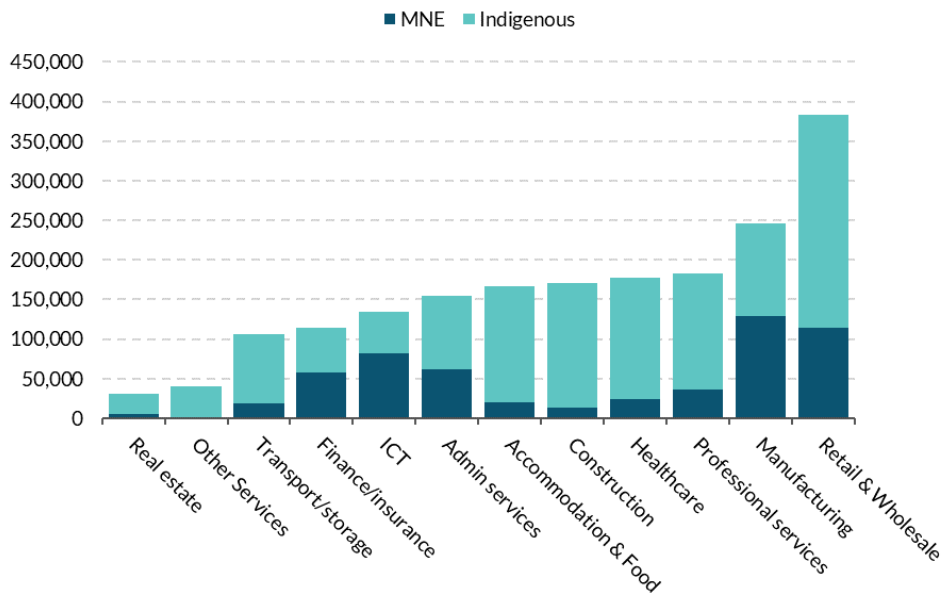
Ireland's unique economic structure combines a small number of large, productive, globally oriented MNEs, with smaller indigenous firms that dominate employment. Despite accounting for only 3.2 per cent of active firms in Ireland, foreign-owned MNEs[2] dominate many macroeconomic aggregates, accounting for over 70 per cent of GVA and turnover in 2022 (CSO, 2024), and 88 per cent of corporate taxes (Revenue, 2025). The employment picture is more balanced with these MNEs accounting for 27 per cent of total employment, equating to 623,000 workers (CSO, 2024), dispersed across a broad array of industries (Figure 3).

MNEs are not homogenous. Half of foreign-owned MNE employment is in higher-tech export-oriented activity, typically supported by the IDA, with the other half being less exposed to global policy developments. Half of the workforce in these MNEs are estimated to be in firms largely serving the domestic Irish economy in sectors such as retail, wholesale and accommodation. The other half are in IDA-client MNEs who use Ireland as an export-platform for their global activities, whether in manufacturing or services such as ICT. For these latter firms, exports accounted for 96% of their sales in 2023.[3] As a result, these MNEs dominate Ireland's international trade statistics, having generated 87 and 82 per cent of export values in goods and services, respectively, in 2022. Operating alongside these MNEs is a diverse indigenous business population, of which most workers are in domestically oriented firms in traditionally non-tradable sectors.

[2] The phrases "MNE" and "foreign-owned MNE" are used interchangeably in this *Article*, and refer to the same category of businesses. Irish-owned multi-national enterprises are included in the "indigenous" category.
[3] Based on a survey of client companies of IDA Ireland (ABSEI, 2023).

Foreign-owned MNEs employ over a quarter of Irish workers, co-existing with indigenous firms in a broad array of industries

Figure 3: Employment in MNEs and indigenous firms across industries, number of workers



Source: Eurostat and authors' calculations, 2021.
Notes: Certain sectors omitted due to lack of data availability.

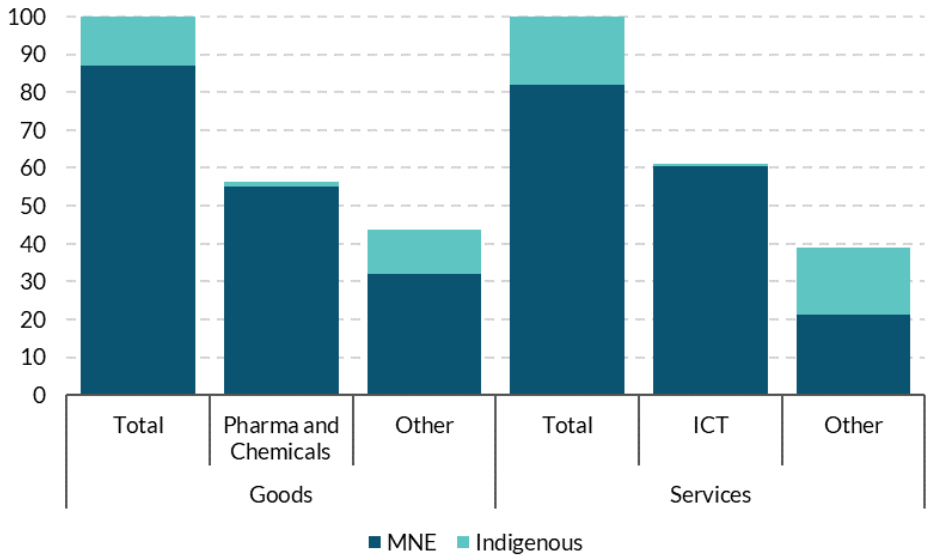
MNEs are more productive than indigenous businesses, reflected in large size differences and significant wage differentials. The average foreign-owned MNE employs 50 workers, more than ten times as many workers as the average indigenous firm. These size differences are even larger in manufacturing, where the average MNE employs 122 workers, compared to seven workers in domestic manufacturing firms (CSO, 2024). On simple metrics such as output per worker, MNEs also far outperform indigenous firms. Lawless (2025) estimates that output per worker was €78,000 among indigenous firms, versus €400,000 among MNEs as of 2021. The wage gap, more closely reflecting underlying labour productivity differences between MNEs and domestic firms, is close to 30 per cent, with median weekly earnings around €1,000 euro for MNEs versus €700 among indigenous businesses (CSO). As a result, and in keeping with evidence from other countries, MNEs are attractive employers that are high up on the `job ladder' (Balsvik , Fitzgerald and Haller, 2023).

Aggregate trade volumes are driven by a concentrated group of US MNEs in a narrow set of sectors. Ireland is the second-largest exporter of pharmaceuticals in the EU, only behind Germany. Firms in the chemicals and

pharmaceuticals sectors, almost all MNEs, accounted for 58 per cent of goods exports in 2023 and 20 per cent of total exports (Figure 4). Firms in these sectors also have a high share of imported materials in production, accounting for 20 per cent of goods imports. Based on Labour Force Survey data, there were around 66,000 people employed in the pharmaceutical sector in 2024, equating to 2.4 per cent of overall employment.[4] On the services side, exports from MNEs in ICT account for 60 per cent of aggregate service exports and 50 per cent of services imports. The importance of foreign MNEs in total corporation tax receipts has also generated well-known fiscal concentration risks, which the Irish government has recently sought to address through the establishment of long-term savings vehicles (Boyd, Conefrey, Hickey, Lozej, Madzharova, McInerney and Walsh, 2025).

Goods exports are heavily skewed towards MNE exports of pharmaceuticals and chemicals, with service exports similarly concentrated in MNE exports of ICT

Figure 4: Exports share by sector and ownership, per cent



Source: Eurostat and authors' calculations.

In contrast to MNEs, most indigenous firms are small and are not directly engaged in international trade. Across the entire business economy, around 3 (12) per cent of indigenous firms export (import) goods.[5] Indigenous goods exports are concentrated in firms in manufacturing, wholesale and retail

[4] See LFS, NACE 21.
[5] Authors' calculations and CSO. This does not preclude that small indigenous businesses are *indirectly* engaged in international trade if they purchase imported inputs from domestic importers, or export via domestic intermediaries in wholesale or retail.

sectors. Firms in these industries account for 70 per cent of exporters and 50 per cent of importers, and an even larger share of the value of exports and imports (CSO, 2024).[6] For other service sector firms (excluding wholesale and retail), less than 2 per cent of firms either export or import services.[7]

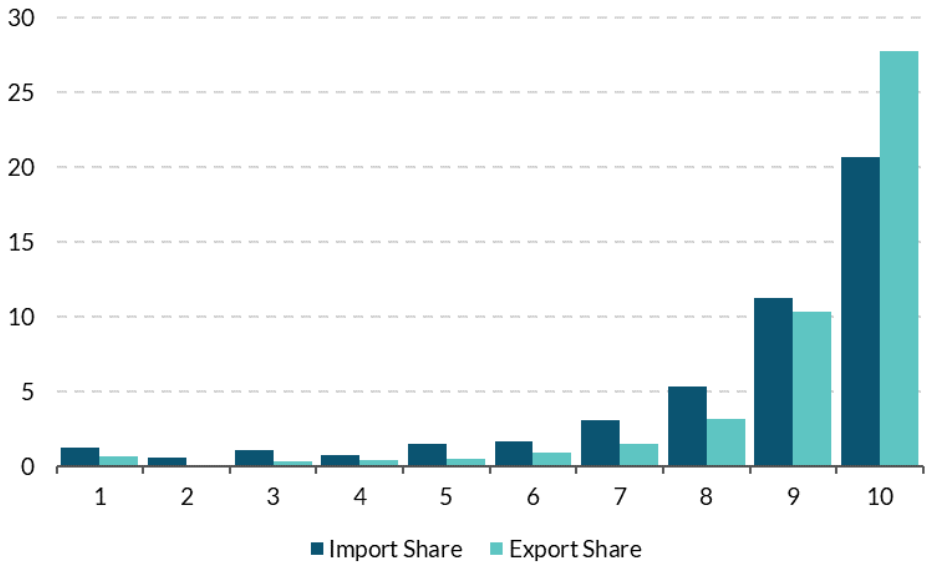
Export and import activity is most common among the largest indigenous businesses. The average indigenous manufacturing exporter has 38 employees, in contrast with the sector average of seven.[8] Among the top ten per cent of firms, exports account for an average of 30 per cent of total sales, compared to under 1 per cent among the smallest half of firms. Similar patterns hold for imports across the indigenous firm size distribution (Figure 5). In aggregate, exports make up 31 per cent of the total output for indigenous manufacturing.[9] In the services sector, a similar size relationship holds, with service exports as a share of sales increasing from less than 1.5 per cent for firms with under 20 employees, to over 10 per cent for firms with over 100 employees. These are familiar patterns from the academic literature (see Haller and Fitzgerald (2018) and Lawless, Studnicka and Siedschlag (2017) for evidence from Ireland), which has confirmed systematically that international trade is engaged in by relatively more productive firms due to high overhead and entry costs, with a high concentration in "superstar" firms driving macro aggregates (Freund and Pierola, 2015).

Overall, the structure of the economy means that Irish workers are highly exposed to international trade, with more than half of the private workforce in firms directly engaged in international activities. There were around 2.29 million workers in the Irish "structural business economy" in 2022 (CSO).[10] Just over 300,000 work in the highest-profile, export oriented MNEs, supported by the IDA. Another 330,000 work in MNEs outside the IDA remit, which typically service the domestic market. While typically less discussed than MNEs, the trade exposure of the workforce among indigenous business is in fact larger: 331,000 work in indigenous firms that export goods, with a total of 689,000 workers exposed to international developments at indigenous firms that import (Figure 6).[11]

[6] Despite this, only 11 (12) per cent of firms in manufacturing (wholesale and retail) export, and 32 (49) per cent of firms import.
[7] Author estimates from Annual Services Inquiry (ASI) for 2016 (see also Lawless and Studnicka, 2017).
[8] The gap is slightly smaller for importers, who on average have 20 employees.
[9] CSO Trade and Census of Industrial Production (CIP) estimates for 2018. Eurostat estimates for 2021 suggest even higher export shares of output for indigenous firms of 39 per cent.
[10] The Structural Business Economy is defined by the CSO in line with EU practices as incorporating all NACE sectors B to S, excluding O and S94.
[11] Authors' estimates from CSO micro-data (CIP, ASI, Trade and Business Register).

Export and import shares sharply increase in firm size.

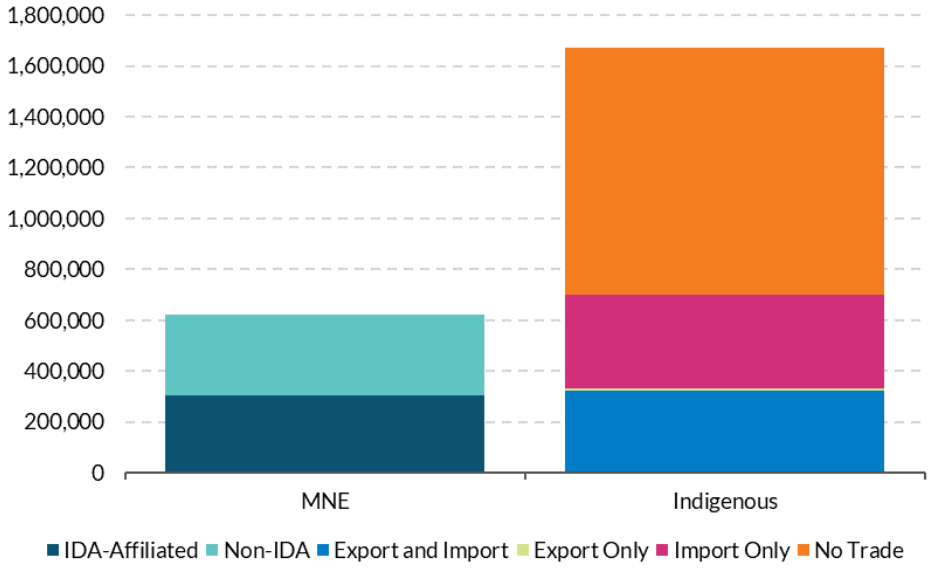
Figure 5: Export and import shares by decile of firm size, per cent



Source: CSO (CIP, Trade and Business Register) and authors' calculations for 2019.
Notes: x-axis is decile of firm sales. Export shares are relative to sales, import shares are relative to intermediate expenditures. Figure reports averages across firms within size decile.

A majority of private-sector workers are employed in MNEs or firms that trade goods internationally.

Figure 6: Decomposition of employment in Irish business economy, number of workers



Source: Eurostat, CSO (CIP, ASI, Trade, Business Register), Activity of Multinational Enterprises database (AMNE), IDA and authors' calculations, 2022.

3. The geography of indigenous Irish trade

Indigenous businesses' main export destinations are the EU and the UK, with the US far less important than is the case for MNEs. Exporters typically enter markets sequentially, starting with markets where shipping costs and trade barriers tend to be lower, usually those that are geographically or culturally close (Lawless, 2009). Only a small cohort of successful exporters manage to sustainably continue to expand into more distant and higher-cost new markets (Albornoz et al., 2011), typically after having already successfully entered easier-to-access markets. These global tendencies are borne out among Irish indigenous exporters, who are much smaller in aggregate than foreign-owned MNEs, accounting for 13 per cent of total goods exports. In 2022, while over 6,000 firms exported to the UK and over 4,000 to the EU, only 1,500 firms exported to the US and 450 to China.[12] This corresponded to almost 70 per cent of the value of indigenous firms' exports flowing to either the UK or the EU (Figure 7). By comparison, just 12 per cent of export values were to the USA, in contrast to the 30 per cent US export share in aggregate trade statistics, highlighting immediately that the direct exposure to US tariffs is smaller in the indigenous economy than one would infer based on macro statistics that include MNEs.[13] Exports to China, already low in the aggregate, are very small for indigenous exporters.

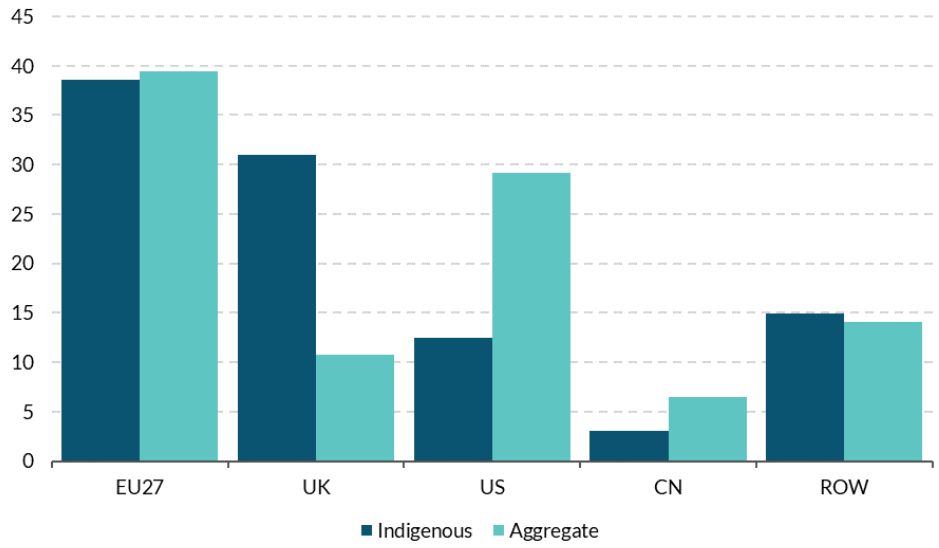
Goods exports, particularly to the US, are complemented by imported intermediate inputs, reflecting the two-sided nature of international trade within firms. A lot more firms import than export, and imported inputs are an important (and often critical) component of costs for Irish businesses, with imported materials accounting for 33 per cent of intermediate purchases for indigenous manufacturers. In total, two thirds of these firms' imported intermediates are from the EU (41 per cent) and UK (25 per cent), with only 12 per cent from the US.[14] Indicative of the complex nature of international trade and global value chains, exports of high quality products often rely on high quality imported inputs (Fieler, Eslava and Xu, 2018). This is clear from the Irish data, which shows both that 98 per cent of manufacturing exporters also import intermediate inputs, with the share of imports in costs increasing in line with the share of exports in sales for larger firms (Figure 5). Notably, firms

[12] Author calculations using CSO CIP, Trade, ASI and Business Register.
[13] The pattern for imports is similar though less stark, the UK (US) import share is 29% (12%) for indigenous firms versus 21% (15%) in aggregate trade statistics. China is the next largest individual destination country for indigenous firm exports, but stands at only 3%, though somewhat higher as a source of imported goods at 8%.
[14] The low import share of countries such as China (8 per cent) might understate the reliance on imports from those sources if these are critical inputs to production, as is the case for a large share of firms in Spain, Germany and Italy (ECB, 2024).

often import intermediate inputs from a source country in order to produce goods that they then export back to the same country. This is particularly true for the US - while the aggregate share of US imports in output is around 3 per cent for Irish indigenous manufacturing, the US import share of indigenous firms exporting to the US was 11 per cent in 2020.

Indigenous businesses mostly export to the EU and UK, with the USA much less important than for MNEs.

Figure 7: Share of goods exports by destination, per cent



Source: CSO (Trade) and authors' calculations.

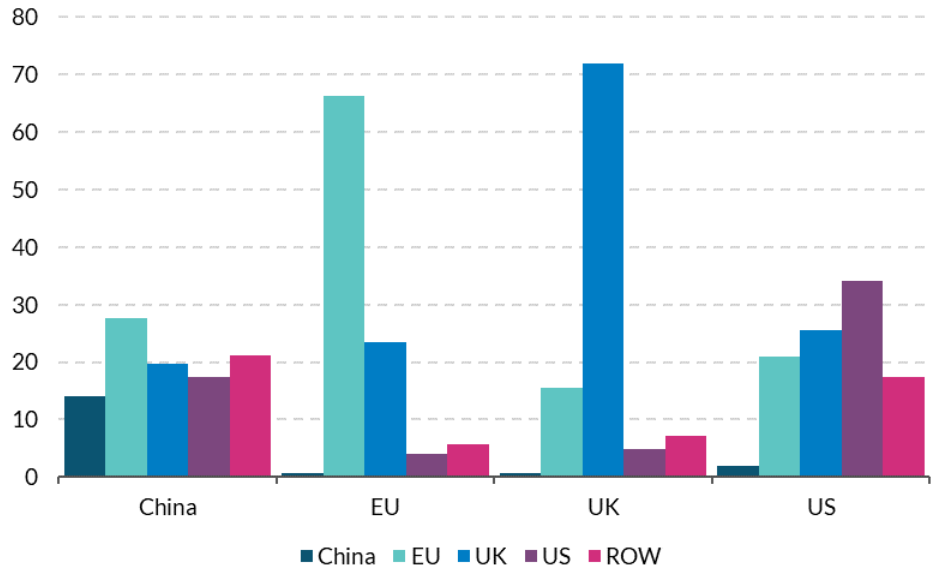
Indigenous firms that export to the US tend to be large and geographically diversified. Consistent with selection of only the most productive exporters into distant markets, US exporters have 60 employees on average, considerably more than EU (28) and UK exporters (39).[15] Most indigenous firms that primarily export to the UK or the EU are also concentrated in these core markets, shipping close to 80 per cent of total exports to these destinations. By contrast, firms exporting to the US are more diversified, likely reflecting their higher productivity and broader international reach: they sell only 35 per cent of total exports to the US, while also having substantial exposures to the UK, EU and ROW (Figure 8). This diversification even holds at the level of specific products – over half of the products exported by indigenous firms to the US are also being exported (by the same firm) to another destination market.

[15] A similar size gap is present for importers.

These firms are therefore in a strong position to adapt to tariffs in aggregate, although profitability may be disproportionately affected due to high margins in the US. The level of diversification, before the onset of the recent trade uncertainty with the US, suggests these firms face into the period of US tariffs in a strong starting position to adapt. The adjustment is still unlikely to be painless, given that analysis suggests a higher profit margin on US exports than sales to other destinations, which may be eroded as part of the adjustment (see Box 1). US tariffs may therefore have a greater impact on indigenous firm profitability than indicated by the weighting of the US in their exports.

Indigenous firms exporting to the US and China are more diversified than exporters to the EU or UK

Figure 8: Average export shares across destinations, conditional on exporting to a destination, per cent



Source: CSO (Trade) and authors' calculations.
Notes: Bars refer to the average share of China, EU27, UK, US and Rest of World, in the export basket of firms who export to China, EU27, UK, or US (as denoted by x-axis titles).

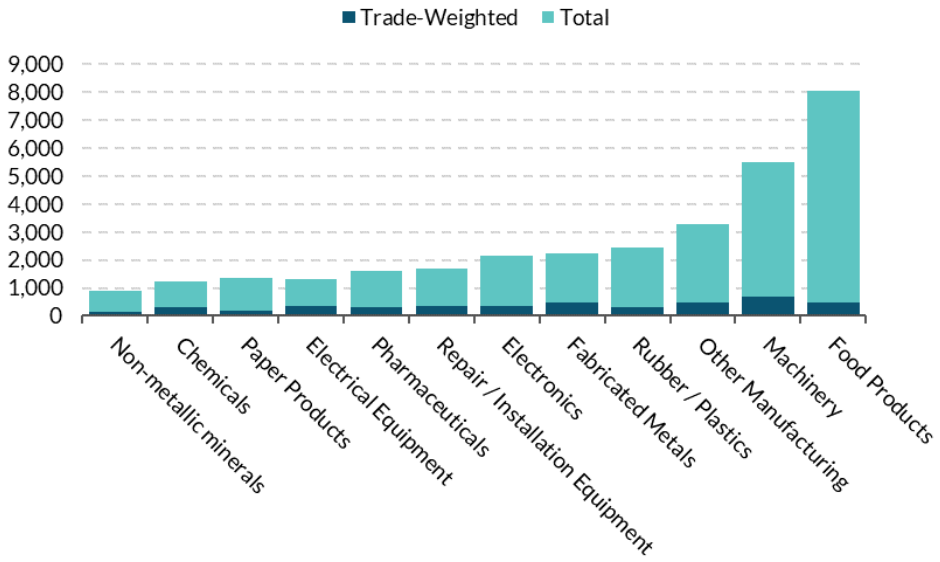
Indigenous US goods exporters employ 120,000 people, equating to a US exposure of close to 10,000 workers on a sales-weighted basis. In order to estimate how many workers in these firms are exposed to the US market, we weight each firm by the estimated share of US exports in total sales using CSO micro data for 2023. We obtain that almost 10,000 workers in indigenous firms can be viewed as producing goods for export to the US, and are therefore directly exposed to US tariffs.

Workers directly exposed to US tariffs are distributed widely across indigenous industries. Manufacturing and Wholesale and Retail Trade are the

most exposed sectors, though there are firms in other service sectors (such as Computer programming, consultancy and related activities) that also have significant US tariff exposures.[16] Figure 9 focuses on the distribution of employment across manufacturing industries. While Food Products, Fabricated Metals, and Machinery are the most exposed sectors with over a thousand workers exposed on a sales-weighted basis between them, there are another eight sectors with on average 300 exposed workers in each.

Within manufacturing, Food Products, Fabricated Metals, and Machinery have the greatest employment exposure to US tariffs among indigenous firms

Figure 9: Employment in manufacturing firms that export to the US, number of workers



Source: CSO (Trade, CIP and Business Register) and authors' calculations.
Notes: Total height of bars shows total employment in firms that export to the US. Trade-weighted bars weight total employment by the estimated share of US exports in firm sales, summed up across firms.

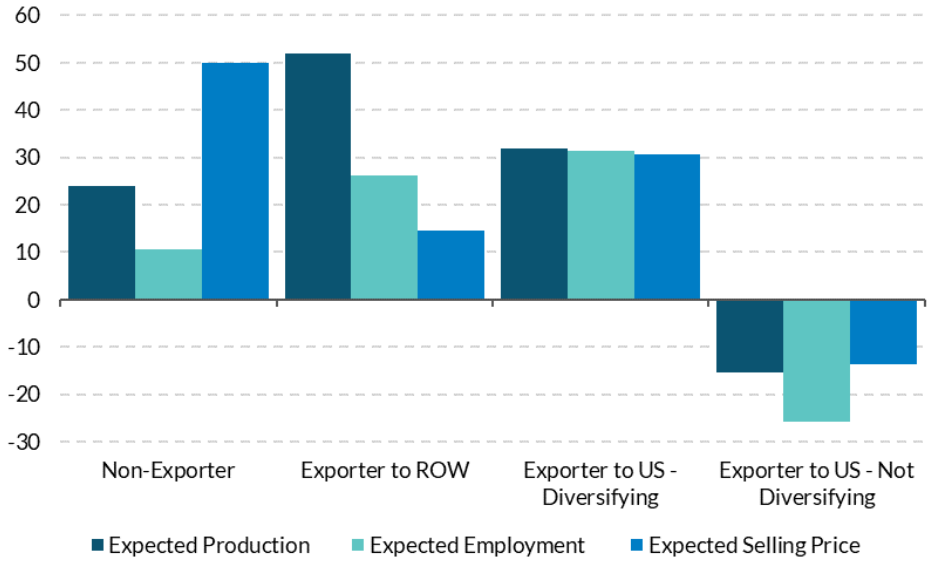
One third of exporters to the US report having already started diversifying to other foreign markets prior to the July 2025 tariffs. Survey evidence from early July 2025 shows that firms started diversifying before the July 2025 EU-US trade deal announcement.[17] One third of manufacturing firms that

[16] This broad sectoral coverage is indicative of the fact that many firms classified in service industries based on their main activity also export goods.
[17] Survey data on exporter behaviour is sourced from a special module of the monthly European Commission's monthly Business and Consumer Surveys (BCS) sponsored by the Central Bank of Ireland. The exact question firms were asked was 'Has your firm recently undertaken or is your firm currently undertaking measures to diversify your export markets away from the US?'

currently export to the US report recently or currently seeking to diversify their export markets away from the US. One third of these were looking to diversify to other EU markets, another third to other non-EU markets, with one third diversifying to both. Unsurprisingly, given the uncertainty regarding US trade policy, exporters to the US in July 2025 had lower expectations for production, employment and selling prices than exporters to other destination. However, this is entirely driven by those not diversifying to other markets, with those diversifying having more comparable expectations to other exporters (Figure 10).

Exporters to the US have lower production, employment and price expectations than other exporters, entirely driven by those that are not diversifying

Figure 10: Net share of firms reporting an increase, per cent



Source: European Commission Business and Consumer Survey for July 2025.
Notes: Responses averaged using survey weights. The y-axis measures the difference (in percentage points) between the proportion of firms reporting "up" and the proportion of firms reporting "down"in response to each question.

Irish firms would also seek to reorganise their import supply chains if retaliatory EU tariffs were implemented. Given that imports from the US play an important role in supporting exports to the US, retaliatory tariffs would represent a double hit to Irish indigenous US exporters, increasing their costs at the same time as lowering their demand. One reaction to offset this increase in costs would be for firms to reorganize their supply chains and find new suppliers – behaviours that are key to the understanding of general equilibrium implications of tariffs as modelled in Section 5. Survey evidence from early July

2025, at which point retaliatory tariffs by the EU on the US were not confirmed or ruled out, shows that 80 per cent of firms would have sought to find different suppliers had retaliatory tariffs been implemented. Notably, and highlighting Ireland's key reliance on foreign suppliers, firms would exclusively have looked for other foreign suppliers, rather than domestic suppliers. While such an escalating tariff scenario has currently been avoided, the survey findings showcase how import tariffs can lead to significant reorganizations of the firm's entire global supply chain.

Tariffs are expected to directly reduce EU-US goods exports, though the net effect on Irish exporters will partly depend on how readily they can find new markets. The impact of tariffs on trade flows is typically referred to as the "trade elasticity". This is a combination of the impact of tariffs on prices, and the impact of prices on quantities demanded. The former will depend critically on the ability of exporters to adjust their margins, while the latter depends on the sophistication or specialisation of products, and buyers' elasticity of substitution (see Box B for a discussion of trade elasticities for Ireland's pharmaceutical exports). Fitzgerald and Haller (2018) estimate short-run trade elasticities in response to tariffs for indigenous Irish exporters between 1.5 and 3.5, in line with evidence on the Chinese experience of the 2018 trade war with the US. This range of trade elasticities would imply a 15 per cent increase in US tariffs leading directly to a reduction in indigenous firms' exports to the US by between 22.5 and 52.5 per cent. However, the net effect on total exports can be mitigated by diversification and expansion into other export markets, as shown in Jiang, Lu, Song and Zhang (2023) for Chinese exporters. In higher-skilled, higher-technology-intensive product lines, China experienced no reduction at all in total exports, despite up to 15 per cent reductions in exports to the US, indicating significant capacity to divert trade, rapidly adjust and find new buyers.

Trade in services, so far broadly unaffected by geoeconomic fragmentation, remains an important source of external demand and inputs for Irish indigenous firms. Tariffs are restricted to goods trade, leaving services unaffected. However, services trade often faces lower variable costs than goods trade, but risks being affected by other policy shifts and levers that may be triggered as part of escalating global trade tension. Apart from wholesale and retail (where goods trade is common but not services trade), service exports as a share of sales rises from less than one per cent for the indigenous firms with under 20 employees to around 10 per cent for the largest firms with

over 100 employees.[18] Service imports behave similarly, though with a rise from around 1 per cent to 3 per cent. Ireland's economy may benefit from further expansion of services exports from local firms, particularly if global trade in goods continues to be faced with greater tariffs and barriers.

Box A: Export market entry: lessons from recent research

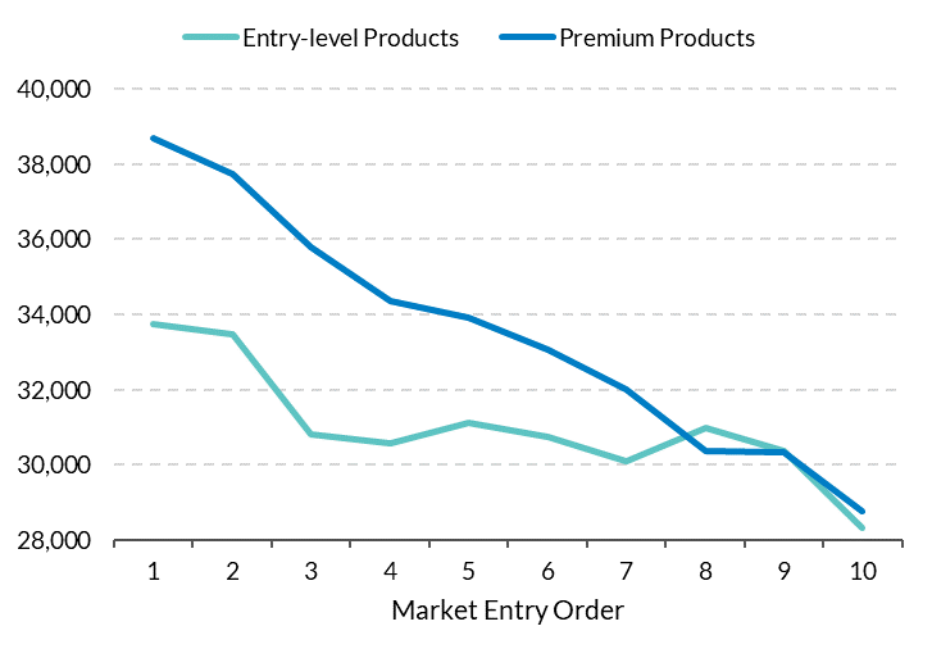
By Boryana Madzharova

Will the composition of exports by Irish indigenous firms to the US change as a result of US tariffs? The findings of a recent work by Jaimovich, Madzharova and Merella (2024) provide a set of potential patterns based on product quality and the income level of destination countries.

Working with data from the refrigeration industry, the authors show that new products are typically launched in new markets sequentially, with high-quality products found to exhibit differential diffusion dynamics compared to low-quality products. Specifically, as shown in Figure 1, premium products enter wealthier destinations much earlier in their life-cycle and may not be present in relatively poor markets at all. In contrast, entry-level products show little association between market-entry-order and market income.

Premium products enter high income destinations earlier in their life-cycle

Figure 1: Order of market entry vs income



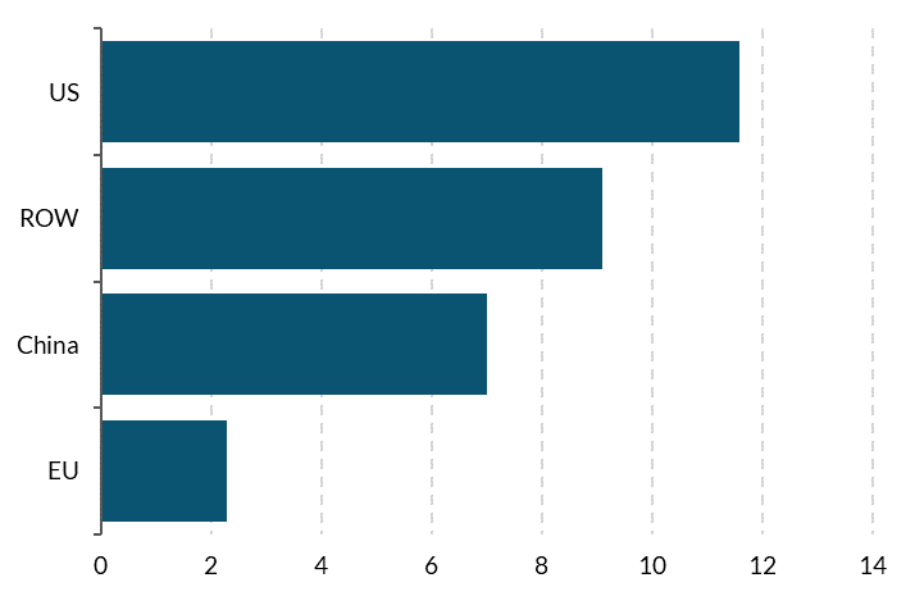
Source: Jaimovich, Madzharova, & Merella (2024).
Notes: x-axis refer to the nth market in which a product is exported.

[18] Authors' calculations from CSO micro-data (ASI, Business Register).

Distance from the first market of entry matters for sequential expansions for both types of products, but it matters relatively less for high-quality goods, for which income proximity takes precedence over geographic proximity. The authors explain the above differential dynamics with people in wealthier countries tending to prefer higher-quality products, which lets companies charge more in those markets (pricing-to-market).[19] [20] Calculations from CSO Trade micro-data, for example, reveal that Irish exporters charge close to a 12 per cent premium on the same good in the US compared to the UK, though this number also factors in disparities in landed cost structures across the two locations (Figure 2). Jaimovich, Madzharova and Merella (2024) demonstrate that even after accounting for underlying differences in labour costs, overhead costs and others, the same product sold at the same time in a rich and in a mid-income market will as a rule remain significantly more expensive in the richer destination.

Price premiums for the same product are larger in higher-income destinations relative to the UK

Figure 2: Average price difference relative to the UK, per cent



Source: CSO (Trade).
Notes: estimated average price differences relative to the UK for the same firm-product. Product defined as a HS6 code.

[19] Consumer behaviour characterized by increasing desire for quality with income are called nonhomothetic preferences along the quality distribution.
[20] These findings cannot be fully explained by supply-side factors—namely, the tendency of firms producing high-quality goods to manufacture them in high-income markets, which also happen to be the initial markets of sale.The results remain robust if a product's market-entry sequence is entirely composed of export destinations or if at least the first three sales-markets are not manufacturing locations. The important mechanism at play, therefore, appears to be nonhomothetic *demand* preferences.

In the context of the above findings, the repercussions of trade shocks such as tariffs under the current US administration, are also likely to exert differential impacts by quality levels for Irish indigenous exporters. High income-elastic products (high-quality products) will tend to have lower price elasticity of demand in high-income countries. On the one hand, this translates into lower sensitivity to price changes of high-quality products and thus, even if prices increase by the full extent of tariffs, a smaller likelihood of consumers modifying their buying behaviour. On the other hand, as discussed above, since a low price elasticity allows for higher mark-ups, exporters have the option to only partially pass tariffs into prices, further mitigating the consequences on their market shares. Even though it comes at the expense of lower profitability, not passing the full burden of tariffs onto consumers could nevertheless allow exporters to remain competitive in the US market. Conversely, low-quality goods are likely to face much narrower set of options as even small price increases may result in large falls in demand, while partly absorbing the cost of tariffs may not be possible with slim profit margins.

For Irish exporters, therefore, the level of quality may be a decisive factor of how well they fare in the current trade climate. As most indigenous Irish exporters to the US are large firms with an average of 60 employees exporting a wide variety of products, within a firm, a spectrum of quality is being exported. Consequently, firms are likely to redirect (new) low-quality products to alternative markets, while premium quality retains access to the US market. It is possible therefore that the distribution of product quality exported to the US from Ireland becomes more right-skewed.[21] Whether this development will stimulate targeted innovation aimed at producing higher-quality goods remains uncertain. It will likely depend on Irish exporters' ability to access alternative markers for premium products, as well as their capacity and the incentives they face to invest in research and development.

According to the findings of Jaimovich, Madzharova and Merella (2024), exporters whose products are sold in a set of destinations with more dispersed incomes tend to export to substantially more destinations than those accessing predominantly markets with homogenous incomes. In line with these findings, indigenous Irish exporters to the US, the majority of which are found to sell in a diverse set of locations, also have access to a larger number of export destinations than firms that export to the EU and/or

[21] The above analysis abstracts away from the possibility of retaliatory EU tariffs on the US. If the EU retaliates, another dimension of relevance would be a firm's reliance on intermediate inputs imported from the US as indicated in Section 3 of the Signed Article.

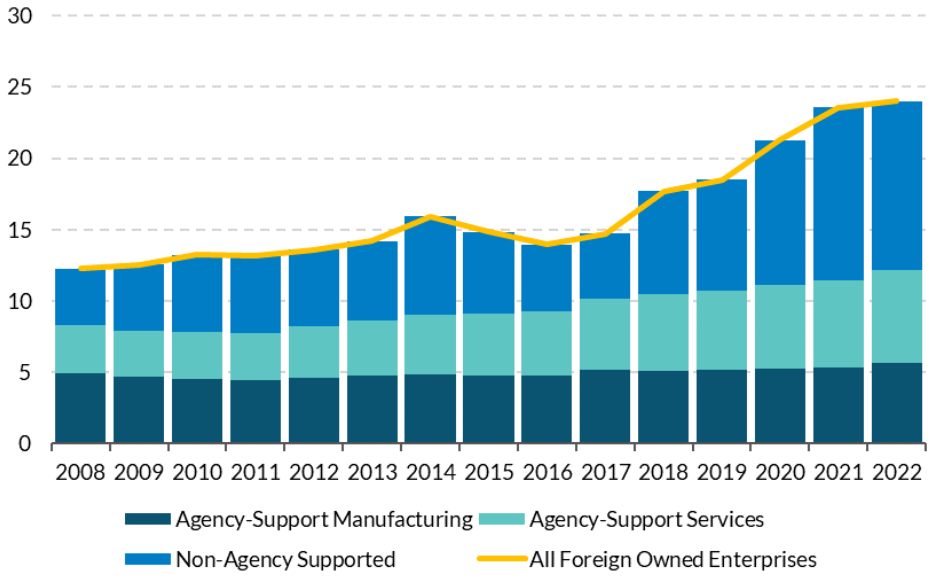
the UK alone (Figure 8). Irish exporters with multiple sales locations should therefore be able to more effectively redirect trade of low- to medium-quality products to geographically nearby destinations they are already familiar with (i.e. in which their products are present) than exporters that have never accessed these markets before or consistently sell to (a few) income-homogenous locations (Chaney, 2014). Diversification not only along the quality distribution but also in export destinations are therefore important determinants of the resilience of Irish indigenous exporters to the US under the current tariff regime and in the face of future trade uncertainty.

4. FDI at a time of changing US policy

FDI has been central to the Irish growth story for many decades, accounting for over a quarter of the workforce, although only half of FDI employment is in export-oriented MNEs. Foreign-owned firms in Ireland account for 27 per cent of business employment in 2022, and around almost a quarter of aggregate employment. This share has risen considerably since the financial crisis (Figure 11). Half of MNE employment in Ireland is in firms in sectors broadly serving the domestic economy, such as Wholesale and Retail, Accommodation and Food, and Transportation and Storage. The other half of workers are operating in high-tech firms, clients of the IDA, who use Ireland as an export-platform as part of their global activities. Attracting such foreign firms has been a key part of government policy and Ireland's overall growth model for many decades. Recent employment growth in this group has been largely driven by services MNEs, two thirds of which are in ICT, which has increased from just over 2 per cent to over 5 per cent of employment since 2010.

Multinationals account for a large and growing share of employment in Ireland

Figure 11: Share of MNEs in aggregate employment, per cent

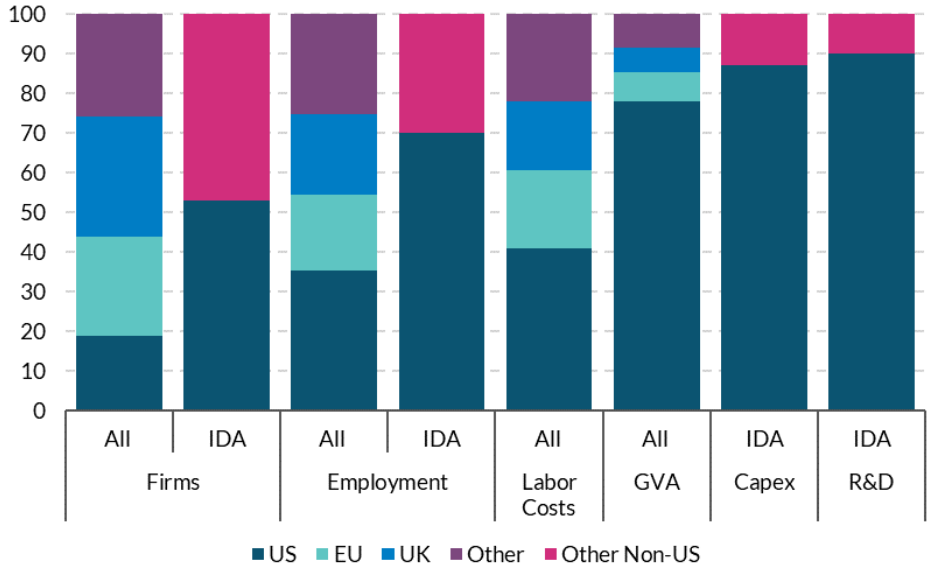


Source: AMNE, IDA, DETE and authors' calculations.

The US is the most important source of FDI into Ireland, particularly for export-platform FDI. The EU, UK and US make up 70 per cent of MNE ownership in Ireland (Figure 12). While the US accounts for less than 20 per cent of MNE businesses, this rises to 30 per cent of employment, 40 per cent of labour costs and almost 80 per cent of value-added. The US is particularly important among IDA client firms, where it makes up half of firms and 70 per cent of employment. At a time of rising geopolitical tensions globally, FDI inflows from the US have remained strong over the last decade. Between 60 and 70 per cent of all inward foreign investments recorded by the IDA in each year since 2015 are by US firms. Highlighting the US' disproportionate role in capital and innovation-intensive activity, the share of US firms in total MNE capital expenditures is around 90 per cent between 2021 and 2023, while the share of US firms in R&D spending has risen from 70 to 90 per cent since 2010 (Figure 12).

US firms dominate MNE economic activity

Figure 12: Percentage of MNE economic activity by country of origin, per cent



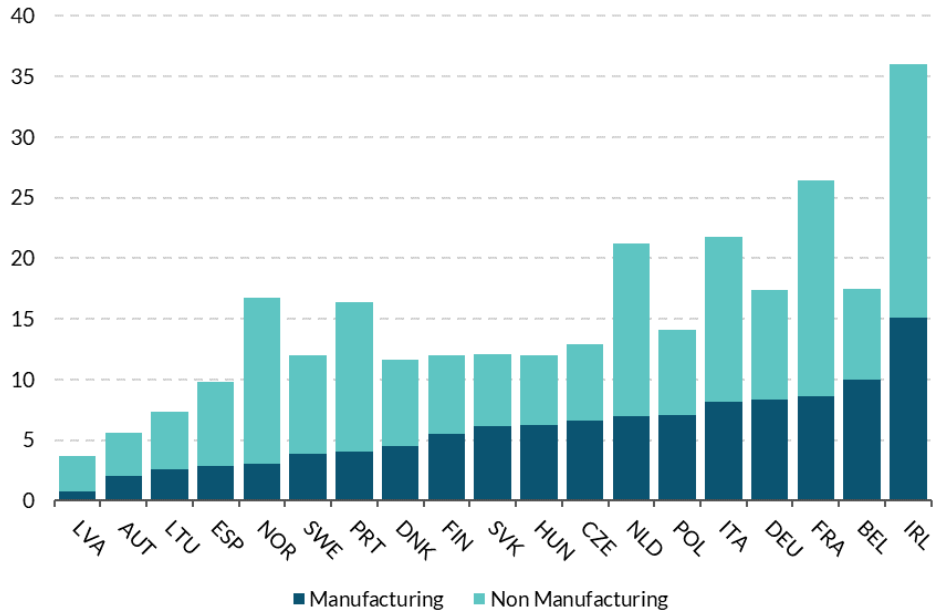
Source: AMNE, IDA and authors' calculations.
Notes: The category 'All' refers to all foreign-owned MNE affiliates in Ireland. The category 'IDA' refers to IDA client MNE affiliates in Ireland.

While US FDI inflows have driven growth in living standards, they also create concentration risk. Ireland has the highest concentration of US MNE activity of any EU country. At close to 40 per cent, the US share in MNE employment is more than double that of most European countries (Figure 13). When measuring US dominance through measures such as Gross Operating Surplus or Turnover, the US share in total MNE activity in Ireland rises above 70 per cent, further outstripping EU comparators. This concentration of MNE-activity among US firms arose as a natural consequence of the success of Ireland's growth model and the emergence of clusters of specialisation. US dominance has likely driven disproportionate growth in prosperity in Ireland, given the US' considerably stronger economic and productivity growth since the early 2000s than Europe (Draghi, 2024). 'Superstar' firms in particular have experienced rapid growth globally during this period, (Autor, Dorn, Katz, Patterson and Van Reenen, 2020) many of whom had already set up operations in Ireland prior to the 1990s, such as Intel and Pfizer. With current new IT developments such as AI, which US firms have had a better track record of adopting (Bloom, Saddun, Van Reenen, 2012), the outperformance of US firms over their European counterparts may well continue. In such a scenario, the continued presence of US MNEs in Ireland would be supportive of further growth in Irish living standards. On the other hand, in the current geopolitical environment, the

disproportionate concentration of US firms increases the risk from scenarios stemming from US firms' location decisions, whether due to prohibitively high tariffs or other US policy reforms.

Ireland has the highest concentration of US MNE activity of any EU country

Figure 13: US share of total MNE employment, per cent



Source: AMNE and authors' calculations.

The concentration of US MNEs is particularly notable in pharmaceuticals and chemicals, where Ireland has become a global manufacturing hub. MNEs in manufacturing are concentrated in the key sectors of Chemicals and Medical Devices (broadly Pharmaceutical related) and Computer / Electronic Equipment, with these sectors making up over 70 per cent of manufacturing MNE employment, or around 100,000 workers. Ireland has become a global hub for the production of pharmaceuticals, being among the top pharmaceutical exporters globally (Box B). There are sector-specific risks emerging, beyond the direct risks relating to tariffs, as evident in the US administration's launch of a Section 232 review of the pharmaceutical sector.

The ultimate impact of changing US policies on Irish MNEs' pharmaceutical operations is highly uncertain. Pharmaceutical sales are prone to geoeconomic fragmentation, changing tax policy and tariff-related disruptions, given their high import-content of exports and globally distributed sales, with 40 per cent of Irish pharma exports going to the US. Recent US tariffs may affect the pricing of pharma products and Irish corporate taxes (Boyd et al., 2025). The

impact on export volumes will depend on the sensitivity of Irish pharma exports to tariffs, which is likely to be lower than sensitivities estimated for pharma globally given the highly specialized nature of pharmaceuticals produced in Ireland (Box B). MNEs with substantial intra-group trade may have the possibility to mitigate the impact of US tariffs through adjustments to the pricing of these intra-group transactions, something highlighted as a response to previous tariffs by French MNEs in Davies, Martin, Parenti and Toubal (2014). However, longer-term uncertainty remains that, rather than export from their Irish operation, US MNEs may restructure part of their operations in response to further US policy changes, with knock-on implications for employment and activity here.

Box B: The (In)elastic Nature of Ireland's Pharmaceutical Exports

By Katie Bourke

Ireland is now the third largest exporter of pharmaceuticals globally (IDA), accounting for roughly 10 per cent of global pharma exports by value in 2023, with many of the leading global firms in the sector producing best-selling treatments and products (Table 1).

Ireland has become a key manufacturing base for specialised pharmaceuticals

Table 1: Top 10 pharmaceutical companies globally and their Irish presence

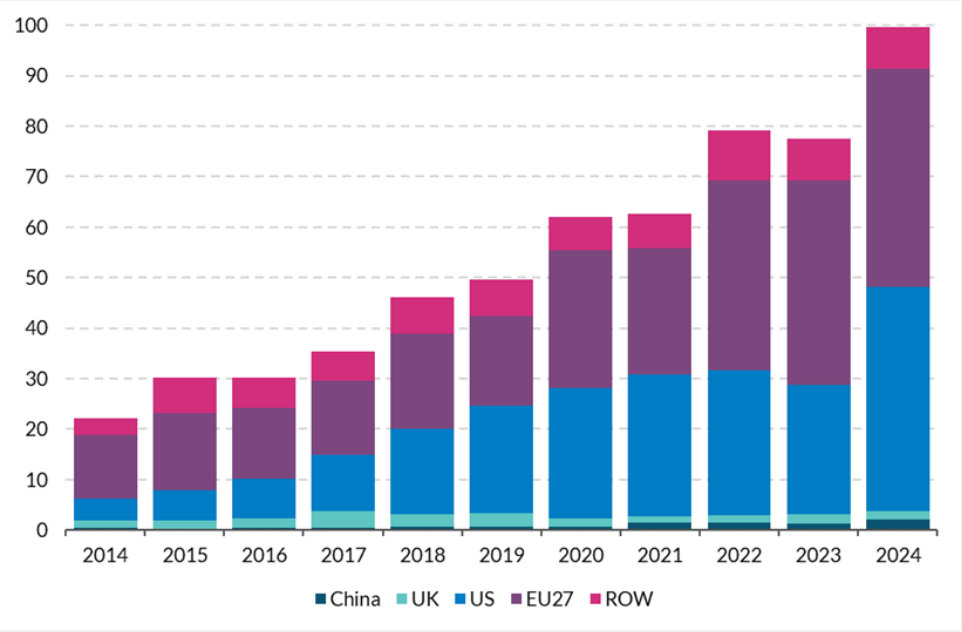
Drug Name	Manufacturer(s)	2024 Global Sales (USD m)	Increase (Y-o-Y)
Keytruda	Merck*	29482	17.9
Eliquis	Bristol Myers Squibb/Pfizer*	20703	9.2
Ozempic	Novo Nordisk*	17451	25.8
Dupixent	Sanofi/Regeneron	14147	22.1
Biktarvy	Gilead Sciences Inc.	13423	13.3
Jardiance family	Boehringer Ingelheim/Eli Lilly*	12385	15
Skyrizi	AbbVie*	11718	50.9
Darzalex & Darzalex Faspro	Johnson & Johnson*	11670	19.8
Mounjaro	Eli Lilly*	11540	123.5
Stelara	Johnson & Johnson*	10361	-4.6

Source: Drug Discovery and Development
Notes: Pharma 50: The top pharma companies in the world for 2025. Companies with asterisks have manufacturing plants based in Ireland. Ranking is based on 2024 global revenues.

Pharmaceutical products account for 45 per cent of Irish merchandise trade, with almost 40 per cent of these shipments destined for the US (Figure 1). As such, pharmaceutical exports is the primary channel through which Ireland is affected by US tariffs (see Lukmanova and O'Grady, 2025). This Box explores evidence on the sensitivity of pharmaceutical exports to tariffs, while also factoring in the specific market characteristics for the main pharmaceutical products produced in Ireland.

The share of Irish pharmaceutical exports to the US has grown over time

Figure 1: Irish trade in medicinal and pharmaceutical products, € billions



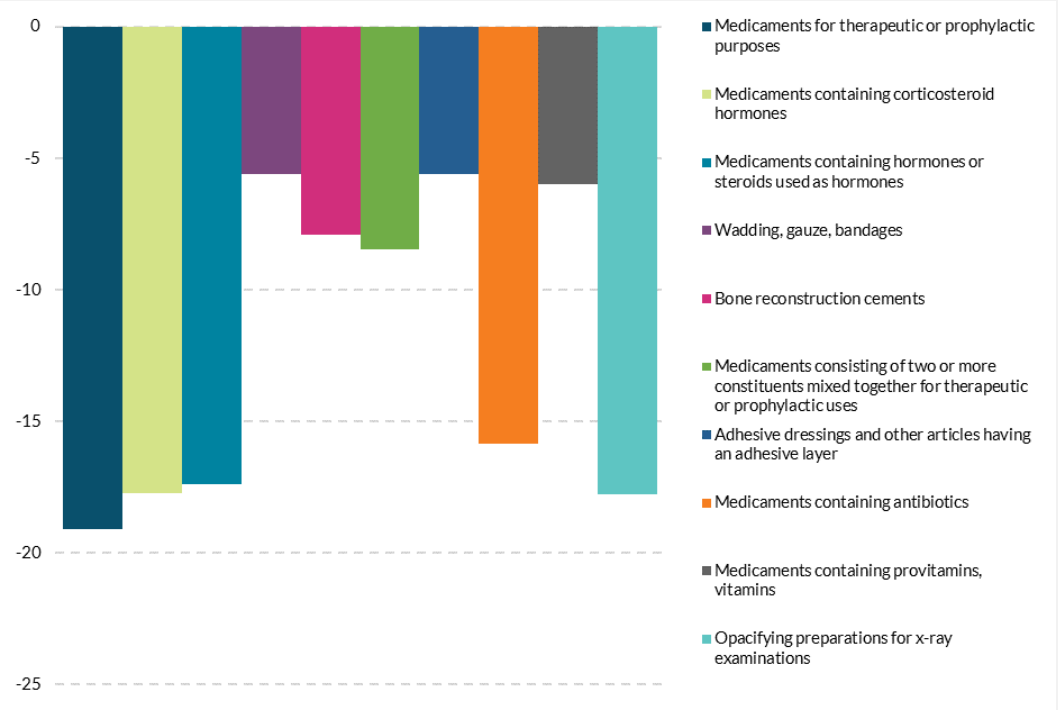
Source: Eurostat.

The sensitivity of import demand for a good to a change in its own price is known as the trade elasticity, with higher values indicating greater price sensitivity. Estimates of trade elasticities vary widely (Broda and Weinstein (2006), Romalis (2007), Ossa (2014)), but mostly fall in the range of 3 to 10, with Fontagné, Lombard and Orefice (2022) estimating a median elasticity around 5. This implies that a 10 per cent increase in price of an imported good reduces demand by 5 x 10 = 50 per cent. Notably, for many pharmaceutical lines, Fontagné et.al. (2022) estimate even higher elasticities. Ireland's pharmaceutical exports range from products with estimated elasticities close to the median to those among the highest observed in the literature, such as extracts of glands for enzyme production, vaccines, antisera, and medicaments containing insulin, penicillin, antibiotics and

hormones (Figure 2). In practice, however, the elasticities relevant to the specific nature of Irish exports are likely to be smaller than these global averages.

Ireland's top pharmaceutical exports are among those with the highest implied elasticities

Figure 2: Elasticities of Top 10 Irish Pharmaceutical Exports



Source: Dataset of *Tariff-Based Product-Level Trade Elasticities* by Fontagné et.al (2022)
Notes: Elasticities are matched up to the top 10 Irish pharmaceutical exports based on available data from Eurostat.

Much of the high elasticity evidence for pharmaceuticals likely represents long run substitution in the generics market where products are highly interchangeable.[22] On the other hand, a large share of Ireland's pharmaceutical exports consists of patented drugs and specialty high value biopharmaceuticals produced by multinational firms at the final stages of the global value chain.[23] These products are typically protected by intellectual property rights and often have no close substitutes, which limits the scope for importers to switch suppliers in response to price changes, particularly in the short run. This was evident during the COVID-19 pandemic, where the global demand and prices for vaccines and antiviral medicines manufactured

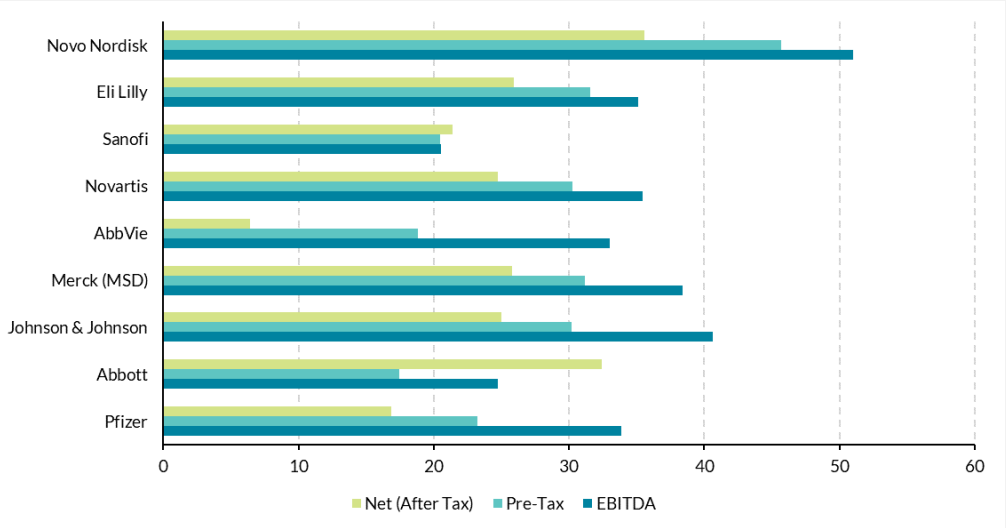
[22] Boehm (2023) show that trade elasticities are much lower in the short run than over longer horizons as it may take time for firms to adjust production.
[23] See Box 2, Quarterly Bulletin Q1 2025.

in Ireland and elsewhere surged, with countries willing to pay premium prices largely irrespective of cost.[24] Best estimates for Ireland come from Fitzgerald and Haller (2018) who estimate an elasticity of aggregate exports with respect to tariff changes of between 1.5 and 3.5 on impact, which are larger in the long run (between 2 and 5).[25] What is clear is that elasticities tend to be smaller in the short-run and larger in the long-run, hence the persistence of tariffs and not just their level would likely influence elasticities.

The Irish pharmaceutical sector's position at the end of the value chain also means that much of the recorded export value reflects high profit margins and intangible assets rather than price sensitive intermediate inputs. Honohan, 2021 has shown that profit margins in the pharmaceutical sector are very high compared to other manufacturing industries, with a substantial portion of these earnings accruing to foreign parent companies. Indeed, of the largest pharma companies operating in Ireland their profitability metrics are relatively favourable (Figure 3). This profitability gives firms the scope to absorb tariff related cost increase through reduced margins rather than lower export volumes.

High profit margins of specialised pharmaceuticals provide a buffer to absorb impact of tariffs

Figure 3: Pharmaceutical company profit margins, percentage of revenue



Source: Macrotrends
Note: Q2 Data is representative of the twelve months ending June 30. Margins expressed as a percentage of revenue. EBITDA is earnings before Income, Taxes, Depreciation, and Amortization.

[24] See Box D, Quarterly Bulletin Q3 2023.
[25] Fitzgerald and Haller (2018) conclude that over time firms can reallocate resources, change suppliers, alter product mix and enter/exit export markets. Once those adjustments take place, measured elasticities are much higher.

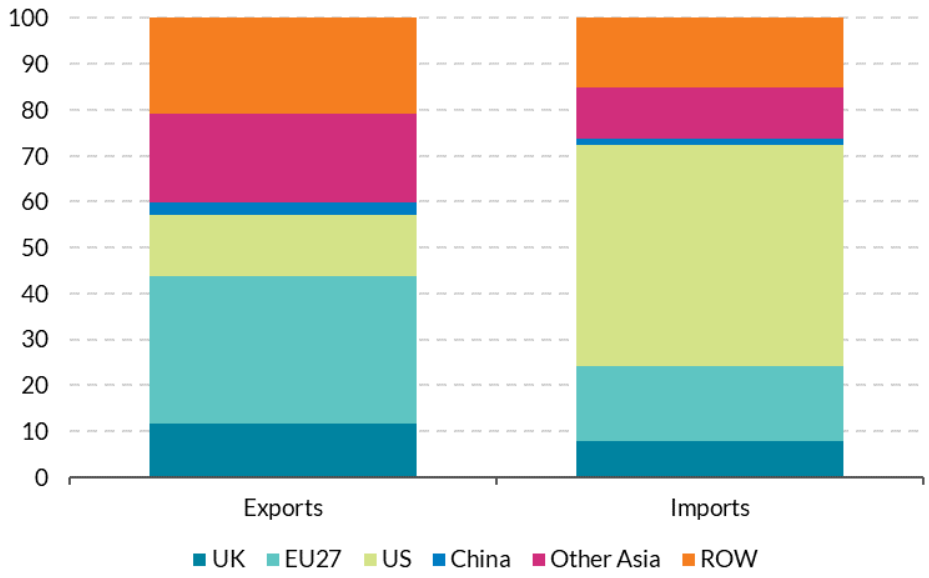
Finally, Ireland's pharmaceutical exports are largely driven by the production decisions of multinational firms that operate Irish facilities as part of global supply chains. In many cases, these are intra-firm or intra-industry trades, where the affiliate plant ships an active ingredient or finished product to an affiliate in the US (Alfaro, 2025). This reflects Ireland's trade structure where roughly 30 per cent of exports and 25 per cent of imports represent intra-firm trade, with the US responsible for around 70 per cent of these flows (ESRI, 2016). As a result, measured trade elasticities may appear lower in the Irish case, given that these flows are more determined by firms' global production and supply chain strategies than by the price sensitivity of consumers.

Summing up, pharmaceutical production In Ireland is anchored by intellectual property, regulation and intra-firm trade which makes it unlikely that export volume responses to tariffs will match the scale implied by global averages estimated in the literature. At the same time, the sector faces risks from other US policy changes such as regulation of drug prices or reforms to corporate tax which, if implemented, could also have a significant impact on the trajectory of Irish exports.

MNEs in ICT, while not directly affected by tariffs (which apply only to goods), may be exposed to other forms of regulatory or tax policy changes. Outside of manufacturing, ICT is the most important sector for export-platform FDI from US MNEs. The international trade activity of these firms is focused on services, with the intra-company import of intellectual property and related services supporting exports of computer software. As such, they are unaffected directly by tariffs on goods, which has meant that services have remained relatively insulated from the process of geoeconomic fragmentation so far (Li and Zymek, 2025). Geographically, Irish services exports are also diversified, with roughly half going to the UK and EU (Figure 14). Reflecting the dominant role of US MNEs in Ireland, half of services imports originate from the US. Despite not being exposed to tariffs, risks of a deterioration in US-EU co-operation exist over issues such as data privacy, digital taxes, and competition for large platforms. Any changes in US corporate taxation could also have a significant effect on the nature of their Irish operations. Given MNEs in ICT are not as intensive in physical capital investments as MNEs in manufacturing, their sunk costs are likely to be smaller.

Service exports are more geographically diversified than service imports

Figure 14: Geography of services exports and imports, per cent

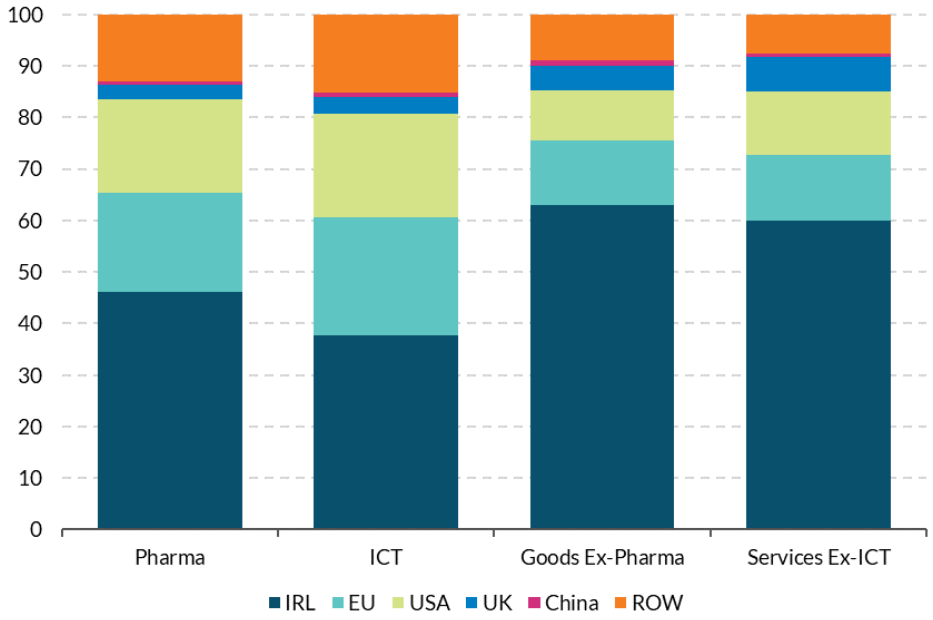


Source: CSO

More broadly, MNEs in pharma and ICT are both indirectly exposed to geoeconomic fragmentation though their integration into global value chains. The goods and services produced by these sectors have a particularly high import-content of exports, with less than 50 per cent of value-added produced in Ireland, considerably below other sectors (Figure 15). This reflects the extent to which global value chains underpin the activities of multinationals (Lukmanova and O'Grady, 2025). This also creates additional risks, as disruptions in other parts of the supply chain (for example U.S.-China tariffs) can impact either the input costs of firms operating in Ireland or their downstream demand. These can be particularly disruptive if it affects access to critical inputs in production.

Pharmaceuticals and ICT have particularly strong backward linkages through GVCs

Figure 15: Origin shares of gross value added in Irish exports, per cent



Source: ICIO, Lukmanova and O'Grady (2025)

Given the high physical sunk-costs, the main channel of risk from current levels of US tariffs stems from the potential future flow of new investment in Ireland. The huge capital investment involved in FDI activity, particularly in manufacturing, makes it costly for firms to change their production locations rapidly. To evaluate this more formally, Box C provides an overview of analysis from a model at the global methodological frontier, capturing US MNE investment decisions across time and space (Garetto, Ma, Oldenski and Ramondo, 2024). The model suggests that the share of sales of US affiliates based in Ireland back to the US would fall due to current levels of tariffs, but the share of US affiliates operating in Ireland would not change meaningfully. This is primarily due to the substantial sunk cost investments already made in Ireland and the fact that Ireland remains an export platform for non-US exports, particularly to the EU. However, even in this scenario, which is illustrative and subject to uncertainty, the longer-term arrival of new investments may slow. Section 6 discusses long-term policy issues to be considered in light of the potential for slower future FDI inflows.

Box C: Multinational Expansion in the Era of Trade Conflicts

By Xiao Ma (Peking University)

Many questions in international economics involve the complex activities of multinational enterprises (MNEs) over time and space. Episodes such as the United Kingdom leaving the European Union ("Brexit"), the US-China trade war in 2018, and the 2025 US tariff war, involve not only the re-arrangement of trade flows, but also of MNE activities across different countries.

To understand the implications of MNE expansion, we develop a multi-country general equilibrium dynamic model of firm expansion (see Garetto, Ma, Oldenski and Ramondo, 2024). Firms decide whether, when, and where to open foreign affiliates, which, in turn, can sell both to their host market and to any other market, subject to sunk, fixed, and variable costs. The MNE decisions of whether to set up an affiliate in a market, and whether to export from it, are shaped by the interaction of firm-specific characteristics, persistent aggregate shocks, and an array of costs. We calibrate the model to data moments for US MNE affiliates across 10 host countries, including Ireland.[26] The model corroborates the importance of Ireland as an export-platform for US MNEs; if trade costs were so prohibitively expensive that MNE affiliates could not export outside their host countries, the share of US affiliates in Ireland could fall substantially.

The model features iceberg trade costs which capture variable trade costs that scale with the value of exports (e.g. shipping costs or tariffs), per-period fixed costs which capture overheads (e.g. administrative costs), and one-time sunk costs which are only paid on market entry (e.g. setting up a distribution network).

Increasing trade barriers in a destination country has three main effects on Ireland. First, exporting from Ireland to that destination becomes more costly, decreasing the incentive to open US affiliates and export from Ireland. Second, increases in trade costs affect firms' export entry and exit decisions—an effect only present in dynamic models. Finally, the increase in trade frictions changes aggregate prices and wages through general equilibrium effects. A Brexit scenario analysis in the paper shows that export volumes from Ireland to the UK declines significantly only when iceberg trade costs are affected. This is because changes in fixed and sunk costs

[26] The other countries are Brazil, Canada, China, France, United Kingdom, Germany, Japan, Mexico, and Singapore.

primarily influence marginal firms, which tend to be small. Notably, fixed and sunk costs have larger quantitative effects on export participation—even when they imply the same increase in the per-period cost of exporting.

We use the model to evaluate the effects of the tariff announcements made by the Trump Administration between April and July 2025 on the activities of US MNE affiliates. For each host country, we calculate new tariffs (including threats) using the April 2nd announcement as well as news sources (up to July 30th, 2025). The tariff increase for Ireland is 15 per cent, aligning with the level of other EU countries. We then compute the implied change in iceberg-trade costs and simulate the new model equilibrium for all the countries in our sample.

US tariffs reduce MNE sales to the US by 10 per cent, but only slightly reduce the share of US affiliates operating in Ireland

Figure 1: Irish economic response to US Trade War

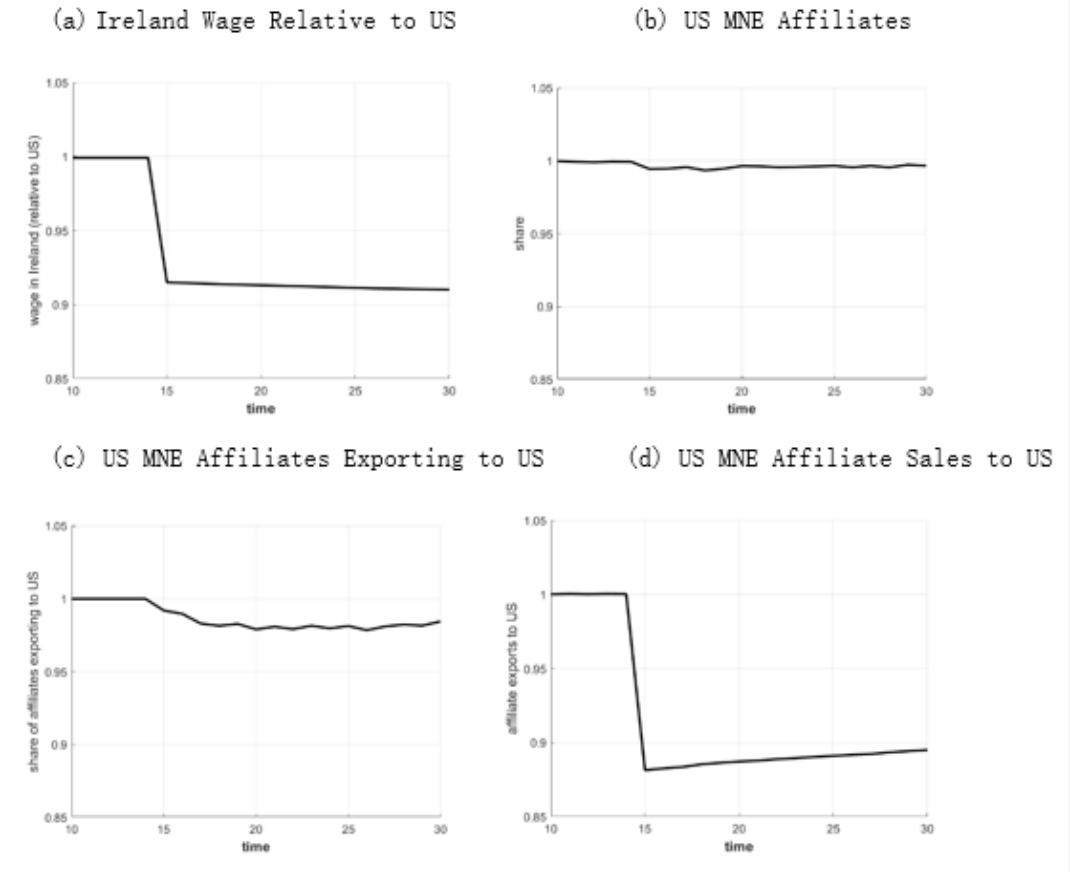


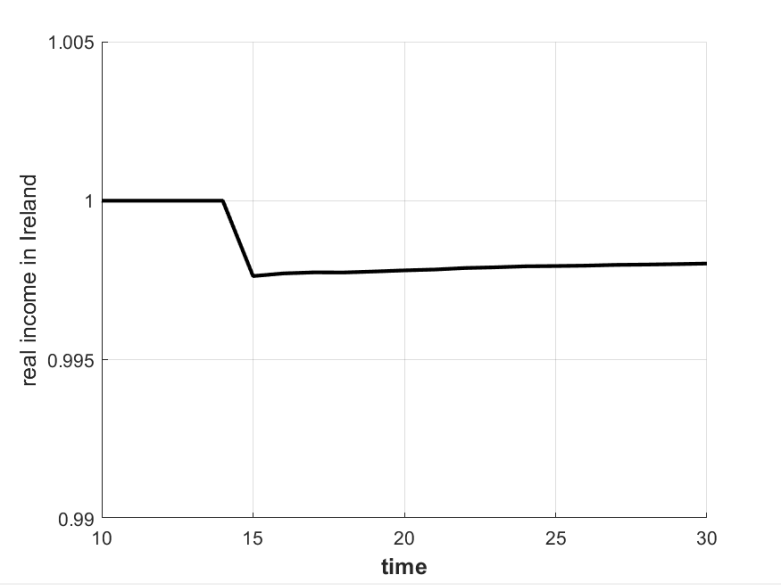
Figure 1(a) illustrates that the tariff shock effectively functions as a negative productivity shock for Ireland, leading to a decline in Irish nominal income relative to the US due to general equilibrium responses, akin to a terms of

trade effect. Figure 1(b) shows that the share of US affiliates operating in Ireland is broadly constant following the imposition of tariffs, with the marginal fall primarily driven by a reduction in the option value of exporting to the US from Ireland. Figures 1(c) and 1(d) indicate that, among active affiliates in Ireland, the share of firms exporting to the US falls modestly, though the total volume of exports to the US declines more significantly, by over 10 per cent. Overall, our model projects a 0.2 per cent reduction in real income resulting from the tariff increase, as shown by Figure 2. These findings underscore the importance of maintaining a low trade cost environment for the Irish economy. Furthermore, reducing barriers to MNE operations can help mitigate the economic costs of trade conflicts by incentivizing greater MNE presence.

In summary, our research highlights that the type of frictions affecting MNE activity—whether variable, fixed, or sunk—along with general equilibrium effects, play a critical role in shaping aggregate firm dynamics. Recent trade conflicts, such as Brexit and the Trump-era tariffs, may influence MNE presence in Ireland by altering these frictions in complex ways. A caveat to our analysis is that our model does not *explicitly* feature corporate taxes. This is therefore not a framework that captures the fiscal impact of a reduction in US MNE activity in Ireland, nor the impact of a change in US tax policy.

Real income in Ireland falls by 0.2 per cent due to US tariffs

Figure 2: Real income in Ireland, relative to baseline = 1

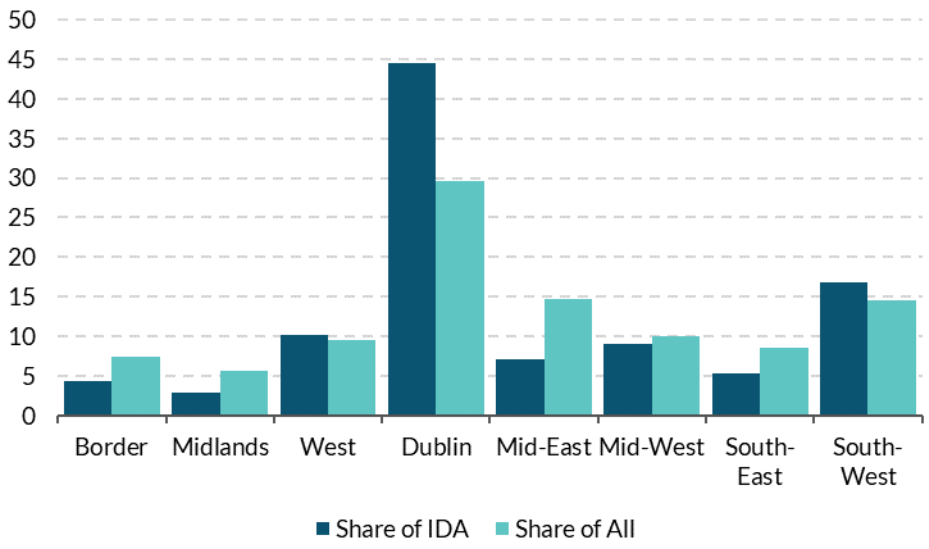


A gradual long-run slowdown in FDI would adversely affect Ireland's long-run growth trajectory. Historically, new FDI into the Irish market has been more than sufficient to offset the closure of plants and job losses of existing MNEs, which have often occurred in response to structural and technological changes impacting the global market.[27] However, this dynamic could be challenged in the coming years, amid a more fragmented global economy. This could lead to a gradual erosion of productive capacity in Ireland, with less investment and fewer workers employed in companies operating at the global technological or knowledge frontier.

Beyond aggregate effects, such a scenario would have important implications for Ireland's regional economies. At 44 per cent, Dublin dominates overall IDA-supported employment, outstripping even its share in total employment of 30 per cent (Figure 16).

Dublin dominates MNE employment

Figure 16: Share of employment across regions, per cent



Source: IDA, CSO, authors' calculations.
Notes: "Share of IDA" refers to each region's share of total IDA-client employment in Ireland. "Share of All" refers to each region's share of total employment as per the Labour Force Survey.

The reliance of regions on US employment varies, with the US share of MNE employment highest in the Mid-West, South-West and West regions. These regions are well known for exposure to highly visible sectors such as pharmaceuticals and medical devices. These firms are typically large employers

[27] While net job growth has overall been positive, gross job creation and destruction are both much higher than net job creation for MNEs (CSO).

in the local labour market, paying high wages and sustaining employment in other local services. As such, the closures of one large facility – absent replacement - can have a large negative effect on the local economy (Moretti, 2010, Autor, Dorn & Hanson, 2013). These regional exposures are large: 165,000 workers are employed in IDA-supported MNEs outside of Dublin, 118,000 of which are US MNEs.

5. Potential macroeconomic implications

Current US tariffs will have immediate direct effects on the Irish and global economy, while the effects of the structural shift towards greater fragmentation may play out over decades. In the short run, higher tariffs directly affect externally oriented firms, eliciting responses from firms, households, financial markets, and fiscal and monetary policy makers. Into the medium-run, firms will gradually adjust to the new external environment, with economic activity, exports and sourcing strategies reallocating across partner countries and sectors, reshaping global value chains and patterns of trade. Analysis in Section 4 suggests that, in the absence of more significant policy shifts, MNE activity in Ireland is unlikely to change dramatically in the coming years given the substantial sunk costs of investment, though corporate tax receipts from MNEs could change much more rapidly. Over a longer horizon, however, the trend towards a more fragmented global economy could affect the structure and international orientation of Ireland's economy. A more competitive landscape for attracting FDI may result in a lower long-run share of MNEs in aggregate activity, with accompanying lower investment and spillovers to the rest of the economy. Breakdowns in international co-operation may also make access to critical inputs more difficult, potentially affecting Ireland's ability to make long-term infrastructure investments, including to achieve a green transition.

Assessing the impact of global increases in tariffs over the short to medium-run requires rich macroeconomic models that can capture the concentration of international trade in key sectors, as well as Ireland's role as an export platform. The Central Bank has developed two models that can help to shed light on these issues. Firstly, a four region global DSGE model building on Jacquinot, Lozej and Pisani (2022), augmented with imports of intermediate inputs and contract manufacturing is used. Secondly a multi-country, multi-sector model in the spirit of Baqaee and Farhi (2024) which allows a rich set of sectoral cross-border input-output linkages to be modelled, capturing the production network structure of the Irish economy and its position in global value chains is used (see Lukmanova and O'Grady, 2025). The DSGE model

allows the dynamics of responses to be traced out in the aftermath of a tariff shock, whereas the production network model focuses on the steady state the economy converges to over the medium to long run, factoring in adjustments in global value chains.

We consider a scenario in line with the global tariffs in place as of early-August 2025 to evaluate the effects of US tariffs on the Irish economy. The scenario assumes that the US imposes a 15% tariff on all goods from Europe (including Ireland), with no exceptions. The EU (including Ireland) does not retaliate. The US also imposes tariffs on China (35 per cent) and the rest of the world whereby China retaliates and the rest of the world does not. The increase in tariffs is assumed to be permanent.

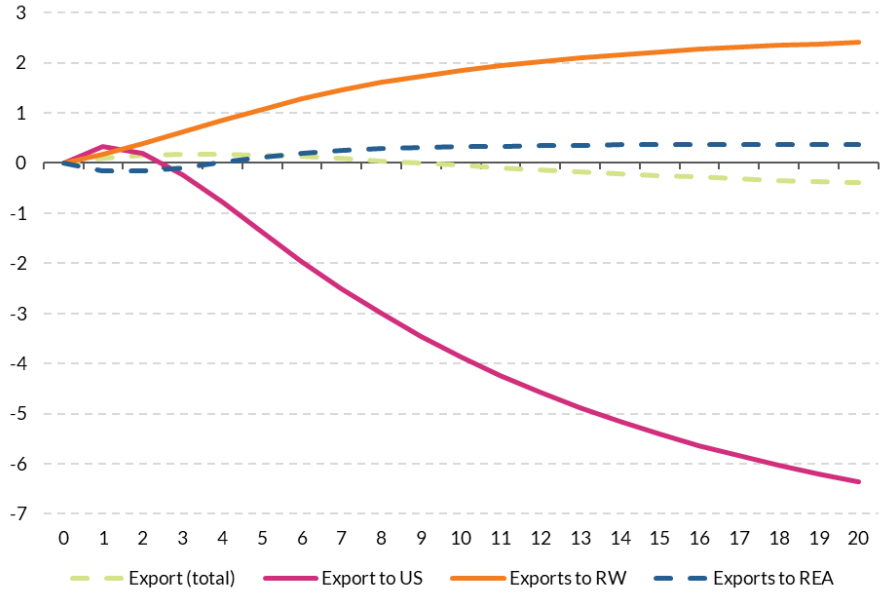
Trade diversion to other countries partly offsets the decline in exports to the US, especially in the short run. The direct impact of the tariff shock is to lower Irish exports to the USA, with both real and nominal rigidities leading to a gradual decline over time.[28] However, the four-region DSGE model finds that, through trade diversion, there are moderate increases in exports to the Rest of World in the scenario, in line with discussions in previous sections on the diversification and adaptability of exporters in the face of such a shock (Figure 17). However, this effect is tempered because the real exchange rate depreciation vis-à-vis these regions is relatively small, and because tariffs cause output to fall globally, weakening external demand for Irish goods.

Model estimates predict around a 1 per cent decline in the level of output relative to the steady state baseline, with larger deviations in consumption and investment. There are strong real effects from the modelled tariff shock. Output deviations emerge slowly due to real costs in adjusting production, ending just over 1pp lower compared to the baseline (Figure 18). Consumption and particularly investment, on the other hand, both react faster and farther as firms and households respond more rapidly to the new environment, settling close to 2.5 and 3.5 per cent respectively below the baseline. The price level increases only moderately over the long-run, due to weaker economic activity offsetting the direct price effects of tariffs.

[28] The initial increase in US exports in Figure 18 stems from frontloading ahead of full implementation of tariffs and due to the depreciation of the dollar vis-à-vis the euro in the short run.

The decline in US exports is partly offset by an increase in exports to the rest of the world.

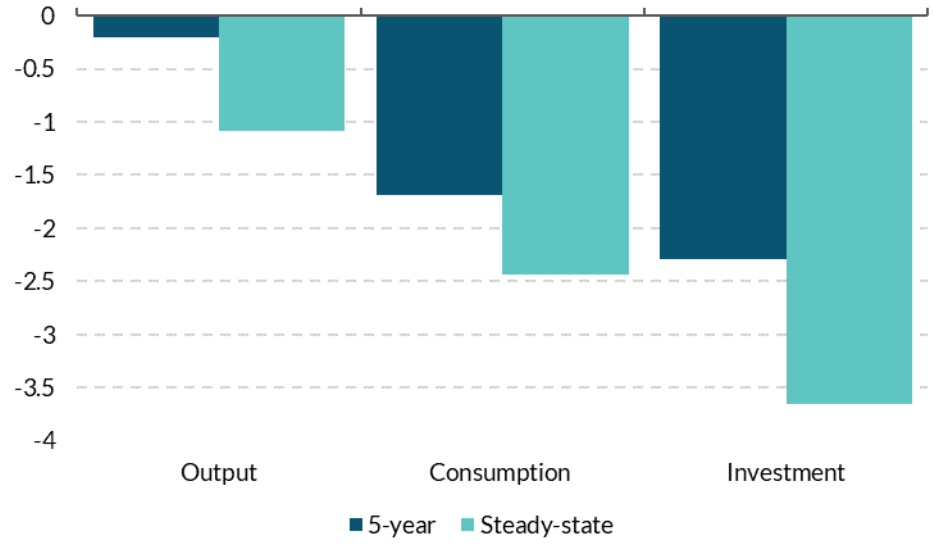
Figure 17: Deviation of exports from baseline, per cent



Source: CBI model estimates from four-country DSGE model building on Jacquinot et al (2022).
Notes: x-axis measured in quarters from announcement of tariffs.

Investment and consumption fall more than output in response to US tariffs.

Figure 18: Deviation of output, consumption and investment from baseline, per cent

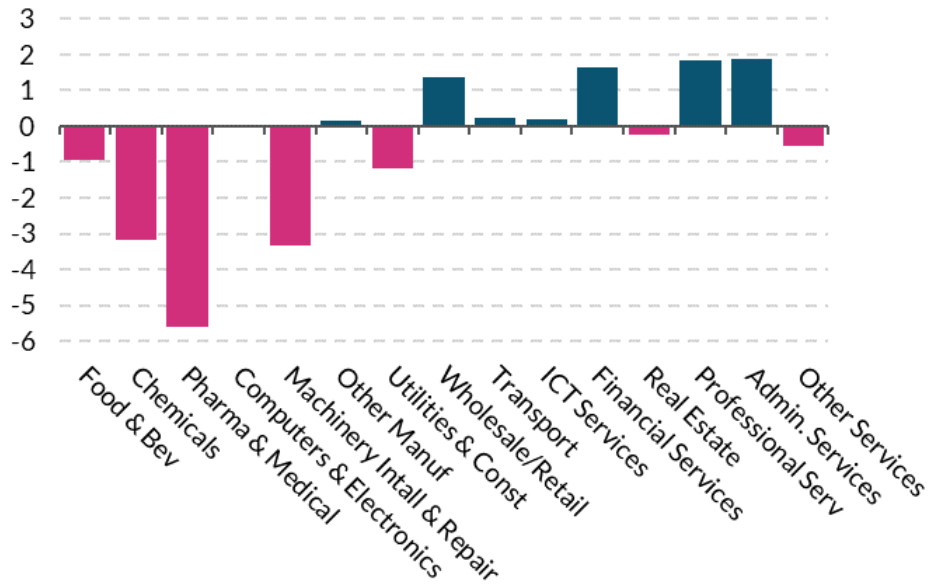


Source: CBI model estimates from four-country DSGE model building on Jacquinot et al (2022).

Over the medium-run, pharmaceuticals would be the main driver of a fall in Irish output, but reallocation of economic activity across sectors is a key adjustment. Model-based analysis from Lukmanova and O'Grady (2025) shows the extent of sectoral heterogeneity in the impact of US tariffs.[29] As expected, pharma-related sectors see more substantial drops in economic activity (pharmaceuticals and chemicals suffer output declines of 6 and 3 per cent, respectively, equating to a 0.7 per cent fall in aggregate output), with other Irish sectors providing intermediate inputs to these sectors (such as Administrative and Support Services) seeing second round impacts through the input-output network. On aggregate, output and consumption fall by 0.6 per cent and 1.6 per cent respectively. However, the fact that services are exempt from tariffs leads to a broad reallocation of economic activity in Ireland from goods to services production over the medium-run, with sectors such as Financial Services and Professional Services growing (Figure 19). This reallocation helps to mitigate the negative effects of tariffs on goods.

In response to US tariffs on goods, economic activity in Ireland shifts from goods to services production.

Figure 19: deviation of sectoral output from baseline, per cent



Source: Lukmanova and O'Grady (2025).

[29] See SI for more detail. The model includes five regions (Ireland, rest of EU, UK, US, China) and a residual Rest of World bloc. Each country comprises 16 sectors that use capital, labour and intermediate inputs, which can be sourced in any country. The model captures the impact of tariffs through direct effects on Irish production and indirect substitution channels that operate through international input-output linkages.

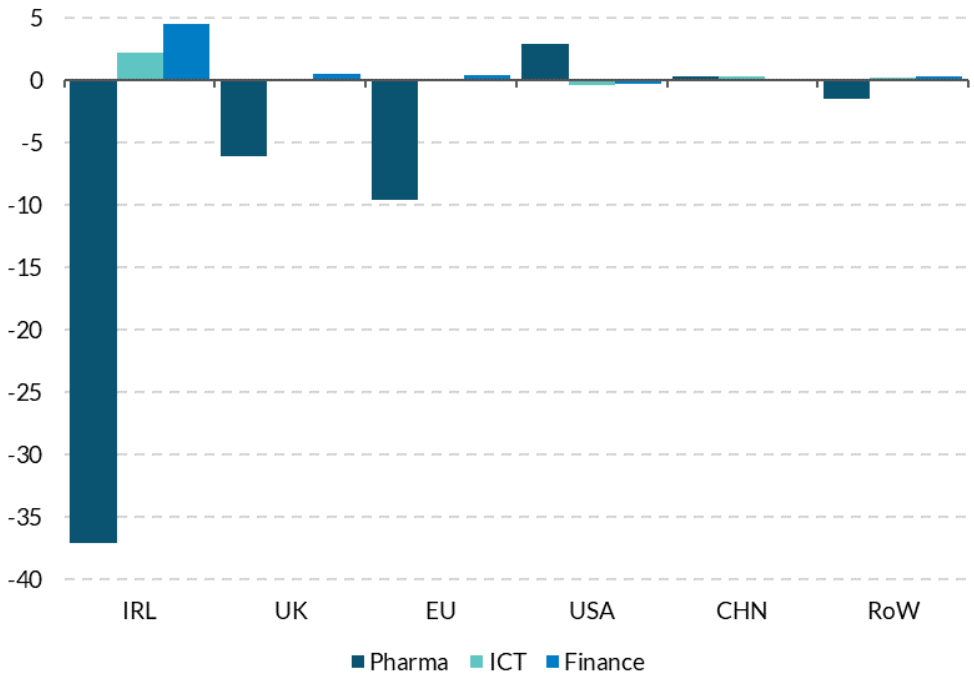
The models highlight the important role that factor reallocation across sectors plays in the economy's adjustment to shocks. US tariffs will distort trade flows, and present opportunities for Irish exporters. Economies react dynamically to shocks, with businesses adapting their sales and sourcing strategies to reflect relative shifts in prices and demand. These two rich models of inter-sector and inter-country linkages allow these mechanisms to be embedded in scenario analysis. From the policy perspective, it is critical that Irish businesses can avail of opportunities in third markets that may arise because of the changing nature of US trade policy. Policymakers can support Irish exporting businesses through the provision of market research, network-building, and information on opportunities that emerge as the global economy adjusts to these shocks (Section 6).

Sector-specific targeting of the pharmaceutical sector by the US would affect Ireland more than other EU countries. An additional tariff scenario is considered where a 50 per cent tariff is levied on the pharmaceutical sector by the US. Though the tariff only increases 4-fold, the pharma sector sees a decrease in real value added of 35 per cent, 7 times greater than in the baseline. The impact on real GDP is also commensurately greater, falling by almost 2.5 per cent. Given the concentration in our export structure, Ireland stands out as the most affected country by this policy (Figure 20). These findings highlight the significant risks to the Irish economy from escalation of tariffs and protectionism in the current environment. Escalation of a trade war and greater fragmentation of international trade leaves Ireland in a more vulnerable economic position, before factoring in any potential long-run slowdown in FDI flows.

Overall, the model-based estimates of the effect of current tariff levels predict a moderate rather than severe macroeconomic impact. Having benefitted from such close ties with the US economy for many decades, Ireland is now more vulnerable than other European countries to shifting US policy. However, the models also clearly illustrate how dynamic the global economy is, and how a reversal in trade with the USA can be absorbed through various channels of reallocation and diversion. Falls in output, consumption and wages represent moderate, rather than severe, economic impacts in the short-to medium-run. Important caveats must always be attached to such modelling exercises, which do not capture sudden shifts that could occur based on idiosyncratic location decisions of FDI employers, or the impact of a rapid reduction in excess corporation tax receipts.

Ireland would be disproportionately exposed to pharma-specific tariffs, with strong non-linear effects on aggregate output.

Figure 20: deviation of sectoral output from baseline, per cent



Source: Lukmanova and O'Grady (2025)

Even if the modelled costs of tariffs are moderate in the short run, fragmentation poses a range of important risks to potential output over the long run. Long-run potential growth in Ireland is driven by fundamental factors such as population growth, investment and productivity (Conefrey, Keenan, Staunton and Walsh, 2024). Geoeconomic fragmentation is one of a number of key structural changes with the potential to significantly affect the long-term prosperity of the Irish population, along with population ageing, climate change and the transition to net zero, and the growth of Artificial Intelligence (AI) and digital technologies. Historically, capital investment and total factor productivity have contributed 40 per cent each to Irish growth (Conefrey et al., 2024). Fragmentation could significantly affect both of these if it results in a slowdown in real FDI inflows into Ireland. This would have a direct negative impact on investment and productivity, given MNEs tend to be capital-intensive and highly productive firms paying high wages, and are key to the process of knowledge diffusion across borders (Ahn, Kim, Li and Manera, 2024). A geopolitical shift towards "friend-shoring" in the EU could potentially help compensate any reduction in future investment by US MNEs, although this regionalisation of economic linkages is likely to be inflationary and to

weaken economic growth across the euro area (Clancy, Smith and Valenta, 2024). Similarly, EU-wide initiatives to boost productivity and investment as recommended in Draghi (2024) could help support long-run potential growth in Ireland.

A reduction in FDI could also slow productivity growth by lowering spillovers to indigenous firms and workers. While export-oriented MNEs tend to be deeply embedded in GVCs and are hence very import-intensive, they do still have an important role in the Irish input-output structure, purchasing materials and services from domestic Irish suppliers (O'Grady, 2024). Irish-sourced materials (services) as a share of total materials (services) purchases were 13 (5) per cent in 2023 (ABSEI, 2023). They are also linked through workers who change jobs, moving between indigenous and foreign-owned firms. Estimates from Flaherty (2024) indicate that roughly 6 per cent of workers in larger indigenous firms have previous experience at a multinational.[30] As such, the presence of MNEs can also keep domestic firm wages higher through competition in the labour market (Balsvik, Fitzgerald and Haller, 2023). Box D provides a comprehensive discussion of the channels of FDI spillovers.

Box D: Channels of FDI spillovers in Ireland

By Fergal McCann

The consensus globally is that FDI improves host country economic outcomes. Much academic literature has focussed on *productivity* spillovers among firms either connected through supply chains, or competing with, FDI firms. More recently, with the advent of granular data sources connecting workers and employers, researchers have investigated productivity differences, wage premia, and knowledge spillovers, among workers moving between the MNE and local sectors.

The existence of these spillovers raises important questions for a scenario where FDI inflows were to slow or reverse. In the Irish case, the evidence base for positive FDI spillovers is relatively sparse. This lack of formal evidence on the channels through which FDI has benefitted the economy makes it harder to predict how these spillovers could unwind in such a scenario. Based on a review of the global literature, in this Box we identify five distinct channels.

[30] This statistic is calculated as a share of workers in indigenous firms with more than 10 workers.

Through *knowledge and technology diffusion*, FDI is thought to deliver productivity benefits to the host country. Within this broad category, however, two distinct channels can be in operation. Firstly, MNE presence can increase productivity in the host country through the diffusion of knowledge across borders, as shown in the case of cross-border patent citations by Ahn, et al. (2024). The importance of MNEs in driving innovative activity is supported in the Irish data, with MNEs accounting for the vast majority of R&D expenditure in the economy. Second, the direct connections between MNEs and local firms can boost productivity of the latter, a process often referred to as a *vertical productivity spillover*. Due to the higher quality, technological know-how, and managerial practices of the MNE, the local supplier improves its productivity through both learning and adherence to higher standards.[31] There is a large global evidence base for the presence of these vertical spillovers, where local firms' productivity is boosted as a result of supplying MNEs, dating back at least as far as Javorcik (2004). The evidence in Ireland is weaker, but need not be interpreted to mean that no positive spillover exists (see for example Di Ubaldo, Lawless and Siedschlag (2018) who find that selling to MNEs has a positive effect on local Irish business productivity, driven by firms engaged in R&D activity). The data do however suggest the overall *scale* of these may not be large in Ireland, with ABSEI data reporting that the purchase of local goods and materials by MNEs in Ireland was €4bn in 2023, or 19 per cent of their payroll bill. By contrast, Irish-owned Enterprise Ireland clients spent 1.5 times their payroll bill on local materials in 2023, suggesting local firms are proportionately much more connected to local supply chains (ABSEI, 2023).

Even absent productivity spillovers, local businesses, particularly in non-tradable services, benefit from *higher direct demand* that comes from MNE presence. MNEs provide local demand stimulus for many suppliers in traditional non-tradable sectors, where one would not necessarily expect productivity spillovers. Examples can vary from local service providers working with MNEs and their staff (catering, hospitality, transport services, facilities and cleaning, maintenance, repair, construction) to those providing professional services. State agency data (ABSEI, 2023) highlights the size of these linkages – as of 2023 there was €9.4bn of purchases of services in the Irish economy by MNEs.

[31] There is a smaller literature that identifies vertical *downstream* spillovers, where MNEs improve the productivity of local businesses that purchase their output. However, we ignore this here given that the vast majority of vertical relationships in Ireland are between MNE buyers and local *upstream* suppliers, rather than vice versa.

Horizontal competition from MNEs drives productivity improvements within sectors. FDI firms compete in their own sector of operation directly with local providers, boosting the productivity of the local sector, both through upgrading, reallocation, and exit of less productive incumbents. In a small, export-platform-oriented economy like Ireland, this form of competition is unlikely to be material, particularly in IDA-supported export-platform sectors. For example, indigenous Irish firms do not directly compete with pharmaceutical, medical device, ICT or computer hardware MNEs. In line with this, Di Ubaldo et al. (2018) find a null or negative effect in Irish data for this form of spillover. Such horizontal competition *may* however be more likely to boost indigenous productivity through competitive forces in non-exporting sectors where MNEs and local firms compete to serve the same market (for example in grocery or hotels). Consistent with this mechanism, seminal work from Keller and Yeaple (2009) does find productivity spillovers from inward FDI within-sector in the larger US market, where domestic competition between incumbents and inward MNEs is more likely. In the Irish case, Section 2 has highlighted the materiality of this form of non-exporting inward FDI: employment in this type of MNE is slightly larger than in IDA clients.

The local or regional economy also benefits from *aggregate demand multipliers* that arise from FDI employment. MNE workers receive particularly high salaries, in higher-skilled jobs, many of which would not exist in the absence of MNEs. This employment generates significant spending on local goods and services, which creates knock-on employment and demand spillovers in non-tradable sectors. In Ireland, evidence of these spillovers exists: Brady (2019) identifies that one new job in the multinational sector creates three additional local jobs in the same county, a result that is in line with estimates for spillovers from high-skilled jobs in other countries. The key policy question facing Ireland in 2025 is the *degree of symmetry* in these spillovers. If one FDI job were to be lost in a given county, would three additional local jobs be lost consequently? This prospect is difficult to assess with any precision currently, given a lack of prior research globally on such episodes, and may be impacted by the capacity of workers to relocate across counties in response to such shocks.

Finally, the economy benefits from FDI through *knowledge transfers and worker skill upgrading*. Workers in MNEs are likely to be among the most skilled and productive in the economy, and are paid a premium relative to workers at local firms. On top of this, *while working at the MNE*, workers' skills

and sector-specific knowledge may become more enhanced through on-the-job training and learning, which can lead to higher wage growth throughout a worker's career (see Arellano-Bover, 2022) who shows that wage growth in Spain is higher for workers who happen to begin their career at larger, more productive firms). This higher skill level creates direct benefits but can also lead to a potential positive knowledge and productivity spillover: in the event that workers do leave MNE employment, they are likely to boost productivity of the local firms that hire them (or even create high-potential local firms themselves). In Ireland, Flaherty (2024) shows that local incumbent workers benefit in terms of wage growth when MNE workers move to their firm; however, this spillover is found to only exist among the highest-paid 40 per cent of incumbent workers in Ireland, in line with global evidence on the skill-bias in technological change.

The relative magnitude across these channels, in a case where FDI inflows slowed in Ireland, is difficult to forecast. The data in this Box suggests that vertical productivity spillovers, from buyer to supplier, are unlikely to have been a major feature of Irish economic growth in recent decades, due to the high import content of export-platform FDI. Rather, the strongest channels likely to be in operation relate to the skills acquired in MNE employment, the wage premium and local demand spillovers that accompany MNE activity. In regions outside Dublin, it is likely that reductions in MNE presence would lead to loss of local demand that would be difficult to offset without the attraction of new internationalised employment in the region. Further, the investment, particularly in R&D, that has been driven by MNEs is unlikely to be replaced by indigenous businesses, based on Ireland's current industrial structure. Significant and ambitious policy steps would be required to prepare for any such shortfall (see Section 6).

Finally, geoeconomic fragmentation may also affect government's ability to deliver on other long-term policy goals, such as the green transition. A key focus of recent geopolitical tensions has been on inputs perceived as critical to countries' national security and long-term prospects. On the technology side, this has focused on semiconductors and semiconductor manufacturing, in particular as dominance and adoption of AI may be a key driver of the next wave of economic growth. Another key area lies in the critical inputs that are central to achieving net zero emissions by 2050, with the expansion of wind turbines, solar panels and electric vehicles, as well as the associated electricity infrastructure central to this. Rare earths and minerals are key bottlenecks in

the production of many of these technologies, and are highly concentrated in a handful of countries. As of May 2025, 55 per cent of critical minerals were subject to some form of export restrictions, including four of the main five minerals required for EVs (Box E). Coordination with the EU on maintaining a diversified supply of these will be critical to ensure that such long-term targets remain achievable.

Box E: Mines, minerals and megawatts – Clean tech's critical mineral challenge

By: Wendy Disch and James Carroll

Ireland is amongst many countries that have committed to reversing the accelerating impacts of climate change, with targets of reducing greenhouse gas emissions 51 per cent by 2030 and achieving net zero emissions by 2050. The expansion of clean, emission-reducing technologies, such as wind turbines, solar panels and electric vehicles (EVs), play a central role in the path towards a carbon-neutral society. Securing access to such technologies is, however, dependent on a highly concentrated supply chain that is vulnerable to geopolitical tensions. One particularly crucial input for clean technologies is the accessibility of critical minerals. [32] They are deemed "critical" by most governments due to their economic importance, supply risk and lack of substitutability (European Union, 2017).

The purpose of this Box is to explore the role and value of these minerals in meeting Ireland's wind, solar and EV targets for 2030, as set out in the Climate Action Plan. This exercise does not comment on the technical feasibility of the targets but rather illustrates the potential supply chain risks associated with clean technologies, including the lack of global diversification in mineral supply and potential export restrictions due to current and future geopolitical tensions.

Table 1 presents Ireland's 2030 clean technology gaps (difference between stocks in 2025 and targets for 2030). Notably, there is a considerable gap between the current stock and 2030 targets, as Ireland has reached just 22 per cent of its solar target, 35 per cent of its wind target and just 9 per cent of its EV target. In Figure 1, these gaps are converted into expected mineral costs using input intensity estimates (mineral quantities per unit by technology) and mineral prices (as of end-2024). Assuming national targets

[32] Also referred to as "Rare earths", which represent a subset of critical minerals which cannot be extracted in an isolated form but distributed through other minerals (National Energy Technology Laboratory).

are reached by 2030, clean technology adoption will require 310,650 tonnes of critical minerals, valued at €2.48 billion. EVs account for the largest share of Ireland's expected mineral costs (58 per cent of total), followed by wind (30 per cent) and solar (12 per cent). While there are approximately 25 critical minerals in the clean tech supply chain, nearly 80 per cent of national costs are associated with just four minerals – copper, nickel, cobalt and graphite).

The acute supply chain concentration in global critical minerals is illustrated in Figure 2 (estimates for 2030) by presenting China's dominance in mining and refining of the key EV minerals (nickel, graphite, cobalt, lithium and copper). Chart 2 also presents export shares of lithium-ion battery packs to date. By 2030, China will have the highest share (top panel) of global graphite (79 per cent) and lithium (28 per cent) mining. While China's mining shares for the remaining minerals are considerably lower, global supplies remain highly concentrated in a small group of countries – by 2030, the top three countries will account for 51 per cent of global copper mining (Chile, Peru and the Democratic Republic of the Congo (DRC)), 78 per cent of nickel mining (Indonesia, Russia and the Philippines) and 83 per cent of cobalt mining (DRC, Indonesia and Russia). For refining (middle panel), China's global shares are considerably. Importantly, it is evident that the EU plays no significant role in global critical mining and refining for these five minerals. For battery pack manufacturing (bottom panel), China's rising dominance is very clear, increasing from 34 per cent of global exports in 2015 to 74 per cent in 2024.

Ireland faces a significant gap between current green technologies and its 2030 targets

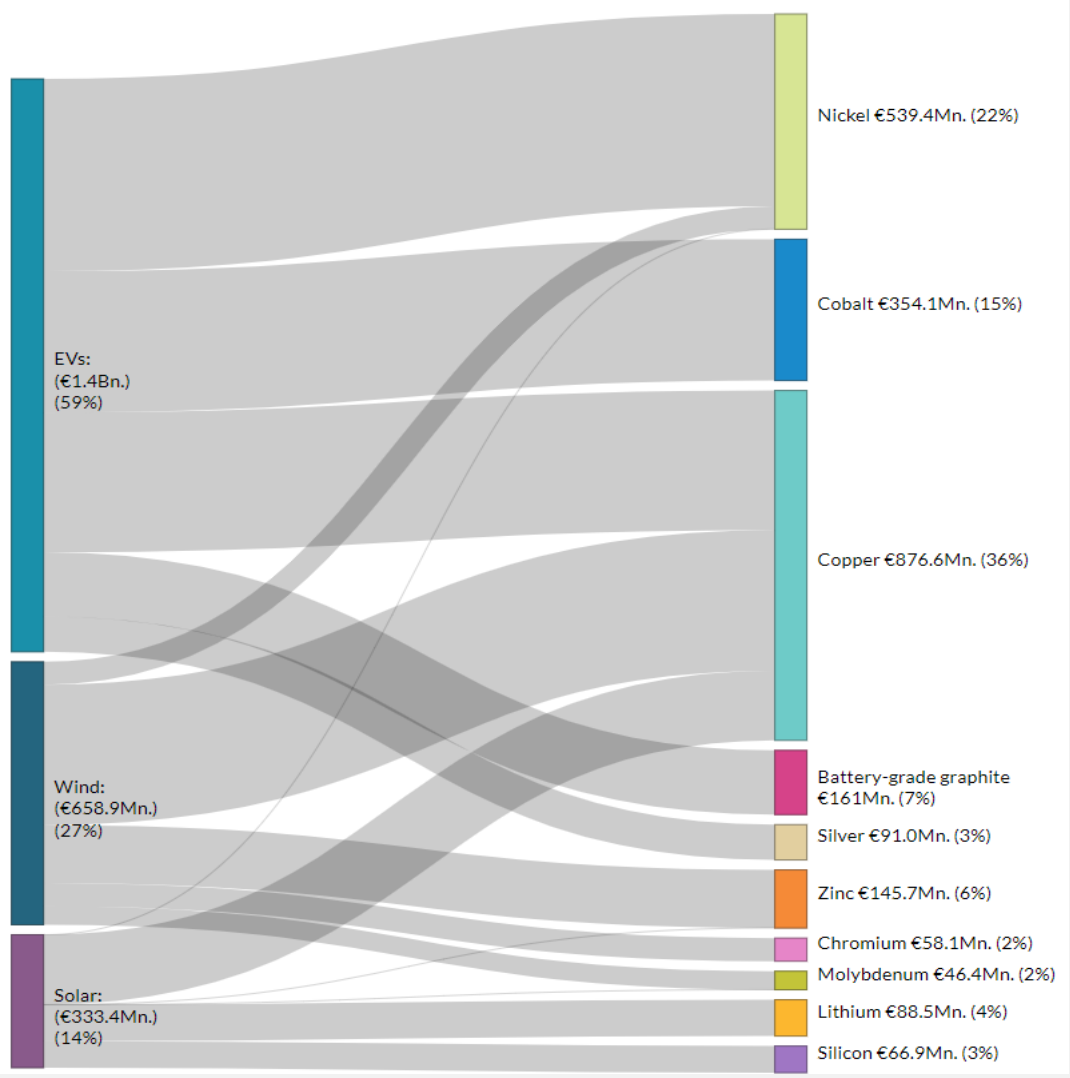
Table 1 – Ireland's current capacity and climate targets

	Stock - 2025	Target - 2030	Gap - 2030
Solar (Installed MW)	1,767	8,000	6,815
Wind (Installed MW)	4,836	14,000	9,164
EV (Numbers)	76,033	845,000	768,967

Sources: Climate Action Plan 2024; Climate Action Plan 2025; Solar Ireland; Wind Energy Ireland; Central Statistics Office
Note: The Climate Action Plan targets 9GW of onshore wind and 5GW of offshore wind. Due to data availability, these are combined. Current stock of wind capacity refers to installations in the Republic of Ireland. For simplicity, only passenger vehicles are considered. Current capacity is based on data available as of July 2025

Electric vehicles account for the greatest share of mineral costs associated with green technology targets

Figure 1: Critical mineral costs related to Ireland's 2030 Green Technology Targets



Sources: Own calculations using data from International Energy Agency Critical Minerals Dataset and EV dataset (intensities of minerals) and US Geological Survey (prices)
Note: For graphite price, we use "High-End Artificial Graphite For NEV" from the Shanghai Metal Market as of 12/08/2025. Figure displays costs of the Top 10 minerals required to meet green technology targets.

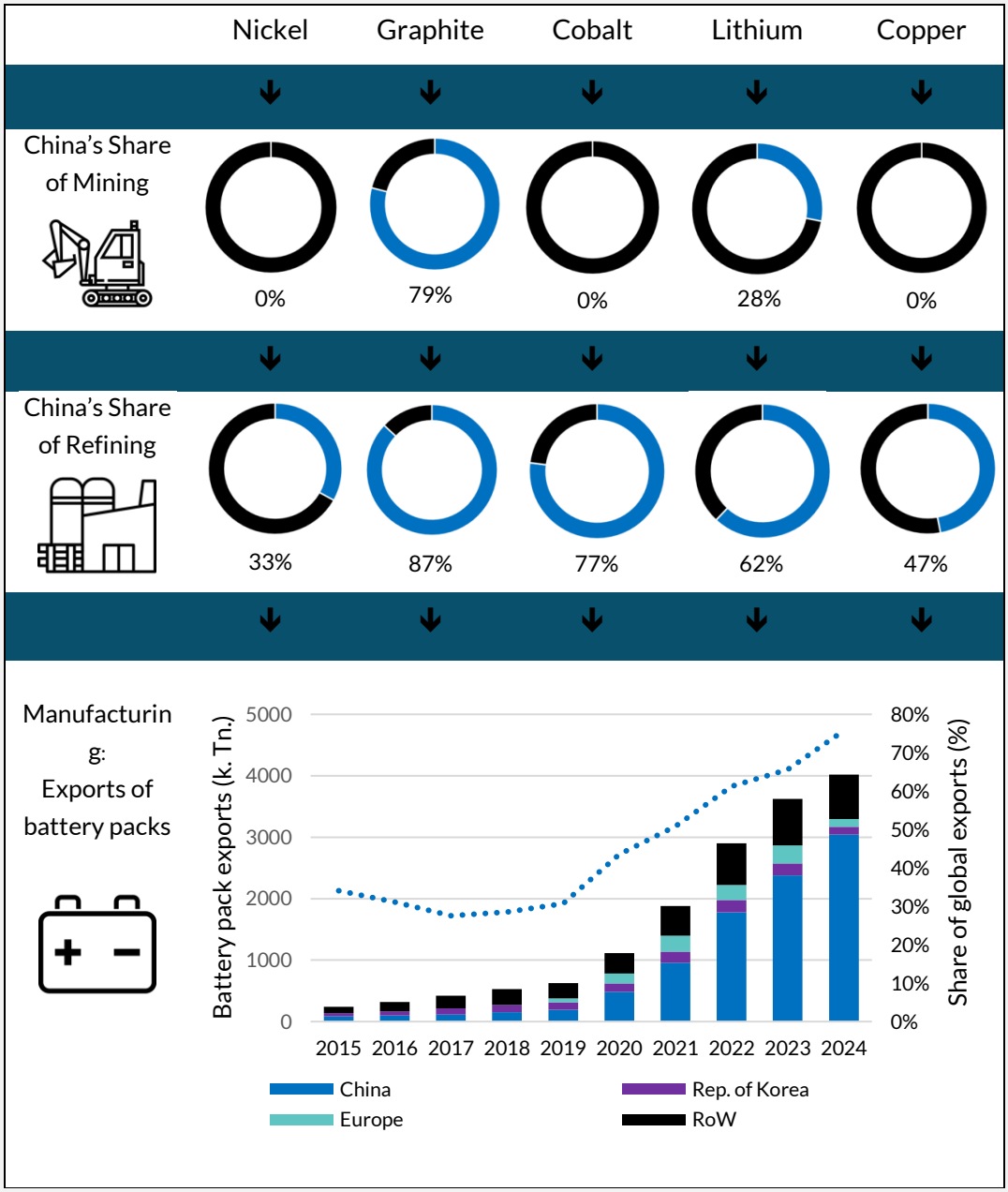
The lack of diversification in critical mineral mining and refining leaves clean technology deployment vulnerable to various supply chain disruptions, which could in turn lead to price volatility, reduced availability and increased uncertainty. For regions with very limited domestic supply (such as Europe), this could hinder emissions targets. Currently, intentional disruptions such as tariffs and export bans are a top concern, with over half of all critical minerals subject to some form of export restriction as of May 2025.[33] While the EU

[33] Zimbabwe introduced a ban on lithium ore exports (Dec 2022) as well as licensing requirements (Jan 2023) while China introduced export controls on refining technology (Jan

has entered into strategic agreements with partner countries to safeguard access to these minerals, ongoing uncertainty over export restrictions will continue to pose risks to the outlook for these minerals.

China plays an outsized role across the EV critical minerals supply chain

Figure 2: China's Share of Global Mining, Refining and Battery Exports



Sources: Global Critical Minerals Outlook 2025 (IEA) and UN Comtrade Database

Nevertheless, in the medium term, supply chain risks would be alleviated through new mining/refining investments, as well as through green technical

2025); China introduced export licensing on Graphite (Dec 2023); the Philippines proposed a ban on raw exports of nickel (Feb 2025); and the DRC introduced a 4 month halt to exports of Graphite (Feb 2025) (IEA, 2025).

progress. For example, the EU has recently announced 47 strategic projects for extraction (to meet 10 per cent of EU demand by 2030), processing (40 per cent) and recycling (25 per cent) (EC, 2025). Ireland has the potential to contribute to these targets through its production of zinc and the exploration for other minerals, including lithium (O'Donnell and McGrath, 2023; Department of Climate, Energy and the Environment, 2022). Decreasing recycling costs of end-life technology will also replace mineral demand imports into the EU, particularly for mineral-heavy EVs. For example, while 95 per cent of the mass of solar panel components are recyclable, only about 10 per cent of end-life panels are currently being recycled (IEA, 2022). Finally, technical progress in the form of continued improvements in solar cell input/output efficiency, as well as new battery chemistries based on minerals that are more abundant will lower future demand pressures for mineral demand (IEA, 2025).

6. Policy considerations

Short-term mitigation of the tariff shock must be complemented with a longer-term strategy to position Ireland's economy for a potentially changed geoeconomic context. There are short-term and long-term policy implications from US tariff changes in 2025 and the longer-running threat of a reversal of global economic integration. Short-term discretionary policy measures may be required to support specific cohorts of affected firms if tariff increases or other shocks go beyond what is currently anticipated. However, such supports should focus on reducing practical frictions to trade, rather than direct fiscal support, factoring in the strong starting position of most affected businesses and the need to ensure a more sustainable position for the public finances in Ireland (CBI, 2025). Over the longer-term, uncertainty over the geoeconomic landscape requires that Ireland's economic strategy is robust to potential structural shifts in the global economy. Maintaining Ireland's attractiveness to FDI, fostering local business dynamism and strengthening Ireland's de facto integration into the EU single market are important policy priorities in light of the changing geoeconomic landscape.

6.1. Mitigating short-run effects

US trade and economic policy changes and wider global fragmentation mean that the risk of a loss of corporation tax revenue in Ireland has increased. The growth in corporation tax (CT) receipts over the last decade has facilitated large increases in government expenditure along with the establishment of

two State savings funds but CT revenue is at risk as MNEs respond to the changing US policy environment. The loss of all recent windfall CT receipts would see the Exchequer move immediately into deficit, with knock-on implications for spending plans on much-needed infrastructure. Through usual cyclical channels, pressure on the budget deficit would increase further if the economy were to slow due to the effect of the tariffs. Large increases in public capital investment have been implemented in recent years and spending is projected to grow further out to 2030. This investment is needed to help address known infrastructure gaps. To create the economic and budgetary headroom to absorb the necessary rise in capital spending, restraint is needed in other parts of the budget including day-to-day (current) spending and taxation. Implementing measures to broaden the tax base would help to improve the resilience of the public finances to a loss of CT and would better enable budgetary policy to respond to future downturns.

Policy support should leverage existing state agencies, focusing on specific market failures or information gaps that may be hindering adaptation to the US tariff shock. In a more constrained fiscal setting, policymakers must resist the urge to cushion the impact of this shock with untargeted direct spending. Exporters to the US are facing challenges, but are also among the most productive firms in the Irish indigenous economy (Section 3). Policy can target viable but exposed businesses, supporting them in meeting the up-front frictions of adjustment to this rapid and unexpected shock to US policy. Given that policy support should, as a general principle, not be channelled to firms who may have the capacity to adapt themselves, lower-cost, practical policy support is preferable to direct fiscal transfers to affected businesses. Examples include the provision of information, network contacts and business development opportunities by state agencies such as Enterprise Ireland to support market search and entry in new export destinations, or to better understand the likely impact of changing tariffs on demand in the US market.

6.2. Supporting long-term prosperity

Sustained and sustainable growth is required to support living standards in Ireland over the long-term. A key ingredient in Ireland's growth experience in recent decades has been the ability to attract large multinationals, which have created high-wage jobs in technologically-advanced sectors, driving investment and high corporate tax receipts. The next phase of Ireland's growth story needs to be robust to a geopolitical environment characterised by greater levels of protectionism and industrial policy, without abandoning the source of previous success. In particular, policies to bolster the growth

potential and export capacity of the indigenous economy will be key in a more fragmented, uncertain geoeconomic context.

External developments are out of Irish policymakers' control, but policy can ensure that Ireland remains as attractive as possible to new FDI flows. Ireland has established itself as a global hub for multinational activity in a number of manufacturing and service sectors, a strong starting point given the importance of network effects in these sectors. Regardless of geopolitical developments, the attraction of FDI will remain a core policy priority for an economy as small and open as Ireland's.

We identify three key priority areas for policy to build further on these strengths.

- First is major investments in infrastructure, particularly water, energy, transport and communications. Improving capacity will not only ensure that existing MNEs can continue their operations, but also build confidence that infrastructure will not be a bottleneck for potential future plants.
- Secondly, policies to boost the housing stock will be required (see CBI, 2024). This is an important societal priority as well as an economic one. And it will be an important factor in remaining attractive to new FDI flows, which will lead both to new jobs for indigenous workers but also increased immigration, given that MNEs have a higher employment share of foreign-born workers than domestic firms (CSO, 2025).
- Thirdly, maintaining high levels of investment in education and life-long professional learning to ensure that workers have the right mix of skills to fill jobs in frontier sectors to adapt to rapid technological changes.

While these factors will ensure that Ireland remains competitive in attracting FDI, they will also all benefit indigenous firms and economic growth potential more broadly.

While a productivity gap between MNEs and indigenous firms is in line with patterns identified globally, indigenous Irish businesses lag behind European peers on a number of metrics. Value-added per worker is about 15 per cent lower among indigenous Irish firms compared to an average of other small and advanced open economies (Smart and Taft, 2024). Investment per person employed, at €7,000 in Ireland, and the share of businesses with "technological innovation activities", at 48 per cent, are both lower among Irish indigenous

businesses than in all but one other country in a sample of similarly-structured European economies.[34]

Complementing FDI activity, long-term growth will benefit from a policy focus on fostering local business dynamism. A key starting point is to enable new firm entry and the growth of young firms, making entrepreneurship more appealing. While small firms are the largest employers in Ireland, young firms drive the greatest share of employment *growth* (Lawless, 2014). This growth is driven typically by 'gazelles', young firms that grow rapidly. The 'up or out' process, by which gazelles thrive while less viable firms close, with capital and labour reallocating, is a key driver of aggregate productivity growth in market-based economies. Policy can enable it by reducing the costs of forming and running businesses, and ensuring the tax system appropriately incentivises risk-taking and entrepreneurship. In this context, recommendations of the National Competitiveness & Productivity Council (2025) regarding reporting burdens for SMEs, energy and electricity costs, and insurance costs are particularly important.

Economic policy should focus on encouraging successful reallocation of resources in response to structural changes, rather than directly supporting firms in sectors experiencing structural decline. In a rapidly changing geopolitical and technological environment, it will be impossible to forecast which firms will win and which will lose out. Rather than focusing on supporting firms in response to a series of recurring external shocks, policy should allow reallocation to occur while supporting affected workers. While politically challenging, policy should not focus on provision of fiscal support to keep struggling industries alive, and rather prioritise on-the-job learning, reskilling and retraining, all of which will allow the economy to dynamically adjust to structural change that is occurring at rapid pace. More broadly, in such an unpredictable global environment, stable and predictable domestic policy-making will reduce the uncertainty facing firms and provide a more supportive environment for new investment.

By creating the conditions for indigenous business to thrive and grow, policy can create virtuous circle effects both in the internationalisation of local firms and in their linkages to MNEs. A more dynamic and productive domestic economy will inherently be more externally oriented, as firms look to foreign markets to grow and expand, and more productive local firms build relationships with MNEs. A reliance on exports, whether driven by MNEs or

[34] Lawless (2025), based on a sample of Belgium, Denmark, Luxembourg, Netherlands, Austria, Finland, Sweden.

local firms, will be a key driver of Irish prosperity due to Ireland's size and geographic location. Local firm export growth can be promoted and facilitated through policy action to reduce barriers to entry into foreign market for growing firms. Larger firms, through the process of growth and successful expansion, will typically be more diversified across markets and more resilient to unexpected shocks. Further, expanding the role of large indigenous exporters would reduce future economic risks from any further retrenchment in global FDI activity.

A larger, more productive indigenous business population would create substantial direct linkages and demand spillovers to other local firms. Research and policy discussion has focussed traditionally on positive spillovers from inward FDI (see Box D), but less on the positive spillovers that emerge when *local indigenous businesses grow and expand*, particularly into export markets. Survey data from the State's agencies suggest that local expenditure in the Irish economy is in fact higher among Enterprise Ireland client firms (who are predominantly indigenous) than among IDA-supported MNEs, indicative of greater supplier demand spillovers from local firm growth than from MNE entry, which is often heavily export-focussed.[35] EI client businesses spent €18bn on Irish goods materials in 2023, versus €4bn by IDA clients. This corresponds to a 65 per cent expenditure share on Irish-sourced materials out of total materials for domestic firms, vs. a 13 per cent share for foreign firms.[36] An additional benefit from a stronger indigenous business population would be the greater local demand and investment spillovers that emerge when a greater share of capital is held domestically, rather than overseas.[37]

Further opportunities for growth are likely to exist in the EU single market. Both due to the English language and historical relationships, Ireland's trade and investment flows tilt more towards the US and UK than is typical among EU member states. Ireland's EU-owned FDI stock, for example, accounts for a smaller share of FDI employment than any other country in Europe, according to bilateral data on FDI activity. Data on indigenous firm exports, who have relied on the UK as their main destination for decades, is also instructive:

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[35] All figures in this paragraph taken from ABSEI 2023 and the annual reports 2024 of the two agencies (Enterprise Ireland report here; IDA Ireland report here).

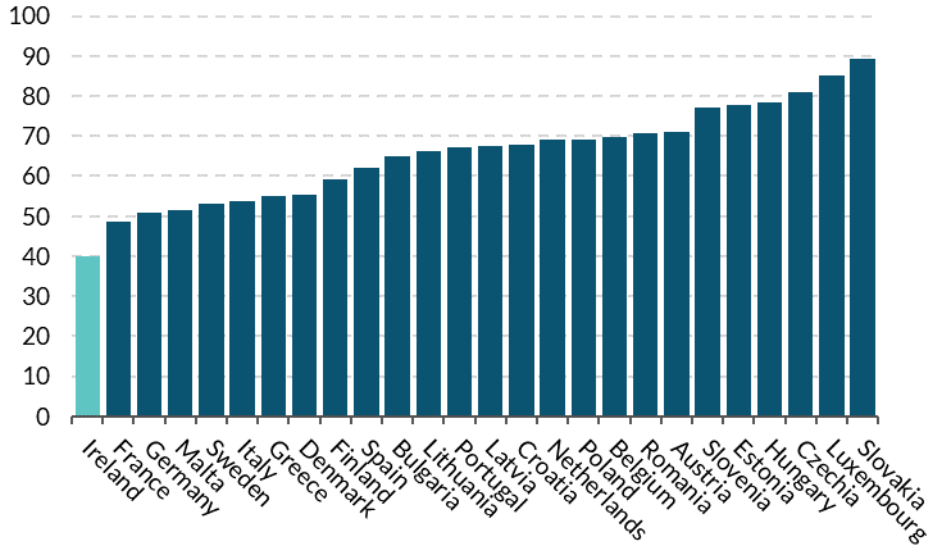
[36] For Irish-sourced services, €8bn was spent by local firms, versus €11bn by foreign-owned clients, corresponding to 56 per cent Irish-sourced share for indigenous firms vs. 5 per cent for foreign firms.

[37] Balsvik, Fitzgerald and Haller (2023) show that, in a model of the Norwegian private sector, the returns to domestic capital would rise 20 per cent in a scenario where MNEs were not present – partly but not fully offsetting the significant wage losses that would occur in such a scenario.

Ireland has the lowest share of indigenous firm exports within the EU27 of any member state (Figure 21).

Irish exporters sell proportionately less in the EU27 than indigenous exporters from any other member state.

Figure 21: Share of intra-EU exports by indigenous firms, per cent

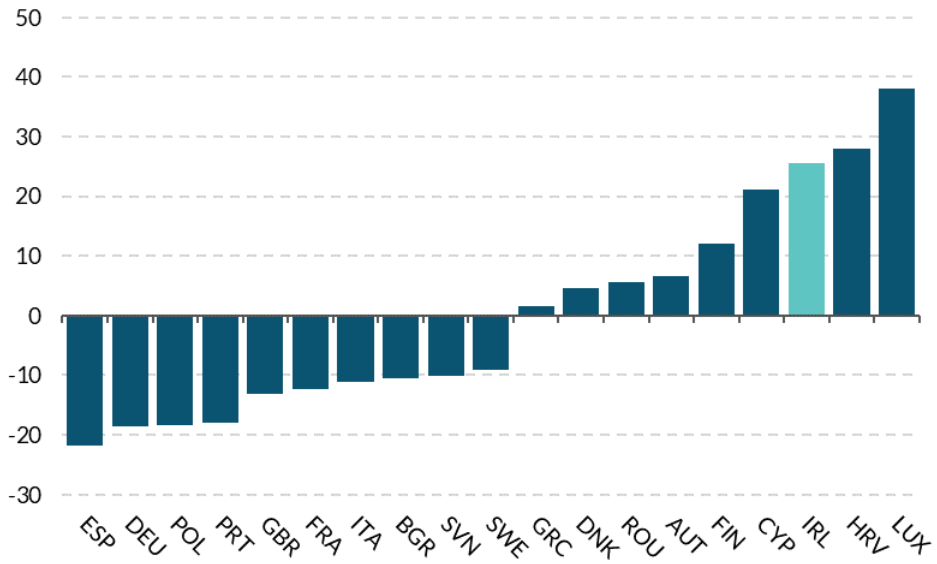


Source: Eurostat Trade by Enterprise Type.

Trade policy certainty within the EU may be particularly valuable amid a more volatile global order. The EU is the largest integrated trading bloc in the world, providing guarantees of zero-tariff market access across 27 economies, with a population larger than the USA. Irish authorities should continue to advocate for, and play a key role in, the further removal of intra-EU non-tariff barriers (as per Draghi, 2024) and the advancement of a stronger Single Market in Europe. This would increase Ireland's potential trade and investment opportunities with the EU. Estimates indicate that the underlying frictions on intra-EU trade implied by bilateral goods trade flows across member states are higher in Ireland than in most other member states, even controlling for geographic proximity (Figure 22). The estimates here suggest there are large unrealised gains that could be exploited from lowering effective trade frictions to Ireland's intra-EU trade, potentially through targeted export promotion policies. Separately, high-potential Irish businesses may also benefit from opportunities, which come with higher risks and entry barriers, in higher-growth emerging markets.

Ireland has higher implied trade frictions within the EU than most member states

Figure 22: Estimates of intra-EU implied trade costs, percentage points



Source: World Bank ESCAP trade costs data, CEPII gravity data, authors' calculations.
Notes: A value of 20 implies that a country has ad-valorem equivalent trade barriers with other member states, as per the method of Novy (2011), that are 20 percentage points higher than the average for other EU countries' trade within the Union.

The financial sector plays a critical role in facilitating both the growth of high-potential businesses and shaping economic reallocation to structural change. Intangible assets, which are less easily collateralisable in bank lending than tangibles, are increasingly important in the economy, and particularly important among high-potential businesses. To ensure that the financial system can adequately support a thriving indigenous business economy, particularly in a setting of less inward FDI, policymakers should strive to develop a funding ecosystem where a mix of equity, mezzanine and debt financing are available to Irish business across their lifecycle. This will require a diverse blend of banks, non-bank lenders and a variety of funds specialising in private equity and venture capital, complemented by involvement from State agencies where market failures and funding gaps require intervention. Such a funding landscape will require substantial capital inflow from across European and global financial markets.

The financing of future growth may also require products better tailored to export growth of high-potential young businesses. Ireland's small and open nature means that in order for local businesses to scale, they will need to access export markets relatively early in their lifecycle. The availability of

financial products tailored to expansion into export markets such as invoice discounting products and export credit insurance may therefore be particularly important in supporting long-term growth of the indigenous business population. Where market failures are identifiable, there may be justification for public guarantees or other interventions to ensure adequate provision of this important source of finance.

Ireland can benefit from a stronger and more integrated European financial market and payments system. Further integration of the European financial system will benefit the Irish economy as it looks to exploit more opportunities within the EU export market, and source further funding from across the continent. Additional market-based financial products, increased in availability through the unlocking of retail investments as part of "Savings and Investment Union" initiatives, may provide some of the additional growth capital needed in the Irish economy. A more integrated European payments system will also reduce frictions to trade for Irish importers and exporters looking to access markets across the continent. Ireland can increase the likelihood of these opportunities arising through the active promotion of European initiatives to integrate the continent's financial system.

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