Working Paper:

Analysis of UK "No Deal" TariffSchedule in the Context of Cross-BorderTrade

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Key Messages:

- The UK government published in March 2019 a temporary schedule of tariff rates to be applied for up to 12 months in the event of "no deal" exit from the EU.
- Almost all research up to now assumed a degree of symmetry in the tariffs being applied but the new schedule changes this considerably.
- Under the new tariff schedule, the UK plans to abolish tariffs entirely for a wide range of products and substantially reduce them for most others.
- It additionally announced a temporary period where the tariff being faced by exporters from Ireland to Northern Ireland would be set at zero for all goods.
- If the same temporary tariff schedule is applied to trade from Ireland to Northern Ireland as was announced for the rest of Great Britain, Irish firms would face an average tariff of 1.45%.
- This is compared to a potential increase of 17.5% if the UK had adopted the EU level of tariffs.
- In contrast, trade from Northern Ireland to Ireland with the maximum EU tariff schedule applied would increase in price by 15.8% on average.
- The majority of this tariff effect (and the resulting trade fall) for Northern Ireland would be on the Dairy sector where tariffs and increased costs of non-tariff barriers could result in close to a complete cessation of trade.
- There may be some space for exemptions under inward and outward processing rules to allow cross-border supply chains in this sector to continue but these exemptions have rarely been applied to agricultural products.
- Beef exports remain one of the few sectors where the new UK tariff schedule imposes tariffs in excess of 25% making this the most exposed of sectors exporting from Ireland.
- A reduction in the value of sterling would have the potential to offset the negative impact on Northern Irish exporters to some extent (while making it more expensive for firms from Ireland to sell into Northern Ireland). However, as many firms are trading in both directions across the border, the gains from currency movements could be limited.
- In the main, for Irish firms exporting to Northern Ireland, the trade risk would appear to shift from direct tariff costs to concern about the opening of the UK market to increased competition from lower cost countries through the tariff reductions. This also likely to be a key concern for Northern Ireland business in addition to the direct costs to their EU exports.
- Additional competitive pressures would arise from the introduction of zero rate tariff-free quotas for products such as beef and poultry as these quotas would be available to all countries.

1. Introduction

This report re-evaluates the potential impact of Brexit on cross-border trade in Ireland to take into account several developments in announced policy positions and in the availability of more appropriate and accurate data since this issue was previously examined by InterTradeIreland in 2017.[1] The previous report assumed that the tariffs imposed would be the same for trade flows in both directions across the border. In March 2019, however, the UK government published a new temporary tariff schedule that would apply in the case of exiting the EU without a withdrawal agreement in place.[2] The core objective of this report is to examine this temporary tariff schedule and compare it to that of the EU. This will allow us to examine how exposed firms trading across the border are to a hard Brexit and how the extent and distribution of that exposure differs depending on sector and direction of trade.

The previous report and other existing research suggested potentially substantial negative impacts on Northern Ireland of any significant changes in the *status quo* trade arrangements. In particular, it highlighted that cross-border trade was likely to be considerably more impacted by EU-MFN tariffs than trade between Ireland and the rest of Britain.[3] Likewise, exports from Ireland to Britain were more impacted than imports. The share of agri-food products in each direction of trade was the key driver of the differences in relative impacts when using the EU-MFN tariff schedule as this sector is subject to particularly high tariffs under that schedule. Examining how the UK temporary tariff schedule differs from that of the EU is therefore an important element in establishing the level and distribution of exposure across trading firms.

The temporary UK tariff schedule announced on 13th March 2019 also differs importantly in its implications for the broader competitive environment within the UK market as the tariffs (and for some products, tariff-free quotas) apply to all trading partners and not just to the EU. The previous report made a number of assumptions on the extent of the effect of other barriers to trade and sensitivity to price changes. Since then, considerable further research has been undertaken on these issues and more targeted estimates have been developed by the OECD and HM Government which we adopt in this report.

[1] https://intertradeireland.com/insights/publications/intertradeireland-potential-impact-of-wto-tariffs-on-cross-border-trade/
[2] https://www.gov.uk/government/news/temporary-tariff-regime-for-no-deal-brexit-published
[3] MFN tariffs refer to "Most favoured nation" rates, the upper-bound at which tariffs are set by a country for all trade partners (apart from those with a recognised trade agreement). Note that the actual applied level of tariffs may be lower so long as the lower level is applied in a non-discriminatory way to all trade partners.

While considerable research has been undertaken on the potential impacts of Brexit, both on the UK and on its European trading partners, it was generally assumed that the UK would be likely to "inherit" the EU tariff schedule agreed with WTO at the initial stage of the exit process. All of the empirical analysis was therefore based on the upper bound schedule of tariffs that the EU has registered with the World Trade Organisation for countries that it has no formal trade deal with (known as "3rd countries"). In the absence of any alternative information on the issue, it was therefore assumed that tariffs would be applied symmetrically with the same basic rates applying for UK trade with the EU as the EU would charge on products originating in the UK.

While the UK has submitted a maximum tariff schedule to the WTO that mirrors that of the EU, the UK government also published details of a "temporary" tariff and quota schedule in the event of EU exit without a deal whereby lower tariff rates would actually be applied to all countries as well as some tariff-free quotas. The previous assumption of symmetry in the tariff rates for cross-border trade therefore does not hold in the immediate aftermath of a no-deal Brexit occurring. This temporary schedule of tariffs was published in the run-up to the previously agreed exit date at the end of March but has not been revised in the intervening period of extension and appears to remain the schedule for application in the event of an exit on October 31st without an alternative Withdrawal Agreement or trade deal being in place. The schedule describes itself as being "temporary", which is defined as applying "for up to 12 months while a full consultation and review on a permanent approach to tariffs is undertaken".

As part of the announcement of the tariffs, they were described as having been reduced to zero for 87% of UK-level imports from the EU as a whole with tariffs remaining on the other 13% of imports. Under WTO rules, while increases in the maximum bound tariffs must usually be agreed by members, the organisation's "bias towards liberalisation" means tariffs can be lowered by any member so long as the lower tariffs apply to all trading partners ("most favoured nation" rule). As these temporary applied rates are lower than the maximum registered, there is scope for increases in the UK tariff schedule up to the level of the bound tariff schedule once the temporary period as elapsed. On the other hand, lowering tariffs for one country or for a group of trading partners is only allowed by agreeing a "comprehensive" trade deal. The UK temporary schedule therefore applies to all of the remaining EU member states and also to all other countries including those that it has rolled over a specific free trade deal with if these temporary rates are lower.

This report focuses solely on the comparison of the two tariff schedules and links them to the current structure of cross-border trade on the island of Ireland. It does not address broader questions on how the change in tariffs charged by the UK on other countries may affect trade flows, apart from noting that, in the longer-run, this may have significant implications for the competitive environment faced by Irish and Northern Irish firms.

The announcement of the temporary tariff policy also contained a proposal that trade between Ireland and Northern Ireland would temporarily be treated differently in terms of customs checks relative to trade from Ireland to Great Britain. Unlike the overall schedule, the term "temporary" is not defined in the context of a tariff-free approach being taken to all cross-border trade in Ireland. The base comparison case is therefore that there are no changes in trade costs for Irish firms exporting to Northern Ireland but new tariffs and regulatory checks on Northern Irish firms exporting to Ireland. Given that the temporary term that this case holds is uncertain, we also examine how trade from Ireland to Northern Ireland maps against the full UK temporary tariff schedule in terms of product coverage.

Given these developments relating to the publication of new temporary tariff and quota schedules, it is timely to revisit the previous analysis and evaluate the degree to which the new policy measures affect those findings. This report therefore focuses on the following research questions:

- What are the main differences in the UK tariff schedule vis-à-vis the EU schedule examined in the previous InterTradeIreland research?
- To what extent does this change the relative exposure of products and sectors to a "no deal" Brexit?
- How will this impact on the relative exposures of South-North trade compared to North-South trade if different tariff schedules are in place depending on direction?
- How do the published quota volumes compare to current levels of trade?

2. Data on Cross-Border Trade

This section sets the scene for how the different tariff schedules might affect trade flows by giving a brief overview of the sectoral composition of cross-border trade. This is based on data collected by the Central Statistics Office for the Republic of Ireland in which Northern Ireland is identified separately from the rest of the UK as a trading partner. The data is available at an extremely disaggregated product level, which it is possible to match to the bound tariff schedule registered by

the EU with the WTO and with the UK temporary schedule. The detailed product data covers 90 per cent of trade in both directions, with the remaining 10 per cent being estimated in the total statistics and not assigned to a specific product category.

Table 1: Sectoral Composition of Cross-Border Trade

	Ireland to NI	NI to Ireland
Live animals	4.2%	0.7%
Meat and fish	10.6%	6.0%
Dairy	3.2%	14.8%
Vegetable products	2.5%	4.6%
Products of milling industry, oil, fats	2.8%	4.7%
Foodstuffs	4.9%	6.3%
Beverages	5.4%	3.7%
Residues of food and tobacco	3.8%	8.8%
Mineral products	6.5%	3.8%
Chemical and pharmaceutical products	2.6%	1.9%
Other organic chemicals	3.7%	1.5%
Other chemicals	2.1%	0.6%
Plastic and rubber	5.9%	5.6%
Raw Hides, skins, leather, & furs	0.3%	0.1%
Wood and wood products	6.2%	6.0%
Textiles	0.1%	0.2%
Carpets, footwear, umbrellas	2.7%	1.8%
Stone, glass	1.8%	1.6%
Metals	5.0%	4.1%
Machinery, electrical	7.3%	6.3%
Transportation	3.0%	4.0%
Miscellaneous	15.3%	12.8%
	100.0%	100.0%

Table 1 gives an overview of the structure of trade between Ireland and Northern Ireland. The overall structures of North-to-South and South-to-North trade are not dissimilar, with the main exception being the very large share of exports from Northern Ireland accounted for by the Dairy sector. Relative

to its importance in total Irish exports, trade in the Chemicals and Pharmaceuticals sector makes up a relatively minor 2.6% of exports to Northern Ireland.

Data on cross-border trade is also collected by other agencies such as the Regional Trade Statistics from HMRC and through survey data by NISRA with the levels of reported trade varying across sources. However, an examination of the methodological differences of the different sources undertaken by InterTradeIreland[4] did not show any systematic bias across sectors although the levels did vary. The distribution across sectors of the exposure to tariffs analysed in this work should not therefore be very sensitive to these data collection issues.

3. Comparison of the tariff schedules' average rates

Tariffs can be applied in two different ways – the most common are *ad valorem* tariffs (i.e. charged as a percentage of the value of the goods being shipped) while others are applied as a charge per unit quantity or by weight. In some instances, the two methods are combined, as for example in the case of the EU tariff on fresh or chilled boneless bovine meat which is 12.8% of the value of the product plus €303 per 100 kg. As the CSO data on cross-border trade flows that we will use provides the weight as well as the value of trade to allow us to include both elements where applicable.

Table 2 compares the UK temporary tariff schedule to be charged on Irish trade into Northern Ireland (following any temporary period of zero tariffs, as mentioned above) to the tariffs that would have been charged if the UK had used the EU schedule of tariffs as assumed in most earlier analyses of the impact of Brexit. The average EU tariff to be charged on trade from Northern Ireland into Ireland is also included. Note that this analysis is an upper bound as it does not include the use of any zero rate tariff rate quotas being utilised. As the tariff-free quotas are accessible by all trading partners, it would not be possible to estimate what share of the quota would be used by exporters from Ireland specifically.

As the sector average rates are based on aggregating over many detailed products, we see that the averages can vary by direction of trade flow as the underlying composition in terms of which products are being traded may differ. The inclusion of some charges based on the physical weight of the goods

[4] https://intertradeireland.com/assets/publications/Investigation-into-North-South-Trade-Statistics.pdf

being trade can also impact on the calculation of the sector average depending on which specific products are being aggregated over. This is the reason that the sector averages for the EU tariffs can be different for Northern Ireland to Ireland trade compared to those for Ireland to Northern Ireland even though they are based on the same product-level tariff rates. For example, the sector average tariff for the Meat and Fish sector is 73.4% for Northern Ireland to Ireland but the same EU tariff schedule shows a 34.8% tariff on Ireland to Northern Ireland trade due to differences in the types of meat traded attracting different tariffs.

Table 2: Comparison of average tariffs by sector

Sector averages (trade-weighted)	EU Tariffs: NI to Ire	EU Tariffs: Ire to NI	UK-wide Temporary Tariffs: Ire to NI	UK Temporary NI-specific Tariffs: Ire to NI
Live animals	22.98%	9.87%	0.00%	0.00%
Meat and fish	73.42%	34.80%	16.42%	0.00%
Dairy	52.48%	64.24%	0.25%	0.00%
Vegetable products	18.85%	8.42%	0.00%	0.00%
Products of milling industry, oils	26.38%	23.75%	0.09%	0.00%
Foodstuffs	13.51%	11.10%	0.09%	0.00%
Beverages	3.10%	2.24%	0.00%	0.00%
Residues of food and tobacco	7.87%	7.66%	0.00%	0.00%
Mineral products	1.05%	0.50%	0.00%	0.00%
Chemical and pharmaceutical	1.35%	1.13%	0.00%	0.00%
Other organic chemicals	5.75%	5.15%	1.21%	0.00%
Other chemicals	1.27%	4.24%	0.00%	0.00%
Plastic and rubber	4.61%	5.70%	0.17%	0.00%
Raw Hides, skins, leather & furs	0.71%	3.29%	2.40%	0.00%
Wood and wood products	1.45%	0.51%	0.00%	0.00%
Textiles	5.28%	4.73%	0.00%	0.00%
Carpets, footwear, umbrellas	10.47%	10.96%	3.26%	0.00%
Stone, glass	2.82%	3.38%	0.22%	0.00%
Metals	2.32%	1.14%	0.04%	0.00%
Machinery, electrical	1.62%	1.65%	0.02%	0.00%
Transportation	3.88%	5.25%	4.40%	0.00%
Miscellaneous	0.82%	1.74%	0.00%	0.00%
Average across all sectors	**15.79%**	**17.51%**	**1.45%**	0.00%

The overall average tariff in the case of the EU schedule is a 15.79% increase in price for goods going from Northern Ireland to Ireland and a slightly higher 17.51% increase for goods moving from Ireland to Northern Ireland. It is clear from the table, however, that averaging over all products produces a rather misleading picture as the variation is substantial. Tariffs on manufactured products are in general relatively low, in the region of 1% to 2% for most sectors with an outlier of an average tariff exceeding 10% for the Carpets, footwear and umbrellas sector. The picture across food sectors is strikingly different with tariffs well in excess of 50% in some instances. The share of agri-food in trade is therefore the key driver of exposure to Brexit for firms in Northern Ireland exporting into the EU.

The third column of Table 2 then calculates the sector average tariffs for Irish trade to Northern Ireland using the March 2019 temporary tariff schedule for the UK overall. This schedule sees tariffs abolished for a wide range of products and substantially reduced for most others. It brings the overall average tariff being faced by exporters from Ireland to Northern Ireland down to 1.45% compared to the potential increase of 17.51% if the UK had adopted the EU level of tariffs. The only sector where significantly high tariffs are maintained are in the Meat and Fish sector where the average tariff is now 16.4%. This continues to hide some variation within the sector, which we will look at in more detail in the next section. The final column for comparison shows that the additional temporary regime announced specifically for trade between Ireland and Northern Ireland would result in no tariffs across any products.

Table 3 shows the extent of the reduction in tariffs with the UK temporary schedule relative to what might have been expected from the UK adopting the EU schedule of tariffs. This completely removes tariffs from many sectors – including live animals, mineral and chemical products and machinery. Other sectors continue to have some tariffs being applied but with reductions of over 90% in all but a few cases. Despite retaining the highest average tariff rate, the Meat and Fish sector does also show substantial reductions in duties. Across all trade from Ireland to Northern Ireland, the UK tariff schedule results in tariff duties that are 78% lower than the hypothetical comparison of the UK having applied EU-level tariff rates. This assumes that these rates are applied to cross-border trade with the alternative case of tariff-free trade (on a potentially temporary basis) on all trade arriving in Northern Ireland.

Table 3: Change in tariff duties if UK temporary rates applied instead of EU rates

	Ire to NI
Live animals	-100%
Meat and fish	-68%
Dairy	-84%
Vegetable products	-96%
Products of milling industry, oils, fats	-100%
Foodstuffs	-100%
Beverages	-77%
Residues of food and tobacco	-100%
Mineral products	-100%
Chemical and pharmaceutical products	-100%
Other organic chemicals	-100%
Other chemicals	-97%
Plastic and rubber	-98%
Raw Hides, skins, leather & furs	-93%
Wood and wood products	-100%
Textiles	-100%
Carpets, footwear, umbrellas	-66%
Stone, glass	-99%
Metals	-98%
Machinery, electrical	-100%
Transportation	-47%
Miscellaneous	-100%
Total decline in tariff duties due	-78%

4. Distribution of tariff rates within sectors

The previous section showed the extent of variation across sectors in average tariff rates and the extent to which these are lower in the UK temporary tariff schedule relative to those in place for the EU. These sector averages can mask considerable variation across products within the same sector, which this section looks at in more detail. The following set of graphs show the dispersion of tariff rates across products is to look at how many products and the associated share of current trade values fall into different tariff ranges, using both the EU and UK tariff schedules.

Products are ordered by the level of tariff they would face under each tariff schedule and divided into groups as follows:

- Products with a zero tariff

- Products with a tariff higher than zero but less than 10%
- Products with a tariff between 10% and 25%
- Products with a tariff over 25%.

Figure 1 shows the share of products in each tariff group and Figure 2 shows the associated share of trade in each group by sector if we apply the EU bound tariff schedule to trade from Northern Ireland to Ireland. This is the schedule likely to be faced by Northern Ireland in the event of a no-deal Brexit. The following figures, Figure 3 and Figure 4, show the share of products and trade value respectively of applying the EU tariff schedule to trade from Ireland to Northern Ireland. Prior to the publication of the UK tariff schedule in March 2019, this was the assumed default scenario to be faced by Irish firms selling into Northern Ireland and the rest of Britain.

This has now been superseded by the publication of the UK temporary tariff schedule. The differences between the two schedules are notable in Figure 5 (share of products) and Figure 6 (share of trade value) where the UK temporary tariff schedule is applied to trade from Ireland to Northern Ireland.

When we apply the EU tariff schedule to Northern Ireland exports to Ireland, Figure 1 shows that 36% of all products would be free of tariffs corresponding to 35% of trade values in Figure 2. The variation across sectors is considerable with no zero-rated products in the Dairy sector and just 9% in the other Foodstuffs sectors ranging upwards to over 80% of products facing no tariffs in the Minerals sector. Close to half of products (47%) then face tariffs in the region of 0.1% to 10%, with a further 12% of products facing tariffs between 10% and 25%. The remaining 3% of products attract tariffs exceeding 25%. This highly exposed 3% of products are however disproportionately important in terms of the composition of Northern Irish trade, accounting for 22% of the trade value. The contribution of the Dairy sector is key in this regard as 32% of Dairy products are in the 10% to 25% tariff bracket and a further 50% of products face tariffs of over 25%. The most exposed product group accounts for half of Dairy export value. Recall that the Dairy sector accounts for almost 15% of trade from Northern Ireland to Ireland as we saw in Table 1.

Applying the EU tariff schedule to trade from Ireland to Northern Ireland in Figures 3 and 4 gives a broadly similar picture, reflecting the symmetric application of the tariffs and differing only due to trade composition. The contrast between agri-food and other sectors is probably the most notable feature of the EU tariff schedule in determining relative exposures across sectors.

Figure 1: Share of Products by EU Tariff Band (NI to Ire)

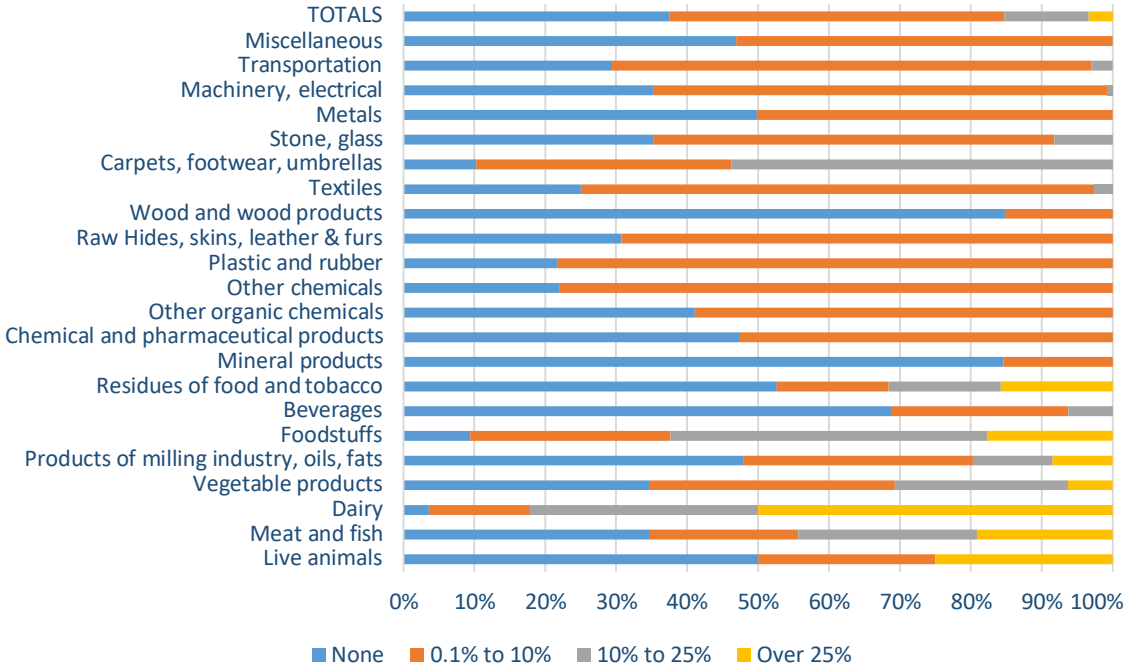


Figure 2: Shares of Sector Trade Value by EU Traiff Band (NI to Ire)

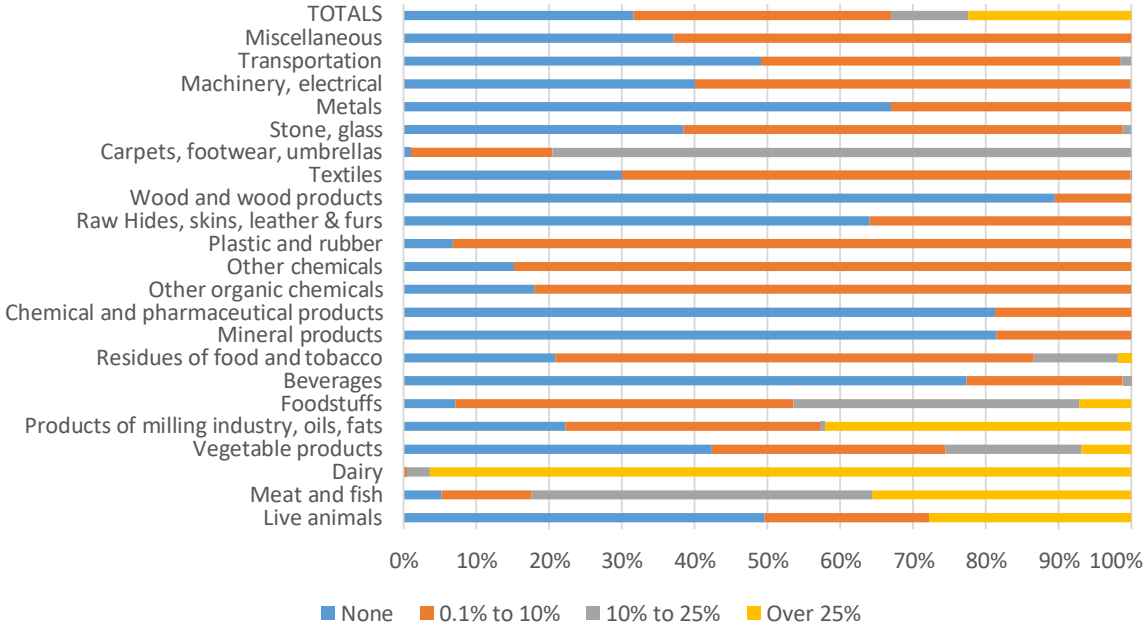


Figure 3: Share of Products by EU Tariff Band (Ire to NI)

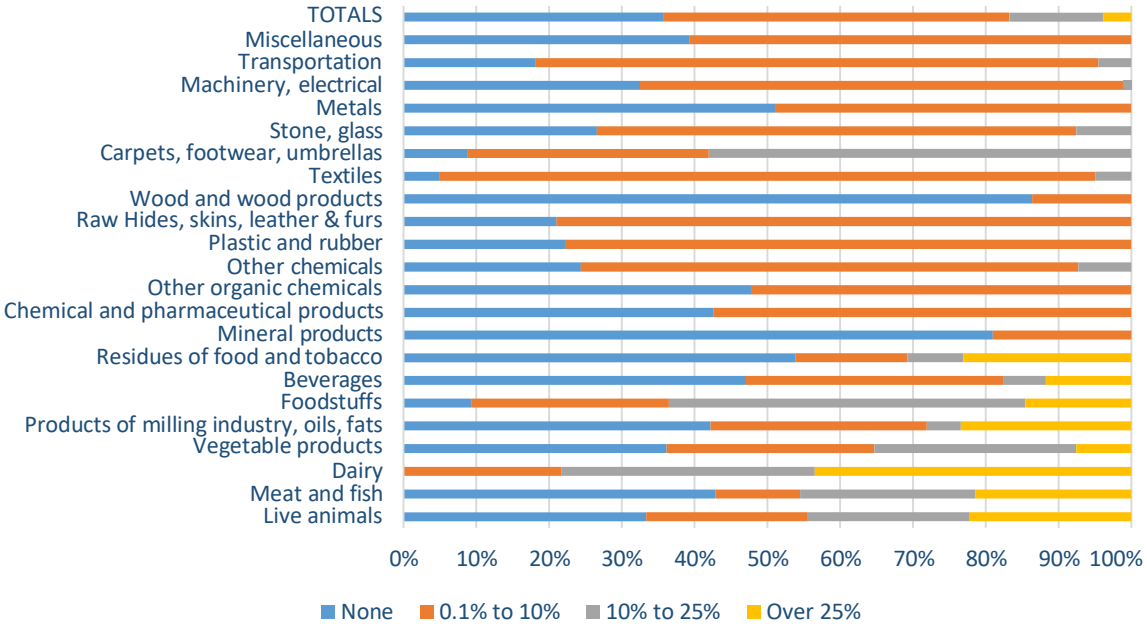


Figure 4: Shares of Sector Trade Value by EU Tariff Band (Ire to NI)

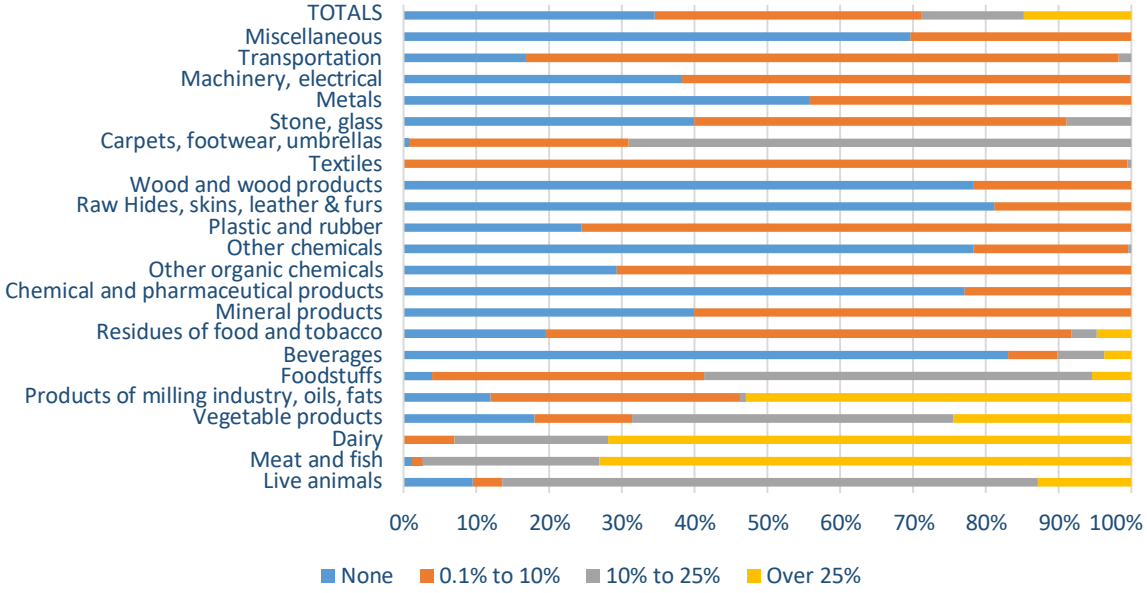


Figure 5: Share of Products by UK Temporary Tariff Band (Ire to NI)

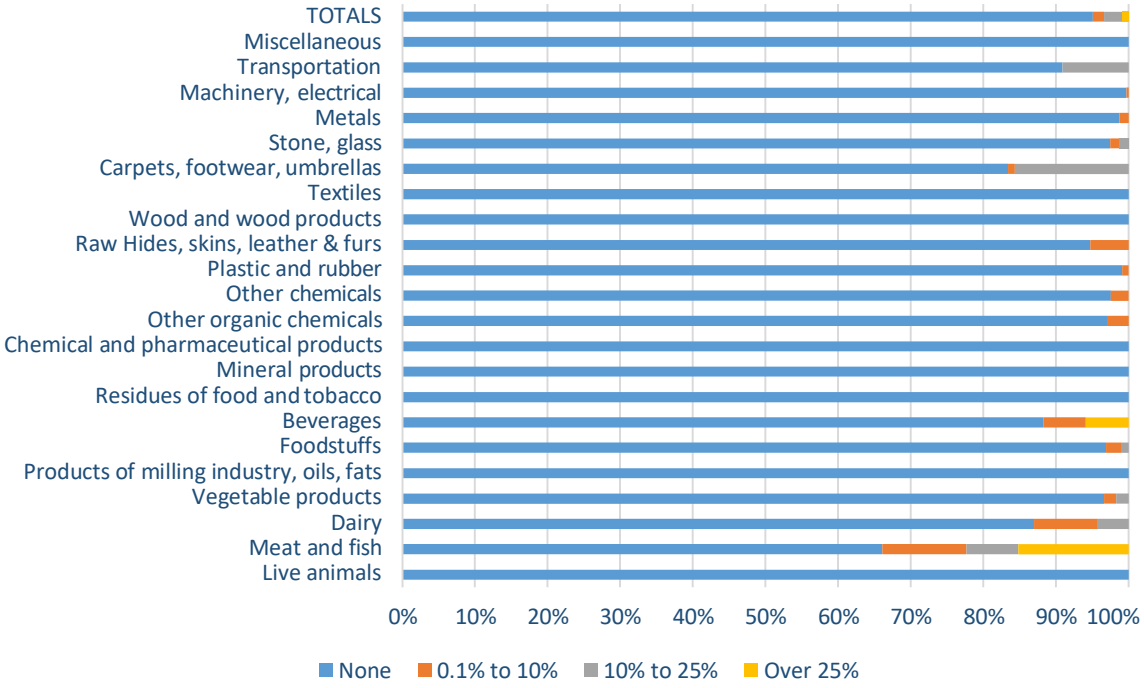
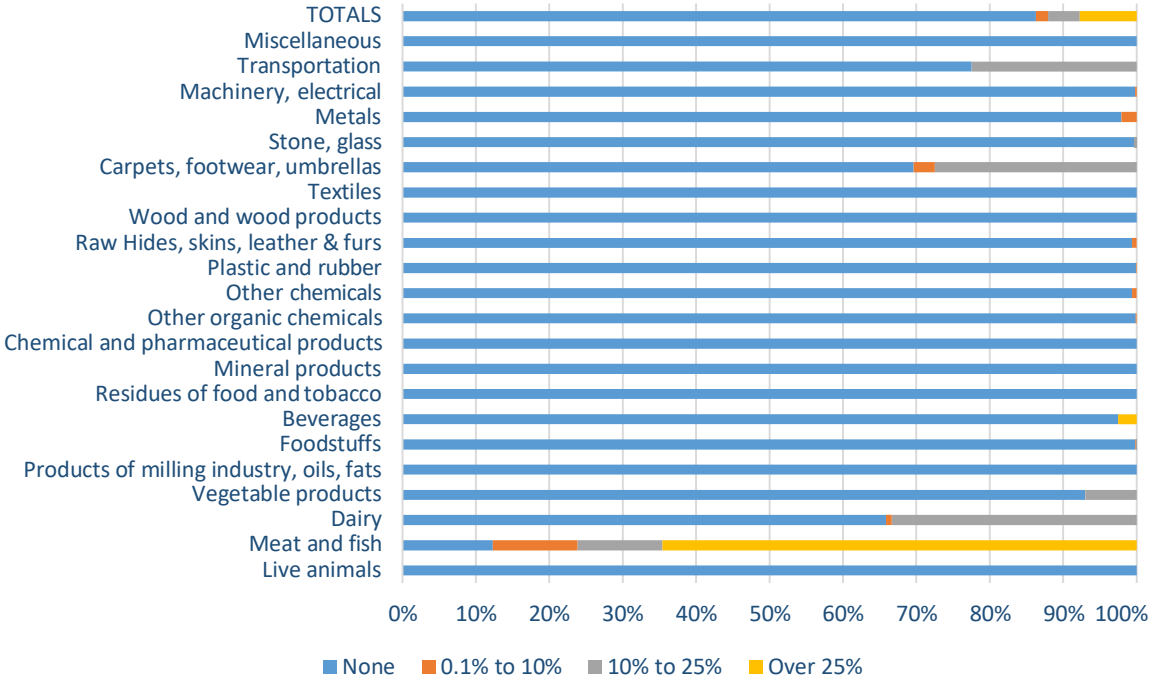


Figure 6: Shares of Sectoral Trade Value by UK Temporary Tariff Band (Ire to NI)

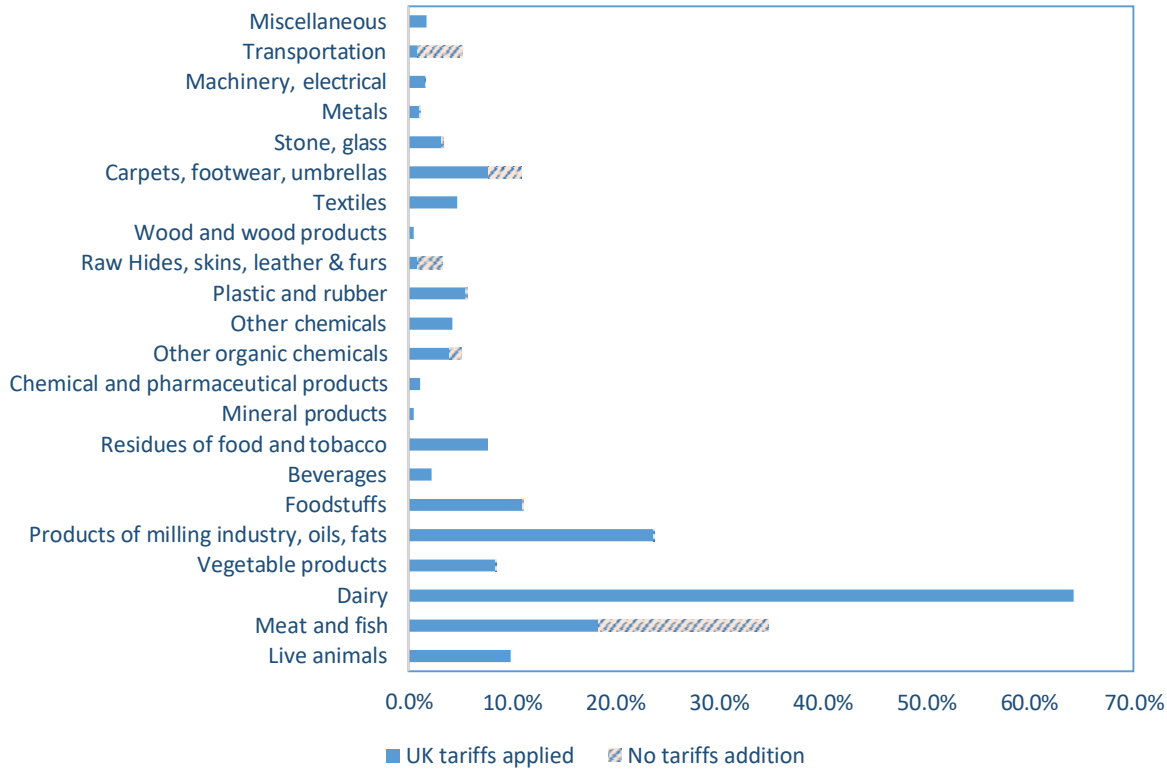


Figures 5 and 6 then apply the UK temporary tariff schedule to trade from Ireland to Northern Ireland. The share of products where no tariff is to be applied increases from 36% under the EU schedule to 95% of products under the UK schedule. This corresponds to 86% of trade value now being free of tariffs. A substantial number of sectors have all of their products in this bracket of no tariffs being applied, including Minerals, Chemicals and Pharmaceuticals, Wood, Textiles and Machinery. The sector with the lowest share of products having all tariffs reduced to zero is Meat and Fish, where although 66% of products have had all tariffs removed, a further 15% remain with tariffs over 25% and 7% of products have tariffs between 10% and 25%. The products within the highest tariff bracket are also those (primarily beef products) that make up a substantial share of exports from Ireland as can be seen by the high share of trade (65%) in this sector coming from the products in the over-25% tariff band.

5. Asymmetric tariffs and supply chains

The considerable difference in the levels at which tariffs are to be levied in the UK temporary schedule compared to that of the EU would introduce a considerable asymmetry in costs faced by firms trading across the border.

Figure 7: Tariff cost wedge for NI Exporters to Ireland



Assuming a no-deal Brexit occurs and both tariff schedules are fully applied, then goods moving from Northern Ireland to Ireland will be charged EU tariffs and goods moving from Ireland to Northern Ireland will be charged either the UK temporary tariff schedule or, according to the UK government information on no-deal tariffs, may be exempt from tariffs for an initial temporary period.[5] In either case, there will be a significant difference in costs to be incurred depending on the direction of trade. This tariff-induced cost wedge is graphed in Figure 7 and shows the difference in tariff rates applied to Northern Irish firms relative to that to be faced by Irish firms. As many sectors have had all tariffs eliminated (or nearly so), for most sectors there is little noticeable difference between the cost wedge from moving immediately to the standard UK schedule or having no tariffs applied on trade coming into Northern Ireland. However, there are some sectors where there is a gap between the UK tariff schedule and tariff-free trade such that having a tariff-free interval would increase the asymmetry in trading costs for Northern Irish trades vis-á-vis firms trading from Ireland.

The average gap between the EU and UK temporary tariff schedules is 16.1% and this would increase by a further 1.4% to 17.5% higher cost for moving goods North-South rather than South-North. This tariff cost wedge is quite heavily concentrated, however, with the largest gap being the increase in costs of over 60% faced by firms in the Dairy sector. This is followed by a 18.4% cost wedge for Meat and Fish in the event of the UK tariff schedule being applied or 35% if no tariffs are imposed. Excluding these two sectors, most others face divergences in trading costs due to tariffs mainly in the region of between 5% and 10%.

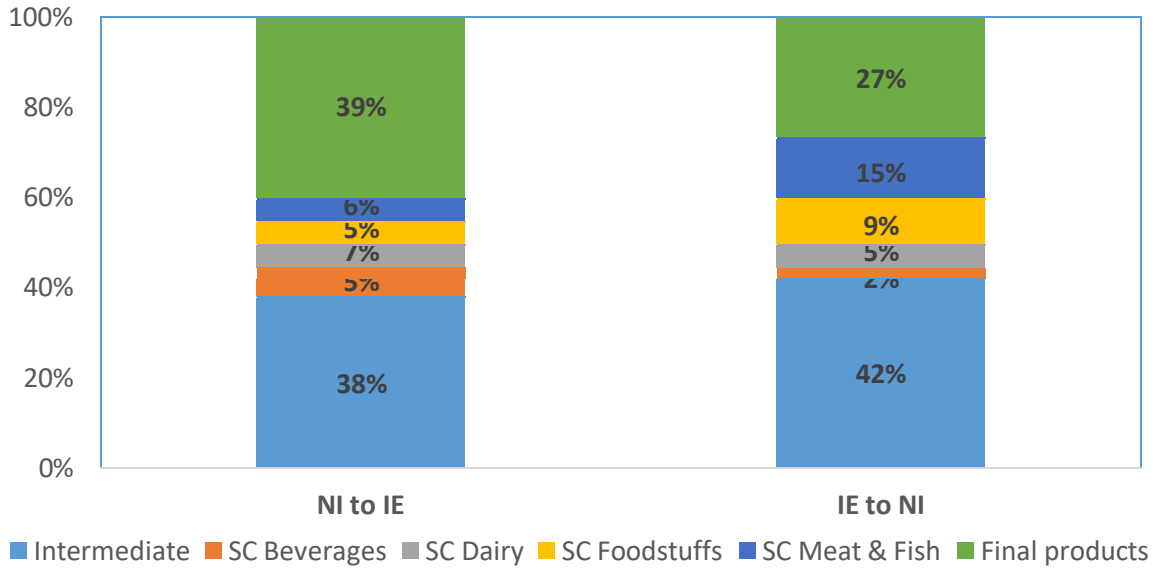
The tariff calculations above look at the total direct movement of goods across the border. An important aspect of cross-border trade that may be additionally impacted is in terms of the extent of supply chain integration. InterTradeIreland[6] discussed a number of indicators of the degree of this integration. As an simple initial indicator, it noted that Northern Ireland accounts for between ten and twelve percent of total exports from Ireland to the UK and accounted for seven to eight per cent of imports even though the region contains less than three per cent of the UK population, showing much more intensive trade links than between Ireland and the UK overall. Furthermore, it found that a very significant share of cross-border trade is accounted for by firms that trade simultaneously in both directions. These two-way traders make up around 18 per cent of firms in our sample but accounted for over 60 per cent of exports and over 70 of imports.

[5] https://www.gov.uk/government/news/temporary-tariff-regime-for-no-deal-brexit-published

[6] https://intertradeireland.com/insights/publications/cross-border-trade-supply-chain-linkages/

The Northern Ireland Statistics and Research Agency (NISRA)[7] investigated supply chain integration further by adapting the standard United Nations classifications of trade to take into account the specific features of cross-border trade. An issue with the UN product classification[8] which divides all traded products into consumption goods, intermediates, capital goods and others is that it classifies almost all food, including dairy and beef products, as being for final consumption. Given that these are sectors with substantial cross-border movement and processing, this would very much underestimate the level of cross-border supply chain linkages. NISRA therefore examined firm-level customs data in order to classify as intermediate trade these products (meat and fish, foodstuffs, dairy and beverages sectors) that were being traded across the border in both directions by individual companies to better reflect the cross-border movements for processing within these particular sectors.

Figure 8: Intermediates in Cross-Border Trade



Source: Cross-Border Supply Chain Report, NISRA (2018)

Figure 8 shows the extent of these SC (supply chain) components of each of the four sub-sectors and also shows the contribution of intermediate inputs (using the standard classification) and other trade in final products. The standard measures of intermediate trade shows that it makes a considerable contribution to cross-border trade with 38% of Northern Ireland trade to Ireland being in these products and 42% of Irish trade to Northern Ireland also being in these goods. Broadening the definition of intermediates to account for supply chain integration in the four agri-food subsectors

[7] https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/SCS_JUNE2018_FINAL.pdf
[8] https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=10

increases the size of the contribution of intermediate trade quite substantially. The combined contribution of these supply chain food movements makes up a further 23% of trade from Northern Ireland to Ireland and 31% of trade from Ireland to Northern Ireland. When this broader definition of intermediates is used, the total contribution to cross-border trade is that intermediates comprise 61% of trade coming from Northern Ireland and 73% of trade from Ireland, reflecting a very high degree of interdependence and multiple movements across the border as part of the production process.

The issue of how tariffs are applied to cross-border trade in intermediates and to firms moving products across for multiple stages in the production process will therefore be key to the overall impact of Brexit on cross-border trade. There are current exceptions to some tariffs on imported intermediate inputs within the EU, generally applying to goods that are to be processed in the EU but are then destined for onward sale outside the EU. In this circumstance, firms can apply for an "Inward Processing authorisation" which allows products imported from a non-EU country to be processed within the EU and customs duty and VAT on the imported product is suspended until an end product is produced. If the end product is sold to another non-EU country then the no duties or VAT are paid in the EU (although the end product may have tariffs apply in the destination country). If the end product is sold within the EU, however, then duties become due. Similar tariff exceptions can also apply to outward trade flows under "Outward Processing authorisations".[9]

While this could reduce the tariff liabilities of some cross-border movements, depending on which country the final good is sold in, one are of concern is that there are additional requirements for the authorisations to be granted in the case of agricultural products particularly for 'sensitive products' which includes milk which is one of the largest individual products exported from Northern Ireland. Specifically, "sensitive products" are listed as including meat, eggs, cereals, rice, sugar, olive oil, milk, wine, ethyl alcohol, unmanufactured tobacco and any fishery products subject to an autonomous quota. These products are rarely approved for the inward processing authorisations. How these authorisations are to be administered after Brexit is therefore potentially extremely important to the smooth functioning of cross-border supply chains. How costly, in time if not in financial terms,

[9] Details on this procedure are available from the Revenue Commissioners at http://www.revenue.ie/en/customs/businesses/economic/inward-processing.html and http://www.revenue.ie/en/customs/businesses/economic/outward-processing.html and also from HMRC at https://www.gov.uk/government/publications/notice-3001-special-procedures-for-the-union-customs-code/annex-d for general information and here for additional information in relation to Brexit https://www.gov.uk/guidance/customs-procedures-if-the-uk-leaves-the-eu-without-a-deal.

acquiring such authorisations will be is another issue given that much cross-border trade comes from smaller firms as detailed in previous InterTradeIreland work on cross-border export participation.[10]

6. Potential cross-border trade flow effects

In order to give some indication of how the different tariff schedules might affect trade levels, a number of assumptions are necessary. For simplicity, we assume that the full amount of the tariff is passed through into prices. The actual extent of pass-through to prices has been found to be highly imperfect in studies of the effects of exchange rates on trade which has tended to be explained by the fact that larger traders tend to simultaneously export and import so any exporting benefit of a depreciation is offset to some degree by more expensive imports. [11] The role of costs to trade other than tariffs – known as non-tariff barriers - is also a factor on which much additional work has been developed since the previous evaluation of Brexit on cross-border trade. In this section we update the measures of non-tariff barriers used to take this into account by using much more recent and targeted information on the potential scale of EU-UK non-tariff barriers from the OECD and also update another key assumption relating to the responsiveness of demand to price increases which we now base on work by HM Government in its detailed modelling of Brexit.[12]

The non-tariff barriers used in the OECD modelling work[13] give estimates based on data for a wide range of countries for the different types of policy measures other than tariffs that act to restrict or inhibit international trade flows. Until more detailed information is available on the nature and extent of regulatory checks that would be put in place after Brexit, there are no bespoke cost estimates for non-tariff barriers between the UK and EU. The OECD estimates are divided into Sanitary and Phyto-sanitary measures (SPS, rules designed to protect health and food safety), Technical barriers to Trade

[10] https://intertradeireland.com/insights/publications/export-participation-and-performance-of-firms-across-the-island-of-ireland/

[11] See Morgenroth (2000) for example on shocks to the Sterling-Irish Punt exchange rate (https://www.tandfonline.com/doi/10.1080/000368400323029) and Amiti, Itskhoki, and Konings (2014) for evidence on the role of two-way traders in influencing pass-through (https://www.aeaweb.org/articles?id=10.1257/aer.104.7.1942).

[12] Specifically the lower estimate of the elasticity of substitution from the technical reference papers: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/760484/28_November_EU_Exit_-_Long-term_economic_analysis__1_.pdf and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/759763/28_November_EU_Exit_Long-Term_Economic_Analysis_Technical_Reference_Paper.PDF

[13] See the appendix for examples of the variation in these measures across sectors. Source: Cadot, Gourdon and van Tongeren (2018) https://www.oecd-ilibrary.org/docserver/f3cd5bdc-en.pdf?expires=1566906878&id=id&accname=guest&checksum=690DD8E7FA550A23D81A013A3809B81E

(TBT, differences in product standards), Border control measures (BCM, requirements on customs inspections and documentation) and Quantitative restrictions (QR, the impact of quantity limits on products). While we use the estimate of the total non-tariff barrier on each sector, the variation in the contribution of each type of barrier is worth noting as some may be more amenable to mitigation than others – for example, the technical barriers to trade will depend on the extent of divergence in standards as would sanitary and phyto-sanitary measures on animals and foods. The modelling work undertaken by HM Government also gives estimates of non-tariff barriers which have approximately the same midpoint estimate of 10% for manufactured goods and 15% for agri-food products as the OECD but have less published information on how these vary across sectors.

While there are a number of assumptions therefore being made in the calculation of the impacts, we would emphasise that the objective of this exercise is mainly focused on the relative exposures of different sectors and directions of trade flow in order to understand where the main risks lie in the absence of a deal or other mitigating policy intervention. The variation across sectors is therefore the focus rather than the point estimates which should be interpreted as being indicative of the distribution of risks rather than forecasts of highly uncertain outcomes.

Table 4 looks at the difference in effects of applying separate tariff regimes to trade moving from Ireland to Northern Ireland as compared to that moving from Northern Ireland to Ireland. Only direct tariff costs are considered in this table and additional costs of also including non-tariff barriers are presented in Table 5. The asymmetry of the effects are considerable with trade from Ireland to Northern Ireland falling by just 2% compared to a 18% reduction in exports from Northern Ireland to Ireland (Northern Ireland will also of course be affected by the same tariffs on its trade with other EU member states but we do not have the detailed product breakdown necessary to analyse that in the same way).

The middle column of Table 4 shows the alternative scenario of a separate tariff-free treatment for Irish exports into Northern Ireland. In this case, the Ireland trade flow section shows no impact on any sector increasing the asymmetry of the effects still further.

Table 4: Impact across sectors of different tariff schedules

	IRE to NI		NI to IRE
	UK Temporary tariffs	**Tariff-free cross-border trade**	**EU tariffs**
Live animals	0.00%	0.00%	8.11%
Meat and fish	14.66%	0.00%	31.05%
Dairy	4.04%	0.00%	83.75%
Vegetable products	0.20%	0.00%	5.27%
Products of milling industry, oil, fats	0.00%	0.00%	23.90%
Foodstuffs	0.00%	0.00%	3.62%
Beverages	0.42%	0.00%	0.45%
Residues of food and tobacco	0.00%	0.00%	2.25%
Mineral products	0.00%	0.00%	0.03%
Chemical and pharmaceutical products	0.00%	0.00%	0.13%
Other organic chemicals	0.00%	0.00%	0.66%
Other chemicals	0.01%	0.00%	0.47%
Plastic and rubber	0.01%	0.00%	0.71%
Raw Hides, skins, leather, & furs	0.01%	0.00%	0.26%
Wood and wood products	0.00%	0.00%	0.06%
Textiles	0.00%	0.00%	0.66%
Carpets, footwear, umbrellas	0.83%	0.00%	2.51%
Stone, glass	0.01%	0.00%	0.35%
Metals	0.00%	0.00%	0.08%
Machinery, electrical	0.00%	0.00%	0.11%
Transportation	2.21%	0.00%	0.89%
Miscellaneous	0.00%	0.00%	0.10%
All trade	**2.00%**	0.00%	**18.04%**

The key message is the degree of variation across sectors rather than the aggregate level. However, even with the much reduced tariff schedule announced by the UK government, the exposure of the Meat and Fish sector in Ireland to tariffs is considerable and accounts for the bulk of the entire effect given that most other sectors now face relatively minimal tariffs. On the Northern Irish side, the impact

is concentrated to a significant degree in the Dairy sector with sizeable exposures also for the Meat and Fish and Milling Industry, Oils and Fats. One of the higher degrees of exposure on the Irish exporting side is also Dairy, which again reinforces the role of cross-border processing in this sector.

Table 5: Impact across sectors of different tariff schedules and non-tariff barriers

	IRE to NI		NI to IRE
	UK temporary tariffs + OECD NTBs	**No checks or tariffs on cross-border trade**	**EU tariffs + OECD NTBs**
Live animals	1.2%	0.00%	11.5%
Meat and fish	49.8%	0.00%	71.0%
Dairy	29.2%	0.00%	97.4%
Vegetable products	20.0%	0.00%	35.8%
Products of milling industry, oil, fats	39.8%	0.00%	46.4%
Foodstuffs	19.3%	0.00%	34.9%
Beverages	10.7%	0.00%	12.1%
Residues of food and tobacco	4.3%	0.00%	9.8%
Mineral products	0.5%	0.00%	0.7%
Chemical and pharmaceutical	1.6%	0.00%	2.1%
Other organic chemicals	1.6%	0.00%	4.1%
Other chemicals	1.6%	0.00%	3.6%
Plastic and rubber	1.6%	0.00%	4.3%
Raw Hides, skins, leather & furs	1.7%	0.00%	3.2%
Wood and wood products	5.8%	0.00%	4.7%
Textiles	2.2%	0.00%	6.2%
Carpets, footwear, umbrellas	9.3%	0.00%	16.4%
Stone, glass	0.1%	0.00%	0.7%
Metals	1.1%	0.00%	1.7%
Machinery, electrical	1.0%	0.00%	1.5%
Transportation	19.5%	0.00%	18.3%
Miscellaneous	0.7%	0.00%	1.2%
All trade	**12.5%**	0.00%	**31.1%**

Introducing non-tariff barriers increases costs on both directions of trade, as shown in Table 5. In the first and third columns, the same level of non-tariff barriers on both trade flows whereas in the middle column the outcome of the UK announcement that it will recognise all EU standards and hence does not require checks is shown. In the case of a temporary treatment of no tariffs or checks applied to the Ireland to Northern Ireland trade flow, the level of trade would not be expected to change in the immediate interval after Brexit. As already noted, however, there are likely to be longer-run changes in the competitive environment coming from the UK temporary tariff rates and quotas being applied to countries outside the EU.

As with tariffs, non-tariff barriers tend to impose the highest costs on food sectors so including them in the second calculation further broadens the dispersion between the impacts of Brexit on agri-food sectors relative to manufactured products. One exception to this is the extent of technical barriers to trade on transport equipment, particularly on cars. The negative effect on Meat and Fish exports from Ireland to Northern Ireland almost triples if the OECD level of non-tariff checks are applied while food sectors in Northern Ireland could be faced with the loss of the majority of their export sales to Ireland in the most extreme case.

7. Tariff-free quotas in UK trade schedule

A final part of the announcement on a new temporary trade schedule by the UK government in March 2019 was the publication of a set of tariff-free quotas. Table 6 lists the new temporary quota amounts and the products they apply to with further information on the extent to which existing EU quotas have been divided between the UK and remaining EU member states are listed on the UK government website.[14] The tariff-free quotas set specific weights on products for which exemptions from tariffs can be applied for. Once the tariff-free quota allocation is filled, further imports of the product will be subject to the appropriate tariff rate as described above. Importers can also choose to import at the applied MFN tariff rate even if the quota has not been exhausted.

The UK will operate the tariff system on a "first-come first-served allocation system". [15] This is one of the most common methods of quota allocation but other methods such as granting of licences in advance (to prevent a rush of deliveries in the case of over-subscribed quotas), auctioning licences or giving preference to trade partners on the basis of historical trade shares are other regularly used

[14] https://www.gov.uk/government/publications/the-customs-tariff-rate-quotas-regulation
[15] Quoted here: https://www.gov.uk/government/publications/the-customs-tariff-rate-quotas-regulation

methods.[16] The quota amounts in Table 6 are given on an annual basis but it should be noted that, to spread supply over the year, some will be allocated on a quarterly basis.

Table 6: Tariff-free quotas from UK March 2019 temporary trade schedule

Product type	TRQ volume amounts (annual)	Volume unit
Fresh or chilled bovine meat	1,244,015	100kg
Frozen bovine meat	562,179	100kg
Bovine meat (salted, in brine, dried or smoked)	500,434	100kg
Fresh or chilled chicken meat	1,661,968	100kg
Frozen chicken meat	795,103	100kg
Prepared or preserved chicken or turkey meat	141,983	1000kg
Fresh or chilled duck meat	18,884	100kg
Frozen duck meat	61,520	100kg
Fresh or chilled turkey meat	160,089	100kg
Frozen turkey meat	41,982	100kg
Rice varieties	75,000	1000kg
Rice varieties	50,000	1000kg
Raw cane sugar	2,600,000	100kg
Prepared or preserved skipjack not in vegetable oil	42,453,793	kg
Prepared or preserved skipjack in vegetable oil	6,005,093	kg
Prepared or preserved yellowfin tuna not in vegetable oil	1,050,237	kg
Frozen fish fillets (specific product code 03048990)	2,130,240	kg
Frozen shrimps of genus "penaeus"	7,855,157	kg
Frozen shrimps of other types	1,411,556	kg
Prepared or preserved tuna in vegetable oil (except skipjack and yellowfin)	457,931	kg
Frozen fish (specific product code 03038990)	516,727	kg
Prepared or preserved yellowfin tuna in vegetable oil	229,131	kg
Prepared or preserved tuna not in vegetable oil (except skipjack and yellowfin)	126,646	kg

[16] Discussion of the different allocation methods (from a US perspective) is available here: http://www.fao.org/3/x7353e/X7353e05.htm

Table 7 then compares these tariff-rate quotas to the CSO data on current trade from Ireland to the UK overall and the split between trade destined for Northern Ireland and for the rest of the UK. With bovine meat a major export of Ireland into the UK, we can see that Ireland alone would exceed the tariff-rate quota allowance even if no competing imports came from other countries. Current Irish trade is also at a fairly significant level of the potential quota amounts for chicken and turkey meat. However, in the case of no tariffs or checks on trade from Ireland to Northern Ireland, these tariff-free quota amounts would not be relevant as no tariffs would apply on any level of trade.

Table 7: Current Irish-UK trade as share of UK quota

	Ire to GB	Ire to NI	Ire to UK
Fresh or chilled bovine meat	118%	22%	140%
Frozen bovine meat	69%	2%	72%
Bovine meat (salted, in brine, dried or smoked)	75%	0%	75%
Fresh or chilled chicken meat	9%	4%	13%
Frozen chicken meat	5%	1%	6%
Prepared or preserved chicken or turkey meat	29%	1%	30%
Fresh or chilled duck meat	0%	0%	0%
Frozen duck meat	2%	0%	2%
Fresh or chilled turkey meat	10%	6%	16%
Frozen turkey meat	45%	2%	47%
Rice varieties	0%	0%	0%
Rice varieties	0%	0%	0%
Prepared or preserved skipjack not in vegetable oil	0%	0%	0%
Prepared or preserved skipjack in vegetable oil	1%	0%	1%
Prepared or preserved yellowfin tuna not in vegetable oil	1%	0%	0%
Frozen shrimps of genus "penaeus"	0%	0%	0%
Frozen shrimps of other types	8%	0%	0%
Prepared or preserved tuna in vegetable oil (except skipjack and yellowfin)	0%	0%	0%
Frozen fish (specific product code 03038990)	1%	0%	0%
Prepared or preserved yellowfin tuna in vegetable oil	1%	0%	0%
Prepared or preserved tuna not in vegetable oil (except skipjack and yellowfin)	2%	3%	6%

8. Conclusions and additional considerations

This report looks at the potential impact of Brexit on cross-border trade in Ireland by incorporating the March 2019 temporary tariff schedule published by the UK government to apply if they exit the EU without a withdrawal agreement in place. It also includes estimates of non-tariff barriers and demand reactions from more recent, Brexit-specific research than previous work. As estimates on the level of the effects of a no-deal Brexit are subject to error, given that a number of assumptions need to be made and no mitigating dynamic policy responses can be incorporated, the emphasis of this report is on the distribution of exposure and how this differs depending on sector and direction of trade.

Under the March 2019 temporary tariff schedule, the UK plans to abolish tariffs entirely for a wide range of products and substantially reduce them for most others. It brings the overall average tariff being faced by exporters from Ireland to Northern Ireland down to zero in the initial temporary treatment of trade into Northern Ireland. In the event of a move to the UK temporary tariff rates for all countries being applied to trade from Ireland to Northern Ireland, this would result in an estimated average tariff of 1.45%. These zero or 1.45% rates can be compared to the potential increase of 17.5% that would have been incurred if the UK had adopted the EU maximum level of tariffs. In comparison, the overall average tariff for goods going from Northern Ireland to Ireland with the EU tariff schedule applied would be 15.8% increase in price, introducing considerable asymmetry in trade costs for firms operating across the border depending on their current location, particularly in the initial period when no tariffs are planned to be levied on trade from Ireland to Northern Ireland.

There is considerable variation within sectors under both tariff schedules. When we apply the EU tariff schedule to Northern Ireland exports to Ireland, 36% of all products would be free of tariffs but 12% of products face tariffs between 10% and 25% and 3% of products attract tariffs exceeding 25%. This highly exposed 3% of products are however disproportionately important in terms of the composition of Northern Irish trade, accounting for 22% of the trade value with the high-tariff Dairy sector being the main contributor. Despite the almost total abolition of tariffs from the UK schedule, the Meat and Fish sector exporting from Ireland to Northern Ireland remains exposed. Around 15% of the sector's products, which account for 65% of trade value in this sector, continue to have tariffs of over 25%.

A number of caveats need to be made on issues that were beyond the scope of the analysis but that may be important in determining the extent of trade changes in the aftermath of a no-deal Brexit. The first, and arguably the most important, is that we look solely at cross-border trade flows without

modelling the impacts on changes in competition from other countries. The UK temporary tariff schedule applies not just to the EU countries from which it is exiting a free trade arrangement but are also being lowered for all other countries as well. This constitutes a fairly large reduction in tariffs for importing into the UK and for these countries the shift in tariffs is very like the comparison provided above between the UK and EU schedules (with exceptions where trade deals have been carried over or where less developed countries can access preferential tariff treatment).

This is likely to incentivise entry to the UK market from these other countries and therefore change the competitive environment for both Irish and Northern Irish producers. As the reductions in tariffs are large for agri-food products (particularly for beef products), these sectors are especially vulnerable to the risk of increased competition from lower-cost producers from outside the EU. Further trade deals by the UK government could also chance the balance in terms of market access and competition in the future. Given that the UK tariff schedule examined here is explicitly described as being "temporary", it may take some time for any new entry to occur as firms from other countries may adopt a wait-and-see approach until the UK's tariff schedule is finalised. Dramatic changes in competition from third countries may therefore take some time to emerge but in the longer-run could have significant consequences depending on how the structure and coverage of post-Brexit UK tariffs evolve.

A second, more immediate, issue is the size of many trade transactions across the border are very small so even moderate changes in costs or bureaucracy could have disproportionate effects on the ability of traders to continue their current business model. In the CSO trade figures, for example, where we used detailed product codes to match trade to tariff rates, approximately 10% of cross-border trade was listed as being "unallocated" to a product code. This is because detailed returns on trade flows within the EU are not required for smaller traders so as to minimise reporting burdens. However, after Brexit, it is likely that the majority of these transactions will have to be reported as the threshold for supplying information on goods coming into the EU from a non-member is much lower than for internal EU trade flows. Even if no tariffs are liable for a product in that instance, increases in reporting could put a burden on small firms with frequent but low value deliveries, the type of firm that research from both NISRA[17] and InterTradeIreland[18] have shown to be a common feature of cross-border trade.

[17] https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/SCS_JUNE2018_FINAL.pdf
[18] https://intertradeireland.com/insights/publications/export-participation-and-performance-of-firms-across-the-island-of-ireland/

A final item to note is on exchange rates. A reduction in the value of sterling would have the potential to offset the negative impact on Northern Irish exporters to some extent (while making it more expensive for firms from Ireland to sell into Northern Ireland). However, as was noted in the discussion above, many firms are trading in both directions across the border so any gains from currency movements could be limited. An additional complication is that the weight-based tariffs on agri-food products are denominated in euros in both the EU and UK tariff schedules.

It should be emphasised that the analysis in this report is based on the tariff rates and treatment announced on 13th March 2019 by the UK government and that these rates, and the further statement that there will be no tariffs or checks at all on trade from Ireland to Northern Ireland, have been announced as being temporary.

Appendix: OECD Sector-level non-tariff barriers

	SPS	TBT	BCM	QR	All
Wheat	0.0	0	0	0	0
Cereal grains	30.9	20.4	0	0	51.4
Vegetables, fruit, nuts	3.6	18.2	0.5	0.7	23
Oil seeds	5.7	0.1	3.1	0.9	9.8
Plant-based fibres	0.0	0.2	0	0	0.2
Crops	4.1	9.7	0.5	0.2	14.6
Bovine cattle, sheep and goats, horses	7.9	0	0	0	7.9
Animal products	2.9	1.5	0.5	2.3	7.3
Wool, silk	0.0	14.3	5.5	0	19.9
Forestry	7.6	0.5	0	0.9	9
Fishing	6.6	3.6	0.3	2.1	12.6
Mining Minerals	0.0	0.3	0	1.8	2.1
Bovine meat products	2.2	13.1	0.6	0.2	16
Other Meat products	24.3	18.7	4.8	0.2	48
Vegetable oils and fats	8.4	5.4	0.6	1.8	16.2
Dairy products	2.6	23.8	0	1.7	28.2
Processed rice	0.0	2.7	0	0	2.7
Sugar	0.2	0	0	0	0.2
Other Food products	13.2	17.3	0.4	1.2	32.1
Beverages and tobacco products	10.3	4.2	2.8	4.7	22
Textiles	0.9	7.2	0.6	0.9	9.7
Wearing apparel	0.4	15.8	0.6	1	17.9
Leather products	0.1	2.6	0.8	5.6	9.2
Wood products	3.1	15.2	0.2	3.4	21.9
Paper products, publishing	2.1	4	0.1	1.5	7.6
Chemical, rubber, plastic products	2.4	5.2	0.6	0.7	8.9
Other Mineral products	1.0	6.7	0.1	0.4	8.2
Ferrous metals	0.0	6.2	0.9	1.8	8.9
Other Metals	0.0	1.6	0.1	0.7	2.5
Metal products	0.0	4.5	0.2	1.3	5.9
Motor vehicles and parts	0.0	17.3	0.8	6.8	24.8
Other Transport equipment	0.0	4.1	0.4	0.5	5.1
Electronic equipment	0.0	4.5	0.6	0.1	5.2
Other Machinery and equipment	0.0	5.8	0.5	1.3	7.6
Other Manufactures	0.2	4.1	0.6	1	5.9

Note: SPS is Sanitary and Phytosanitary measures, TBT is Technical barriers (standards), BCM is Border control measures and QR is Quantitative restrictions.

Source: Cadot, Gourdon and van Tongeren (2018)
https://www.oecd-ilibrary.org/docserver/f3cd5bdc-en.pdf?expires=1566906878&id=id&accname=guest&checksum=690DD8E7FA550A23D81A013A3809B81E