Brexit and trade on the island of Ireland

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After decades of expansion and deepening integration in Europe, the referendum in the United Kingdom in June 2016 to leave the European Union was an unprecedented event. Amongst the many issues to be negotiated in unravelling membership, the withdrawal process has been dominated by the implications for the island of Ireland. Northern Ireland has been to the forefront as the location of the new border between the EU and a non-member state. While much of the focus has been on the political implications, this paper looks at the potential effects of Brexit on Ireland and Northern Ireland from an economic perspective. The current patterns of cross-border trade are examined and the potential impacts of Brexit discussed, depending on the extent to which it changes the economic relationship between the UK and EU and hence in the immediate neighbourhood of Ireland and Northern Ireland.

Keywords: Brexit, Free trade agreements, Irish border.

1. Introduction

From its initial inception as the European Coal and Steel Community with a group of six countries co-ordinating a limited range of industrial activities, the supra-national organisation that is now the European Union (EU) has grown for almost seventy years both in terms of the breadth of membership and the depth of coordination amongst member states. The expansion and deepening have tended to come in waves interspersed with periods of consolidation. How far membership

1. Thanks to all participants of the EUROFRAME conference and two anonymous referees for comments and discussion on the earlier version of this paper.

could be extended and how close the relationship between members could become have been debated since the earliest days of the European project. The decision by the United Kingdom (UK) in a referendum in June 2016 was a watershed moment as the first time a member state of the EU decided to leave the organisation.[2] The process of negotiating exit, commonly referred to as "Brexit", is still underway with further negotiations on the future relationship between the UK and EU set to follow. While the referendum decision to exit naturally focused on the UK-EU relationship, the withdrawal process has been dominated by the implications for the island of Ireland as the location of the new border between the EU and a non-member state. This paper looks at the potential effects of Brexit on Ireland and Northern Ireland from an economic perspective, documenting existing patterns of cross-border trade in particular and the challenges that changing the economic relationship between the two parts of the island could pose.

It should be emphasised at outset that the economic angle is a subsidiary factor in placing the status of post-Brexit Northern Ireland as one of the key issues to be determined in the exit stage of the Brexit process with implications for peace being the dominant consideration. The border between Ireland and Northern Ireland, one of the constituent countries of the UK, has a long and fraught history. Emerging in parallel with nationalist movements across many parts of Europe in the late nineteenth century, the campaign for Irish independence (or more limited devolved autonomy in the form of "home rule") was resisted from its early stages by Unionists who felt that Ireland should remain an integral part of the UK. As the Unionist movement was a minority in the country overall but formed a majority in the north-eastern six counties, the outcome of the treaty negotiations of 1921 to end the Irish War of Independence was to partition the island into an independent Ireland but to have Northern Ireland remain part of the UK.[3] Resistance to partition erupted in violence in the 1970s with over 3,000 deaths in the following thirty years, a period known as the "Troubles". The Good Friday Agreement to restore peace and establish new democratic institutions with cross-community sharing of power

2. While Greenland technically exited the European Economic Community in 1985 following its autonomy from Denmark, it continued to maintain close links (via Denmark) as one of the Overseas Countries and Territories of the EU.

3. Initially Ireland was known as the Irish Free State with the King of England remaining as head of state. It became a republic in 1949.

was signed at Easter 1998. Although this was primarily a political process, the removal of customs checkpoints at the border between Ireland and Northern Ireland with the completion of the European Single Market in 1993 played a supporting role. As a physical demonstration of the border, customs posts had been subject to attack throughout the period of the Troubles and the distinction between customs checks and security checks could become blurred.[4] The Good Friday Agreement also allowed a unique sharing of citizenship entitlements with anyone born in Northern Ireland entitled to apply for either Irish or British (or both) passports.

With the peace process well established and with free trade in goods and services as members of the EU along with free movement of people, the border between Ireland and Northern Ireland is today frequently characterised as being a "soft" border, close to being inconspicuous and putting essentially no frictions on cross-border activity. If Brexit results in the UK no longer being a member of the Single Market and Customs Union as at the moment, then a return to economic checks on goods crossing the Irish border (in one or both directions) becomes a strong possibility, perhaps an inevitability. Hence the description of Brexit as "hardening" the Irish border.

This paper begins by looking at the different layers of economic integration and the extent to which Brexit can be made compatible with maintaining the free economic flows in place across the Irish border today (Section 2). It then moves on in Section 3 to look at estimates for how Brexit, particularly one without agreement of a withdrawal treaty, might impact the Irish economy. Section 4 looks more closely at the intensity and composition of cross-border trade with a focus on the potential distribution of changes in trade costs that may result from Brexit. The final section concludes with some comments on the current mitigation measures being put in place and the extent of uncertainty that still surrounds the final outcome.

2. Layers of integration

The extent to which economic and political sovereignty can be pooled across countries can vary in many dimensions. Within the EU, there are subgroups of countries where deeper integration has

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4. A full chronology of the Troubles is maintained by the University of Ulster on its CAIN (Conflict Archive on the INternet) web site: https://cain.ulster.ac.uk/index.html

occurred than across the Union as whole – the sharing of monetary policy by the countries of the euro area being the most obvious example. The greatest focus of the Brexit negotiation process and of internal debates in the UK on Brexit have tended to be on how close future trade relationships will be between the UK and EU. This is a key aspect of the implications of Brexit for the island of Ireland as, in general, the closer the trade relationship remains then the more open and frictionless the border can be.

The range of options are illustrated in Figure 1 which gives some (non-exhaustive) examples of how trade policy between EU members and other countries is structured.[5] At the centre are euro area countries where trade integration is supplemented by sharing of a common currency and monetary policy. For the EU as a whole, trade is governed by free circulation of goods with mutual recognition of standards and a common external tariff. It is worth distinguishing the two separate elements of this arrangement: the first is the Customs Union, which removed all tariffs and charges from goods circulating between EU member states with the tariffs applied to goods entering the EU from other countries set at EU level and having no variation across member states. Once a good enters any EU country therefore, it pays the tariff due at this point (which can vary depending on the origin country and product in question) and can then be moved and sold on in any EU country. However, this means that there is no possibility for EU countries to have an independent trade policy. The second, related but distinct, element underpinning the free movement of goods is the Single Market which entails common recognition of standards and also broadens the freedom of movement beyond goods to apply also to services, capital and workers.

As we move away from the centre of the tightly integrated EU, we find that the distinction between customs and the other freedoms of the Single Market can result in different degrees of trade relationship with the EU. Members of the European Economic Association (EEA – Iceland, Liechtenstein and Norway) are in the Single Market, recognising and applying EU regulations with generally free movement of goods, services and people between each of them and the EU but they are not part of the Customs Union. Some exceptions do apply, such as

5. A comprehensive list of countries with which the EU has trade agreements (or is in the process of negotiating one) and the details of each agreement is available at https://ec.europa.eu/trade/policy/countries-and-regions/negotiations-and-agreements/

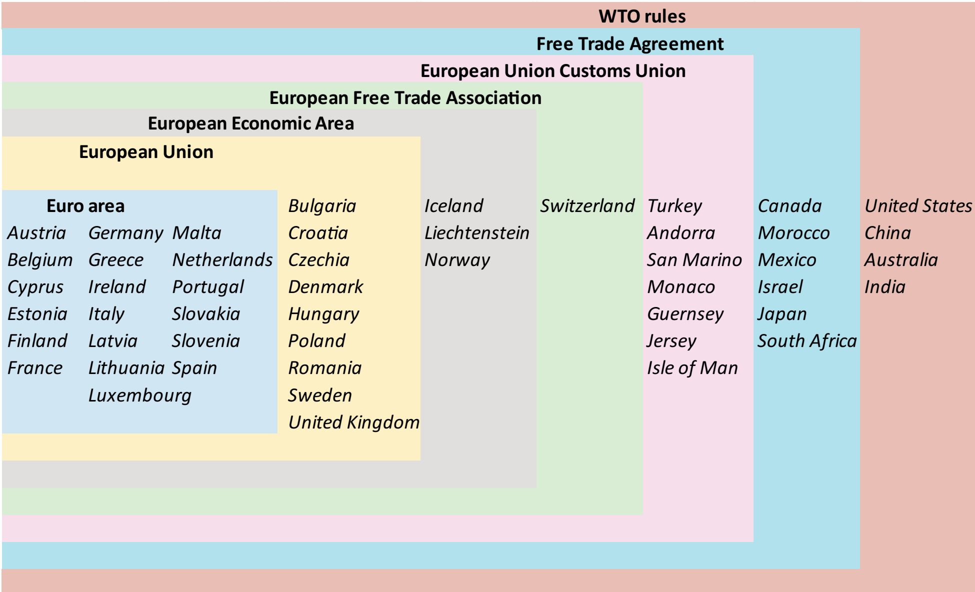
Liechtenstein retaining rights to restrict access of workers from the EU. They can therefore run a separate trade policy and charge their own tariffs on trade coming from third countries. This does however require that some checks are in place between the EU and EEA members in order to establish that goods coming from any third countries meet EU standards and for tariffs due to the EU to be collected. The situation for goods trade in the case of the European Free Trade Agreement with Switzerland is similar built up in a different manner through a series of bilateral treaties and is slightly less comprehensive as it excludes some trade in services.

Conversely, the next set of countries including Turkey are members of a custom union with the EU but one which is somewhat less comprehensive than *the* Custom Union amongst member states and is not a member of the Single Market. This means most manufactured goods from Turkey enter the EU without tariffs or other restrictions although there are some limits on trade in agricultural products and it does not extend to services. Customs union membership means that Turkey applies the same external tariff as the EU to other countries, thereby restricting its ability to negotiate separate trade deals. Despite the Customs Union membership applying to bilateral trade, there remain checks at the EU-Turkey border to inspect documentation and goods not covered by the customs agreement.

That physical checks remain on the border between the EU and Turkey (customs union but not the Single Market) and the borders of the EU and Switzerland or Norway (Single Market but not customs union) shows that completely frictionless trade flows require a high degree of integration and alignment and while either one of the Single Market or customs union can reduce trade costs, some restrictions remain unless both are in place.

The EU also has a large number of countries that it has signed free trade agreements with, most recently Canada (2017) and Japan (2019). These deals come close to eliminating tariffs on bilateral trade as well as covering a range of issues related to mutual recognition of standards. Even in the case of tariff elimination, these more standard free trade agreements require checks on goods crossing between markets largely to ensure that the goods do indeed originate in the market that the free trade deal is with and that standards are fully documented.

Figure 1. **Layers of integration of European countries**



Source: European Commission trade policy https://ec.europa.eu/trade/

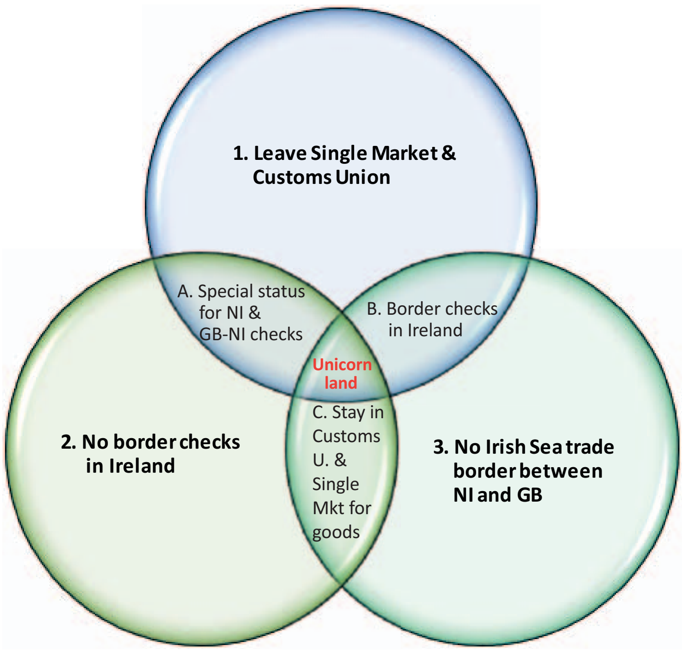
Finally countries with which the EU has no trade deal agreement are traded with on the basis of World Trade Organisation (WTO) rules, whereby a country can set maximum non-discriminatory tariffs that are applied to all countries.

These different levels of trade integration, and the extent to which most require checks on movement of goods, are central to how Brexit could impact on the island of Ireland. With both the UK and Ireland being members of the EU Single Market and Customs Union, all trade between the two countries flows freely with no checks for tariffs, regulatory inspections, or to establish the origin of inputs. Hence the stated Brexit aim of the UK government, first announced in Prime Minister May's speech at Lancaster House on 17th January 2017, that it would leave the Single Market and Custom Union in order to pursue a separate trade policy and not be bound by EU regulations raised an immediate issue for how this would impact the Irish border.[6] In relation to Northern Ireland, the speech also said that "Nobody wants to return

6. Full text of speech https://static.rasset.ie/documents/news/theresa-may-speech.pdf

to the borders of the past". A further commitment was added later that the entire UK would leave the EU on the same terms and that there would be no separate treatment for Northern Ireland.

Figure 2. **Brexit trilemma**



Source: Based on R. Daniel Keleman, Rutgers University

The difficulty in delivering on these three commitments – sometimes referred to as the "red lines" of the UK negotiating position – is illustrated in Figure 2, based on the identification of the incompatibility of the different elements and summed up as being a Brexit trilemma by R. Daniel Keleman. As shown in the description of how trade operates with countries such as Norway and Turkey, leaving the Single Market and Customs Union leads to a need for checks on goods moving between the UK and EU. Even in the event of a comprehensive trade deal between the two resulting in no tariffs or quantitative restrictions to trade, a range of other checks on regulatory alignment and proof of origin would be required. This last would be particularly relevant if the UK went on to sign trade deals with other countries on different terms than the EU. For example, if the UK were to sign a free trade deal with China that had substantially lower tariffs applied on Chinese goods coming into the UK than those applied on Chinese goods imported into the EU, without border checks between the UK and EU there would be an incentive for Chinese goods destined for the EU to be routed through the UK in an attempt to avoid tariffs. Similarly if the UK signed trade deals allowing products to be sold in the UK that do not meet EU regulations (chlorine-washed chicken from the US has become the short-hand example of where standards might diverge) it would be difficult to prevent goods initially delivered to the UK from being sold on into the EU market unless product checks are carried out at the UK-EU border.

This first priority of the UK government, leaving the EU Single Market and Customs Union, therefore requires checks somewhere to prevent goods entering the EU that avoid tariffs or regulations. In most international trade structures, the obvious place would be at the relevant border (or in a convenient location nearby depending on the geography). However, the history of checks on the Irish border, both customs and security, has led to considerable resistance to this idea and avoidance of border checks in Ireland has been promised both by the UK and Irish governments. A proposal for squaring this circle emerged in negotiations in 2017 as the Northern Ireland "backstop". This would entail a special economic zone in Northern Ireland that would keep it in the EU Single Market and Customs Union after Brexit (and following any UK-wide transition period) unless and until some alternative mechanism or technological approach could be developed that would enable it to leave these structures while maintaining a free flow of goods across the Irish border.

In order for the Northern Ireland backstop to operate, however, the EU required that goods entering Northern Ireland from Great Britain (i.e. the UK excluding Northern Ireland) would need to in compliance with EU regulations and pay EU tariffs (if needed). This was the reason for the rejection of the backstop offer by the Democratic Unionist Party (DUP) who objected that this instituted a sea border between Northern Ireland and Great Britain which treated Northern Ireland differently and would tie it to future developments in EU regulation into which they would have no input. Given these objections, a new version of a Withdrawal Agreement was reached between the UK and EU that would keep all of the UK in the Customs Union and Single Market until alternative arrangements could be negotiated. This was however rejected (three times) by the House of Commons.

The compromise deal reached at the European Council Summit on 17th October 2019 tries to resolve the impasse created by the unavoidable reality that the Venn diagram in Figure 2 does not have an intersection that does not involve compromising one of these aims. Effectively it does so with an arrangement that is closest to the intersection zone A by treating Northern Ireland differently from the rest of the UK in terms of its trade relationship with the EU post-Brexit. Unlike the original backstop, which if it had been put into effect would have treated Northern Ireland as entirely within the EU Customs Union and Single Market, the October 2019 deal includes some additional features that allow Northern Ireland firms to import goods from Great Britain without any tariffs provided that they can demonstrate that these goods will not pass into the EU. This removes one stumbling block of the backstop arrangement, which meant that Northern Ireland firms and consumers would not form part of any new free trade deals that the UK struck with other countries.

The key features of the deal are that EU regulations will apply to all goods in Northern Ireland which means checks will be required on goods entering from Great Britain to maintain the integrity of the Single Market. While precise details on implementation are still unclear at this time, it appears that in terms of the customs arrangements, Northern Ireland will officially remain within the UK customs area but firms will have to pay EU level tariffs on goods entering Northern Ireland if these goods are deemed to be at risk of entering the EU market – if the goods can be shown to be sold in Northern Ireland, these tariff payments can be refunded. This allows Northern Ireland to avail of both the UK and EU trade arrangements in many ways, although the administrative cost of this somewhat complex system remains to be seen. As Northern Ireland will not be represented at the EU and, hence, not have a voice in determining any new regulations, a consent mechanism is included in the deal with a review and vote on the continuation of this dual arrangement to be held by the Northern Ireland assembly after four years.

3. Estimating the impact on Ireland

Although Ireland is one of the most internationally open countries in the world, the UK remains an important economic partner. While diversification has reduced the share of the UK in Irish exports and imports substantially since both joined the EU in 1973, the UK is the destination for approximately 13% of Irish goods exports and accounts for over a quarter of goods imports. It is a particularly important trade partner for domestically owned small and medium enterprises, which tend to be less internationally diversified than the foreign-owned multinationals which make up the majority of aggregate Irish exports (Lawless, Siedschlag and Studnicka, 2017). Changes to this trade relationship and potential increases in trade costs or competitive environment meant that Brexit could result in a negative economic shock to Irish performance. This risk was recognised by the Irish government even before the result of the Brexit referendum with an assessment of the main sources of risk undertaken by the ESRI as part of a research programme with the Department of Finance (Barrett *et al.*, 2015). While this included an overview of several issues, ranging from migration to the all-island electricity market, trade disruption was highlighted as the main channel through which Brexit was likely to have an economic impact on Ireland (the political impacts and border arrangements were beyond the scope of the study).

Since the referendum, a range of studies have been published estimating the impacts on the long-term performance of the Irish economy. A sample of their main estimates as a percentage of GDP over a ten-year horizon are shown in Table 1. The range of estimates is fairly wide, with the scenario being modelled one of the main major judgements that had to be made by anyone approaching the topic. In other words, to get an answer to how Brexit would impact Ireland, one first has to define what Brexit might look like. This is quite problematic as considerable uncertainty remains on both the process of exit and, even more so, on how close the post-Brexit relationship between the EU and UK will be.

Bergin *et al.* (2019) use a structural model of the Irish economy (COSMO) to generate its estimates of the impact of Brexit, drawing on estimates of the overall impact of Brexit on the UK from the NiGEM model and also incorporating evidence from micro-founded work on the specific impact on UK-Irish trade such as Lawless and Morgenroth (2019). The estimates by the Central Bank of Ireland (2019) take a similar approach using COSMO but have a somewhat larger effect of a disorderly scenario. Arriola *et al.* (2018) also use NiGEM, incorporating estimates from a general equilibrium trade model to quantify the tariff and non-tariff barrier impacts on trade flows under a WTO scenario.

The analysis by Copenhagen Economics (2016) and Vandenbussche *et al.* (2019) is undertaken at a more disaggregated sector level (using a CGE trade model and a network input-output model respectively) so that both incorporate more detail on supply chain structures than the macroeconomic papers. This is likely a key source of their rather higher estimates of the negative effects. The IMF (2018) also uses a CGE approach.

Table 1. **Estimates of economic impact on the Republic of Ireland**

Study	Scenario	% Reduction in long-run GDP
Bergin *et al.* (2019)	Deal	-2.6
	No deal	-4.8
	"Disorderly" no deal	-5.0
Arriola *et al.* (2018)	No deal	-2.3
Copenhagen Economics (2016)	EEA (Norway deal)	-2.8
	FTA (Canada deal)	-4.3
	No deal	-7.0
Central Bank of Ireland (2019)	"Disorderly" no deal	-6.0
IMF (2018)	FTA (Canada deal)	-2.5
	No deal	-4.0
Vandenbussche *et al.* (2019)	EEA (Norway deal)	-1.3
	No deal	-5.7

Sources: As referenced in table.

Bergin *et al.* (2019) point to two fundamental sources of this uncertainty. The first is the political uncertainty as the rejection of the Withdrawal Bill three times in the UK in 2019 means the form and timing of EU exit remained unknown as did the shape of final trade agreement. The modellers therefore in the main took existing trade arrangements between the EU and other countries as the basis of their scenarios particularly in the earlier estimates (EEA membership, Canada-style free trade agreement) with the more extreme disorderly exit without a deal added as possible out by later work as political uncertainty increased.

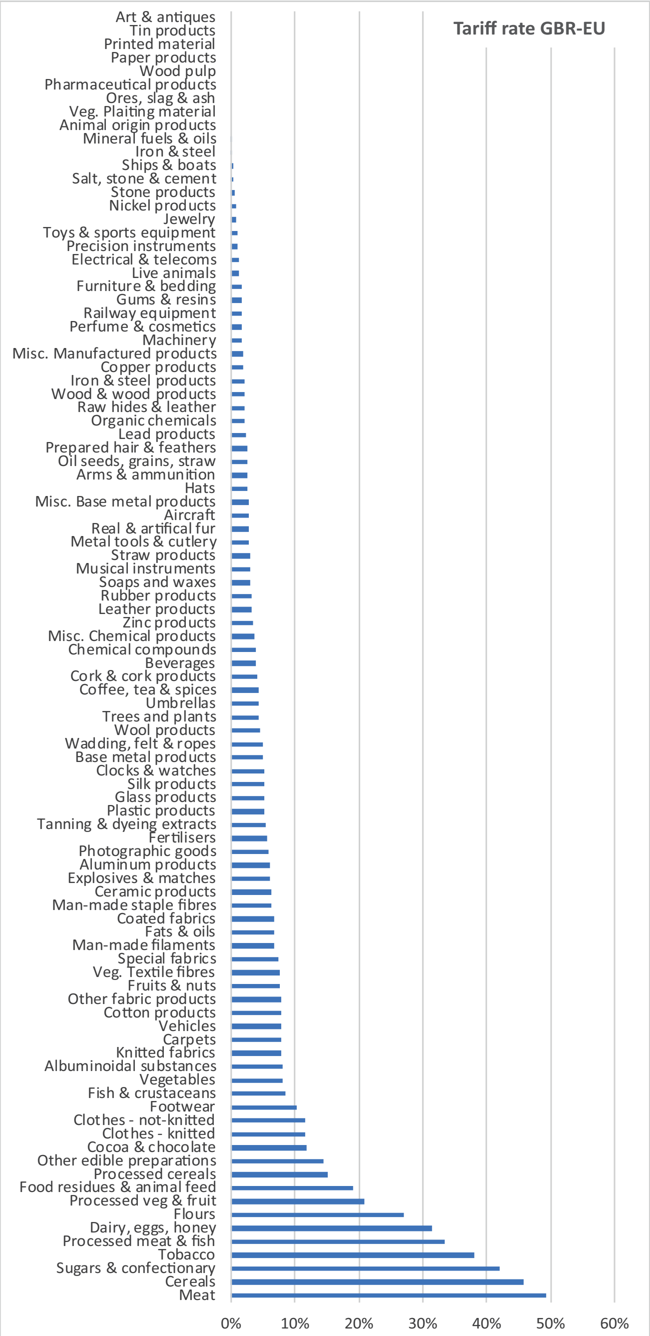
The second source of uncertainty in taking these alternative trading relationships as the basis of Brexit scenarios is economic uncertainty. There is no precedent of a country leaving a major trading block such as EU so most estimates based on estimates of the impact of EU membership and an assumption of symmetry that gains from membership would be reversed on exit. However, this symmetry assumption could be inaccurate for a number of reasons – gains built up over many years against a backdrop of global technological developments and supply chain integration may simply not be a good basis for estimating a sudden change to trade costs. Secondly, most estimates apply to the long run; they compare a pre-Brexit trading world to a post-Brexit world with new trade arrangements in place. Even if these estimates turn out to be extremely accurate, they do not tell us much about the transition process from one scenario to the other so the shorter run uncertainty about the adjustment path is considerable.

While the range of estimates does vary, there is general agreement on the direction with Brexit having a negative effect in all cases. Output falls both because the introduction of trade barriers reduces the level of trade and also because this further leads to a reallocation of resources away from their current use to sectors where they are less productive. In addition, a further impact for the UK is the possible outward relocation of activity currently serving the Single Market although this may result in some offsetting increase in FDI for Ireland and other EU member states. Work by the UK Government estimating the impact of Brexit on the UK economy itself finds potentially negative impacts in the order of a 7.7 per cent reduction in GDP in a no deal scenario and a 4.9 per cent reduction in an average free trade agreement scenario (HM Government, 2018). These effects could be further exacerbated (by approximately 1.5 further per centage points in each scenario) by a negative labour market effect if an assumption of zero net inflows of EEA workers is included.[7]

While the estimates of GDP reduction over the longer run are reasonably substantial, the distribution of the impact of Brexit across sectors and regions has also been the subject of research. Lawless and Morgenroth (2019) take the EU most-favoured nation tariffs registered with the WTO as the "hard" Brexit default where no trade deal is agreed. These tariffs are matched at a 6-digit product level to patterns of both exports from the UK to other EU members and exports from EU members to the UK. This covers 5205 product types and hence accounts for the differences in trade patterns across countries as well as differences in tariffs across products. They take into account both tariffs that are applied as a percentage of the value of good traded (ad valorem tariffs) and also fixed tariff charges by unit of weight (e.g. chilled boneless bovine meat is subject to a tariff of 12.8% of the value of the product plus €303 per 100 kg).

7. These numbers are the central ranges of a wide set of estimates summarised in Table 4.10 of HM Government (2018).

Figure 3. **WTO implied tariffs on UK to EU exports by product**

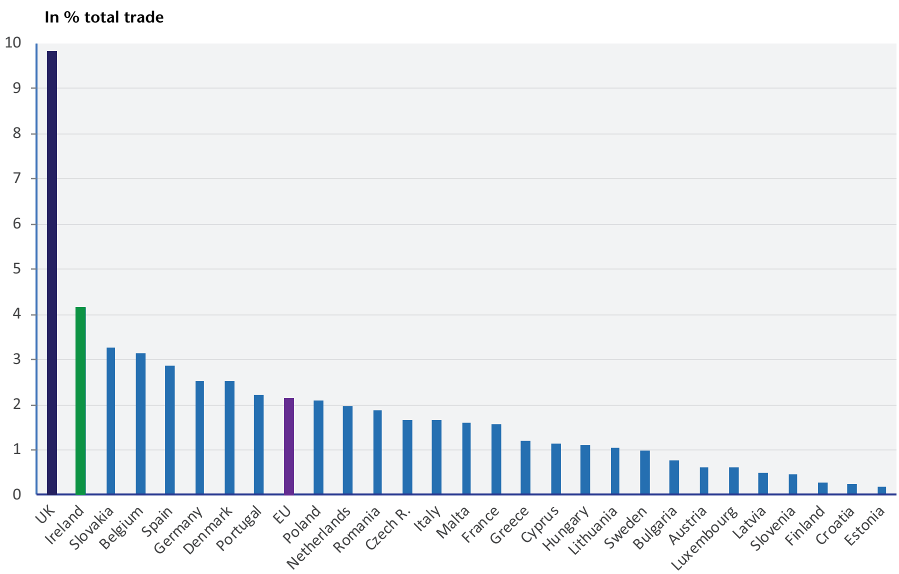


Source: Lawless and Morgenroth, 2019.

Aggregated to sector level, Figure 3 shows the extent to which these EU external tariffs can vary. For most manufactured goods, the tariffs average around 4% with higher rates of up to 8% on vehicles. A step change at the lower portion of the figure shows that a very different pattern applies to agricultural and food products which account for almost all of the highest tariff bands. The highest sectoral average is just under 50% for meat but behind this also lies considerable variation with rates on some beef products reaching over 80%.

As EU member states vary not just in terms of how much they trade with the UK but also in the composition of that trade, the impact of Brexit across countries was estimated by Lawless and Morgenroth (2019) to range from relatively negligible for some such as Croatia and Estonia to more considerable impacts of up to a 4% reduction in total trade flows for Ireland followed by falls in the region of 3% for Slovakia and Belgium. As shown in Figure 4, the average fall in overall EU trade was estimated to be just over 2%. The negative impact on the UK is much greater at just under 10% as the UK faces reductions in trade across a much larger trade partner when all 27 members of the EU are considered jointly. Ireland's high impact comes partially because it

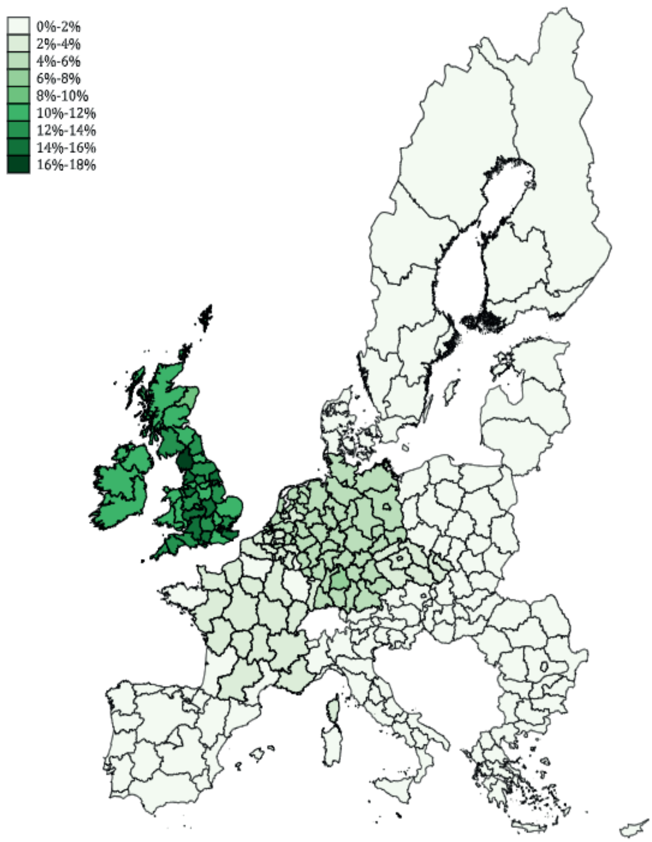
Figure 4. **Estimated impact of WTO tariffs**



Source: Lawless and Morgenroth, 2019.

trades more with the UK (as a share of overall trade) but also because the composition of that trade includes more of the agricultural and food products that would face higher than average tariffs if the UK mirrored the EU tariff schedule for third countries. These effects are based on the application of tariffs with no other changes in trading costs considered. Later in this section, we discuss other potential increases in costs from non-tariff barriers which, as they are generally approximately the same size as tariffs themselves, might be expected to almost double these falls in trade.

Figure 5. **Potential impact of Brexit on regional GDP across EU**

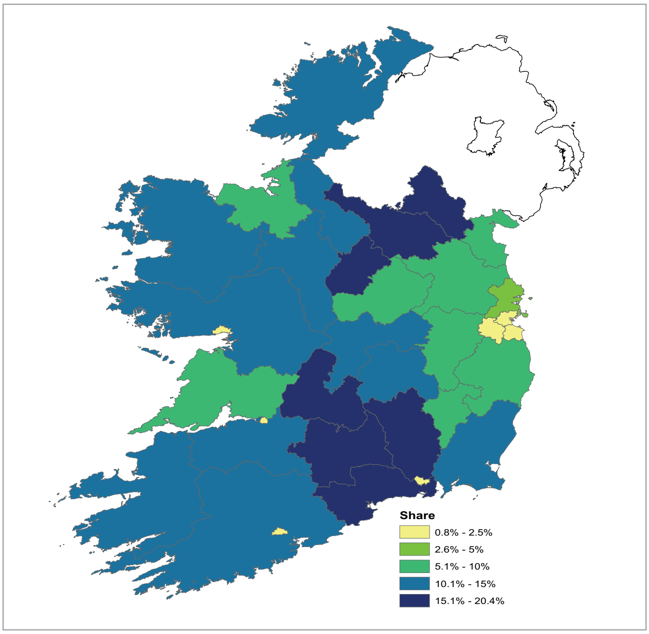


Source: Chen *et al.* (2018).

Along with this uneven impact at sector level comes uneven impact at regional level for largely the same reasons. Chen *et al.* (2018) mapped this regional spread of Brexit (reproduced as Figure 5) showing relatively little impact across the countries of southern and eastern EU with most of the impact concentrated in Ireland, followed by the trading hubs of Belgium and Netherlands and areas of Germany and Slovakia where the car industry is concentrated. They used a regional extension of the World Input-Output Database to develop an indicator of sector and region level exposure to Brexit. The approach therefore takes account of more supply chain reliance than the work of Lawless and Morgenroth but is at a higher level of aggregation (sector rather than product). Despite these quite different methodologies, both Chen *et al* (2018) and Lawless and Morgenroth (2019) come to a similar conclusion that the most negative impacts of Brexit are likely to be on the UK itself and its regions.

Morgenroth (2018) also looked at potential regional variation in Ireland by examining where the agri-food industry plays the most substantial role in local labour markets (Figure 6). As this is the sector most at risk of negative impacts from Brexit, its regional distribution is likely to be a good proxy for the overall exposure of each county.

Figure 6. **Potential regional impact of Brexit within Ireland: Share of agri-Food in total employment**



Source: Morgenroth, 2018.

This map shows the Dublin relatively little affected and moderate exposure of the broader eastern region. Counties across the west and, in particular, those bordering Northern Ireland tend to have the greatest share of agri-food jobs in total employment and hence would be most vulnerable to shifts in trade patterns for these goods.

Direct tariff costs are of course just one element in which trade barriers can be imposed. As noted in the discussion above on the role of regulatory alignment in facilitating trade, many other types of barrier were removed by the EU integration process to reach the current form of Single Market with complete free circulation of goods (and other factors of production) between countries. Even with a comprehensive free trade agreement being signed by the UK and EU to minimise tariffs, trade costs could still increase after Brexit if non-tariff barriers are put in place. Non-tariff barriers are anything that is not a tariff but that acts to restrict or inhibit international trade flows such as:

— Quantity limits (quotas)

— Subsidies to domestic production

— Technical requirements - licensing, labelling, standards

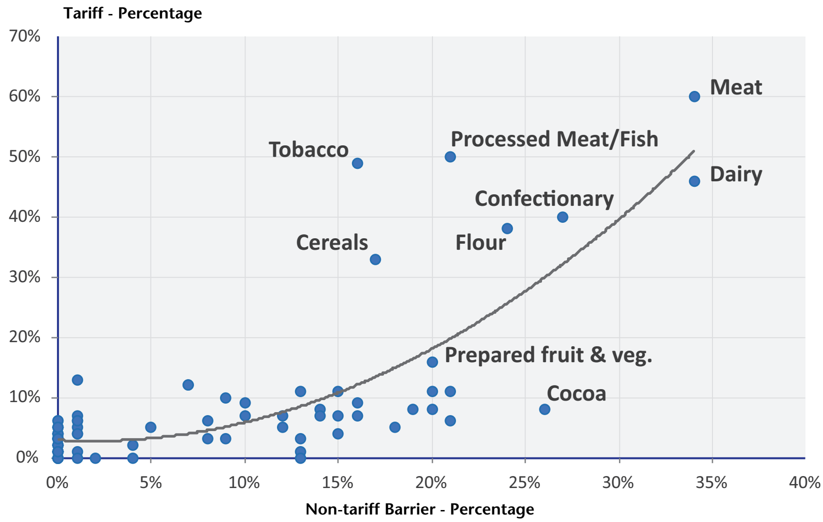
— Sanitary and phyto-sanitary rules (food and plant health rules).

— Customs inspections and documentation

Some of these costs such as customs procedures have been shown to have a large negative effect on export participation although relatively little on average trade values per firm as they operate as fixed costs which imply larger impacts on small firms (Lawless, 2010). Although it is more difficult to estimate the impacts of non-tariff barriers in advance, as many of the costs will depend on the extent to which regulatory standards diverge post-Brexit, Lawless (2018) showed that the distribution of the impact of tariffs and non-tariff barriers tend to be similar in terms of the sectors that they impact with international measures of non-tariff barriers highly correlated with tariffs (Figure 7). This is driven mainly by the costs associated with validating standards of food products which, as shown in Figure 3, are where tariffs also fall most heavily.

One potential off-setting factor to the negative impact of Brexit on Ireland through the trade channel could be an increase in FDI. This could arise FDI that might otherwise have been destined for UK gets diverted to other EU countries, including Ireland. This could occur if access to the broader EU market is one of the factors being considered by investors, particularly by those from outside the EU. Existing literature suggests that EU membership increases FDI from outside the EU by 28% (Dhingra *et al.* 2016). Lawless and Morgenroth (2016) assumed leaving the EU has the opposite effect and Ireland attracts a share of diverted FDI. This results in a reduction in negative impact of Brexit on Ireland but one that is not nearly large enough to offset trade reductions.

Figure 7. **Correlation between tariffs and non-tariff barriers**

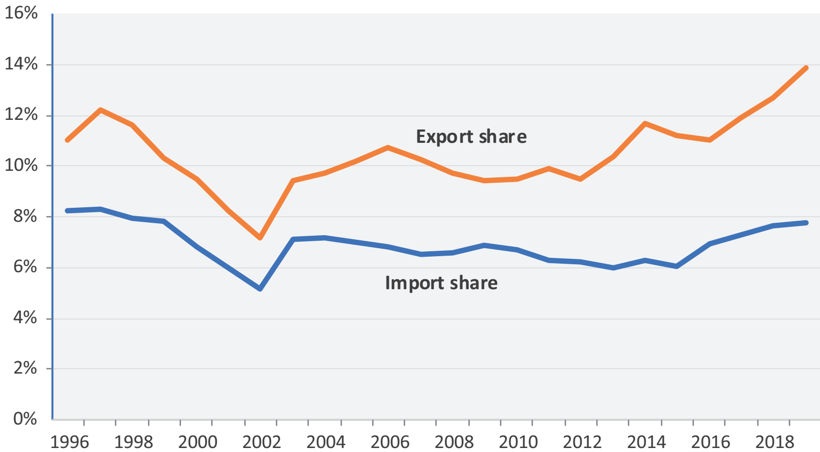


Source: Lawless, 2018.

4. Northern Ireland exposure to Brexit

While Northern Ireland has been to the forefront of the withdrawal discussions, these have tended to focus on political and peace concerns as well as the logistical challenges of implementing any checks on the long, meandering border if such checks were ever required. This sections examines how the current structure of cross-border trade also places Northern Ireland at the forefront of risks to changes in the cost of trading between the UK and EU from a purely economic perspective. Northern Ireland accounts for in the region of 11% of Irish exports to the UK and roughly 8% of imports (Figure 8). Given that the Northern Ireland population makes up 3% of the UK total, this shows a markedly close trading relationship.

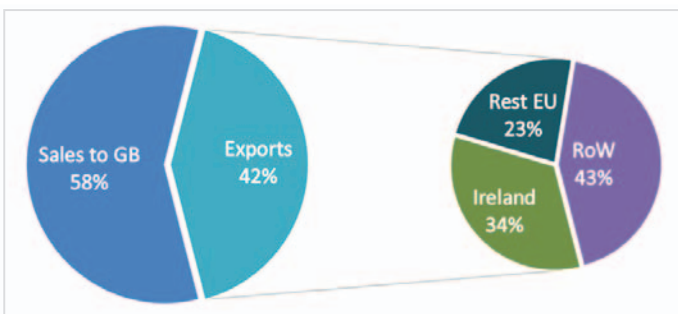
Figure 8. **Share of NI in Irish goods trade with UK**



Sources: CSO 2016 and InterTradeIreland 2018.

The importance of Ireland as a trading partner for Northern Ireland is even more notable. Figure 9 shows the structure of sales outside Northern Ireland, distinguishing between external sales to the rest of Great Britain and international exports. A reasonably substantial majority of external sales (58%) are to the British market with the remainder sold to other markets. Of these exports, over one-third are sold to Ireland and a further 23% to other EU countries.

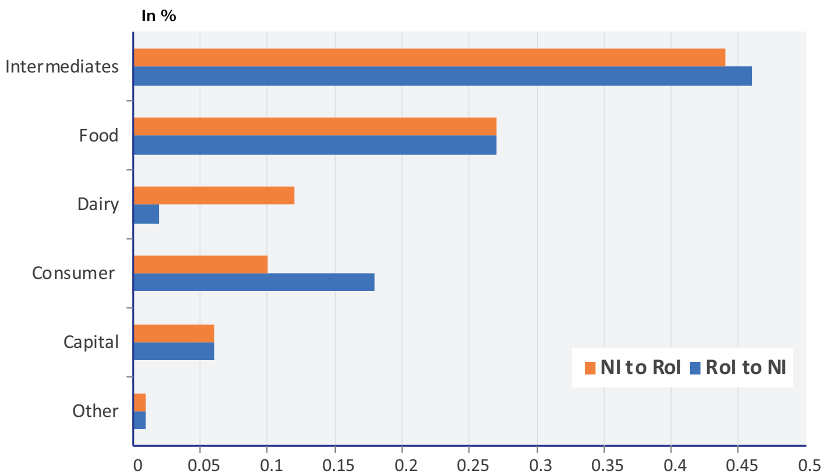
Figure 9. **Northern Ireland external trade structure**



Source: NISRA (2018a).

Cross-border trade is particularly notable for the important share of intermediate inputs in the trade composition, indicating close supply chain linkages across the island. Figure 10 shows that around 45% of trade in each direction is in products identified as intermediates based on the United Nations Broad Economic Categories (BEC) classification of products. This is likely to be something of an underestimate, however, as NISRA (2018b) shows that much of Northern Ireland's cross-border trade in food products, especially dairy products, is undertaken by firms moving products for processing purposes whereas the BEC system regards all food products as being final consumption. Food makes up almost one-quarter of trade across the border and the dairy sector is a particularly important contributor to exports from Northern Ireland to Ireland, accounting for around 13% of the total.

Figure 10. **Cross-border trade structure**



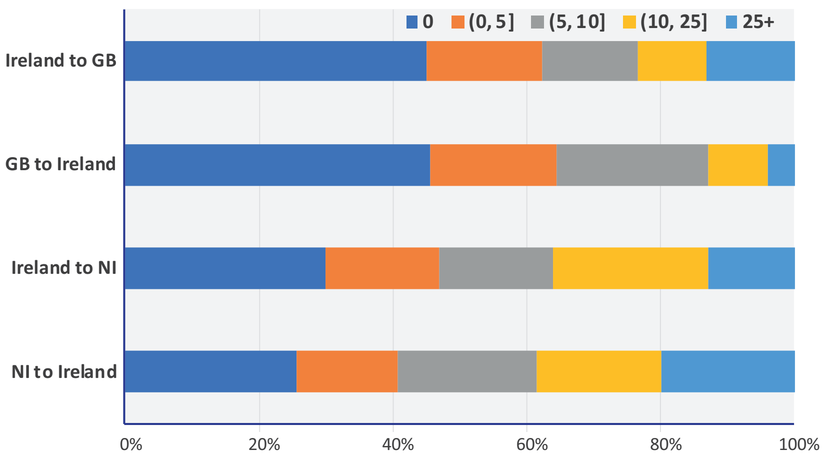
Source: CSO 2016 and InterTradeIreland 2018.

Figure 11 maps the external EU tariff rates charged on third countries shown in Figure 3 onto the current structure of cross-border trade assuming that the same tariffs would be applied in both directions. This shows that a sizeable percent of trade would be unaffected by tariffs as they are in sectors with rates set at or very close to zero: these include paper products, pharmaceuticals, iron and steel. These tariff-free products make up a reasonable substantial proportion 45% of trade in each direction of trade between Ireland and Britain but the tariff-free share of trade is considerably lower for cross-border trade. This suggests that

30% of trade from Ireland to Northern Ireland would be unaffected by tariffs and just 26% of trade from Northern Ireland to Ireland.

As noted in the discussion of Figure 3, food accounts for most of sectors with the highest tariffs and meat and dairy in particular are sectors where high tariff rates are imposed under the current EU WTO schedule. This variation across products is very important as these high-tariff products make up a substantial share of cross-border trade flows. This results in 39% of trade from Northern Ireland that could have been faced with tariffs above 10% in this hard Brexit scenario, 19% of which would be impacted by tariffs of over 25%. From Ireland to Northern Ireland, a similar 36% of trade would fall into the over-10% tariff range, although the share impacted by the very highest tariff rates is slightly lower at 13%.

Figure 11. **Share of trade by potential WTO-level tariff level**



Sources: CSO 2016 and InterTradeIreland 2018.

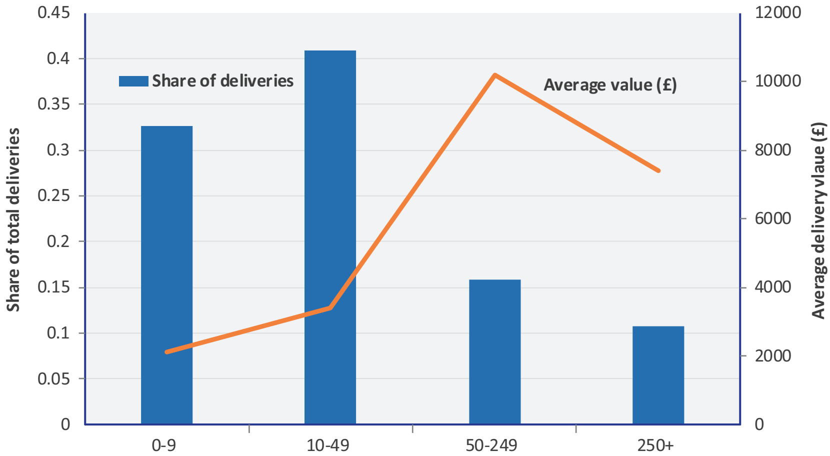
Along with the exposure to Brexit by sector, there is variation across firm types. This comes about as smaller firms are much more likely to be less diversified and to export only to Ireland when they export at all than bigger firms. Figure 12 shows how export participation rates in Northern Ireland vary by firm size, dividing firms into micro (0 to 9 employees), small (10 to 49 employees), medium (50 to 249 employees) and large firms (250 or more employees). In line with international evidence, the likelihood of a firm being an exporter increases substantially as we move up the size categories with around 12% of micro firms exporting compared to 46% of large firms (left-panel). When smaller firms do export, they tend to overwhelmingly export only to Ireland (right-panel) with over 80% of micro firms and over 70% of small firms concentrating all of their export activity in Ireland. This is the case even amongst the largest firms where almost half of exporters sell only to Ireland.

Figure 12. **Which firms export from Northern Ireland?**

Sources: CSO 2016 and InterTradeIreland 2018.

Cross-border trade is also characterised by very high frequency, relatively low value deliveries as shown in Figure 13. One-third of all cross-border deliveries are made by micro firms with 41% made by small firms. Together these two groups of firms account for around 74% of cross-border movements but, in terms of value, these deliveries are less than one-fifth of cross-border goods trade. The smaller number of higher value deliveries account for the majority of trade value despite accounting for just 25% of the trips. This small but frequent pattern of deliveries would be disproportionately hit by changes in customs procedures, which tend to require similar levels of documentation on every consignment regardless of size.

Figure 13. **Cross-border deliveries by firm size**



Source: NISRA (2018b).

5. Impact summary

While the final shape of Brexit and the closeness of the following economic relationship between the UK and EU remains to be determined, this paper shows how maintaining the closest possible links are of importance to trade on the island of Ireland. Moves away from the current joint membership of the Single Market and Customs Union opens up many complications in terms of requirements for checks on what is moving across the border, unless a special status is finally agreed for Northern Ireland (as seems reasonably likely at the time of writing).

The particularly high exposure to Brexit for cross-border trade between Northern Ireland and Ireland comes partly because in many dimensions it is more like local trade than international export activity with a high frequency of low value deliveries for small firms. Furthermore, almost all exporting firms in Northern Ireland include Ireland as one of their destination markets and over 80% of the smallest firms that export from Northern Ireland have all of their export sales in Ireland. We also noted a high degree of cross-border integration through supply chains. Given the estimated negative effects on trade from the presence of an international border from a wide range of gravity-style studies (Head and Mayer, 2014), it is clear that a new border would be likely to be highly disruptive. Putting all of this together suggests that the impacts of any changes in the cost of trading post-Brexit would be liable to be felt most particularly by very small firms trading across the border.

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