Assessing the impact of Brexit on the economic activity of the UK's closest partners: the trade channel

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The European Union is a highly integrated free trade zone in which goods circulate freely, and as such the potential consequences of Brexit are multi-faceted and difficult to predict. While much has been written about the possible effects of Brexit on the British economy, its potential impact on the United Kingdom's main partners has received less attention. The purpose of this dossier is to estimate the knock-on effects of Brexit on economic activity in these countries, with particular focus on trade.

Brexit could result in an increase in customs duties between the United Kingdom and its trading partners, which would have consequences for international trade and thus for world demand for the products of all countries involved. The method used here takes into account the international nature of value chains, estimating the distribution of shocks between the UK's trading partners. This serves to precisely identify the circuits through which the initial shocks from disruption in British trade would be transmitted, both by country and by product, along the whole length of the value chains.

For the purposes of this report we have analysed two potential scenarios for the UK's exit from the EU. In the soft Brexit scenario, the United Kingdom and the EU would succeed in reaching a deal, triggering a period of transition which would run until 31st December 2020. Any increase in customs duties would thus be delayed until 1st January 2021. In this case the cumulative effect on French economic activity would be equivalent to –0.3% of GDP, spread over several quarters. In our hard Brexit scenario, the two parties fail to reach a deal: the sudden hike in customs duties following a hard Brexit would cost the French economy 0.6% of GDP, spread over several quarters. Other countries could be hit harder, for example Ireland (between –1.4% and –4.1% of GDP) and Germany (–0.5% to –0.9%). In both cases these are counter-factual projections, i.e. based on attempts to predict what GDP would have been without Brexit, not the actual current level of GDP.

This estimate is based on the assumption that the general structure of world trade remains unchanged. Modelling the decline in trade between the United Kingdom and its trading partners does not take into account the potential reorganisation of international production chains and demand for products, which could offset the negative impact. On the other hand, nor does this method account for other channels through which the shock further to Brexit might spread, such as the effects on capital transfers or the migration and freezing of investment. Moreover, non-tariff barriers could significantly aggravate the estimated effects of Brexit.

Given the high level of uncertainty involved, this exercise does not constitute an alternative to the detailed forecasts for the French economy contained elsewhere in this Conjoncture in France report. A hard Brexit at the end of March 2019 would undoubtedly have a negative impact on the growth forecast for Q2 2019. But the effect for Q2 alone cannot be deduced simply from the estimates contained in this Special Analysis, especially since the British government could take a unilateral decision to delay the application of customs duties on imports from the EU, while also temporarily reducing some of the duties charged on imports from the rest of the world. ■

This report has been enriched by contributions from Pierre-Damien Olive (SNDI Paris)

Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

Brexit represents an unprecedented development in economic history

The EU guarantees the absence of customs barriers between its members

In June 2016, the British people voted to leave the European Union (EU). Membership of the European Union exempts countries from all customs duties on goods and services exchanged between member states, and allows them to benefit from preferential customs duties negotiated by the EU with the rest of the world. Furthermore, the harmonisation of standards and regulations at EU level has significantly reduced the presence of non-tariff barriers to trade within the single market, particularly thanks to the easing of customs checks.

Brexit would lead to an unprecedented economic shock

In this context, Brexit is quite unprecedented both in terms of its handling by the British and EU institutions, and more broadly in terms of the trajectory of economic history. There is no comparable historical example which could be used to estimate the potential effects of such a shock, on the one hand because the European Union represents the most highly-integrated trading agreement yet conceived, and on the other hand because no country has ever left the EU.

Furthermore, the intensification of international trade (particularly within the single market) and the growing integration of international production chains, especially between EU members, makes it more difficult to precisely gauge the scale of the costs induced by Brexit, and which countries will ultimately bear these costs.

A vast corpus of economic literature agrees that Brexit will have a negative impact on the economy of the United Kingdom

Various approaches have been deployed in an attempt to estimate ex ante the impact of Brexit, based on different hypotheses for the outcome of negotiations between the EU and the United Kingdom (*Box 1*). All of these estimates agree that Brexit will have a negative impact on economic activity, but they disagree as to the scale of the damage. Depending on the nature of future tariff and non-tariff barriers, as well as differences in the calculation methods, estimates of the impact on British GDP range from below 1% to over 10%. These studies are primarily focused on the United Kingdom, and do not systematically consider the consequences for the EU and its member states.

This report proposes to estimate the impact of Brexit on the UK's trading partners

This report estimates the cost of Brexit for the United Kingdom's trading partners, and particularly for France. The approach adopted involves analysing world input-output tables (WIOT, *Box 2*) to account for the effects of value chain integration, and thus the indirect or "second-round" effects of Brexit. This approach is particularly well-suited to estimating short and medium-term effects.

Applying this method, the effects of an increase in customs duties on the value added produced by each country can be estimated in several phases: the initial shock of customs duties will be passed on to imports and exports via price elasticities; next, the Leontief matrix (*Box 3*) allows us to deduce the impact on output and the consequences in terms of value added.

The world input-output tables (WIOT) are used to account for the intertwining of global value chains

An increase in customs duties would lead to a reduction in the volume of trade

In the immediate short term, Brexit would lead to an increase in customs duties on goods entering and leaving the United Kingdom, causing their prices to increase. This increase would lead to a decrease in demand in volume, and thus a downturn in production. In order to quantify this reduction, it is necessary to calculate the import price elasticity of every product from every country (see *Box 4* for estimates of elasticities found in the existing literature).

The downturn in trade would lead to a decline in value added

The next step is to measure the impact of a reduction in imports to and exports from the UK on the output of its trading partners, focusing specifically on the value added for each country. A country's economic activity can be defined as the total value added of all goods and services produced within that country, and as such it is possible to calculate the impact of Brexit-related customs increases on the GDP of the UK's trading partners. The resulting shock can be broken down into two types of effects: "first-round" and "second-round" effects.

Box 1: The economic consequences of Brexit: a literature review

Since the debates which arose during the campaign ahead of the referendum on the United Kingdom's continued membership of the European Union in 2016, a number of empirical studies have attempted to quantify the impact of Brexit. Academic studies from international organisations (IMF, OECD) and economic institutes (NIESR, Cepii) have all concluded that Brexit would have negative consequences for GDP and employment in both the United Kingdom and the EU. The approaches used in these studies are based on the econometrics of world trade as well as macro-economic models.

Econometrics of world trade

Brexit analysis is based first on gravity models which explain the trade between two countries based on their size and the distance between them (Dhingra et al., 2017, et Mayer et al., 2018). Under this approach, the closer two countries are to one another, the more they will trade. This analytical framework serves to identify the effects of customs duties on growth by drawing up a counterfactual scenario. The trade gains made by members of a customs union are thus measured in comparison to a fictional protectionist scenario. With Brexit, the cost of the United Kingdom leaving the EU is assumed to be symmetrical to the trade gains made since the UK joined the common market in 1973.

Dhingra et al. (2017) defined two scenarios for tariff and non-tariff barriers which have become benchmarks in the economic literature. In their soft Brexit scenario, a preferential free trade agreement is found with the EU, keeping customs duties at 0% and increasing the cost of non-tariff barriers by an estimated 2.8%. In the event of a hard Brexit, customs duties are applied as per the WTO "most favoured nation" clause and the added cost of non-tariff barriers is estimated at 8.3%. If the United Kingdom and the EU should sign a "classical" trade deal, the impact on the GDP of the United Kingdom would be –1.3%, compared with –2.7% in the event of a hard Brexit. GDP in the EU would fall by between –0.2% and –0.6% depending on the scenario envisaged, with substantial disparities between member states. The effects of Brexit would be felt more keenly by those member states with relatively small economies which export a large proportion of their value added to the United Kingdom (Ireland and the Netherlands in particular). The effects estimated by Mayer et al. (2018) within a similar framework are of comparable scale.

Gravity models measure the "static effects" of an increase in barriers to trade. The "dynamic effects" of a dip in world trade include other factors such as the loss of productivity and the loss of ground in relation to the current state of technological innovation. In order to take such factors into consideration, Dhingra et al. (2017) propose an alternative estimate which incorporates a permanent negative impact on the development of productivity in the United Kingdom after Brexit, leading to a per capita decline in activity three times greater than the static estimate, i.e. between –6.3% and –9.4% of GDP depending on the customs duty scenario.

Nonetheless, these models are beset by certain limits. Closed-loop macroeconomic processes within countries and between countries are not taken into account, nor is the methodology of the world input-output tables. Furthermore, the model is based on several structural economic assumptions, whose robustness when confronted with an event as dramatic as Brexit cannot be guaranteed. Finally, in such studies the effects of Brexit are assumed to be transmitted solely via trade interactions. Nevertheless, these models are pertinent when it comes to estimating long-run effects.

Approaches based on multinational macroeconomic models

Multinational models are composed of sets of econometrically-estimated equations. They can thus be used to simulate international trade shocks, and to estimate their long-term effects. It is possible to calculate the effects on import and export prices using the predefined customs duties scenarios contained in the NiGEM model, allowing for specific estimates of the impact of Brexit (Erken et al., 2018). According to the NiGEM Brexit scenario, the United Kingdom's imports and exports would be hampered by increases in customs duties, and thus prices, since a rise in import prices would lead to inflation in the prices of final or intermediate goods. Real wages would also decline in the UK, and competitiveness would be eroded.

The potential of the United Kingdom's production capacities would also be undermined via decreases in investment and productivity. The decrease in direct investment in the United Kingdom, almost half of which currently comes from the EU, would lead to a slowdown in the growth of the country's capital stock. Meanwhile, obstacles to migration would lead to a decrease in the total number of hours worked. As a result, productivity, which already slowed sharply after the financial crisis of 2007-2008, would not recover. Brexit would thus have a negative impact on the intensity of competition in the United Kingdom, limiting the positive externalities (spillover effects) linked to European R&D. The combined effect of these two factors would be to hamper overall productivity.

Overall, according to this model, the impact of Brexit for the United Kingdom would be a loss of between –6.5% and –11.5% of GDP between now and 2030 (Erken et al., 2018). The Brexit cost estimates produced by the OECD (Kirzenkowki et al., 2016), which utilise the METRO model, also predict a –5% GDP loss for the United Kingdom between now and 2030. The reports published separately by the British government and the Bank of England in November 2018 foresee a long-term GDP loss on a similar scale, ranging from –1% in the event of a soft Brexit to –8% if the UK were to leave without a deal (hard Brexit). In these studies the cost of Brexit is greater than that

estimated by studies focusing solely on international trade (Dhingra et al., 2017), and that derived from the world input-output tables (WIOT). The macroeconomic models also take into account the interactions between nations, particularly contagion effects via world trade and the consequences for the factors which determine domestic demand. The accounting structure of the model ensures that projected developments in trade between countries are consistent. Nevertheless, the structure of the trading partnerships of each country remains fixed, which means that the results could be overestimated, since the potential for changes in the relative weight of trading partnerships post-Brexit is not taken into consideration.

The world input-output table (WIOT) approach

Another approach consists of analysing trading relationships between countries on the basis of their consolidated national accounts. For example, Vandenbussche et al. (2017) use the latest WIOT contained in the World Input-Output Database (WIOD). Based on a number of hypotheses regarding the behaviour of businesses and consumers, they simulate the effects of customs duties on imports and exports. In this analysis, the impact of Brexit on the EU is not solely defined by the decline in trade with the United Kingdom. It also incorporates the indirect consequences of a slowdown in trade between European nations, caused by a slowdown in trade within the value chains whose ultimate output is the production of final goods for the British market. According to Vandenbussche et al. (2017), the indirect effects account for 25% of the total cost of Brexit, with the impact varying considerably between countries. The hypothetical scenarios employed in this study are the same as those used by Dhingra et al. (2017) and described above, which demonstrates how different methodological approaches yield different estimates for the cost of Brexit. In all, the impact of Brexit on the United Kingdom in terms of GDP loss is estimated at –1.2% (for soft Brexit) and –4.5% (hard Brexit), while the corresponding impact for the EU would be –0.4% (soft Brexit) and –1.5% (hard Brexit).

The IMF estimates, based on WIOD figures, put the cost of Brexit at a level below that predicted by most articles on the subject (Chen et al., 2018). In the IMF's view, if the United Kingdom and the EU succeed in agreeing a free trade deal with no customs duties but containing stricter non-tariff barriers, then output from the EU27 would ultimately fall by 0.8% compared to the forecasts for the outlook without Brexit. If the parties were to fall back on WTO rules, the decline in real output would be 1.5% in the long term. However, under a Norway-type scenario (soft Brexit), whereby the UK leaves the customs union but retains access to the single market, the impact on EU27 output would be less substantial. ■

The effects of Brexit would spread through the international value chain

The first-round effects for a given country correspond to the reduction in volume in its exports to the United Kingdom. Nevertheless, the full scale of the shock would not be limited to these immediate effects. The fact that trading partners are part of complex international production chains increases the number of channels through which the effects of an exogenous shock are diffused to each individual country. Some countries also trade indirectly with the United Kingdom, exporting products to countries which in turn export them to the UK, or else use them as intermediate consumptions in the production of goods for export to the United Kingdom. A reduction in the exports of these "third-party" countries to the United Kingdom would thus lead to a reduction in exports to the third-party countries themselves: these are what are referred to as "second-round" effects. Countries will be all the more exposed to such effects if they export products to the United Kingdom via other countries. The mathematical formula used for these calculations is shown in *Box 3*.

An increase in trade barriers is the only hypothesis considered here

The results obtained are subject to the hypotheses inherent to the use of the WIOT. First and foremost, the effects of Brexit on the activity of the United Kingdom's trading partners are estimated via a single channel, i.e. international trade in goods and services. Effects linked to transfers of capital and persons are not taken into account.

Secondly, the effects of an increase in customs tariffs are assumed to be limited to variations in international trade: exchange rates thus remain hypothetically unchanged. Any increases in non-tariff barriers (reductions in import quotas, health standards for imported goods etc.) are considered separately (*Box 5*).

Furthermore, changes in behaviour among agents are not accounted for in the model: it is thus assumed that consumers will not switch to alternative products (there are no calculations for cross-elasticities) and that businesses will pass on all of the increase in their production costs to their final prices, thus preserving their margins.

The effect modelled here is short or medium-term

Finally, the structure of world trade is assumed to remain unchanged: the model does not account for the potential reorganisation of production chains. What is modelled here is a medium-term effect, wherein exporters and importers have not

Box 2: World input-output tables (WIOT)

The world input-output table (WIOT) is a database recording the output of 44 countries in 56 categories of products, along with their resources and their final and intermediate uses.

Each line corresponds to the possible uses of a given pairing (product - country) p, i.e. the use of a product in a country. Of central importance to the WIOT is the world intermediate input table (WIIT), which describes the intermediate uses of $44 \times 56 = 2464$ couples (country-product) in the output of 2464 couples (country-product), combined with five vector columns corresponding to the end uses of these 2464 couples in the 5 categories of final demand in the 44 countries: household consumption, non-profit institutions serving households, public sector consumption, investment and inventory change.

The technical coefficient matrix A is constructed by dividing each cell (i,j) in the WIIT by the value of the output Xj of the country-product pairing j.

(country-product) $a_{i,j} = \frac{TIEI_{i,j}}{X_j}$

The item ai,j in the matrix A thus designates the proportion of intermediate consumption coming from the pairing (product-country) i in the output of the pairing (product-country) j.

The balance between resources and uses for a pairing (country-product) i means that the output of i is equal to the sum of its final uses (written as Efi) and its intermediate uses: $X_i = EF_i + \sum_i TIEI_{i,j}$ so, using the technical coefficients:

$X_i = EF_i + \sum_i a_{i,j} X_j$ or, in matrix terms: $X = EF + A.X$, soit $X = (I - A)^{-1}.EF$.

The ratio $(I - A)^{-1}.EF = X$ can also be written $\left[I + A + A^2 + A^3 + ...\right].EF = X$: the output of a (country-product) in response to world demand requires the use of intermediate consumption in all other pairs (product-country), which may in turn make use of any and all other pairs (product-country) and so on and so forth. Thanks to this equivalence we can assess the impact of a decrease in demand EF on output X. The total impact can be broken down into first and second-round effects: $\Delta X = I.\Delta EF + \left[A + A^2 + A^3 + ...\right].\Delta EF$ where $I.\Delta EF$ is the first round and $\left[A + A^2 + A^3 + ...\right].\Delta EF$ the second round.

In this case the aim is to estimate the effect on the fall in the volume of exports from the United Kingdom and its partners on output and, ultimately, on value added (Box 3). The decrease in exports is therefore modelled as a decrease in final demand EF, from the perspective of each country.

yet adapted their behaviour. For example, no attempt is made to estimate the impact of UK-EU trade being replaced by more intensive trading with members of the Commonwealth. All other things being equal, the effect modelled here theoretically corresponds to the upper bound of the impact of international trade, corresponding to the reduction in the volume of trade between each country and the United Kingdom, and not offset by the reorganisation of trading partnerships.

The majority of the United Kingdom's trade is with the European Union, concentrated in the service sector

The EU is the United Kingdom's biggest supplier

In 2014, the date of the most recent WIOT present in the WIOD (World Input-Output Database), 53.2% of Britain's imports came from the EU: 13.4% from Germany, 7.8% from France and 5.7% from the Netherlands (*Graph 1*). Outside the EU, the USA was the largest supplier of goods to the United Kingdom, with 9.6% of imports, followed by China (6.7%) and Norway (3.3%).

The majority of British imports were services (28.6%) and manufactured goods excluding transport equipment (25.2%, *Graph 2*). Nonetheless, British imports vary significantly from one trading partner to the next: Germany and the USA primarily export transport equipment to the UK, while China exports manufactured goods excluding transport equipment, particularly computer equipment and textiles, and France exports services, mostly administrative services and services to businesses.

Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

Box 3: The comprehensive approach adopted in this report

The WIOT, which in its full version contains 44 countries and 56 products (see *Box 2*), is stripped down to focus on 21 countries and 6 products.

The effects of an increase in customs duties on each country-product pairing for the value added of that pairing (country-product) can be calculated by multiplying the following three matrices: *Effet sur la VA* $= V \times L^{-1} \times C$

where:

- C is a 126 × 252 matrix which represents the exogenous shock of customs duties in volume, applied to total world trade. C matches the matrix ΔEF (see *Box 2*). This allows us to define the amplitude and source of the shock. In this case it comes on the one hand from exports from the United Kingdom to its trading partners, and on the other hand from exports from trading partners to the United Kingdom. The matrix C is constructed as the result of a term-to-term product of three matrices measuring 126 × 252:

  - a matrix indicating the differential between customs duties applied to goods entering the United Kingdom from partners and on goods entering partners from the United Kingdom
  - a matrix indicating the price elasticities used to translate the impact on prices into impact on volume (see *Box 4*).
  - a matrix indicating exports of country-product A to country-product B.

This yields the effects of increased customs duties on the value added of all country-product pairings. Since a country's GDP is defined as the sum total of value added of all goods and services produced within its borders, the total effect on the GDP of each trading partner can be deduced by adding up the effects calculated for each product, expressed in percentage points of GDP for each country.

- V is a diagonal matrix of dimensions 126 × 126, containing the value added/production ratios for each pair (country-product). This allows us to translate the impact on output into impact on value added.

- L^{-1} is a Leontief matrix of dimensions 126 × 126 where $L^{-1} = (I - A)^{-1}$, with Id the identity matrix of dimensions 126 × 126 and A the matrix 126 × 126 of the technical processing coefficients j. A term (i,j) in the Leontief matrix indicates the effect of a decline in output from a country x product i on the country-product j, once first and second-round effects have been taken into account. ■

The breakdown of UK exports by destination country is similar to the breakdown of imports by country of origin

The EU is systematically the United Kingdom's biggest client

In 2014, 38.9% of British exports were headed to the EU: Germany accounted for 7.2% of total exports from the United Kingdom, France 6.2% and Ireland 4.6% (*Graph 3*). Outside the EU, the USA was the largest client for British exports with 11.4%, followed by China (3.6%).

Services accounted for the majority of British exports (53.7%), of which 15.0% were financial and insurance services. The next most significant export categories were manufactured goods excluding transport equipment (12.9%), transport equipment (11.1%) and energy (11.0%). The nature of British exports varied little from one trading partner to the next, with the exception of China whose imports of services from the United Kingdom (29.4%) were almost on a par with their imports of transport equipment (26.3%).

The amplitude of the economic shock caused by Brexit on the UK's trading partners will depend on several factors, chief among which are the intensity of trade and the structure of value chains.

The weight of the UK in the economic activity of its main trading partners is most substantial in the EU

Brexit would lead to a significant decrease in Ireland's GDP because of the proportion of exports to the United Kingdom in the Irish economy

The greater the weight of exports to the UK as a proportion of a country's total economic activity, the more dependent that nation is on its trading partnership with the United Kingdom. By measuring exports to the United Kingdom as a percentage of GDP, we can thus determine how exposed individual countries may be to the effects of Brexit. In 2014, the countries for which exports to the United Kingdom represented the most significant percentage of total GDP were primarily members

of the European Union (*Graph 4*): Ireland (16.4% of GDP), followed by Belgium (5.9% of GDP), Luxembourg (5.5% of GDP) and the Netherlands (5.5% of GDP). In France, exports to the United Kingdom represented 2.4% of GDP in 2014, against 3.0% for Germany. In theory, these countries are thus highly exposed to the first-round effects of Brexit, i.e. a downturn in their exports to the United Kingdom.

The national content of exports to the United Kingdom is high among the largest EU and non-EU nations.

The first-round effects of Brexit will be greater for those countries whose exports have a high national content

A country's exports to the United Kingdom can be broken down into two parts: the first is national content, which represents the share of exports produced within the country and thus the value added of that country; the second is imported content, which represents the share of exports originating in third countries and incorporated into exported products as intermediate consumptions. Countries whose exports have a high national content are more likely to be affected by a reduction in the volume of trade, since their contribution to the international production chain generates considerable economic activity domestically. Any reduction in trade affecting the production chain would thus lead to a substantial loss of GDP.

In 2014, the countries whose exports to the United Kingdom had high levels of national content were primarily the USA (86.7%, *Graph 5*) China (83.1%), Italy (77.7%), France (76.7%) and Germany (73.3%).

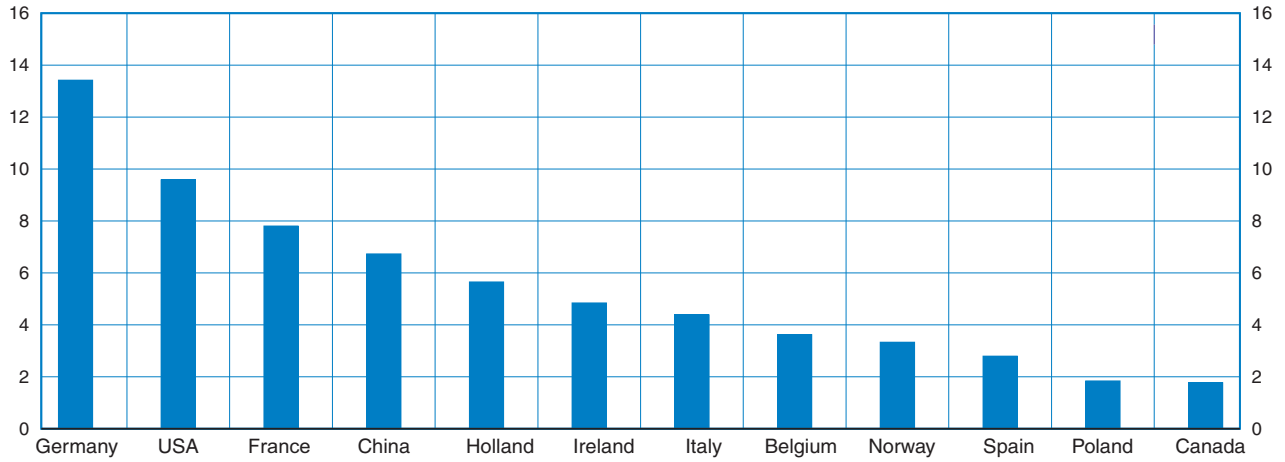
Overall, those countries whose GDP is most dependent on exports to the United Kingdom and which also have a high national content in their exports to the United Kingdom are likely to be most exposed to the first-round effects of Brexit.

A substantial portion of the exports from Europe's smaller economies to the United Kingdom originates in Germany and France

Furthermore, the shock is expected to be even more substantial for those trading partners that contribute a large amount of national value added to the production chain, even via other countries, which will suffer the second-round effects. Among the key trading partners of the United Kingdom, Germany is particularly exposed to these second-round effects. Exports from other countries to the United Kingdom contain a very high proportion of German imports. This is particularly true of various Eastern European nations: Czech exports to the UK contain 11.3% of German products, while Polish exports contain 6.7% (*Graph 6*). As such, a dip in Czech and Polish exports will be partly reflected in a dip in German output. The proportion imported from Germany in Czech exports to the United Kingdom is particularly high for transport equipment (15.8%), chemical and pharmaceutical

1 - Breakdown of British imports by country of origin

in %



How to read it: in 2014, 13.4% of British imports came from Germany. The countries shown here are the 12 biggest exporters to the United Kingdom, in terms of their share of total British imports.

Sources: WIOD, INSEE

products (13.2%), manufactured goods excluding transport equipment (11.4%) and energy (7.3%).

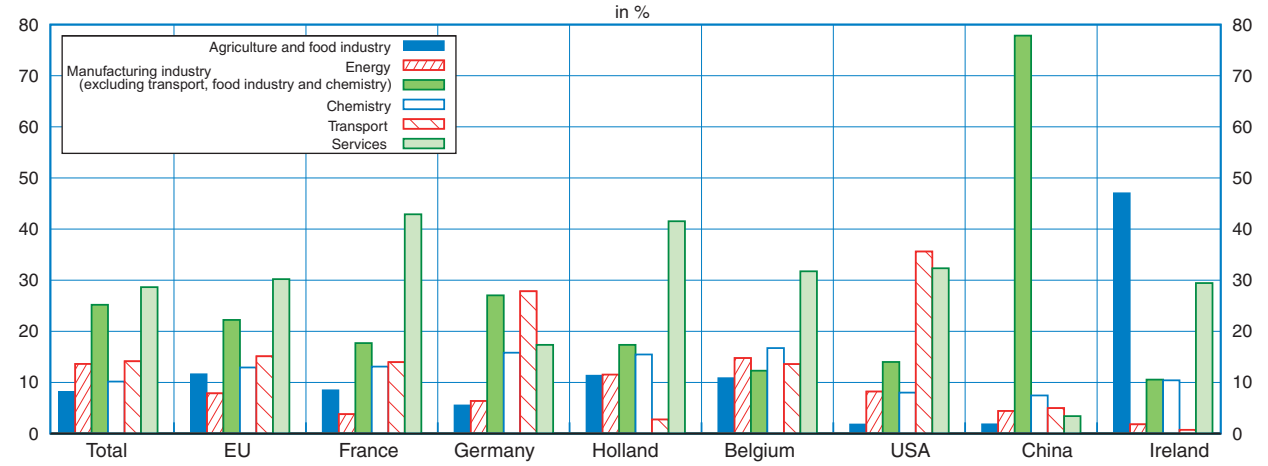
France appears to be less exposed than Germany to such second-round effects: exports from other countries to the United Kingdom contain relatively few French products, with the exception of exports from Belgium (4.0%) and Spain (3.8%).

These figures serve to illustrate the structure of modern value chains and the interwoven nature of Europe's economies. Before going into further detail on the estimated impact of Brexit for the economies of the UK's trading partners, the customs duties scenarios used to make these calculations are explained.

Two potential are envisioned for the future of customs duties after Brexit

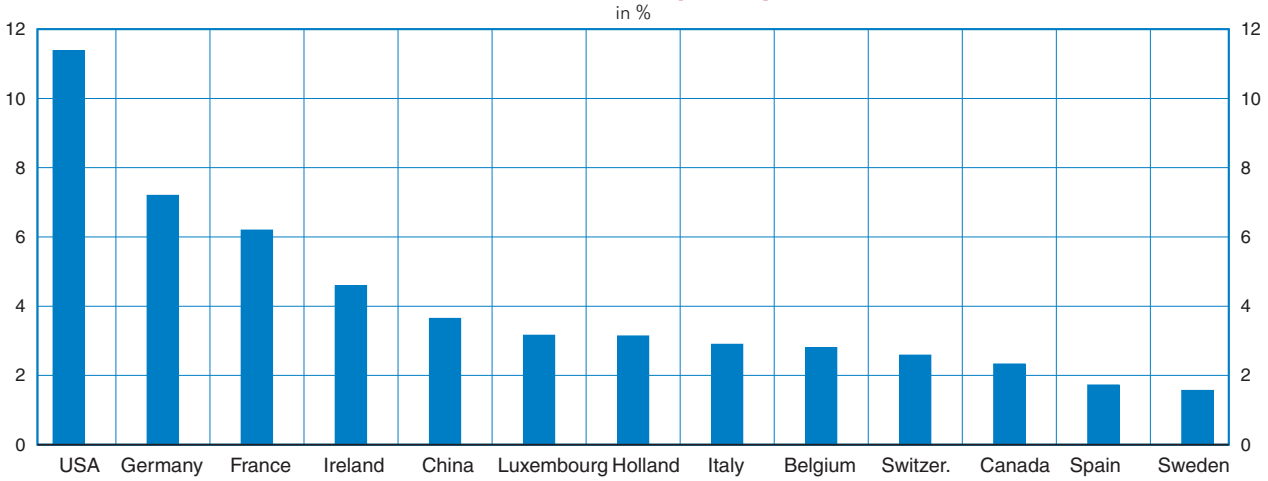
Under the EU Customs Code, all member states apply the same customs duties among themselves (set at 0%) and with third countries. Within this framework, the United Kingdom, like any other member state, is not entitled to negotiate bilateral trade agreements with other EU member states, or with countries outside the EU, as long as the UK remains an EU member. Upon exiting the EU without agreement, in a "hard Brexit" scenario, the customs duties stipulated in the most favoured nation clause (MFN) will apply to exports from the United Kingdom, to

2 - Composition of British imports by country of origin



How to read it: In 2014, 35.6% of British imports from the USA were transport equipment, while the average for this category from all trading partners was 14.1%.
Sources: WIOD, INSEE

3 - Breakdown of British exports by destination



How to read it: In 2014, 11.4% of British exports were to the USA. The countries shown here are the 12 biggest buyers of British exports.
Sources: WIOD, INSEE

the EU as well as to "other countries" (i.e. countries outside the European Union: this level corresponds, for each trading partner, to the default rate applied to fellow members of the WTO with whom no specific trade agreement has been formed). The same logic applies to the customs duties charged on imports to the UK, i.e. they must be the same for all trading partners of the United Kingdom who are WTO members, except in cases where the United Kingdom has a bilateral or multilateral trade agreement in place. The United Kingdom has already applied to the WTO to establish the rate of duties to be charged on imports, a process launched on 24th July 2018. In case of agreement in a scenario of soft Brexit, the tariffs applied between the UK and the US are those existing between the EU and Norway.

Two scenarios are envisioned for the future development of customs duties: soft Brexit and hard Brexit.

The scenarios used here focus primarily on future developments in tariff barriers. Potential modifications to non-tariff barriers are uncertain and difficult to quantify; a separate estimate is proposed in *Box 5*. Customs duties would increase for the various categories of goods, while customs duties on services are assumed to remain unchanged at zero. Two different projections of future customs duties are defined here for each of the five main categories of goods (food, energy, manufactured goods excluding transport equipment, chemicals, transport equipment) according to the two Brexit modalities envisioned (*Table 1*).

Table 2 shows customs duties from the perspective of the importing country. Taxes that are collected by some countries on their exports are not taken into account and considered as unchanged, such as Argentine exports of grains and oilseeds. They are therefore only paid and recorded when they are imported. The increase in customs duties on exports thus corresponds to the import duties charged to the trading partner in question. In both scenarios, customs duties charged on trade with the European Union are higher. The table shows aggregated customs duties for each area, customs duties are consistent with those used by Vandenbussche et al. (2017), Dhingra et al. (2017) and Mayer et al. (2018) but these duties will vary from product to product: these differences are integrated into the present analysis, but are not reproduced in detail here for simplicity's sake. Agricultural products are the most heavily taxed, while customs duties on energy are virtually nil.

Table 1

Calibration of two customs duties scenarios : solft and hard Brexit

	Soft Brexit	***Hard Brexit***
European Union	"Norway type" agreement (1)	Level of MFN customs duties towards the European Union (2)
Outside the European Union	Differential of MFN customs duties in relation to the pre-Brexit situation (3)	

(1) For trade with the European Union, in the event of a soft Brexit the customs duties applied by the United Kingdom would be equivalent to those currently in place between the EU and Norway.
(2) In the event of a hard Brexit the customs duties applied by the United Kingdom would be equivalent to those currently in place for non-EU nations.
(3) In both cases, for certain countries (USA, China etc.), the customs duties applied by the United Kingdom would increase by the amount which separates duties on trade with EU nations and trade with non-EU nations.

Table 2

Increases in customs duties under the different scenarios

in points	***Soft Brexit***	***Hard Brexit***
European Union	+3.3	+7.3
Outside the European Union	+0.3	+0.3

How to read it: In the event of a soft Brexit, customs duties would increase by 3.3 points for imports to Britain from EU countries. The countries "outside the European Union" are Australia, Canada, China, Korea, United States, India, Japan and Turkey. The calculations presented in the file use customs duties by country and by product
Scope: the customs duties shown here are aggregate figures for each country; the precise rates vary depending on the category of product.
Source and note: The data used here are taken from the WITS-TRAINS database maintained by the World Bank, UNCTAD and the WTO. They provide figures for bilateral customs duties by product and by country since the 1980s. The benchmark rate used here corresponds to the customs duties applicable under the most favoured nation clause, i.e. the negotiated maximum rate which a country can impose upon imports from a fellow WTO member without discrimination.

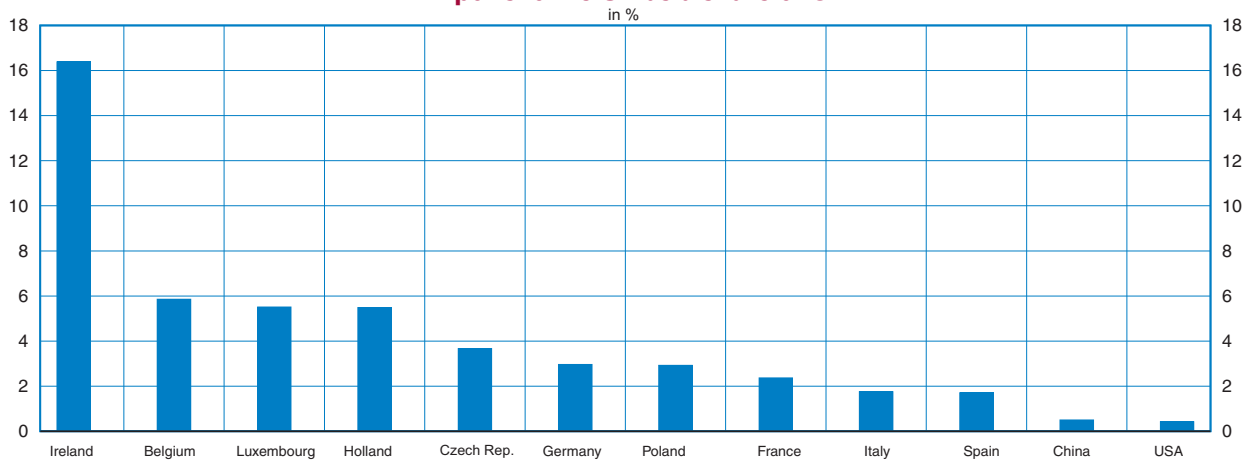
Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

If the behaviour of actors were to remain unchanged, and depending on the scenario, Brexit would reduce French GDP by between 0.3% and 0.6%

If the United Kingdom and the European Union succeed in reaching an agreement, then a transition period will begin, during which time the United Kingdom will continue to enjoy access to the European single market and continue to contribute to the EU budget until the end of 2020. During this period the United Kingdom may continue negotiations with the European Union regarding the nature of their future commercial relationship, and begin negotiations with countries outside the EU. In this scenario, a model can be built for a "soft Brexit" taking effect at the start of 2021.

However, if the United Kingdom and the European Union do not succeed in reaching an agreement, then this transition period will not occur. The United Kingdom would thus find itself with no trade agreements in place with the EU nor with the rest of the world, a hard Brexit taking effect immediately.

4 - Exports to the UK as a share of GDP



How to read it: In 2014, Ireland's exports to the United Kingdom accounted for 16.4% of Irish GDP. This table shows the countries for whom exports to the United Kingdom represent the highest share of GDP, leaving out Sweden (8th place, 2.4%) and Turkey (11th, 1.8%) and adding in China and the USA.

Source: WIOD, INSEE

5 - National content of exports from trading partners to the United Kingdom.

How to read it: In 2014, the national content of French exports to the United Kingdom was 76.7%. This table shows the countries for whom exports to the United Kingdom represent the highest share of GDP, leaving out Sweden (8th place, 2.4%) and Turkey (11th, 1.8%) and adding in China and the USA.

Sources: WIOD, INSEE

Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

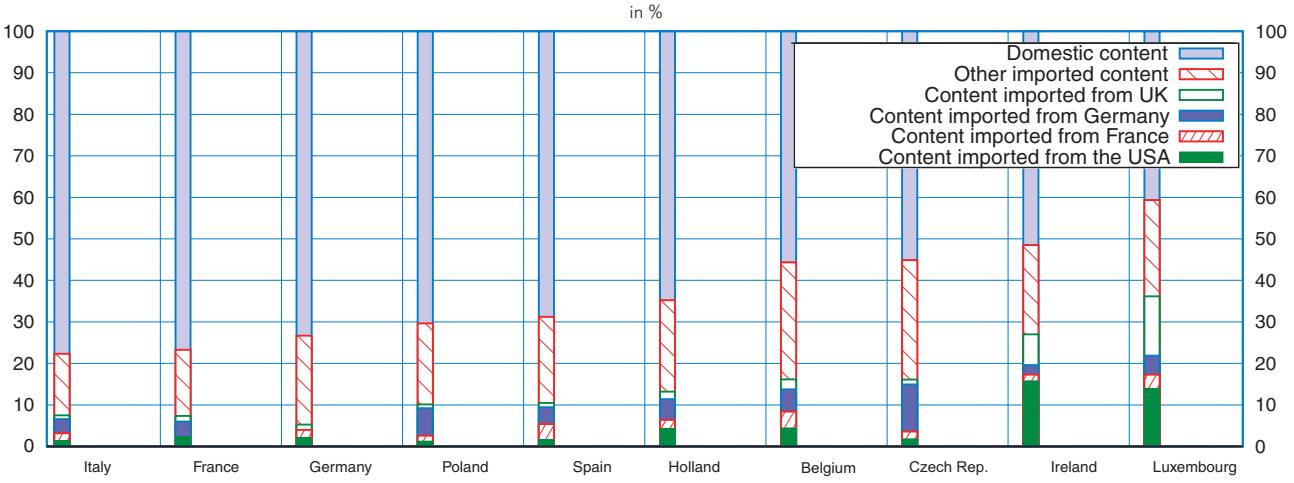
The effects of soft Brexit would be most pronounced for those EU nations which are highly integrated with world trade

In both scenarios, the countries hit hardest by a general increase in customs duties after Brexit would be those EU members whose integration with international trade is strongest relative to the size of their economy, and for which exports to the United Kingdom account for a significant share of GDP: Irish GDP could thus drop by between 1.4% and 4.1%, Czech GDP by between 0.7% and 1.0%, Belgian GDP by between 0.5% and 1.1% and Dutch GDP by between 0.5% and 1.0% (*Graph 7*). Germany would be fifth on that list, losing between 0.5% and 0.9% of GDP. France, Italy and Spain would be less hard hit, relatively speaking: –0.3% GDP with soft Brexit, –0.6% with hard Brexit. Finally, the effects of Brexit on the USA and China would be virtually nil (between 0.0% and –0.1%).

Ireland would suffer due to a sharp decline in its exports to the United Kingdom

Nevertheless, the impact of Brexit on the GDP of the UK's trading partners would not always be transmitted via the same channels. Firstly, because the nature of exports to the United Kingdom varies from country to country. Ireland, whose exports to the United Kingdom comprise 47.1% agrifood products, would be more severely affected by Brexit than any other country since, all else being equal, the post-Brexit increase in customs duties would be most significant for these categories. Thus 44.8% of the loss in GDP sustained by Ireland would be due to the decrease in the value added of the agrifood sector in the event of a soft Brexit (*Graph 8*).

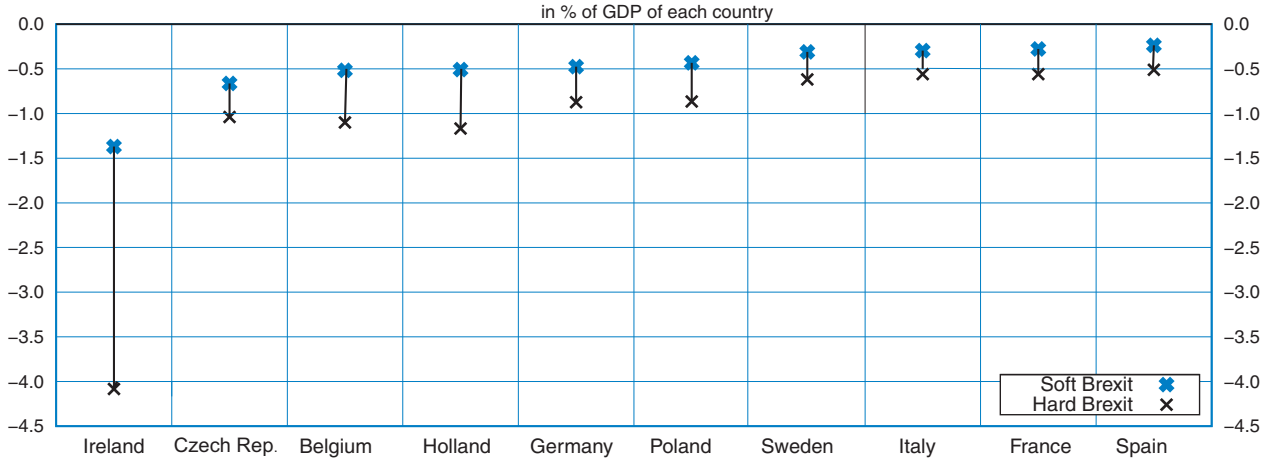
6 - National and imported content of exports from trading partners to the United Kingdom



How to read it: 15.8% of Ireland's exports to the United Kingdom were composed of American imports. This table shows the countries for whom exports to the United Kingdom represent the highest share of GDP, leaving out China and USA from whom the effects are less significant.

Sources: WIOD, INSEE

7 - Effects of post-Brexit increases in customs duties, two potential scenarios



How to read it: Irish GDP would fall by 1.4% in the event of a soft Brexit, and 4.1% in the event of a hard Brexit. The countries shown here are those for which the loss of value added would be most substantial.

Sources: WIOD, INSEE

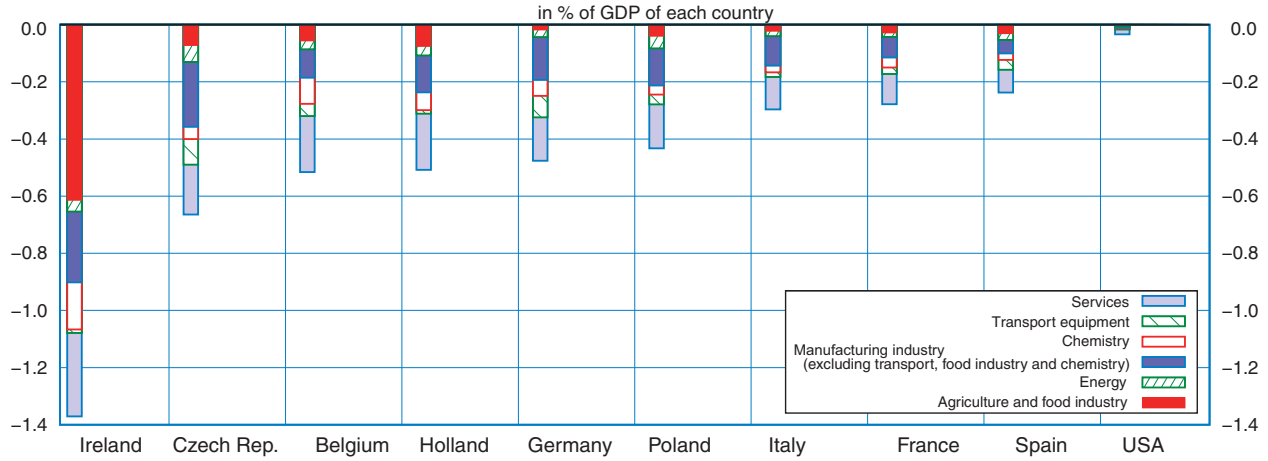
Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

All things being equal, countries that export relatively more services to the United Kingdom would less suffer: customs duties on services are nil and are expected to remain so, and so exporters of services would remain relatively unscathed via this specific channel. This is particularly true of Luxembourg, where services account for 91.2% of exports to the United Kingdom. As such, even though exports to the United Kingdom represent 5.5% of the Duchy's GDP, the negative impact on Luxembourg's overall economic activity would be just 0.2%. This would also explain the reduced impact of Brexit for France, whose exports to the United Kingdom are composed of 42.9% services, and the USA, where the figure is 32.5%. However, non-tariff barriers, which could be potentially significant for services, could aggravate these impacts (see *Box 5*).

The second-round effects of Brexit would be felt most acutely by Europe's largest economies

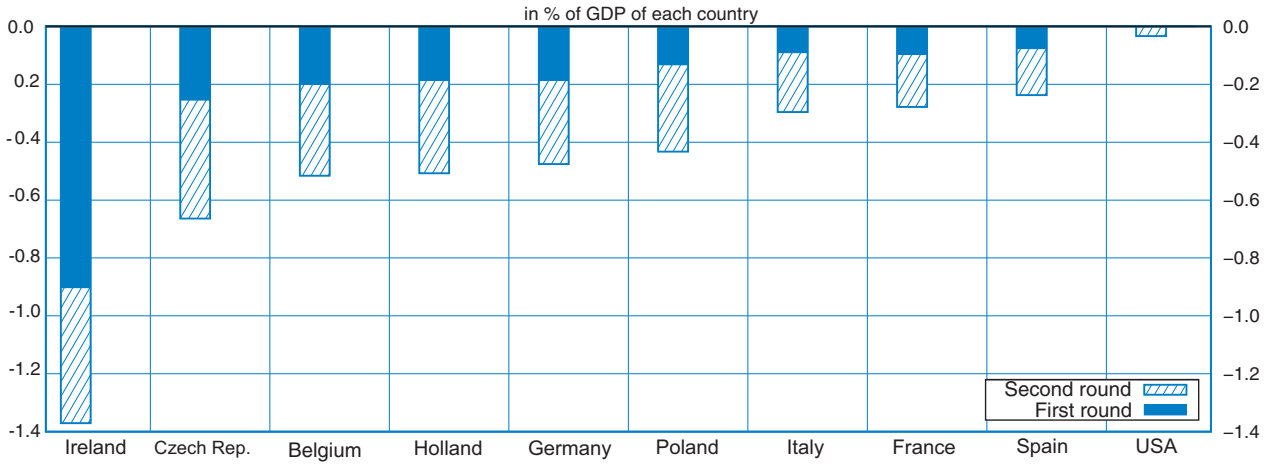
Not all countries would experience the same first and second-round effects: the largest European economies would be primarily affected by the second-round effects (*Graph 9*). Certain countries' exports to the United Kingdom contain a high proportion of French, German and American imports. The USA accounts for 15.8% of the value added of Irish exports to the United Kingdom, and 14.0% for Luxembourg (*Graph 6*). Similarly, 11.3% of Czech exports to the United Kingdom originate in Germany, which would amplify the impact of the second-round effects of Brexit on German GDP, particularly for manufactured goods excluding transport equipment. Conversely, and as with the USA and Germany, French exports to the United Kingdom are characterised by their high national content

8 - Effects of a soft Brexit on the GDP of the United Kingdom's trading partners.



How to read it: the French economy would shrink by 0.3% in the event of a soft Brexit, 0.1% of which would come from the service sector.
Sources: WIOD, INSEE

9 - Effects of a soft Brexit on the GDP of the United Kingdom's trading partners



How to read it: Irish GDP would fall by 1.4% in the event of a soft Brexit, of which 0.9 points would come from first-round effects (a decline in exports to the UK) and 0.5 points from second-round effects. Calculation method is presented in Box 2.
Sources: WIOD, INSEE calculations

(76.7%): a reduction in these exports would therefore have a clear impact on French activity, with limited knock-on effects for other countries.

Second-round effects would be less significant for France than for Germany: French imports are less significant than German and American imports in terms of their proportional presence in the exports of the United Kingdom's other trading partners. The countries whose exports to the United Kingdom contain the highest concentration of French value added are Belgium (4.0%), Spain (3.8%) and Luxembourg (3.3%).

The impact on the French economy would be twice as severe in the event of a hard Brexit

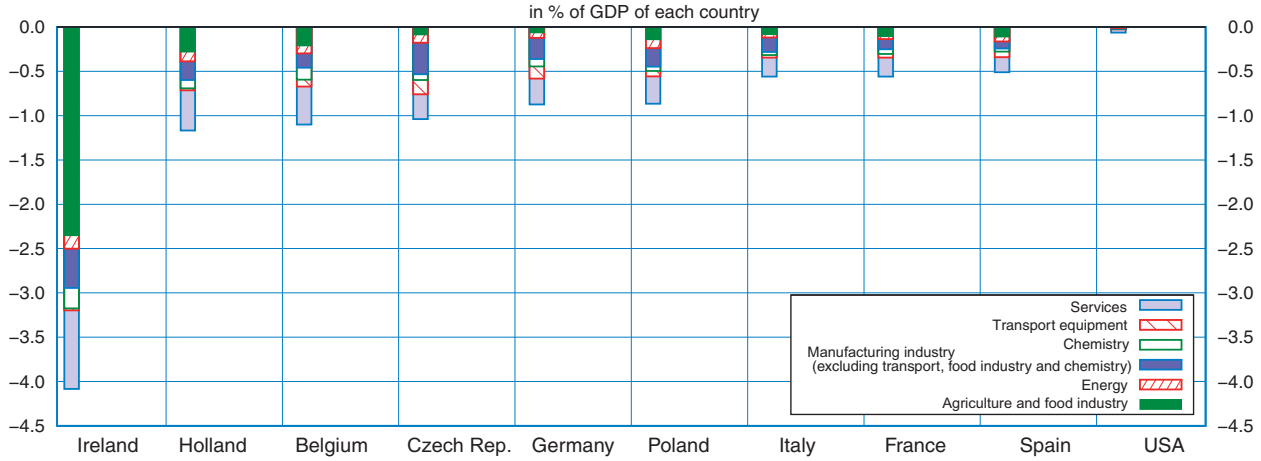
A hard Brexit would hit Ireland hardest (*Graph 10*). The principal difference between the hard Brexit and soft Brexit scenarios concerns the customs duties applied to trade with the EU: the WTO's MFN terms are significantly less generous than those negotiated with Norway, which serve as the basis for the soft Brexit projection, particularly for food and agricultural products. This would have a major impact on Ireland (–4.1% GDP, of which 2.4 points as a result of falling agrifood exports). Outside Ireland, the impact suffered by most EU nations would be doubled: a hard Brexit could cost France 0.6% of GDP. The breakdown of this shock for French value added would be similar to that seen in the soft Brexit scenario: almost 40% of the fall would come from the service sector, with almost a quarter coming from manufactured goods excluding transport equipment.

Non-tariff barriers imposed after Brexit would also damage economic activity

Nevertheless, an increase in customs duties (essentially a tax charged on each unit of goods imported or exported) would not be the sole result of Brexit. There would also be non-tariff barriers (NTBs) to contend with. This term covers other obstacles or additional regulatory, technical or administrative constraints placed on trade. A separate estimate of these effects, based on converting NTBs into equivalent tariffs, is given in *Box 5*.

All in all, the decline in international trade following Brexit, and more specifically the decline in imports to the United Kingdom, would penalise the economic activity of the UK's trading partners in the short term, not taking into account the adaptation measures taken by economic agents. Ireland and the Czech Republic would be hit hardest, losing 1.4% and 0.5% of GDP respectively. They would be more exposed to the effects of Brexit than countries such as Germany and France, for example, due to the importance of exports as a proportion of their GDP. These effects would be accentuated for most countries in the event of a hard Brexit, with the impact tripled for Ireland, on account of the heavy tariffs on agrifood products. In the event of a soft Brexit this effect would probably be spread across several quarters starting in early 2021, after the transition period. In the event of a hard Brexit, with no deal in place, the consequences would be felt more rapidly, with no transition period. ■

10 - Effects of a hard Brexit on the GDP of the United Kingdom's trading partners.



How to read it: Irish GDP would fall by 4.1% in the event of a hard Brexit, with 2.4 points lost by the agrifood sector
Source: WIOD, INSEE calculations

Box 4: Modelling British imports and exports and estimating customs duties elasticities

An increase in customs duties would lead to a slowdown in trading volumes, whose amplitude can be estimated using elasticities. The cost elasticities of exports and imports are defined as the relative variations in volume induced by variations in costs. There is an ample academic literature dedicated to this subject. Elasticity estimates are highly dependent on the methodology adopted and the explanatory variable considered: for example, elasticity to customs duties, exchange rates or prices. Imbs and Méjean ("Elasticity Optimism", 2015) demonstrated that elasticity estimates are particularly subject to aggregation and heterogeneity bias: calculations will yield very different results depending on whether they use aggregated data or precise data for each category of products. Certain products are more elastic than others, reacting differently to increases in prices or customs duties. But increases in customs duties are not identical for all products: for example, governments may decide to increase customs duties on less elastic products in order to minimise price distortion and maximise revenue. Similarly, it is easier for companies to raise prices for less elastic products, i.e. those products for which price increases will not induce such a significant variation in demand.

Making estimates using aggregated data implicitly relies on the hypothesis that increases in customs duties would be homogeneous for all products, and so too would variations in imports and exports. Heterogeneity between products is thus consigned to the residuals of these estimates, introducing bias into the results. Since the biggest variations in customs duties and prices apply to those products which are least elastic they have less impact on the quantity of products traded, thus driving the estimated elasticities downwards. The mean elasticity derived from aggregated data could thus be as much as 3 times smaller than the estimate calculated using more detailed data. In another article, Imbs and Méjean (2017) further pursue this line of research by studying the price elasticity of exports for 28 countries and 5000 products grouped into 26 sectors, concluding that the average elasticity of French, American and British imports is around –5. They use annual data for the period 1995 - 2004 taken from the ComTrade database, producing structural estimates with fixed effects and instrumental variables in order to resolve the problem of the endogenous relationship between prices and quantities traded.

In a literature review covering 32 research articles and 744 statistically significant elasticities, Head and Mayer (2014) demonstrate that elasticities are greater in absolute terms when various control variables are taken into account, including fixed effects for country of origin and destination, as well as for products and for multilateral terms of resistance, reflecting the particular nature of bilateral relations. Furthermore, the variation in quantities traded following a change in customs duties is more substantial than that induced by a variation in exchange rates. The median elasticity to customs duties is –5.03.

Finally, in their articles looking at the consequences of Brexit for activity and employment in European nations, Vandenbussche et al. (2017) use the elasticity values proposed by Imbs and Méjean (2017). We have adopted these elasticities in this report as working hypotheses, aggregating them by product category to correspond to the five products considered in our analysis along with services: food, chemicals, energy, manufactured goods excluding transport equipment, and transport equipment. The elasticities used are as follows:

Import elasticities in the United Kingdom.

Foodstuffs	Chemistry	Energy	Manufacturer excluding transport	Transport equipment
–4.8	–4.6	–6.5	–7	–8

Source: authors' calculations, using the results obtained by Imbs and Méjean (2017)

Export elasticities in the UK, by destination

	Foodstuffs	Chemistry	Energy	Manufacturer excluding transport	Transport equipment
EU (average)	–5.3	–4.6	–5.6	–6.1	–6.7
outside EU (average)	–6.8	–5.2	–4.9	–6.4	–12.4
France	–5.3	–4.6	–3.9	–5.3	–7.1
Germany	–4.4	–3.3	–5.0	–5.5	–6.7
Spain	–6.0	–5.2	–11.6	–6.5	–4.1

Source: authors' calculations, using the results obtained by Imbs and Méjean (2017)

In absolute value terms, elasticity is generally higher for imports from emerging nations and for food and energy products. This is consistent with the results found in the existing literature. ■

Box 5: Modelling the impact of non-tariff barriers

The purpose of this box is to apply the methodology used to estimate the impact of customs duties to the tariff equivalents of non-tariff barriers (NTBs), derived from other studies. The approach used is the same; based on the WIOT and the same calculations detailed in *Box 3*.

Indeed, an increase in customs duties (essentially a tax charged on each unit of goods imported or exported) would not be the sole result of Brexit. There would also be non-tariff barriers (NTBs) to contend with. This term covers other obstacles or additional regulatory, technical or administrative constraints placed on trade. The potential constraints are many and various, and would apply to goods as well as services: inspection times for goods crossing borders, different health standards and regulations, recognition of foreign qualifications, different professional qualifications and certifications, etc. In the service sector, new recording and certification procedures could be introduced. The United Kingdom would also lose its financial passport, which allows financial institutions based in London to operate throughout Europe.

Non-tariff barriers are likely to significantly increase the impact of Brexit on the value added of the United Kingdom's trading partners. In the event of a soft Brexit, estimates suggest that their effects would be slightly greater than those induced by customs barriers for the majority of European Union member states, including France, although broadly similar in scale. In the scenario envisaged here, NTBs would have a much less substantial effect than customs duties for countries outside the European Union, as there would be no new non-tariff barriers between these countries and the United Kingdom. There is still much uncertainty surrounding the impact of the shock caused by new NTBs, and the corresponding time scale. The tariff equivalents of NTBs depend on the agreements put in place, which makes them difficult to quantify. The elasticity of trade in response to these NTBs is also uncertain. Finally, some NTBs would come into effect immediately while others would only be felt in the long term.

In order to determine the impact of new non-tariff barriers we need to analyse a numerical, tariff-equivalent for these barriers. A number of articles have been devoted to this issue, including those by Fontagné, Guillin & Mitaritonna (2011) and Fontagné, Mitaritonna & Signoret (2016), with a particular focus on services. In a document published in November 2018 ("*EU Exit: Long-term economic analysis*"), the British government also considers the quantified equivalent of non-tariff barriers, expressed as a percentage of the total value of trade, for goods and services and various sectors of the British economy: agrifood, manufacturing, services and financial services.

The tariff equivalents for barriers to trade in the service sector stand at around 20% for entry to the United Kingdom, according to the estimates of Fontagné et al. (2011, 2016). However, this is an estimate for existing barriers, not potential future barriers.

The report published by the British government, accompanied by a technical reference document, reproduces the results of econometric estimates and a literature review regarding variations in non-tariff barriers in a number of potential scenarios (no deal, i.e. hard Brexit, or a deal similar to that in place between Norway and the European Union, i.e. soft Brexit). According to this official document, non-tariff barriers between the UK and the European Union would increase slightly in the event of a soft Brexit due to a certain number of new constraints, such as delays caused by border checks or record-keeping and other administrative procedures. The increase would be more substantial in a hard Brexit scenario. With regard to the rest of the world, the document operates on the hypothesis that non-tariff barriers would decrease slightly in the long term, as a result of new free trade agreements. The results are summarised in the table below:

Partners	Canal	Hard Brexit	Soft Brexit
European union	Customs duties	Most favoured nation clause Agro-food industry: 20% Manufacturier: 3%	No customs duties
	Non tariff barriers	Goods: from 6 to 15%	Goods: from 3 to 7%
		Services: 4 to 18%	Services: from 1 to 3%
Rest of the world	Customs duties	No customs duties under the terms of new free trade deals	
	Non tariff barriers	Existing barriers reduced bu new deals Goods: from –2 to –4% Services: from –3 to –5%	

How to read it: according to the British government's forecasts, in the event of a hard Brexit the customs duties on exports to the EU would increase by 20% for agricultural goods, while the introduction of NTBs would be equivalent to an increase of between 6 and 15% on the customs duties charged on goods, and a tax of between 4 and 18% on the value of services.

Source: HM Government, INSEE

Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

Non-tariff barriers to trade with the EU in five key sectors (agrifood, manufactured goods, services, financial services and energy and transport networks) are presented in detail in the table below.

Sector	Canal	Hard Brexit	Soft Brexit
Agri food	Customs duties	+20%	0%
	Non tariff barriers	+15% [+9%; +22%]	+6% [+4%; +9%]
Manufactured goods	Customs duties	+3%	0%
	Non tariff barriers	+10% [+6%; +13%]	+5% [+3%; +7%]
Services	Customs duties	0%	0%
	Non tariff barriers	+12% [+5%; +18%]	+1% [+1%; +4%]
Financials services	Customs duties	0%	0%
	Non tariff barriers	+13% [+4%; +22%]	+1% [+1%; +1%]
Energy and transport networks	Customs duties	+1% (energy)	0%
	Non tariff barriers	+9% [+3%; +15%]	+1% [0%; +1%]

How to read it: in the British government's hard Brexit model, the tariff equivalents for non-tariff barriers in the agrifood sector are between 9 and 22% (confidence interval 95%) and the mean is 15%. The estimated increase in customs duties for food and agriculture products in the event of a hard Brexit is 20 points.
Source: HM Government

The customs duties envisaged in the British government report in the event of a no-deal Brexit are very similar to those shown here. In light of these results and the available literature, we have used the mean hypotheses for non-tariff barriers with the European Union. Hypothetically, non-tariff barriers would be the same for each country in the European Union on the one hand, and for the rest of the world on the other. With regard to the rest of the world, non-tariff barriers are assumed to remain unchanged. Based on the British government's models, the UK would endeavour to maintain non-tariff barriers with countries outside the European Union equivalent to those which currently exist between the EU and the rest of the world, at least in the short term, with the prospect of reducing these barriers in the long term. However, after leaving the European Union the United Kingdom will no longer be covered by the EU institutions responsible for checks, regulations and certification. There is therefore a possibility that new procedures will need to be put in place, creating further delays and obstacles to trade.

Equivalents for non-tariff barriers, identical for goods entering and leaving the United Kingdom to/from the same partner, are expressed as a percentage points of the custom duties in the following table:

Product	Hard Brexit		Soft Brexit	
	EU	outside EU	EU	outside EU
Agri food	15	0	6	0
Energy	9	0	1	0
Manufacturier goods	10	0	5	0
Chemistry	6	0	3	0
Transport equipment	10	0	3	0
Services	12	0	1	0

How to read it: for food and agricultural products, the introduction of non-tariff barriers between the EU and the United Kingdom would be equivalent to a 15% increase in the event of a hard Brexit.
Source: HM Government

The hypothesis applied for the equivalent of non-tariff barriers in the service sector is below the estimate for existing non-tariff barriers for these products, as per Fontagné et al. (2011, 2016). According to these authors, in 2011 non-tariff barriers to entry to the United Kingdom were 20% in the financial sector and 36% in the insurance sector. Non-tariff barriers were greater in other European nations, above 30% in France and between 20 and 60% in Germany depending on the service sector (communication, construction, finance, insurance, transport and commerce). In Ireland, however, the non-tariff barriers were comparable to those in place in the United Kingdom at around 25%, albeit virtually nil in certain service sectors (commerce, insurance, legal services, audit and accounting , etc.).

The elasticities are the same as those found elsewhere in this report for the five categories of goods considered (agrifood, manufactured goods, services, financial services and energy and transport networks). For services we apply an elasticity of –3, which in absolute terms is below the median elasticity of the estimates found in Head & Mayer's literature review (2014) and also below the elasticity values for all other sectors, despite being far higher than the econometric estimates derived from aggregated data and also above the median price elasticity figure observed by Head & Mayer (2014), equal to –1.1. This elasticity is assumed to be identical for all countries, for both exports from and imports to the United Kingdom.

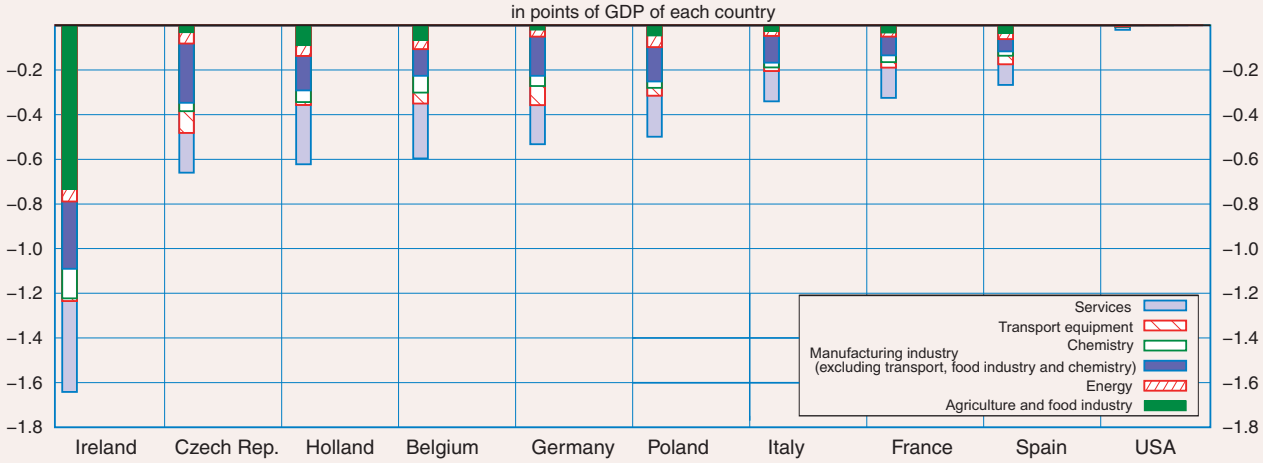
Brexit: what are the likely consequences for the economic activity of the United Kingdom's trading partners?

In the event of a hard Brexit, the effects of non-tariff barriers would be about twice as heavy as the effects of customs duties for the majority of EU member states, due to the introduction of major obstacles for most products and especially services. For most of the products considered, non-tariff barriers would be double the predicted increase in customs duties.

As such, French economic activity would shed 0.3% in the medium term purely as a result of non-tariff barriers introduced after a soft Brexit, with that figure rising to 1.1% in the event of a hard Brexit. In all, under the cumulative effect of non-tariff barriers and the customs duties examined in this report, France's value added would be cut by 0.6% in the event of a soft Brexit and 1.7% in the event of a hard Brexit (*Graphs 11 to 12*). Ireland's GDP would be hardest hit in both scenarios, losing 1.6% after a soft Brexit and 4.9% as a result of a hard Brexit, purely as a result of non-tariff barriers. The German economy would also lose 0.5% of its value added in the event of a soft Brexit, and 1.5% in the event of a hard Brexit, as a result of non-tariff barriers, giving a total impact on value added of 1.0% and 2.4% respectively once the effects of increased customs duties are factored in. These results are subject to considerable uncertainty, and are thus given as an order of magnitude only. The British government has defined confidence intervals for the equivalent of non-tariff barriers: if the lower or upper limit values of these intervals were to be used instead of the median equivalent calculated and used here, the reduction in French GDP would be somewhere between 0.2% and 0.6% in the event of a soft Brexit and between 0.6% and 1.6% following a hard Brexit. ■

11 - Median estimate of the effects of non-tariff barriers on the GDP of the United Kingdom's trading partners, in the event of a soft Brexit.

in points of GDP of each country

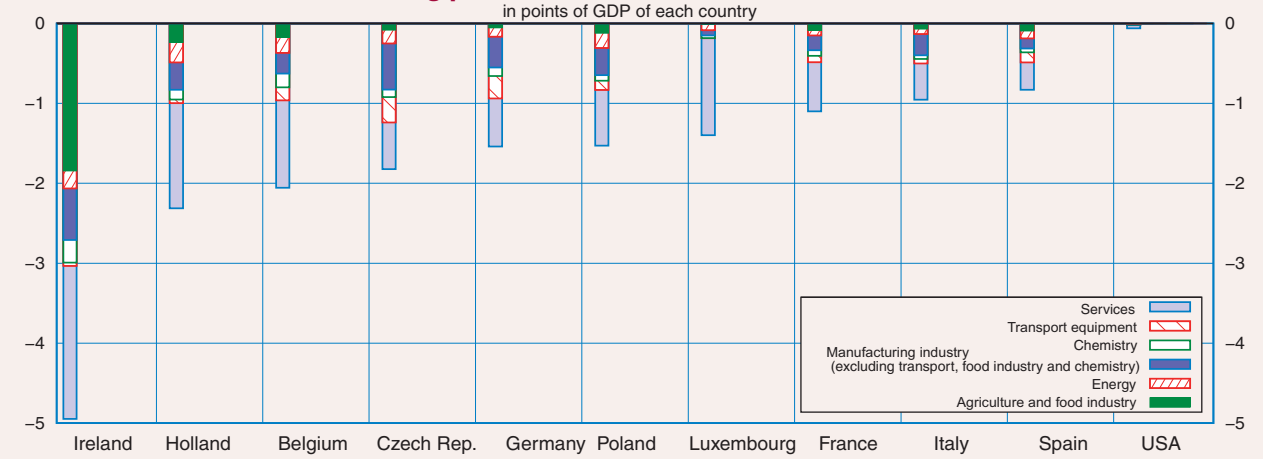


How to read it: Ireland's GDP would fall by 1.6% as a result of new non-tariff barriers following a soft Brexit, of which 0.7 points would be lost in the agrifood sector. The tariff equivalents used in these calculations are shown in the table below, and correspond to the mean values of the estimates obtained, generally within the median of the confidence intervals.

Source: WIOD, HM Govemment, INSEE

12 - Median estimate of the effects of non-tariff barriers on the GDP of the United Kingdom's trading partners, in the event of a hard Brexit.

in points of GDP of each country



How to read it: Ireland's GDP would fall by 4.9% as a result of new non-tariff barriers following a soft Brexit, of which 1.9 points would be lost in the service sector.

Source: WIOD, HM Govemment, INSEE

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