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TRADE IMPACTS OF THE TRADE AND COOPERATION AGREEMENT BETWEEN THE EUROPEAN UNION AND THE UNITED KINGDOM

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By Frank Van Tongeren, Christine Arriola, Annabelle Mourougane and Sebastian Benz

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Abstract/Résumé

Trade impacts of the Trade and Cooperation Agreement between the European Union and the United Kingdom

This paper assesses the medium term impact of the United Kingdom leaving the EU Single Market under the terms of the EU-UK Trade and Cooperation Agreement (TCA) reached at the end of 2020 using the OECD METRO CGE model. The analysis does not include any transitional costs to fully implementing the new trade agreement, nor does it take into account stress on the economy as a result of COVID-19. Lastly, only the implications on services trade from regulatory restrictions on the free movement of people have been incorporated in the analysis while the wider labour market impacts of cross-border movement of people are left aside. Results from the simulation show that real GDP losses in the European Union, in the worst case scenario are expected to be around 0.6% in the medium term, but would vary markedly across countries. Ireland would experience the largest losses, while countries with loose trade links with the United Kingdom would barely be affected. The decline in trade is not uniform among sectors. European Union member states are expected to import less professional services such as financial services and insurance, communication, and other business services. UK exports are estimated to fall by about 6.3% and imports by 8.1% in the medium term. The overall medium-term loss in real GDP could amount to 4.4%.

Keywords: free-trade agreement, Brexit, general-equilibrium model.

JEL Classification: C68, F15; F47

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Impacts commerciaux de l'accord de commerce et de coopération entre l'Union européenne et le Royaume-Uni

Ce document évalue l'impact à moyen terme de la sortie du Royaume-Uni du marché unique de l'Union Européenne selon les termes de l'accord de commerce et de coopération Union Européenne -Royaume-Uni conclu fin 2020 à l'aide du modèle METRO CGE de l'OCDE. L'analyse n'inclut aucun coût de transition associé à la mise en œuvre du nouvel accord commercial, ni ne prend en compte l'impact de la crise du COVID-19 sur l'économie. Enfin, seules les implications sur le commerce des services des restrictions réglementaires à la libre circulation des personnes ont été intégrées dans l'analyse, tandis que les impacts plus larges sur le marché du travail des mouvements transfrontaliers de personnes ne sont pas prises en compte. Les résultats de la simulation montrent que, dans le scénario le plus pessimiste, les pertes de PIB en volume dans l'Union européenne devraient être d'environ 0,6 % à moyen terme, mais varieraient considérablement d'un pays à l'autre. L'Irlande subirait les pertes les plus importantes, tandis que les pays ayant des liens commerciaux moins développés avec le Royaume-Uni seraient à peine touchés. La baisse des échanges n'est pas uniforme d'un secteur à l'autre. Les États membres de l'Union Européenne devraient importer moins de services professionnels tels que les services financiers et les assurances, la communication et d'autres services aux entreprises. Les exportations britanniques devraient chuter d'environ 6,3 % et les importations de 8,1 % à moyen terme. La perte globale de PIB à moyen terme pourrait s'élever à 4,4 %.

Mots Clefs: Brexit, accord de libre échange, modèle d'équilibre général.

Classification JEL : C68, F15; F47

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Trade impacts of the Trade and Cooperation Agreement between the European Union and the United Kingdom

By Frank Van Tongeren, Christine Arriola, Annabelle Mourougane, and Sebastian Benz[1]

In December 2020, the United Kingdom and the European Union agreed on the Trade and Cooperation Agreement (TCA), which set out new trading conditions, ending almost 50 years of the United Kingdom's membership in the EU Single Market. This paper assesses the impact of the United Kingdom leaving the EU Single Market under the terms of the TCA reached at the end of 2020. The work also updates the 2016 and 2020 OECD estimates (Kierzenkowski et al., 2016; Arriola et al., 2020) with more reliable information on the expected rise in non-tariff measures and their impact on trade costs, notably for services sectors. The analysis uses the OECD METRO model, which is comprehensive in its coverage of trade, but omits FDI and productivity. In addition, the analysis is static in nature and focuses on the medium-term effects (5 to 10 years), omitting any transitional costs to fully implementing the new trade agreement. Only the implications on services trade from regulatory restrictions on the free movement of people have been incorporated in the analysis while the wider labour market impacts of cross-border movement of people are left aside. Finally, the paper does not take into account stress on the economy as a result of COVID-19, which may result in structural changes in the economy in the medium to long term. Insights from the impact of the COVID-19 crisis on UK trade can be found in OECD (2020d).

The Trade and Cooperation Agreement between the United Kingdom and the European Union means no tariff and no quotas applied on goods. However, trade will not be fully free but subject to a range of costs (Box 1). Those include border costs (customs procedures), technical barriers to trade and sanitary and phytosanitary measures (to verify food and sanitary regulations of the country they enter into are met), rule-of-origin (to check the genuine origin of the imports and prevent fraud) and costs from behind the border regulations (to check imports meet standards and regulations to be sold in the country they enter into). Financial services are assumed to experience a greater increase in trade costs than other services sectors. No new agreement between the United Kingdom and non-EU countries is assumed and existing market access to non-EU WTO members does not change. Strictly speaking, the agreement considered here could be classified as a preferential rather than a free trade agreement.

The main insights from the simulations are as follows:

[1] The authors are from the OECD Trade and Agriculture Directorate and the Statistics and Smart Data Directorate. They would like to thank Sophie Guilloux-Nefussi, Elenora Mavroeidi, Alvaro Pina, Pierre Beynet and colleagues from HMT and EU Commission for their comments, and Emily Derry for her excellent assistance.

- Output losses in the European Union are expected to be around 0.6% in the medium term, but would vary markedly across countries. Ireland would experience the largest losses, while countries with loose trade links with the United Kingdom would barely be affected.
- The decline in trade is not uniform among sectors. European Union member states are expected to import less professional services such as financial services and insurance, communication, and other business services.
- UK exports are estimated to fall by about 6.3% and imports by 8.1% in the medium term. The overall medium-term output loss could amount to 4.4%.

Box 1. The EU-UK Trade and Cooperation Agreement and market access for goods and services

With the Trade and Cooperation Agreement (TCA), the European Union and the United Kingdom have achieved their primary goal of ensuring tariff and quota free trade in goods. However, the degree of market integration varies strongly across issue areas and overall, market access is significantly reduced compared to the EU Single market which the United Kingdom decided to leave. The agreement's architecture maintains a lot of flexibility allowing for, and in many cases requiring, further negotiations and specifications. In some areas, the integration can still be deepened, while in others a regulatory diversion might lead to more trade restrictions.

Standards and Regulations on goods

The TCA includes a chapter on Sanitary and Phytosanitary (SPS) measures ensuring that both sides can maintain fully independent SPS rules on food imports to protect human, animal and plant life and health, preserving each Party's right to independently regulate, while not creating unjustified barriers to trade. The new and separate SPS regimes mean that there is no automatic equivalence of the parties' rules as of 1 January 2021, which almost takes the European Union and United Kingdom back to WTO terms. The new SPS checks and paperwork create frictions that did not previously exist, although the actual impact on agrifood businesses will depend on the implementation of the provisions. There is no agreement yet on how to reduce the burdens of SPS checks and to enhance cooperation.

The European Union started full checks on 1 January 2021. The United Kingdom on the other hand gradually phased in its SPS controls over 2021. Products entering the United Kingdom subject to SPS checks will eventually have to transit through designated specially equipped Border Control Posts.

The TCA also includes a chapter on Technical Barriers to Trade (TBT) that includes a definition of international standards that anchors both parties to the international standardisation system and identifies the relevant international standard-setting bodies. This seeks to ensure that both sides' domestic product standards and technical regulations continue to be based on the same international references. There is agreement for several highly regulated industries which should act to reduce administrative costs of compliance, particularly for Pharmaceuticals (Good Manufacturing Practice) and Organics and Wine. There is no Mutual Recognition Agreements for wider industrial goods, meaning that manufacturers must certify compliance with respective regimes in each territory.

Rules of Origin

While the TCA grants tariff and quota free market access for goods, it also has comprehensive Rules of Origin to determine when a good can benefit from the preferential zero tariff rates when traded between the Parties. The rules that determine when a good is considered to be 'originating' are set out in detailed annexes that specify how much of the value of the product must be created in either party to the agreement in order for the product to be eligible for tariff free trade. The TCA contains a provision for 'full' bilateral cumulation of origin. This allows traders to include the value of components originating

and processing undertaken in either the United Kingdom or the European Union when determining origin for the purposes of the TCA.

The product specific rules of origin follow the approach pursued by the European Union and the United Kingdom in their most recent trade agreements. This includes the requirement that key agricultural products must be 'wholly obtained' in order to be eligible for tariff-free market access. For example, meat products must only contain meat from animals that are born and raised in either the United Kingdom or the European Union. For a certain range of product lines, including flour, baked goods both parties agreed to allow for some additional flexibility on the proportion of the value created outside the parties to the TCA. For manufactured products the rules generally allow for 50% of foreign content, whereas cars must contain no more than 45% of materials coming from outside the United Kingdom and the European Union. Phase-in periods were negotiated, allowing the majority of electric vehicles to qualify for tariff free trade in the short term, with the rules becoming stricter over time while the industry adjusts.

Trade in services

Service providers from the United Kingdom or the European Union must now comply with specific domestic requirements when offering cross-border services, which may vary between EU Members States. Locally established enterprises owned by nationals of the other party will be able to continue providing services but may be subject to conditions applicable to foreign direct investment, in accordance with the market access schedules of the TCA. Under the agreement, the recognition of professional qualifications is decided under the laws of the United Kingdom and EU Member States, and UK professionals aiming to provide services across the European Union must have their qualification recognised separately in each Member State where required. The TCA provides a framework to establish arrangements for mutual recognition of professional qualifications between the United Kingdom and the European Union.

On the movement of natural persons for business purposes (GATTS 'Mode 4'), the TCA includes a broad range of reciprocal commitments that will allow a company located in the European Union to transfer certain employees, as intra-corporate transferees, to work in a group company located in the United Kingdom - and vice versa. Provisions are included to facilitate the movement of "contractual service suppliers" or "independent professionals" to supply some services under certain conditions; and of business visitors to freely attend meetings or conferences as long as they do not receive remuneration or supply services in the country concerned.

Separately, the TCA allows for unlimited point-to-point traffic between EU and UK airports, whilst it excludes UK carriers from operating flights between EU destinations on the basis of an UK-issued license. Similarly, the road transport provisions of the TCA allow for unlimited point-to-point access for hauliers carrying loads between the European Union and the United Kingdom, whilst the United Kingdom will no longer be allowed unlimited cabotage operations within the EU Single Market. Many other sectors are subject to conditions and reservations by different EU Member States and by the United Kingdom, making it difficult to assess the general market openness afforded by the agreement.

UK-authorised financial services companies no longer benefit from 'passporting' which previously enabled access within the EU Single Market, nor do EU financial services firms benefit from access to the United Kingdom, which is estimated to lead to a significant increase in trade costs for financial services[1] (Table 2). Similarly to other advanced trade agreements concluded by the European Union, the TCA commits both parties to market openness for commercial establishment and the application of internationally agreed standards in this sector. Both parties retain the right to unilaterally adopt or maintain measures for prudential reasons ('prudential carve-out'), in order to preserve financial stability and the integrity of financial markets. Just like other EU trade agreements, the TCA does not include any elements pertaining to equivalence frameworks for financial services. The European Union and the

United Kingdom can unilaterally decide on the equivalence of respectively the United Kingdom and the EEA (thus comprising the European Union) regulatory and supervisory framework in a particular area. Both jurisdictions retain the right to unilaterally withdraw equivalence. In addition, there are no equivalence provisions that would enable cross-border trade in basic banking services such as lending or deposit taking. On March of this year, the United Kingdom and the European Union concluded the technical discussions on the text of the Memorandum of Understanding (MoU) provided for under the Joint Declaration on Financial Services Regulatory Cooperation. Formal steps are still needed on both sides before the MoU can be signed. Once signed, the MoU creates the framework for voluntary regulatory cooperation between the United Kingdom and the European Union.

Northern Ireland

Northern Ireland will continue to apply a number of EU rules and regulations. Consequently, goods can still flow freely between Northern Ireland and the Republic of Ireland. Instead, there will be some controls as goods cross from Northern Ireland into the rest of the United Kingdom, and vice-versa. There is no provision in the TCA superseding the Northern Ireland Protocol of the Withdrawal Agreement.

Rules on personal data protection, cross-border data flows and digital trade

For the time being, the United Kingdom maintains domestic data protection rules which are almost identical to the EU General Data Protection Regulation (GDPR). Each party is considering taking a decision on whether to recognise the other's regime as 'adequate' for the purposes of cross-border data flows. Such adequacy decisions are unilateral decisions separate from the TCA. A provision in the TCA allows personal data transfers during a six month grace period that ends on 30 June 2021. Before the end of this period, the European Union and United Kingdom both unilateral granted adequacy status to the respective data regimes of the other party, which will allow continued free flow of personal data between the two. Currently, the United Kingdom has announced that it will consider the EU regime adequate for at least until the end of 2024. In June 2021, the European Union adopted two adequacy decisions for transfers of personal data to the United Kingdom under the General Data Protection Regulation and the Law Enforcement Directive. The adequacy decision is limited to four years after entering into force, at which time the decision will need to be reinstated.

More broadly, the digital trade chapter covers several other key issues, including the prohibition of access to source code, e-contracts and open government data. Most notably, the European Union and the United Kingdom commit to refrain from adopting any data localisation measures or imposing customs duties on electronic transmissions. The entire digital trade chapter is subject to general exceptions, security exceptions, and the prudential carve-out.

Public procurement

The Agreement contains some very comprehensive provisions and commitments going beyond the WTO Government Procurement Agreement (GPA). For example on private utility providers and additional services it provides for non-discrimination of EU companies established in the United Kingdom, and vice versa, for non-covered procurement, including small-value procurement.

1. Main features of the METRO model

The METRO model is a computable general equilibrium (CGE) model calibrated for this analysis to 30 regions (with most of the remaining EU members disaggregated), 19 sectors, and 8 production factors (OECD, 2020b). The simulations represent medium-term shocks where production factors are mobile across sectors, but the overall endowment of labour and capital remain fixed at initial levels.

METRO, like many CGE models, rely on a comprehensive specification of all economic activity within and sometimes between countries (and therefore the different inter-linkages that tie these together). The model builds on the GLOBE model developed by McDonald and Thierfelder (2013). The novelty and strength of METRO lies in the detailed trade structure and the differentiation of commodities by end use. Specifically, commodities and thus trade flows are distinguished by whether they are destined for intermediate use, for use by households, for government consumption, or as investment commodities.

The underlying framework of METRO consists of a series of individually specified economies interlinked through trade relationships. As is common in CGE models, the price system is linearly homogeneous, with a focus on relative, not absolute, price changes. Each region has its own numeraire, typically the consumer price index, and a nominal exchange rate (an exchange rate index of reference regions serves as model numeraire). Prices between regions change relative to the reference region.

The database of the model relies on the GTAP v10 database reference year 2014 (Aguiar et al., 2019) in combination with the OECD Inter-Country Input-Output Tables, which are the main source of the OECD Trade in Value Added Indicators and allows the model to distinguish trade for use in intermediate production or final demand. Policy information combines tariff and tax information from GTAP with OECD estimates of non-tariff measures on goods (Cadot et al, 2018), services (Benz and Gonzales, 2019; Benz and Jaax, 2020), trade facilitation (OECD, 2018) and export restricting measures. All commodity and activity taxes are expressed as *ad valorem* tax rates, and taxes are the only income source to the government. The full METRO database contains 65 countries and regional aggregates and 65 commodities.

The model is firmly rooted in microeconomic theory, with firms maximising profits and creating output from primary inputs (i.e. land, natural resources, labour and capital), which are combined using constant elasticity of substitution (CES) technology, and intermediate inputs in fixed shares (Leontief technology). Households are assumed to maximise utility subject to a Stone-Geary utility function, which allows for the inclusion of a subsistence level of consumption. METRO employs a set of elasticities which govern the responses in behavioural relationships. The trade and production elasticities are sourced from GTAP[2].

In the simulations, monetary and fiscal policies are assumed to remain unchanged, the trade balance is fixed and the nominal exchange rate is flexible. Wages are assumed downwardly rigid, but remuneration rates of all other factors (land, capital, natural resources) are assumed to adjust. The government is assumed to maintain their internal balance while allowing their expenditure to adjust.

2. Simulation design

This section presents the assumptions underlying the simulations, which are compared to a baseline where the United Kingdom would have stayed within the Single Market. The simulations are designed to decompose the effects of the TCA into various policy components affecting trade in goods and services:

- Simulation 1: Free trade in goods and services (FTA) between the European Union and the United Kingdom, with no change on free movement of people
- Simulation 2: Simulation 1 combined with the impact on services regulations of ending free movement of people between the European Union and the United Kingdom.
- Simulation 3: Simulation 2 combined with some regulatory liberalisation in the United Kingdom

Simulation 2 closely mimics the provisions in the TCA. While Simulation 1 is designed to isolate the provisions that affect trade restrictions on goods and services, Simulation 3 explores the potential effects of unilateral services reforms in the United Kingdom. The analysis focuses on the trade impact, leaving aside non-EU migration flows, movements in foreign-direct investment and the possible impact of trade on productivity. The focus of the analysis is on medium-term effects. Short-term transitional behavioural changes to adapt to the new agreement are not considered in the analysis.

No new agreement between the United Kingdom and non-EU countries is assumed and existing market access to non-EU WTO members does not change[3]. In the simulations, access to the UK market by non-EU WTO members is governed by the UK MFN schedule submitted to WTO in 2018. New schedules have been submitted in 2019 and 2020, but changes have been punctual and would not alter qualitatively the findings.

2.1. Free Trade between the European Union and the United Kingdom with no changes to the free movement of people

Even if it entails zero tariff and quota, leaving the Single Market entails costs for export and import firms in both the United Kingdom and the European Union. These include non-tariff measures (NTM), such as technical barriers to trade and sanitary and phytosanitary measures for goods and services, costs from rules-of-origin and border-crossing costs. As the two regions are no longer bound to maintain the same regulations and rules, regulatory divergence adds additional costs to producers engaging in trade between the United Kingdom and the European Union.

The increase in trade cost due to divergence of non-tariff measures is assumed to be 50%[4] of the *ad valorem* equivalent of these measures[5] on goods imported into the European Union from third countries. The increase in NTM costs on goods, which covers technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures, have been calibrated using Cadot et al. (2018) and are presented in Table 1. Amongst the NTMs on goods, motor vehicles, parts and transport equipment, agriculture and food and textiles, wearing apparel and leather products display the higher expected increase in trade costs.

Table 1. Increase in non–tariff measures in goods sectors

Per cent, difference to baseline

Commodity	Assumed trade cost increase
Agriculture and food	6.9
Natural resources including coal and petro products	0.0
Textiles, wearing apparel, and leather products	6.1
Other manufacturing	5.3
Chemical rubber plastic products	4.8
Pharmaceutical products	2.0
Minerals, metals, & metal products	2.3
Computer, electronic and optical products	3.3
Machinery and equipment not elsewhere classified	2.8
Motor vehicles, parts, and transport equipment	8.9

Note: Non-tariff measures include technical barriers to trade and sanitary and phytosanitary measures applied to goods imported into the European Union. The assumed increase in import costs related to these measures is equivalent to half the traded weighted average of the NTM AVE estimates in each sector.
Source: OECD calculation using Cadot et al (2018).

As with trade in goods, services exporters face increasing cost of complying with regulations if they diverge. Expected services trade costs have been computed using half of the difference between the intra-EEA Services Trade Restrictiveness Index (STRI) and the STRI which applies to most-favoured nations (Benz and Gonzales, 2019; OECD, 2020c; Figure 4). In the telecommunication sector for instance this would represent an increase of more than 50% in the STRI. Those differences are subsequently translated into trade costs using Benz and Jaax (2020) and estimates from gravity models. This approach could not be followed for financial services which are not well covered by the STRI. The financial services and insurance sector is assumed to face relatively higher restrictions than other services sectors. Specifically, trade cost between the United Kingdom and the European Union in the finance and insurance sector is assumed to increase 80% of the difference between the intra-EEA and MFN STRI on other business[6]. No increase in

trade costs is assumed in other services (real estate activities; recreational and other services; and dwellings). Resulting costs are reported for the Union Kingdom and the European Union in Table 2. Implied increases in trade costs are substantial, especially for the transport, business services and finance and insurance sectors.

Table 2. Increase in trade costs in services sectors

Per cent, difference to baseline

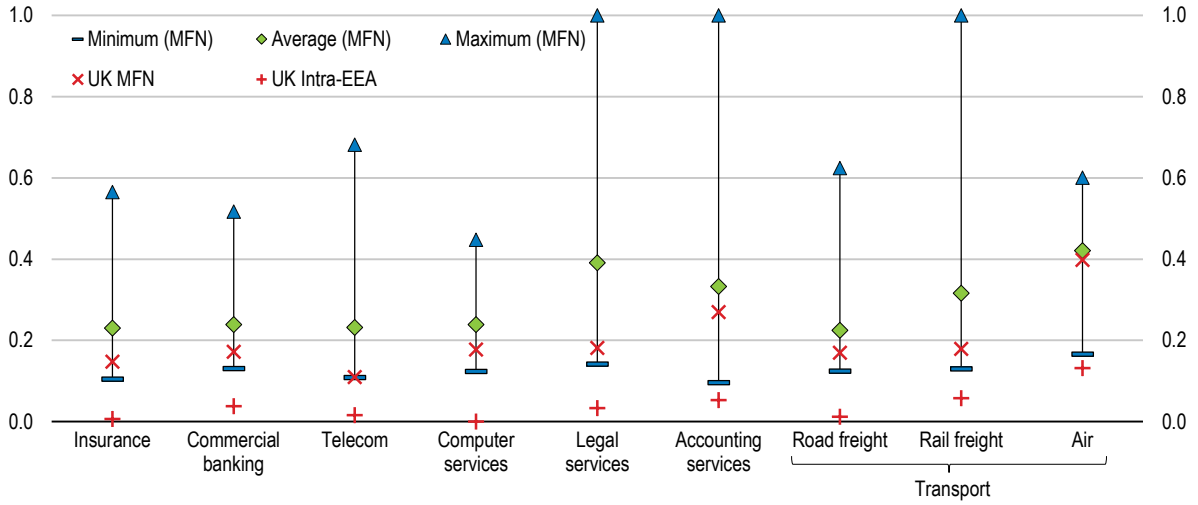
	FTA	TCA = FTA +end of free movement of people	TCA +further service liberalisation	
	European Union			
	Vis-à-vis United Kingdom	Vis-à-vis United Kingdom	Vis-à-vis United Kingdom	MFN
Communication	7.7	12.5	12.4	0.0
Business services not elsewhere classified	11.4	21.3	21.3	0.0
Finance and insurance	18.6	29.1	29.0	0.0
Transport	13.2	20.1	20.1	0.0
	United Kingdom			
	Vis-à-vis EU27	Vis-à-vis EU27	Vis-à-vis EU27	MFN
Communication	7.4	11.7	0.9	-11.5
Business services not elsewhere classified	10.1	18.1	7.0	-13.2
Finance and insurance	16.5	24.8	13.2	-13.2
Transport	13.1	19.1	9.0	-11.3
Construction	10.2	16.3	5.6	-12.0
Trade	10.2	16.3	5.6	-12.0
Public Services	10.2	16.3	5.6	-12.0

Note: The cost increase of financial services is calibrated using information on business services not elsewhere classified under the assumption that the finance services and insurance sector will face higher trade costs than the business services sector. Estimates for the first simulation capture the increase in services trade costs due to regulatory divergence. The second set of estimates include the additional cost related to ending the free movement of EU workers. The third simulation assumes that while there may be some regulatory divergence, certain UK regulations in the services sector are less restrictive than even before Brexit. For example, costs and amount of time to process visas are reduced as well as regulations related to procurement, cross-data transfers and screening. Estimates of the trade cost increase for the European Union presented in the table is a simple average of those applied in the model which varies by individual member states.
Source: Calculations using Benz and Jaax (2020) and Benz and Gonzales (2019).

Under any FTA, rules of origin are required to ensure that the favourable access granted between countries is not used for trade from third-parties to bypass their arrangements with either of the economies concerned. Rules of origin are generally used to determine the national source of a product and, together with maximum import content requirements, determine whether it qualifies for tariff-free entry. Under the new UK-EU TCA, firms face rules-of-origin obligations when exporting to the other party. In the simulations, rules-of-origin costs are borne by the exporter and applied as an export tax. Using a similar approach as Petri, Plummer and Zhai (2011) and Lakatos et al. (2016) the increase in export taxes are assumed to equal 10% of the tariff reductions achieved when entering a FTA (10% of EU MFN tariffs). The assumed cost increase due to rules of origin is small (1% or less), and may be underestimating the true burden to exporters. The top sectors facing increased costs include the textile and wearing apparel industry, agriculture and food, chemicals, and the motor vehicles and parts (1.0%, 0.6%, 0.5% and 0.5% respectively).

Figure 1. Restrictions on trade in services sector rise with the United Kingdom leaving the Single Market

Services Trade Restrictiveness Index, scale from 0 to 1 (most restrictive), 2019



Note: STRI indices are calculated on the basis of the STRI regulatory database which contains information on regulation for the 37 OECD Members, Brazil, China, Costa Rica India, Indonesia, Malaysia, Russia, Thailand and South Africa. The Intra European Economic Area STRI covers 25 countries and 22 sectors. For more methodological information, refer to Benz and Gonzales (2019).
'MFN' denotes Most Favoured Nation trade restrictions; 'UK-Intra EEA' denotes the services restrictions that the United Kingdom was facing on average across the markets of the European Economic Area.
Source: OECD (2020c), "Service Trade Restrictions Index by services sector" and "Intra-EEA Services Trade Restrictiveness Index" in OECD Industry and Services Statistics (database).

Increased customs checks and border delays between the European Union and the United Kingdom are expected to weigh on border costs. The OECD Trade Facilitation Indicator (TFI) is used to measure the cost of border disruptions. The trade facilitation policy changes are captured through *ad valorem* equivalents which express the value associated to a change in clearance delays triggered by changes in border procedures (OECD, 2016). For the simulation, the increase in cost from border delays are computed as the difference between the *ad valorem* equivalent of the OECD TFI of EU countries and non EU countries and is applied as an iceberg cost where, a portion of the value of goods payed to the exporter 'melts away' due to border costs. The cost increase is the portion of the shipment exported but not received by producers in the importing country. The estimated border costs increases are reported in Table 3. Those costs tend to be small, for most products. They are higher for some manufacturing products, in particular sectors with complex global value chains such as motor vehicles, and nil or close to zero for agriculture, food natural and pharmaceuticals products.[7]

Table 3. Border cost increase

Per cent, difference to baseline

EU27 importing from the United Kingdom	
Agriculture and food	0.2
Natural resources including coal and petro products	0.0
Textiles, wearing apparel, and leather products	0.4
Other manufacturing	0.5
Chemical rubber plastic products	0.6
Pharmaceutical products	0.0
Minerals, metals, & metal products	0.3
Computer, electronic and optical products	0.4
Machinery and equipment not elsewhere classified	0.5
motor vehicles, parts, and transport equipment	0.6
United Kingdom importing from European Union 27 (EU27)	
Agriculture and food	0.2
Natural resources including coal and petro products	0.0
Textiles, wearing apparel, and leather products	0.4
Other manufacturing	0.5
Chemical rubber plastic products	0.6
Pharmaceutical products	0.0
Minerals, metals, & metal products	0.3
Computer, electronic and optical products	0.4
Machinery and equipment not elsewhere classified	0.5
motor vehicles, parts, and transport equipment	0.7

Note EU 27 is averaged across uses and EU partners for presentation purposes.
Source: Calculations using the OECD TFI.

2.2. Free Trade plus the regulatory impact of ending free movement of people on services costs

Ending free movement for EU nationals is estimated to bring additional output losses (HM Government, 2019). A new Points-Based system came into effect on 1 December 2020. As of 31st December 2020, EU nationals, have been subject to same rules as non-EU nationals. The new system will bring in a points-based system to cater for highly skilled workers, skilled workers, students and a range of other specialist work routes including routes for global leaders and innovators (HM Government, 2020). This will mean in practise a marked fall in EU low-skilled workers migration to the United Kingdom, who used to have free access to the UK labour market. Experience to date suggests that work-related migration from outside the European Union may partially compensate for lower EU migration. These changes are likely to impact sectors differently. Sectors, such as the hospitality and personal care sectors, which rely disproportionately on EU migrants are likely to be particularly affected in the short to medium term.

Against this background, this simulation focuses on the implications of ending free movement of people on services trade costs. It adds to the move into a FTA the consequences on service trade costs of adding labour-market tests and quotas for intra-corporate transferees, contractual services suppliers and independent services suppliers. The simulation assumes that services providers can only enter the United Kingdom based on a list of shortage occupations, economic impact test, domestic advertisement of a position, salary threshold or similar mechanisms and that the number of such providers entering in a given year is limited by a binding quota. This is calibrated using the STRI framework. Similarly to what is done in the first scenario, trade costs in the services sectors are then derived following Benz and Jaax (2020) and

applied to bilateral exports and imports of services between the United Kingdom and the European Union. They are reported in Table 2.

An important caveat to keep in mind is that those estimates are only a lower bound of the estimates of ending free movement of people, as the consequences on international migration and labour supply are not accounted for and only trade in services is assumed to be affected in this scenario.

2.3. Effect of some services liberalisation in the United Kingdom

Combining the second simulation with the liberalisation of some UK regulations in services sectors aims at assessing how unilateral reforms could mitigate some of the economic impacts. Since December 2020, the United Kingdom has put in place a number of measures that have contributed to lower services trade costs. Labour-market tests for workers seeking to provide services on a temporary basis as intra-corporate transferees or independent suppliers were removed. This measure is expected to lower costs in all the sectors by an average of 3 to 4 per cent after 3-5 years. In addition, foreign equity restrictions, which previously existed in air services, according to which non-EU nationals cannot own more than 49% in local airlines, were lifted. This is expected to have a marked impact on services costs in the industry. Combined with the removal of labour-market tests it would lower services trade costs by more than 25% in the air services sector (OECD, 2021).

The possible impacts of those reforms, and further changes aiming at liberalizing services markets in the United Kingdom, are assessed by simulations that assume full liberalisation in the areas of visa process, but also to procurement rules, cross-data transfers and foreign investment screening. About 70% of these reforms could have been introduced while staying in the European Union (e.g. measures related to public procurement). Such policy moves affect trade with all UK partners, not just the European Union. Across sectors, services costs vis-à-vis MFN partners would decline by more than 10% (Table 2). The approach to calibrate those costs is similar to the one used in the previous scenarios, using the STRI framework to infer the impact on the stringency of regulation and translating this decrease into trade costs following Benz and Jaax (2020).

3. Simulation outcomes

3.1. Effect on the European Union

3.1.1. Output losses in the European Union would be moderate

The European Union will experience losses as a result of the United Kingdom leaving the Single Market. The analysis shows that even with an FTA in place, regulatory divergence and increased border measures between the two regions would result in a real GDP decline of 0.4 % in the European Union (Table 4).

This is within the range of what other Brexit studies have found (Annex Table A.1). Mayer et al. (2017), using a gravity estimation, found that under a Regional Trade Agreement (RTA) between the United Kingdom and the European Union, output losses in the European Union would be on average between 0.2 and 0.4%. A similar FTA scenario by the IMF found a GDP decline of 0.8% for the European Union in the long run (IMF, 2018). The Netherlands Bureau for Economic Analysis (CPB) found that GDP losses in the European Union would amount to 0.6% under a differed FTA option (Rojas-Romagosa, 2016).

Ending the free movement of people between the European Union and the United Kingdom is expected to deepen output loss by 0.2 percentage points. However, multilateral services liberalisation by the United Kingdom could slightly mitigate the negative effects of restricting bilateral services trade between the United Kingdom and the European Union.

About half of the cost come from rising technical barriers and sanitary and phytosanitary measures on goods. The remaining half mainly stems from higher restrictions on services. Rules-of-origin and lower level of trade facilitation would have a small effect (Figure 2).

Table 4. Impact on demand and supply components in the European Union

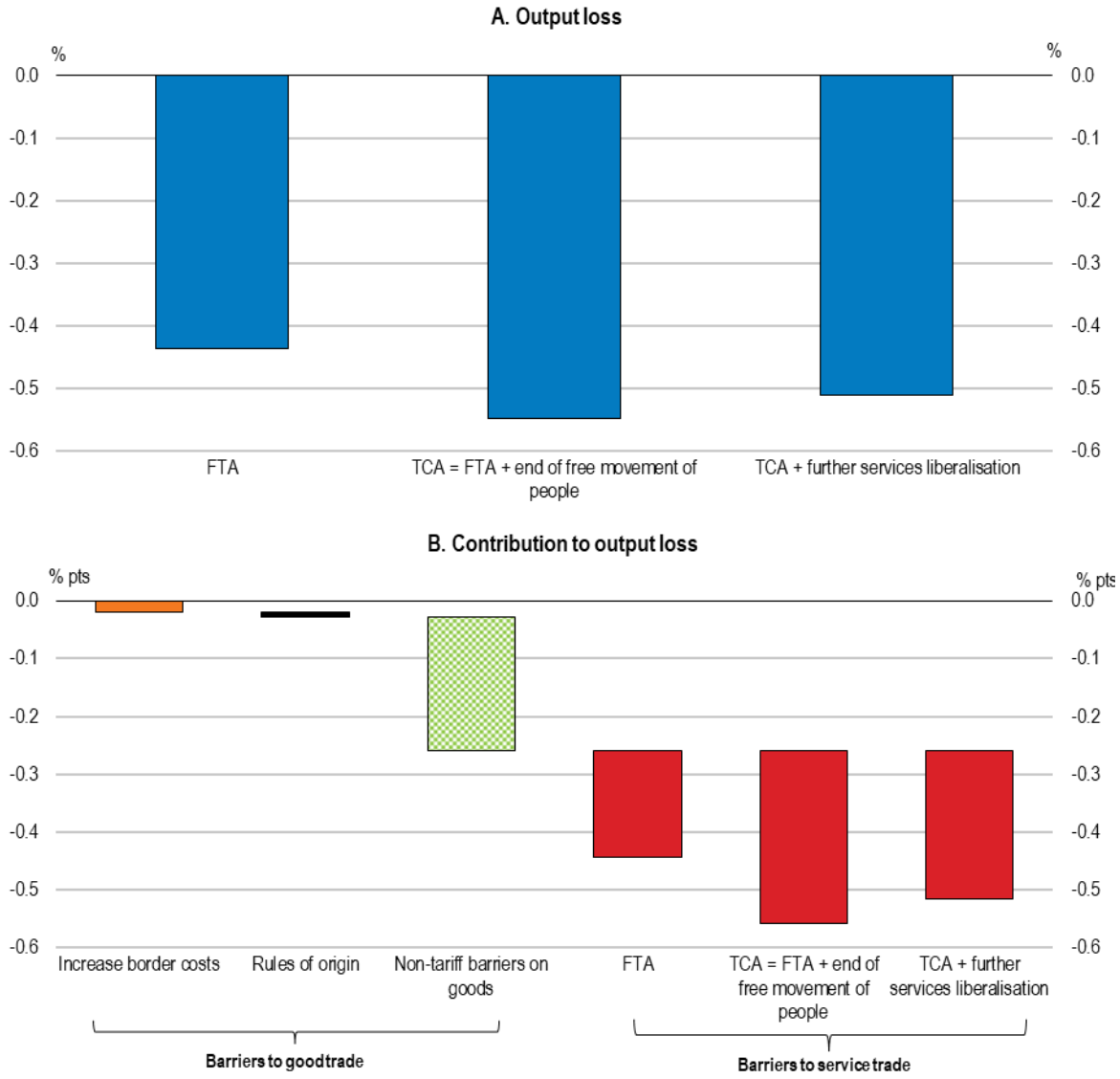
Per cent, difference to baseline

	FTA	TCA = FTA+ end of free movement of people	TCA + further services liberalisation
Real GDP	-0.4	-0.6	-0.5
Final domestic demand	-0.6	-0.7	-0.7
Private consumption	-0.3	-0.4	-0.4
Government consumption	-1.2	-1.5	-1.4
Investment	-0.6	-0.8	-0.7
Goods and services import	-1.0	-1.3	-1.2
Goods and services export	-0.6	-0.9	-0.8
Domestic production	-0.5	-0.6	-0.6
Intermediate use	-0.5	-0.7	-0.7

Note: Goods and services trade includes Intra EU27 trade.
Source: OECD METRO model

Figure 2. Higher non-tariff barriers and barriers to services trade under the free-trade agreement will lead to lower incomes

Difference to real GDP relative to EU Single Market in the medium term



Note: The FTA simulation considers zero tariffs and quota-free trade in goods; increases of trade costs on goods and services through rules-of-origin and non-tariff measures. The "end of free movement of people" simulation adds the impact on services trade of the end of free movement of people. The "further services liberalisation" simulation assumes the United Kingdom is implementing a set of reforms on visa procedures, procurement, screening and cross-border flows.
Source: OECD METRO model.

3.1.2. Trade between the European Union and the United Kingdom declines

In all three scenarios trade between the United Kingdom and the European Union declines (Table 5). Imports from the United Kingdom into the European Union decrease by 20% under an FTA. Trade from other European countries make up some of the decline in British exports to the European Union. Intra-EU27 trade increases slightly under the FTA scenario. Imports into the United Kingdom from the European Union decline between 17.2% and 19.9%. Imports from the rest of the world into the United Kingdom increase in all three scenarios, with the strongest increase stemming from further multilateral services liberalisation by the United Kingdom.

Table 5. Less trade between the European Union and the United Kingdom

Per cent, difference to baseline

Importer	Exporter	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
EU27	**Total**	**-1.0**	**-1.3**	**-1.2**
	EU27	0.1	0.0	0.0
	GBR	-20.0	-24.8	-22.6
	Rest of world	0.0	-0.0	-0.1
GBR	**Total**	**-8.1**	**-9.6**	**-5.8**
	EU27	-17.2	-19.9	-17.3
	Rest of world	1.2	1.1	6.3

Source: OECD METRO Model

3.1.3. The effects of leaving the Single Market on individual EU members vary widely

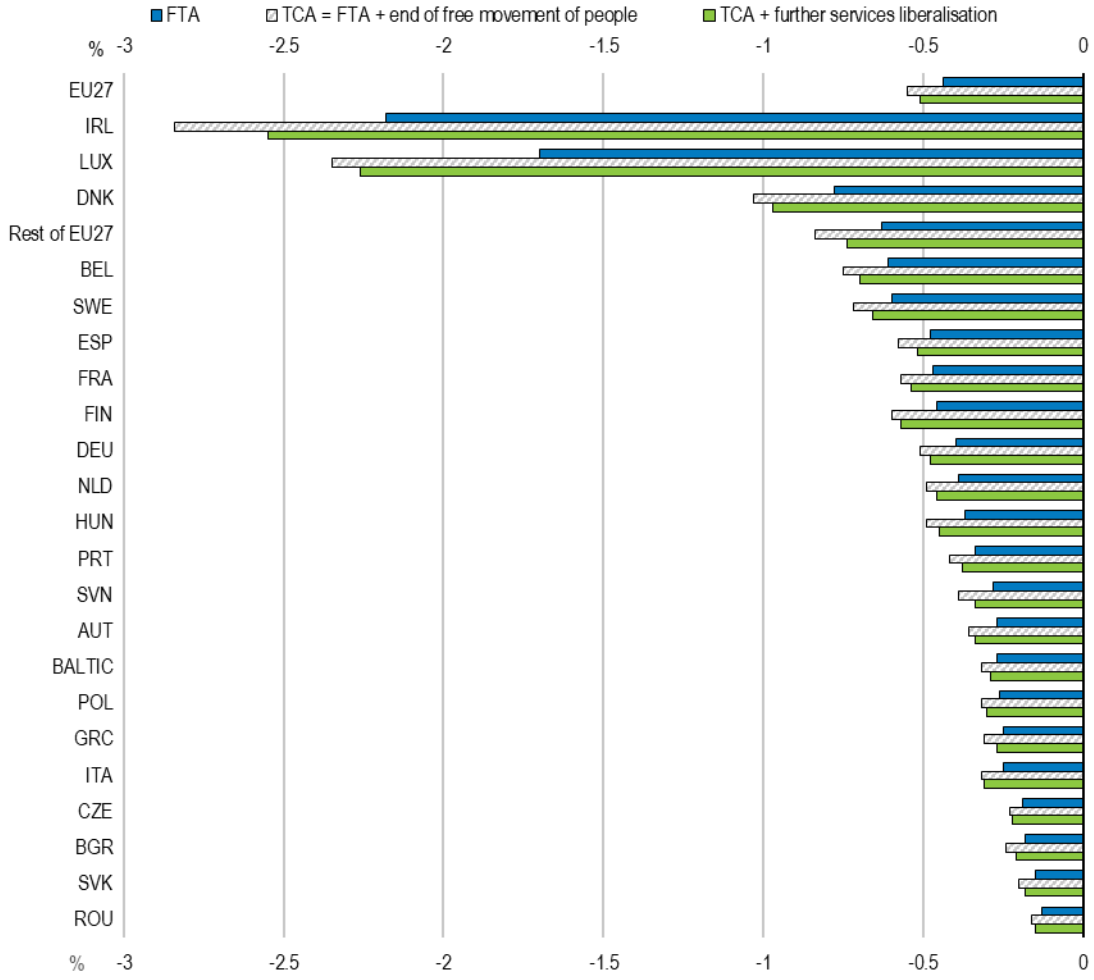
The extent to which individual member states may be impacted vary markedly (Figure 3). Losses depend on a number of factors including current bilateral trade relationships with the United Kingdom, a country's sectoral specialisation, and the degree to which European financial centres are seen as viable substitutes for London (IMF, 2018). Real GDP declines among EU member states are estimated to range from -0.1 % to -2.0% under the assumption of an FTA between the United Kingdom and the European Union. Not surprisingly, EU member states with strong trade relations, particularly in economically important sectors, with the United Kingdom experience larger declines in output and trade. Ireland, Luxembourg and Denmark, small open economies, are the top three countries most affected. These findings are similar to other Brexit studies. Mayer (2017) found GDP losses under a regional trade agreement assumption to range from 0.1 to 2.6% with Ireland, Luxembourg and Malta topping their list. IMF (2018) estimates Ireland to be the most negatively impacted even under an FTA with a GDP loss of 2.5 % in the long run, followed by the Netherlands and Belgium (-0.5 and -0.7% respectively).

The Irish and the United Kingdom economies are deeply integrated across several dimensions including trade and the labour market (Arriola et al., 2018). Production processes in many industries are increasingly fragmented across national borders and a common labour market was established between the two countries even before EU membership (Bergin et al., 2019). As such, Brexit has a large effect on the Irish economy, more than any other EU member state. Under the UK-EU FTA, Irish GDP is found to decline 2.2% in the medium term, where much of the decline is due to divergence in regulations. Increasing restrictions on the movement of people between the United Kingdom and the European Union deepens the GDP loss by an additional 0.7 percentage point. Ireland's Economic and Social Research Institute (ESRI) estimated that the Irish GDP would decline by 2.6% in the long term under a "Deal" scenario which did not include restrictions on migration (Bergin et al., 2019).

EU members with fewer trade links to the United Kingdom are somewhat insulated from the effect of Brexit. For example, Eastern European countries like Bulgaria, Romania, and Slovak Republic are less reliant on British trade. Imports from the United Kingdom make up less than 3% of total imports in each of these three countries. Exports to the United Kingdom account for less than 4% of their respective exports. The smaller trade exposure to the United Kingdom translates to a GDP loss of around 0.1%.

Figure 3. Output losses of European Union

Difference to baseline, real GDP in the medium term



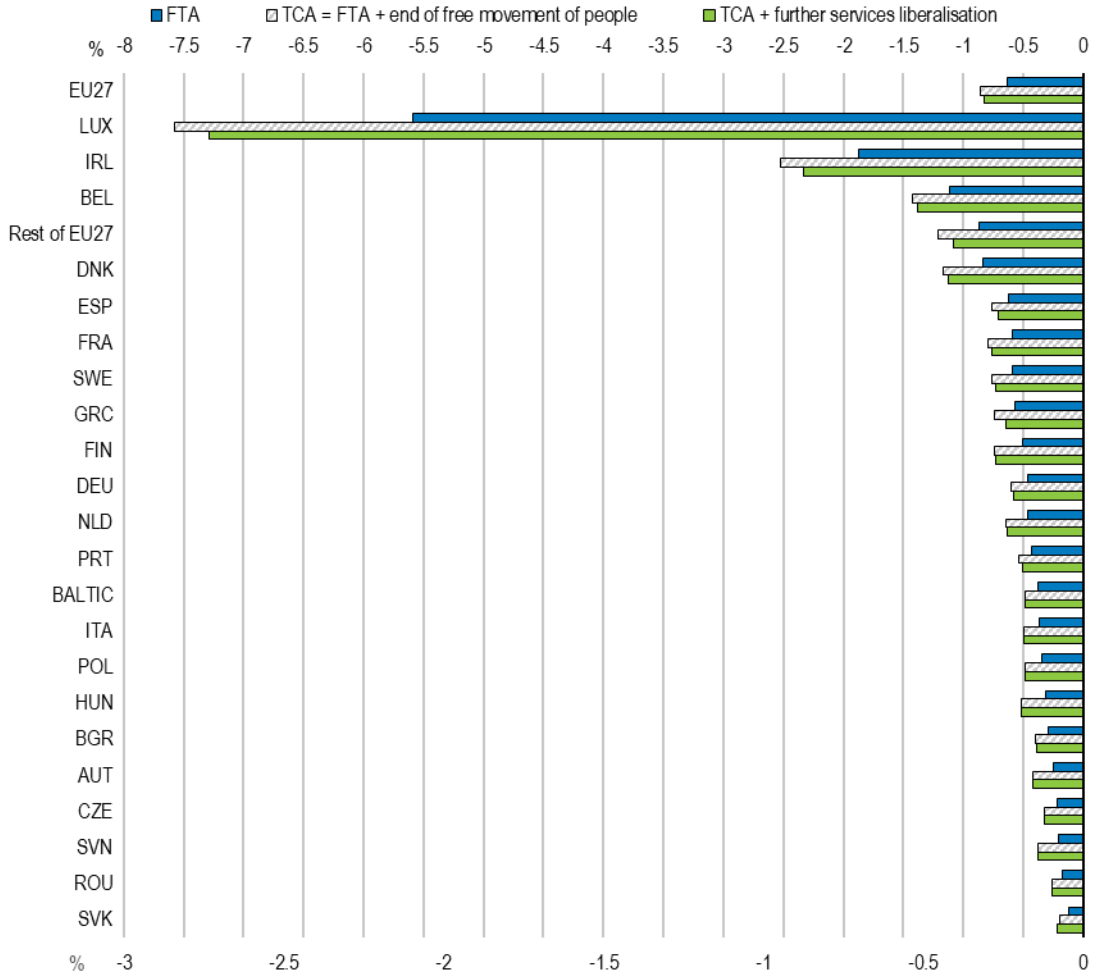
Note: Baltic countries refer to Estonia, Latvia and Lithuania. EU27 refers to 27 European Union member countries.
Source: OECD METRO model.

3.1.4. The decline in trade in the European Union is not uniform across sectors

With the United Kingdom's exit of the Single Market, the two regions are no longer bound to maintain the same rules and standards. Regulatory divergence adds additional costs to both British and European Union exporters, not only in meeting different requirements to trade in goods and services in the other region, but also verifying compliance. As a result, real exports and imports could fall in the European Union (-0.6% and -1% respectively under the FTA scenario).

Figure 4.Export losses of European Union

Difference to baseline, real changes in the medium term



Note: Baltic countries refer to Estonia, Latvia and Lithuania. EU27 refers to 27 European Union member countries.
Source: OECD METRO Model

The decline in trade is not uniform among sectors (Figure 8, Panel A). European Union member states are found to import less professional services such as financial services and insurance, communication, and other business services mainly due to regulatory divergence in the services sector between the United Kingdom and the European Union. Imports of financial services by EU 27 members could decline by 5.3 % with an FTA in place. Business service imports could decline by almost 2%. Ending the free movement of labour further deepens the decline in services trade. Imports of financial services and insurance decrease by an additional 2.2 percentage points for a total decline of -7.6%. Imports of business services fall an additional 1.3 percentage points.

While the manufacturing sectors experience smaller declines relative to the services sectors, manufacturing imports account for almost 60% of the total imports by EU members, of which 5% is sourced from the United Kingdom. The average decrease in imports of manufacturing goods is about 1%, which amounts to a real decline of USD 2.8 trillion of manufacturing imports by EU countries under the FTA scenario.

The decline in exports from EU members is expected to be widespread. As with imports, the financial services and insurance sector has the strongest decline in all three scenarios. Most of the decrease in

exports of this sector (86%) is accounted for by the decline in Luxembourg, where the sector has an important weight in the economy (almost 30% of output) and with strong trade links with the United Kingdom. A handful of countries would experience small gains in exports including Belgium, the Netherlands, Austria and the Czech Republic. The effect on the financial sector, however, is uncertain as negotiations between the European Union and the United Kingdom are still ongoing and the finance sector may have a specific arrangement in the future.

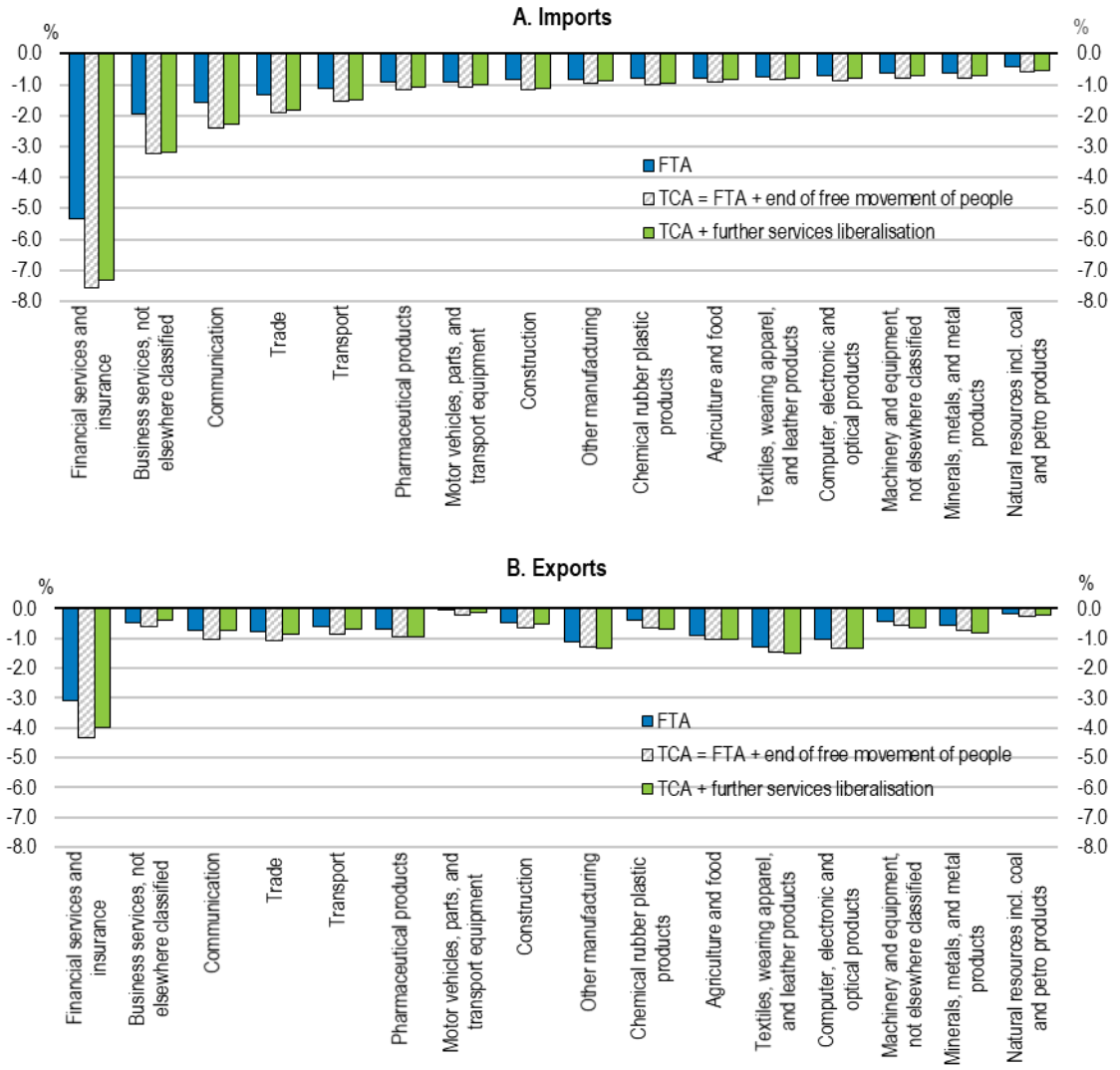
The decrease in manufacturing exports is deeper than the decline in imports, notably for the textiles and wearing apparel sector, other manufacturing and computer and electronics. Under the FTA scenario, gross exports in these sectors would decrease 1.3%, 1.1%, and 1% respectively. The decline in domestic value added in EU27 exports of these sectors would range from USD 1.5 billion (textiles) to USD 2.2 billion (other manufacturing). Most of the loss in gross exports is due to regulatory divergence related to technical barriers, but divergence of services regulation contributes about 0.3 percentage point to the decline. Exports of motor vehicles and parts would be less affected than other sectors. Under the FTA scenario EU27 gross exports of this sector declines only by 0.03% while the European value added content of car exports from the region increases by 0.5%. The minimal negative effect on export demand follows a rise in production in most EU27 countries as well as an increase in intermediate import demand for cars and car parts from Turkey, Switzerland and Eastern Europe.

The United Kingdom is an important source of imported intermediate inputs for EU member states including professional services, notably finance and insurance but also communication and other business services (Annex Table A.4.). For some countries the United Kingdom is also an important source of imported manufacturing goods used as inputs into production. British cars and parts account for a large share of intermediate imports of this sector into Belgium (12%), Sweden (10%), and Germany (8%). The United Kingdom is also a key source of intermediate inputs of pharmaceuticals for some EU countries including the Netherlands, Spain, Ireland, and Portugal. After the United Kingdom's exit of the Single Market, the increase in cost related to importing British intermediate goods and services is reflected in higher production costs in most EU sectors (Annex Table A.3.).

The United Kingdom is also an important export market for many sectors. Trade to the United Kingdom accounts for 11% of total exports between the 27 EU Members plus the United Kingdom and 7% of EU27 exports to all trade partners. The UK market is also important in terms of EU's activity in global value chains. Five percent of EU27 domestic value added that is exported outside of the Single Market is used in British exports. European motor vehicles and parts and the metal products sectors are particularly linked to global value chains via the UK market where over 10% of the exported EU value added in these sectors is used in products and services subsequently exported from the United Kingdom.

Figure 5. Total import and export changes of European Union

Difference to baseline, imports and exports in the medium term



Note: Includes Intra-EU27, which is 27 European Union countries.
Source: OECD METRO model.

3.1.5. EU27 production declines marginally across almost all sectors relative to the baseline

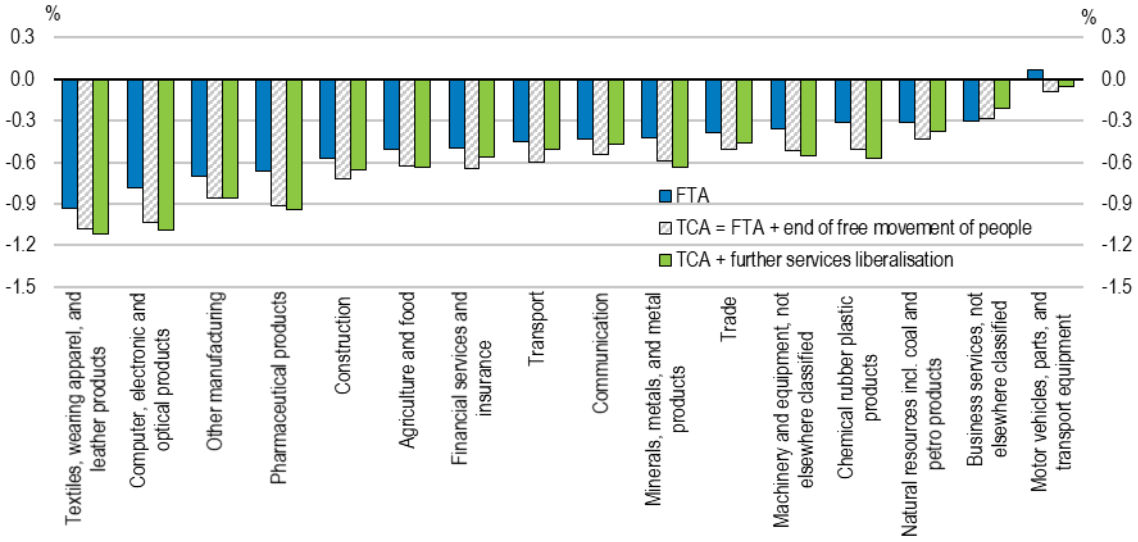
Production in the European Union declines marginally in almost all sectors in all three scenarios compared to a situation where the United Kingdom would stay in the Single Market (Figure 9). The decrease stems from reduced demand for EU exports in the UK market as well as an increase in production costs. With overall output declining in the United Kingdom in the various scenarios, there is less demand for goods and services both imported and domestic. Moreover the increase in the cost of imported intermediate inputs from the United Kingdom into the EU27 increases the price of intermediate goods and services used in production.

Production in the textile industries, computers and, pharmaceuticals sectors could decline by 0.9%, 0.8%, and 0.7% respectively under the FTA scenario. Restricting bilateral services trade between the United Kingdom and the European Union deepens the losses in all manufacturing sectors as services are an

important input into manufacturing industries. The services sector also experience decreases in production ranging from 0.3% (Business services) to 1% (Public services) in the medium term under the FTA scenario.

Figure 6. Production changes in the European Union

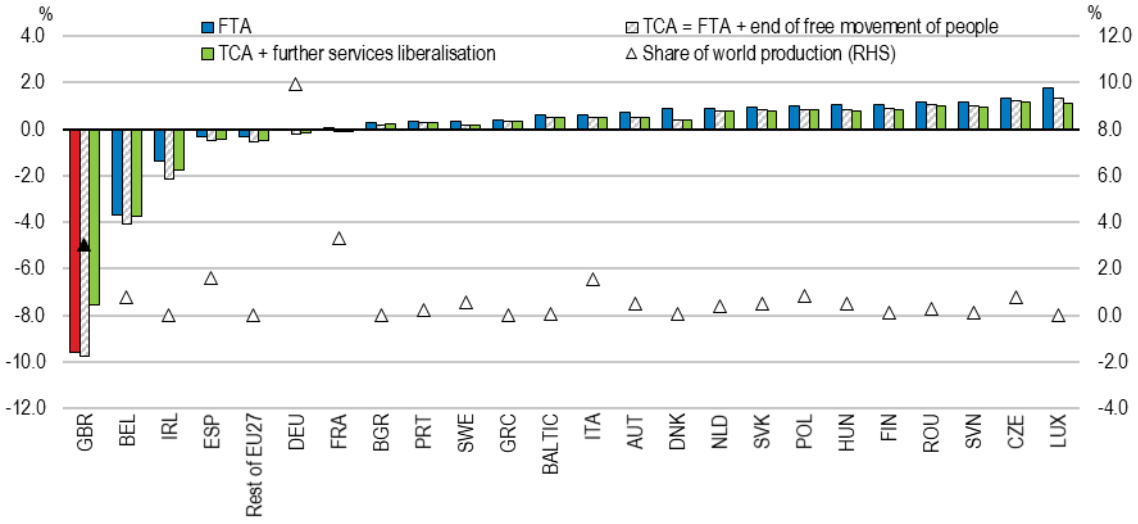
Difference to baseline, production by sector in the medium term



Note: Data refer to 27 European Union countries.
Source: OECD METRO model.

Figure 7. Car production changes in European countries

Difference to baseline, car production by region in the medium term



Note: Data refer to the sector "Motor vehicles, parts, and transport equipment". Baltic countries refer to Estonia, Latvia and Lithuania.
Source: OECD METRO model.

Production could increase in a few sectors in certain countries as a result of trade diversion. Production of pharmaceuticals in Ireland would increase by 1% in all three scenarios. While total EU27 production of the financial sector declines by 0.5% under the FTA scenario, there were small increase in production (less than 1%) in a handful of EU member states including Slovak Republic, Romania, Czech Republic, Denmark and Belgium.

Moreover, under the FTA scenario, the production of motor vehicles and car parts increases slightly by 0.1%. While car production in some western European countries like Belgium and Spain could decline under a Free Trade Agreement (4%, 0.4% respectively), car production in other regions, with less trade exposure to the United Kingdom could fare better and take over some of the market from UK firms (Figure 7). Eastern European Countries such as the Czech Republic and Poland, could increase production of motor vehicles and parts by about 1%. The extent to which European automakers gain from a UK exit from the Single Market depends on if countries maintain their preference for existing trade partners. Smith et al. (2019) showed that if countries are more sensitive to price changes, trade that was once met by the United Kingdom could be diverted towards non-European countries, such as China, India, the United States, and Canada, rather than European partners.

3.2. Effects on the United Kingdom

3.2.1. Output losses could be significant

The simulations suggest that moving to a FTA could lead to a fall by about 6.3% of UK exports and 8.1% of UK imports in the medium term, compared to a situation where the country would have stayed in the Single Market. UK goods exports face higher compliance costs stemming from having to show compliance with EU regulations, border delays and rules-of-origin requirements (Table 6). [2]

Table 6. Impact on demand and supply components in the United Kingdom

Per cent difference to baseline

	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
Real GDP	-3.7	-4.4	-3.3
Final domestic demand	-4.3	-5.2	-3.7
Private consumption	-3.0	-3.6	-2.5
Government consumption	-8.3	-10.0	-7.2
Investment	-4.6	-5.5	-4.1
Goods and services import	-8.1	-9.6	-5.8
Goods and services export	-6.3	-7.3	-4.7
Domestic production	-4.0	-4.8	-3.4
Intermediate use	-4.4	-5.2	-3.6

Source: OECD METRO model

The overall simulated output loss amounts to -4.4%, with considerable variation across sectors (Table 7). Looking at the factors that contribute the most to the output losses, about two-thirds of the cost come from rising technical barriers and sanitary and phytosanitary measures on goods, as related regulations between the United Kingdom and the European Union diverge overtime. The remaining one-third stems from higher restrictions on services. Rules-of-origin and a lower level of trade facilitation (increased border costs) tend to have a small effect.

[2] The relatively strong decline in government consumption stems from the way the government account is modelled in this analysis. The government is assumed to maintain its budget balance at the same level as without the agreement. As the economy contracts, tax revenues decline and to maintain the balance, the government has to reduce expenditures. The same reasoning holds for the government consumption effect of the EU reported in Table 4.

Table 7. Output losses by sectors in the United Kingdom

Per cent, difference to baseline

	FTA	TCA = FTA + end of free movement of people	TCA + further service liberalisation
Agriculture and food	-2.9	-3.5	-1.7
Natural resources including coal and petro products	-0.3	-0.4	0.5
Textiles, wearing apparel, and leather products	-6.4	-6.6	-3.3
Other manufacturing	-3.3	-4.0	-1.3
Chemical rubber plastic products	-3.8	-3.9	-0.6
Pharmaceutical products	-1.6	-1.6	2.5
Minerals, metals, and metal products	-3.1	-3.2	0.5
Computer, electronic and optical products	-5.0	-5.0	0.3
Machinery and equipment not elsewhere classified	-3.9	-4.0	-0.2
Motor vehicles, parts, and transport equipment	-9.6	-9.7	-7.5
Utilities	-4.6	-5.5	-3.7
Construction	-4.4	-5.3	-4.0
Trade	-3.1	-3.8	-2.7
Transport	-2.6	-3.1	-3.6
Communication	-3.8	-4.8	-4.2
Financial services and insurance	-3.4	-4.5	-4.0
Business services not elsewhere classified	-4.1	-5.3	-5.7
Public Services	-7.2	-8.7	-6.5
Other services	-2.1	-2.6	-1.7

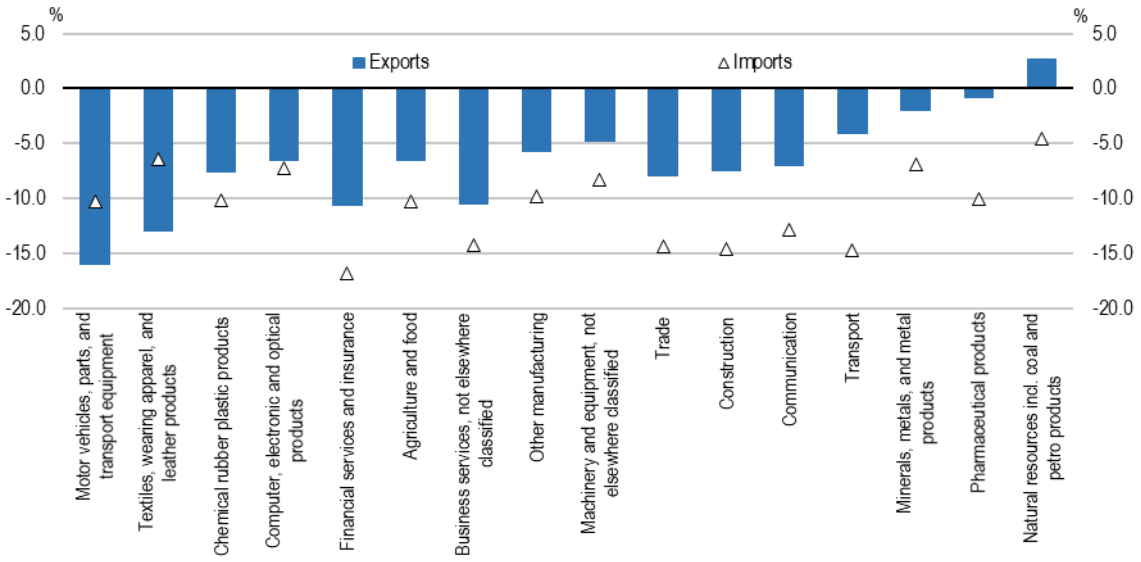
Source: OECD METRO model.

3.2.2. The automobile and textile sectors would be the most affected

The impact of leaving the Single Market to enter the TCA varies markedly across sectors, reflecting the different degrees of openness and other structural differences. In the UK goods sector, motor vehicles, part and transport equipment and to a lesser extent chemical could experience the largest falls in exports (Figure 8).

Figure 8.Export and import losses in the United Kingdom vary by sector

Difference to baseline, exports and imports in medium term



Note: Based on scenario: TCA = FTA + end of free movement of people
Source: OECD METRO model

Conclusion

The paper examines the trade impact for EU countries of the United Kingdom leaving the Single Market to join the TCA signed in December 2020, under different assumptions.

Output losses in the European Union (around 0.6%) are expected to be less pronounced than in the United Kingdom in the medium term, but would vary markedly across individual countries. Ireland experiences the largest losses, while countries with weaker trade links with the United Kingdom could barely be affected. Losses also vary across sectors.

About half of the economic losses come from rising technical barriers and sanitary and phytosanitary measures on goods, and the remaining half mainly stems from higher restrictions on services (Simulation 1). Adding restrictions to the free movement of people adds to the economic losses and particularly affects EU members that rely heavily on trade in services with the United Kingdom (Simulation 2). With an already liberal regulatory regime for services, further unilateral services reform in the United Kingdom would have only small, but positive, economic spillovers to the European Union (Simulation 3).

Estimates reported in this work are likely to be conservative, as they omit factors that are likely to play a key role but whose impact was too uncertain to be captured with the METRO model. This includes the extent to which FDI flows are going to be redirected toward other destinations, as well as the labour-supply implications of international migrations and the productivity impacts. Despite those caveats, the analysis underlines the large heterogeneity of impact across sectors and countries, implying that targeted policy should aim at easing the adjustment costs from the UK leaving the Single Market.

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Annex A.

This annex provides additional statistical tables from the OECD METRO Model.

Table A.1. Results comparison, BREXIT under a Free Trade Agreement

			Percent Change in GDP	
	Model Type	Time horizon	United Kingdom	European Union
This paper	CGE	Medium-run	-3.7	-0.4
Rojas-Romagosa, (2016)	CGE	Long-run	-3.4	-0.9
Mayer et al. (2017)	Gravity	na	-2.4	-0.4
IMF (2018)	CGE	Long-run	-2.5	-0.8

Source: Author's compilation.

Table A.2. Importance of UK EU27 trade relations, at base 2014

Per cent

	Share of global European Exports		Size of European Exports (USD billion)
	UK exports to EU27	EU27 exports to UK	
Agriculture & food	3.4	8.4	557.4
Natural resources	9.4	4.6	225.7
Textiles, wearing apparel, & leather	3.6	6.4	256.8
Other manufacturing	2.9	6.8	377.5
Chemical rubber plastic products	4.6	5.6	701.2
Pharmaceutical products	3.9	7.4	320.8
Minerals, metals, & metal products	2.9	4.8	609.3
Computer, electronic & optical products	4.8	6.9	401.5
Machinery & equipment not elsewhere classified	2.6	4.7	836.0
Motor vehicles, parts, & transport equipment.	3.9	8.3	924.7
Utilities	0.9	5.4	40.4
Construction	1.7	1.9	55.3
Trade	3.2	3.8	197.8
Transport	1.8	3.6	579.9
Communication	8.8	6.0	138.0
Financial services & insurance	12.6	4.5	234.3
Business services not elsewhere classified	9.2	4.7	449.7
Public Services	2.6	6.8	79.0
Other services	4.7	6.0	115.7
Total	4.4	5.9	7,101.1

Note: European trade includes exports by the United Kingdom and EU27 to all partners and includes Intra-EU27 trade.
Source: OECD METRO Model, reference year 2014.

Table A.3. Change in the cost of production across EU27, country-weighted average

Per cent

	FTA	TCA = FTA + end of free movement of people	TCA + further liberalisation of services
Agriculture and food	0.0	0.0	0.0
Natural resources incl coal and petro products	-0.1	-0.1	-0.1
Textiles, wearing apparel, and leather products	0.1	0.1	0.1
Other manufacturing	0.1	0.1	0.1
Chemical rubber plastic prods	0.1	0.1	0.1
Pharmaceutical products	0.0	0.1	0.0
Minerals, metals, and metal products	0.0	0.0	0.0
Computer, electronic and optical products	0.1	0.1	0.1
Machinery and equipment not elsewhere classified	0.1	0.1	0.0
Motor vehicles, parts, and transport equipment	0.2	0.2	0.2
Utilities	0.0	0.0	0.0
Construction	0.0	0.0	0.0
Trade	0.0	0.0	0.0
Transport	-0.1	-0.1	-0.1
Communication	0.0	0.1	0.1
Financial services and insurance	0.2	0.3	0.3
Business services not elsewhere classified	0.0	0.1	0.1
Public Services	0.0	0.0	0.0
Other services	-0.02	0.01	0.01

Note: Weighted by production quantity at the base.
Source: OECD METRO Model.

Table A.4. Share of total imported intermediate goods and services that comes from the United Kingdom, 2014

Per cent

	Agriculture & food	Natural resources	Textiles, wearing apparel, & leather	Other manufacturing	Chemical rubber plastic prods	Pharmaceutical products	Minerals, metals, & metal products	Computer, electronic & optical prod.	Machinery & equipment nec	Motor vehicles, parts, & transport equip.	Utilities	Construction	Trade	Transport	Communication	Financial services & insurance	Business services nec	Public Services	Other services
Austria	0.4	0.3	1.6	1.0	2.5	1.7	1.4	1.4	1.0	3.0	0.5	1.1	2.4	3.9	8.8	10.3	7.6	2.6	8.6
Belgium	2.1	5.4	3.0	3.8	6.4	1.6	3.3	7.6	4.3	12.4	0.6	1.9	2.9	2.8	10.7	9.8	10.6	2.2	7.7
Czech Republic	1.1	0.2	5.1	1.5	3.1	5.8	1.5	4.1	2.4	1.4	0.1	0.4	2.9	4.8	7.0	14.7	8.6	1.7	4.2
Denmark	3.2	4.0	5.7	2.0	6.7	5.2	3.8	7.0	4.4	5.5	0.7	2.6	2.9	4.7	11.1	15.8	16.4	2.0	11.8
Finland	1.8	0.8	4.4	2.6	4.1	7.6	3.0	2.2	3.5	6.9	0.5	0.6	2.9	4.7	10.1	7.7	11.2	3.8	5.7
France	5.7	1.8	2.2	3.6	5.8	5.4	4.4	4.5	3.8	6.1	1.7	3.6	3.0	5.3	13.4	10.5	13.6	1.4	8.3
Germany	1.7	4.6	2.9	1.9	5.8	4.9	4.3	3.5	2.5	7.8	0.8	2.2	2.9	2.9	9.4	18.5	10.8	1.0	11.0
Greece	0.6	0.6	1.9	1.2	1.8	10.0	2.8	7.5	3.4	2.9	0.1	0.8	2.7	1.7	15.1	11.3	12.1	1.1	5.9
Hungary	1.7	0.1	3.0	0.9	2.1	4.2	1.0	2.4	1.3	2.4	0.1	0.8	2.5	2.8	8.7	15.4	8.9	1.4	14.6
Ireland	55.0	51.3	63.6	41.2	32.9	11.9	47.6	33.8	30.5	37.8	19.2	2.0	2.3	9.5	19.5	16.2	11.6	11.8	13.7
Italy	1.3	0.4	2.7	1.5	3.2	5.8	2.5	3.6	3.6	6.7	0.4	1.0	2.4	4.6	11.5	7.2	11.1	1.9	11.4
Luxembourg	0.2	0.2	2.8	2.8	4.5	0.8	1.0	3.9	1.0	1.7	0.7	2.2	3.1	3.3	11.2	21.8	9.3	2.7	12.2
Netherlands	2.8	6.2	8.9	3.4	8.6	22.9	4.2	3.0	3.5	6.5	0.4	2.9	2.6	5.3	13.3	10.3	13.4	3.1	4.5
Poland	1.2	0.3	5.2	1.7	4.3	7.0	1.5	4.6	2.0	3.2	0.9	0.9	4.3	4.4	8.7	16.5	9.3	1.7	8.2
Portugal	2.5	1.4	3.5	1.8	2.1	9.2	5.2	5.0	2.8	2.4	0.5	0.7	2.4	5.2	9.9	13.6	8.3	1.5	8.6
Slovakia	0.5	0.5	1.3	1.3	2.0	1.3	1.4	0.9	0.8	0.8	0.1	0.5	1.5	2.1	5.2	17.5	3.7	1.1	8.5
Slovenia	0.2	0.1	1.2	0.9	1.6	2.9	1.3	3.8	1.2	2.7	0.1	0.7	2.1	2.1	10.2	15.2	7.4	1.2	6.4
Spain	2.7	1.2	2.8	2.0	4.6	10.8	5.7	5.8	3.2	5.3	1.6	0.9	3.5	9.6	10.3	17.2	10.8	0.6	9.8
Sweden	3.2	5.7	4.7	3.0	8.1	12.1	6.8	6.0	3.9	10.0	1.1	3.4	3.8	3.4	10.2	6.7	10.7	2.0	8.2
Bulgaria	0.4	0.1	2.3	0.9	2.5	4.6	1.6	8.6	1.9	2.8	0.3	0.6	4.5	5.3	7.1	15.6	7.8	2.4	8.1
Romania	0.6	0.1	8.7	1.5	1.8	5.6	1.2	2.6	2.2	5.3	1.0	1.6	5.7	4.4	9.3	13.7	8.7	2.0	14.5
Baltic countries	0.9	0.1	5.2	1.0	2.1	1.4	1.1	4.2	2.3	2.9	0.4	0.4	4.8	3.6	8.4	10.2	7.8	2.8	6.1
Rest of EU	4.4	1.7	2.1	5.9	2.3	3.8	2.0	4.1	4.5	5.0	0.2	0.9	3.9	5.4	10.6	14.9	12.5	4.4	10.3

Note: Includes intra-EU trade.
Source: OECD METRO Model.

Table A.5. Share of total exports by sector destined for the United Kingdom at the base 2014

Per cent

	Agriculture & food	Natural resources	Textiles, wearing apparel, & leather	Other manufacturing	Chemical rubber plastic prods	Pharmaceutical products	Minerals, metals, & metal products	Computer, electronic & optical prod.	Machinery & equipment nec	Motor vehicles, parts, & transport equip.	Utilities	Construction	Trade	Transport	Communication	Financial services & insurance	Business services nec	Public Services	Other services
Austria	2.7	0.5	2.2	4.2	2.7	1.5	2.6	4.3	2.9	5.4	1.9	1.2	3.2	2.7	4.6	2.4	3.2	4.3	4.8
Belgium	10.1	3.1	13.3	8.2	7.6	12.4	5.8	9.5	8.9	22.8	4.3	3.3	2.1	1.5	7.3	5.9	5.6	7.7	5.3
Czech Republic	3.8	0.3	4.8	3.7	3.2	3.0	3.2	8.4	4.8	5.1	0.8	0.7	5.3	2.4	4.9	4.5	3.8	5.0	5.4
Denmark	9.4	24.4	6.9	6.0	4.2	5.0	5.0	5.1	7.9	4.5	1.9	1.1	1.5	2.6	5.4	3.2	4.2	3.4	4.7
Finland	1.7	13.3	1.7	8.7	4.4	1.2	4.2	2.0	2.7	2.1	2.8	0.6	0.7	4.1	5.0	3.5	4.4	5.5	4.5
France	9.3	3.1	7.9	10.0	7.5	6.5	5.9	6.6	6.2	7.2	14.0	2.6	5.5	4.3	8.3	7.4	5.1	7.6	8.2
Germany	7.3	2.3	5.4	6.9	6.2	10.6	6.7	7.0	4.7	10.4	0.7	1.6	2.3	2.9	7.3	7.0	6.0	6.7	4.7
Greece	6.1	0.9	6.0	6.1	4.4	12.8	4.4	6.2	6.0	1.0	6.5	1.7	7.9	4.4	9.2	6.0	6.6	8.1	8.4
Hungary	3.3	0.6	2.3	2.4	3.3	3.2	3.1	6.0	3.7	3.2	1.8	0.6	2.5	3.9	6.2	6.3	5.1	4.5	4.1
Ireland	40.2	24.1	37.9	10.7	7.9	6.5	40.1	17.4	17.9	30.0	17.2	6.8	2.3	16.7	8.0	4.8	6.4	17.1	9.2
Italy	8.8	0.9	5.8	6.1	5.0	5.9	4.2	4.2	4.7	7.3	4.0	1.2	4.0	3.9	6.5	5.2	6.0	5.3	6.1
Luxembourg	1.9	5.1	6.1	2.7	4.8	0.4	5.1	4.2	8.0	4.5	2.4	1.4	2.5	2.6	8.4	7.6	8.8	3.0	4.9
Netherlands	9.9	6.3	10.9	8.9	8.1	9.4	5.9	12.3	6.1	6.4	20.6	4.8	4.2	2.7	7.0	4.5	5.8	6.4	8.2
Poland	6.9	4.6	2.7	6.6	5.4	5.1	5.8	10.3	6.1	6.5	1.1	1.4	4.6	2.0	6.3	6.5	5.3	5.5	5.1
Portugal	6.2	0.8	7.8	6.4	4.3	11.5	4.8	10.8	4.6	9.3	3.6	1.8	8.1	7.4	8.7	7.7	5.4	10.0	10.6
Slovakia	2.8	0.1	0.9	4.1	1.9	4.9	2.1	7.0	2.1	5.3	0.9	1.4	2.8	1.9	5.8	4.0	5.6	5.6	4.4
Slovenia	1.6	0.0	0.8	2.5	2.0	1.2	2.0	3.3	1.8	1.4	0.4	0.6	3.1	1.9	5.4	4.5	3.8	4.2	4.0
Spain	8.2	1.6	5.5	5.9	4.3	7.1	6.8	5.6	5.5	12.5	4.1	3.4	10.4	9.5	8.6	10.9	6.7	14.7	10.4
Sweden	6.2	19.3	9.0	10.4	3.7	6.9	5.6	4.0	4.2	6.4	1.0	0.9	1.7	2.1	6.0	3.4	4.9	5.0	5.6
Bulgaria	1.6	0.3	4.0	3.0	3.0	3.0	1.7	4.4	1.7	4.6	1.3	1.2	6.4	4.8	6.9	7.5	7.9	7.0	6.3
Romania	2.2	0.1	8.2	3.1	2.8	8.9	1.6	4.7	3.8	4.3	0.5	1.6	3.4	3.9	7.2	5.1	4.7	5.1	4.1
Baltic countries	2.2	11.8	4.5	9.6	4.4	2.7	3.5	3.2	2.0	1.1	1.8	0.9	3.6	2.1	4.9	7.8	4.9	6.1	4.8

Note: Includes Intra–EU27.
Source: OECD METRO Model.

Table A.6. Impact on demand and supply components in the European Union

Per cent change from baseline

		FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
Austria	Real GDP	-0.3	-0.4	-0.3
	Final Domestic Demand	-0.4	-0.5	-0.5
	Goods and services import	-0.4	-0.7	-0.7
	Goods and services export	-0.3	-0.4	-0.4
Belgium	Real GDP	-0.6	-0.7	-0.7
	Final Domestic Demand	-0.8	-1.0	-0.9
	Goods and services import	-1.3	-1.6	-1.6
	Goods and services export	-1.1	-1.4	-1.4
Bulgaria	Real GDP	-0.2	-0.2	-0.2
	Final Domestic Demand	-0.3	-0.4	-0.4
	Goods and services import	-0.5	-0.6	-0.6
	Goods and services export	-0.3	-0.4	-0.4
Czech Republic	Real GDP	-0.2	-0.2	-0.2
	Final Domestic Demand	-0.4	-0.5	-0.4
	Goods and services import	-0.4	-0.6	-0.6
	Goods and services export	-0.2	-0.3	-0.3
Denmark	Real GDP	-0.8	-1.0	-1.0
	Final Domestic Demand	-1.0	-1.3	-1.2
	Goods and services import	-1.2	-1.7	-1.6
	Goods and services export	-0.8	-1.2	-1.1
Finland	Real GDP	-0.5	-0.6	-0.6
	Final Domestic Demand	-0.6	-0.8	-0.7
	Goods and services import	-0.9	-1.2	-1.2
	Goods and services export	-0.5	-0.7	-0.7
France	Real GDP	-0.5	-0.6	-0.5
	Final Domestic Demand	-0.5	-0.7	-0.6
	Goods and services import	-0.8	-1.1	-1.0
	Goods and services export	-0.6	-0.8	-0.8
Germany	Real GDP	-0.4	-0.5	-0.5
	Final Domestic Demand	-0.5	-0.7	-0.6
	Goods and services import	-0.8	-1.1	-1.0
	Goods and services export	-0.5	-0.6	-0.6
Greece	Real GDP	-0.2	-0.3	-0.3
	Final Domestic Demand	-0.3	-0.4	-0.3
	Goods and services import	-0.6	-0.8	-0.7
	Goods and services export	-0.6	-0.7	-0.6
Hungary	Real GDP	-0.4	-0.5	-0.5
	Final Domestic Demand	-0.5	-0.7	-0.7
	Goods and services import	-0.5	-0.8	-0.8
	Goods and services export	-0.3	-0.5	-0.5
Ireland	Real GDP	-2.2	-2.8	-2.5
	Final Domestic Demand	-4.1	-5.4	-4.9
	Goods and services import	-3.5	-4.7	-4.4
	Goods and services export	-1.9	-2.5	-2.3
Italy	Real GDP	-0.2	-0.3	-0.3
	Final Domestic Demand	-0.3	-0.4	-0.4
	Goods and services import	-0.7	-0.9	-0.9
	Goods and services export	-0.4	-0.5	-0.5

		FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
Luxembourg	Real GDP	-1.7	-2.4	-2.3
	Final Domestic Demand	-1.8	-2.5	-2.5
	Goods and services import	-5.0	-6.8	-6.5
	Goods and services export	-5.6	-7.6	-7.3
Netherlands	Real GDP	-0.4	-0.5	-0.5
	Final Domestic Demand	-0.6	-0.8	-0.7
	Goods and services import	-1.0	-1.3	-1.2
	Goods and services export	-0.5	-0.6	-0.6
Poland	Real GDP	-0.3	-0.3	-0.3
	Final Domestic Demand	-0.4	-0.5	-0.5
	Goods and services import	-0.6	-0.8	-0.8
	Goods and services export	-0.4	-0.5	-0.5
Portugal	Real GDP	-0.3	-0.4	-0.4
	Final Domestic Demand	-0.4	-0.5	-0.5
	Goods and services import	-0.7	-0.8	-0.8
	Goods and services export	-0.4	-0.5	-0.5
Slovakia	Real GDP	-0.1	-0.2	-0.2
	Final Domestic Demand	-0.3	-0.4	-0.3
	Goods and services import	-0.3	-0.4	-0.4
	Goods and services export	-0.1	-0.2	-0.2
Romania	Real GDP	-0.1	-0.2	-0.2
	Final Domestic Demand	-0.2	-0.3	-0.3
	Goods and services import	-0.4	-0.6	-0.5
	Goods and services export	-0.2	-0.3	-0.3
Slovenia	Real GDP	-0.3	-0.4	-0.3
	Final Domestic Demand	-0.4	-0.5	-0.5
	Goods and services import	-0.3	-0.6	-0.5
	Goods and services export	-0.2	-0.4	-0.4
Spain	Real GDP	-0.5	-0.6	-0.5
	Final Domestic Demand	-0.6	-0.7	-0.6
	Goods and services import	-1.0	-1.2	-1.1
	Goods and services export	-0.6	-0.8	-0.7
Sweden	Real GDP	-0.6	-0.7	-0.7
	Final Domestic Demand	-0.8	-0.9	-0.9
	Goods and services import	-1.1	-1.3	-1.3
	Goods and services export	-0.6	-0.8	-0.7
Baltic countries	Real GDP	-0.3	-0.3	-0.3
	Final Domestic Demand	-0.4	-0.4	-0.4
	Goods and services import	-0.5	-0.6	-0.6
	Goods and services export	-0.4	-0.5	-0.5

Note: Baltic countries refer to Estonia, Latvia and Lithuania.
Source: OECD METRO Model

Table A.7. Production changes in European Union

Per cent change from baseline

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
Austria	Agriculture & food	-0.3	-0.4	-0.4
	Natural resources	-0.3	-0.5	-0.4
	Textiles & wearing apparel	-0.2	-0.4	-0.4
	Other manufacturing	-0.6	-0.8	-0.8
	Chem rubber plastic prods	-0.2	-0.4	-0.5
	Pharmaceutical products	-0.5	-0.8	-0.8
	Min, metals, & metal prods	-0.3	-0.5	-0.6
	Computers & electronics	-0.5	-0.7	-0.8
	Machinery & equip nec	-0.2	-0.4	-0.5
	Motor vehicles & parts	0.7	0.5	0.5
	Utilities	-0.4	-0.5	-0.5
	Construction	-0.4	-0.5	-0.5
	Trade	-0.2	-0.3	-0.3
	Transport	-0.4	-0.5	-0.4
	Communication	-0.2	-0.3	-0.2
	Financial services & insur	0.1	0.2	0.3
	Business services nec	-0.1	-0.1	0.0
	Public Services	-0.8	-1.0	-1.0
	Other services	-0.2	-0.2	-0.2
Belgium	Agriculture & food	-0.9	-1.2	-1.2
	Natural resources	-0.2	-0.4	-0.3
	Textiles & wearing apparel	-3.3	-3.7	-3.7
	Other manufacturing	-1.7	-2.0	-2.0
	Chem rubber plastic prods	-0.7	-1.1	-1.1
	Pharmaceutical products	-1.0	-1.5	-1.5
	Min, metals, & metal prods	-0.8	-1.2	-1.2
	Computers & electronics	-1.2	-1.7	-1.8
	Machinery & equip nec	-0.8	-1.2	-1.2
	Motor vehicles & parts	-3.7	-4.1	-3.8
	Utilities	-0.9	-1.2	-1.2
	Construction	-0.9	-1.1	-1.1
	Trade	-0.7	-0.9	-0.8
	Transport	-0.5	-0.8	-0.7
	Communication	-0.5	-0.6	-0.5
	Financial services & insur	0.3	0.4	0.5
	Business services nec	-0.2	0.0	0.1
	Public Services	-1.5	-1.9	-1.8
	Other services	-0.3	-0.4	-0.4
Czech Republic	Agriculture & food	-0.3	-0.3	-0.3
	Natural resources	-0.2	-0.2	-0.2
	Textiles & wearing apparel	-1.2	-1.3	-1.2
	Other manufacturing	-0.4	-0.5	-0.5
	Chem rubber plastic prods	0.1	0.0	-0.1
	Pharmaceutical products	-0.7	-1.0	-1.0
	Min, metals, & metal prods	-0.3	-0.4	-0.4
	Computers & electronics	-1.4	-1.6	-1.5
	Machinery & equip nec	-0.5	-0.6	-0.6
	Motor vehicles & parts	1.4	1.2	1.2

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
	Utilities	-0.3	-0.3	-0.3
	Construction	-0.4	-0.5	-0.5
	Trade	-0.3	-0.3	-0.3
	Transport	-0.2	-0.3	-0.3
	Communication	-0.3	-0.3	-0.3
	Financial services & insur	0.2	0.4	0.4
	Business services nec	-0.1	-0.1	0.0
	Public Services	-0.2	-0.2	-0.2
	Other services	-0.3	-0.4	-0.4
Denmark	Agriculture & food	-1.2	-1.5	-1.6
	Natural resources	-0.2	-0.3	-0.2
	Textiles & wearing apparel	-2.1	-2.5	-2.5
	Other manufacturing	-1.1	-1.6	-1.5
	Chem rubber plastic prods	-0.6	-1.2	-1.2
	Pharmaceutical products	-0.6	-1.0	-1.1
	Min, metals, & metal prods	-1.1	-1.6	-1.6
	Computers & electronics	-0.8	-1.2	-1.3
	Machinery & equip nec	-1.1	-1.6	-1.6
	Motor vehicles & parts	0.9	0.4	0.4
	Utilities	-0.8	-1.1	-1.1
	Construction	-1.0	-1.3	-1.2
	Trade	-0.7	-1.0	-0.9
	Transport	-0.6	-0.9	-0.7
	Communication	-0.7	-0.9	-0.8
	Financial services & insur	0.3	0.5	0.6
	Business services nec	-0.6	-0.5	-0.4
	Public Services	-1.5	-2.0	-1.9
	Other services	-0.6	-0.9	-0.8
Finland	Agriculture & food	-0.4	-0.6	-0.5
	Natural resources	-0.6	-0.8	-0.7
	Textiles & wearing apparel	-0.1	-0.3	-0.3
	Other manufacturing	-1.1	-1.3	-1.3
	Chem rubber plastic prods	-0.1	-0.3	-0.4
	Pharmaceutical products	0.1	-0.1	-0.1
	Min, metals, & metal prods	-0.5	-0.7	-0.8
	Computers & electronics	-0.6	-1.4	-1.5
	Machinery & equip nec	-0.3	-0.6	-0.6
	Motor vehicles & parts	1.1	0.9	0.9
	Utilities	-0.6	-0.8	-0.8
	Construction	-0.6	-0.8	-0.8
	Trade	-0.5	-0.6	-0.6
	Transport	-0.5	-0.7	-0.6
	Communication	-0.5	-0.6	-0.5
	Financial services & insur	-0.2	-0.2	-0.2
	Business services nec	-0.2	0.0	0.0
	Public Services	-1.0	-1.3	-1.2
	Other services	-0.3	-0.4	-0.4
France	Agriculture & food	-0.4	-0.5	-0.5
	Natural resources	-0.4	-0.5	-0.5
	Textiles & wearing apparel	-1.3	-1.5	-1.5
	Other manufacturing	-0.8	-0.9	-1.0
	Chem rubber plastic prods	-0.5	-0.7	-0.8

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
	Pharmaceutical products	-0.9	-1.2	-1.2
	Min, metals, & metal prods	-0.4	-0.6	-0.7
	Computers & electronics	-0.5	-0.7	-0.7
	Machinery & equip nec	-0.4	-0.5	-0.6
	Motor vehicles & parts	0.0	-0.1	-0.1
	Utilities	-0.5	-0.6	-0.6
	Construction	-0.5	-0.7	-0.6
	Trade	-0.3	-0.4	-0.4
	Transport	-0.4	-0.5	-0.4
	Communication	-0.5	-0.6	-0.5
	Financial services & insur	-0.2	-0.3	-0.2
	Business services nec	-0.3	-0.3	-0.2
	Public Services	-1.0	-1.3	-1.2
	Other services	-0.3	-0.3	-0.3
Germany	Agriculture & food	-0.4	-0.5	-0.5
	Natural resources	-0.3	-0.4	-0.4
	Textiles & wearing apparel	-0.5	-0.7	-0.7
	Other manufacturing	-0.6	-0.7	-0.7
	Chem rubber plastic prods	-0.3	-0.5	-0.5
	Pharmaceutical products	-1.2	-1.5	-1.4
	Min, metals, & metal prods	-0.4	-0.6	-0.6
	Computers & electronics	-0.5	-0.7	-0.8
	Machinery & equip nec	-0.3	-0.4	-0.4
	Motor vehicles & parts	-0.1	-0.2	-0.2
	Utilities	-0.4	-0.6	-0.6
	Construction	-0.5	-0.7	-0.6
	Trade	-0.3	-0.4	-0.4
	Transport	-0.3	-0.4	-0.4
	Communication	-0.4	-0.4	-0.4
	Financial services & insur	0.0	0.0	0.1
	Business services nec	-0.3	-0.3	-0.2
	Public Services	-1.0	-1.2	-1.2
	Other services	-0.3	-0.3	-0.3
Greece	Agriculture & food	-0.2	-0.2	-0.2
	Natural resources	-0.4	-0.6	-0.5
	Textiles & wearing apparel	-0.1	-0.2	-0.3
	Other manufacturing	-0.3	-0.4	-0.4
	Chem rubber plastic prods	-0.5	-0.7	-0.7
	Pharmaceutical products	-1.8	-2.2	-2.2
	Min, metals, & metal prods	-0.3	-0.4	-0.5
	Computers & electronics	-0.3	-0.5	-0.7
	Machinery & equip nec	-0.5	-0.6	-0.6
	Motor vehicles & parts	0.4	0.4	0.3
	Utilities	-0.3	-0.4	-0.3
	Construction	-0.3	-0.4	-0.3
	Trade	-0.2	-0.3	-0.3
	Transport	-0.6	-0.7	-0.6
	Communication	-0.1	-0.1	-0.1
	Financial services & insur	0.1	0.2	0.2
	Business services nec	-0.1	-0.1	0.0
	Public Services	-0.6	-0.7	-0.6
	Other services	-0.1	-0.2	-0.2

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
Hungary	Agriculture & food	-0.3	-0.4	-0.4
	Natural resources	-0.4	-0.6	-0.5
	Textiles & wearing apparel	-0.5	-0.6	-0.6
	Other manufacturing	-0.6	-0.8	-0.8
	Chem rubber plastic prods	-0.2	-0.4	-0.5
	Pharmaceutical products	-0.5	-0.7	-0.7
	Min, metals, & metal prods	-0.6	-0.8	-0.9
	Computers & electronics	-1.3	-1.7	-1.7
	Machinery & equip nec	-0.7	-0.9	-0.9
	Motor vehicles & parts	1.0	0.8	0.8
	Utilities	-0.5	-0.6	-0.6
	Construction	-0.6	-0.7	-0.7
	Trade	-0.4	-0.6	-0.5
	Transport	-0.6	-0.7	-0.6
	Communication	-0.4	-0.4	-0.3
	Financial services & insur	-0.2	-0.2	-0.1
	Business services nec	-0.1	0.0	0.1
	Public Services	-0.8	-1.1	-1.0
	Other services	-0.3	-0.4	-0.4
Ireland	Agriculture & food	-6.6	-7.1	-7.1
	Natural resources	-2.6	-3.4	-3.0
	Textiles & wearing apparel	-13.0	-13.7	-13.3
	Other manufacturing	-2.2	-2.5	-2.4
	Chem rubber plastic prods	-0.6	-1.6	-1.8
	Pharmaceutical products	1.4	1.5	1.1
	Min, metals, & metal prods	-3.9	-4.9	-4.8
	Computers & electronics	-4.7	-5.1	-4.6
	Machinery & equip nec	-3.5	-3.5	-3.3
	Motor vehicles & parts	-1.4	-2.2	-1.8
	Utilities	-3.6	-4.8	-4.4
	Construction	-4.1	-5.4	-4.8
	Trade	-2.9	-3.9	-3.5
	Transport	-3.1	-4.2	-3.5
	Communication	-2.2	-3.1	-2.7
	Financial services & insur	-1.2	-2.1	-1.7
	Business services nec	-1.4	-1.8	-1.4
	Public Services	-5.5	-7.3	-6.5
	Other services	-3.0	-4.2	-3.9
Italy	Agriculture & food	-0.3	-0.4	-0.4
	Natural resources	-0.2	-0.3	-0.3
	Textiles & wearing apparel	-0.6	-0.8	-0.8
	Other manufacturing	-0.4	-0.5	-0.5
	Chem rubber plastic prods	-0.2	-0.3	-0.4
	Pharmaceutical products	-1.0	-1.3	-1.3
	Min, metals, & metal prods	-0.2	-0.3	-0.4
	Computers & electronics	0.0	-0.1	-0.2
	Machinery & equip nec	-0.3	-0.4	-0.4
	Motor vehicles & parts	0.6	0.5	0.5
	Utilities	-0.3	-0.4	-0.4
	Construction	-0.4	-0.5	-0.4
	Trade	-0.2	-0.3	-0.3
	Transport	-0.3	-0.3	-0.3

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
	Communication	-0.3	-0.3	-0.3
	Financial services & insur	-0.1	-0.2	-0.2
	Business services nec	-0.1	0.0	0.0
	Public Services	-0.7	-0.9	-0.9
	Other services	-0.2	-0.2	-0.2
Luxembourg	Agriculture & food	-1.4	-1.9	-1.9
	Natural resources	-1.4	-2.0	-2.0
	Textiles & wearing apparel	-0.6	-0.9	-1.0
	Other manufacturing	-2.3	-3.3	-3.3
	Chem rubber plastic prods	-1.3	-2.0	-2.2
	Pharmaceutical products	-0.9	-1.3	-1.4
	Min, metals, & metal prods	-3.3	-4.5	-4.7
	Computers & electronics	-2.1	-2.9	-3.1
	Machinery & equip nec	-2.0	-2.8	-2.8
	Motor vehicles & parts	1.8	1.3	1.1
	Utilities	-2.9	-4.0	-4.0
	Construction	-1.8	-2.5	-2.4
	Trade	-1.7	-2.4	-2.3
	Transport	-0.9	-1.3	-1.2
	Communication	-1.5	-2.1	-1.9
	Financial services & insur	-8.9	-12.0	-11.6
	Business services nec	-1.7	-2.2	-2.0
	Public Services	-2.7	-3.7	-3.6
	Other services	-2.2	-3.1	-3.0
Netherlands	Agriculture & food	-0.6	-0.7	-0.8
	Natural resources	0.0	0.0	0.0
	Textiles & wearing apparel	-2.2	-2.4	-2.4
	Other manufacturing	-0.5	-0.6	-0.7
	Chem rubber plastic prods	-0.1	-0.2	-0.3
	Pharmaceutical products	-0.5	-0.7	-0.6
	Min, metals, & metal prods	-0.1	-0.3	-0.3
	Computers & electronics	-1.3	-2.2	-2.3
	Machinery & equip nec	0.2	-0.1	-0.1
	Motor vehicles & parts	0.9	0.8	0.8
	Utilities	-0.5	-0.6	-0.6
	Construction	-0.6	-0.8	-0.8
	Trade	-0.4	-0.5	-0.5
	Transport	-0.3	-0.4	-0.3
	Communication	-0.4	-0.5	-0.4
	Financial services & insur	-0.2	-0.3	-0.2
	Business services nec	-0.3	-0.2	-0.1
	Public Services	-0.9	-1.1	-1.0
	Other services	-0.4	-0.5	-0.4
Poland	Agriculture & food	-0.3	-0.3	-0.4
	Natural resources	-0.3	-0.4	-0.3
	Textiles & wearing apparel	-0.1	-0.2	-0.2
	Other manufacturing	-0.6	-0.7	-0.7
	Chem rubber plastic prods	-0.2	-0.3	-0.3
	Pharmaceutical products	-0.4	-0.6	-0.6
	Min, metals, & metal prods	-0.4	-0.5	-0.5
	Computers & electronics	-1.4	-1.6	-1.6
	Machinery & equip nec	-0.6	-0.7	-0.8

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
	Motor vehicles & parts	1.0	0.8	0.8
	Utilities	-0.3	-0.4	-0.4
	Construction	-0.4	-0.5	-0.4
	Trade	-0.3	-0.3	-0.3
	Transport	-0.3	-0.4	-0.3
	Communication	-0.3	-0.3	-0.3
	Financial services & insur	0.1	0.2	0.2
	Business services nec	-0.1	0.1	0.1
	Public Services	-0.6	-0.7	-0.7
	Other services	-0.2	-0.3	-0.3
Portugal	Agriculture & food	-0.2	-0.2	-0.3
	Natural resources	-0.4	-0.5	-0.4
	Textiles & wearing apparel	-0.7	-0.7	-0.9
	Other manufacturing	-0.4	-0.4	-0.5
	Chem rubber plastic prods	0.1	0.1	-0.1
	Pharmaceutical products	-0.6	-0.8	-0.8
	Min, metals, & metal prods	-0.1	-0.1	-0.2
	Computers & electronics	-0.5	-0.6	-0.7
	Machinery & equip nec	-0.1	-0.1	-0.2
	Motor vehicles & parts	0.4	0.3	0.3
	Utilities	-0.3	-0.4	-0.4
	Construction	-0.5	-0.6	-0.5
	Trade	-0.3	-0.4	-0.3
	Transport	-0.7	-0.9	-0.7
	Communication	-0.3	-0.4	-0.3
	Financial services & insur	-0.1	-0.1	-0.1
	Business services nec	-0.3	-0.3	-0.2
	Public Services	-0.8	-1.0	-0.8
	Other services	-0.3	-0.4	-0.3
Romania	Agriculture & food	-0.1	-0.2	-0.2
	Natural resources	-0.1	-0.2	-0.2
	Textiles & wearing apparel	-0.4	-0.4	-0.5
	Other manufacturing	-0.2	-0.3	-0.3
	Chem rubber plastic prods	0.0	-0.1	-0.1
	Pharmaceutical products	-0.3	-0.3	-0.4
	Min, metals, & metal prods	-0.2	-0.2	-0.3
	Computers & electronics	0.0	-0.1	-0.2
	Machinery & equip nec	-0.1	-0.2	-0.2
	Motor vehicles & parts	0.3	0.2	0.2
	Utilities	-0.2	-0.3	-0.3
	Construction	-0.3	-0.4	-0.4
	Trade	-0.2	-0.3	-0.3
	Transport	-0.4	-0.6	-0.4
	Communication	-0.3	-0.3	-0.3
	Financial services & insur	0.1	0.2	0.2
	Business services nec	-0.3	-0.4	-0.3
	Public Services	-0.5	-0.6	-0.6
	Other services	-0.2	-0.3	-0.3
Slovakia	Agriculture & food	-0.3	-0.4	-0.4
	Natural resources	-0.3	-0.4	-0.3
	Textiles & wearing apparel	0.3	0.4	0.3
	Other manufacturing	-0.6	-0.6	-0.6

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
	Chem rubber plastic prods	0.0	-0.1	-0.1
	Pharmaceutical products	-0.7	-0.9	-0.9
	Min, metals, & metal prods	-0.3	-0.4	-0.4
	Computers & electronics	-1.0	-1.1	-1.1
	Machinery & equip nec	-0.2	-0.3	-0.3
	Motor vehicles & parts	0.9	0.8	0.8
	Utilities	-0.3	-0.3	-0.3
	Construction	-0.3	-0.3	-0.3
	Trade	-0.2	-0.3	-0.3
	Transport	-0.2	-0.3	-0.2
	Communication	-0.2	-0.3	-0.2
	Financial services & insur	0.4	0.5	0.6
	Business services nec	-0.1	-0.2	-0.1
	Public Services	-0.4	-0.5	-0.4
	Other services	-0.2	-0.3	-0.3
Slovenia	Agriculture & food	-0.3	-0.4	-0.4
	Natural resources	-0.3	-0.4	-0.4
	Textiles & wearing apparel	-0.1	-0.2	-0.2
	Other manufacturing	-0.6	-0.8	-0.7
	Chem rubber plastic prods	-0.1	-0.3	-0.4
	Pharmaceutical products	-0.3	-0.4	-0.5
	Min, metals, & metal prods	-0.5	-0.7	-0.7
	Computers & electronics	-0.3	-0.5	-0.5
	Machinery & equip nec	-0.5	-0.6	-0.7
	Motor vehicles & parts	1.1	1.0	0.9
	Utilities	-0.5	-0.7	-0.6
	Construction	-0.4	-0.5	-0.5
	Trade	-0.3	-0.4	-0.4
	Transport	-0.3	-0.5	-0.4
	Communication	-0.3	-0.3	-0.2
	Financial services & insur	-0.1	0.0	0.1
	Business services nec	-0.2	-0.1	0.1
	Public Services	-0.6	-0.9	-0.7
	Other services	-0.3	-0.4	-0.3
Spain	Agriculture & food	-0.4	-0.5	-0.5
	Natural resources	-0.5	-0.7	-0.6
	Textiles & wearing apparel	-0.4	-0.4	-0.5
	Other manufacturing	-0.5	-0.6	-0.6
	Chem rubber plastic prods	-0.2	-0.3	-0.4
	Pharmaceutical products	-0.7	-0.9	-0.9
	Min, metals, & metal prods	-0.5	-0.5	-0.6
	Computers & electronics	-0.1	-0.2	-0.3
	Machinery & equip nec	-0.4	-0.5	-0.5
	Motor vehicles & parts	-0.4	-0.5	-0.5
	Utilities	-0.5	-0.6	-0.6
	Construction	-0.6	-0.7	-0.7
	Trade	-0.5	-0.6	-0.5
	Transport	-0.7	-1.0	-0.8
	Communication	-0.5	-0.6	-0.5
	Financial services & insur	0.0	0.0	0.1
	Business services nec	-0.3	-0.4	-0.3
	Public Services	-1.0	-1.2	-1.1

EU member	Sector	FTA	TCA = FTA + end of free movement of people	TCA + further services liberalisation
	Other services	-0.4	-0.5	-0.4
Sweden	Agriculture & food	-0.5	-0.6	-0.6
	Natural resources	-0.7	-0.8	-0.8
	Textiles & wearing apparel	-2.1	-2.3	-2.4
	Other manufacturing	-1.3	-1.5	-1.5
	Chem rubber plastic prods	-0.2	-0.4	-0.4
	Pharmaceutical products	-0.8	-1.1	-1.2
	Min, metals, & metal prods	-0.6	-0.7	-0.8
	Computers & electronics	-0.2	-0.3	-0.5
	Machinery & equip nec	-0.6	-0.8	-0.9
	Motor vehicles & parts	0.4	0.2	0.2
	Utilities	-0.6	-0.8	-0.7
	Construction	-0.8	-0.9	-0.8
	Trade	-0.5	-0.6	-0.5
	Transport	-0.6	-0.7	-0.6
	Communication	-0.6	-0.7	-0.6
	Financial services & insur	-0.2	-0.1	-0.1
	Business services nec	-0.4	-0.4	-0.3
	Public Services	-1.4	-1.6	-1.5
	Other services	-0.4	-0.5	-0.5
Baltic countries	Agriculture & food	-0.1	-0.1	-0.1
	Natural resources	-0.1	-0.2	-0.1
	Textiles & wearing apparel	-1.4	-1.5	-1.5
	Other manufacturing	-0.2	-0.2	-0.2
	Chem rubber plastic prods	-0.2	-0.3	-0.3
	Pharmaceutical products	-1.4	-1.8	-1.7
	Min, metals, & metal prods	-0.1	-0.2	-0.2
	Computers & electronics	0.1	0.1	-0.1
	Machinery & equip nec	-0.3	-0.4	-0.5
	Motor vehicles & parts	1.1	1.1	1.0
	Utilities	-0.2	-0.2	-0.2
	Construction	-0.2	-0.3	-0.3
	Trade	-0.2	-0.3	-0.2
	Transport	-0.3	-0.4	-0.3
	Communication	-0.2	-0.2	-0.1
	Financial services & insur	0.2	0.4	0.4
	Business services nec	-0.1	0.0	0.1
	Public Services	-0.4	-0.5	-0.4
	Other services	-0.1	-0.2	-0.1

Note: Baltic countries refer to Estonia, Latvia and Lithuania.
Source: OECD METRO Model

[1] Equivalence has been granted in very limited areas. Three UK clearing houses can continue to provide cross-border services in the EU until June 30, 2022. At the moment EU firms can still provide a certain range of financial services to the UK, and the UK also uses this framework to grant equivalence to other countries. The European Commission also adopted a temporary equivalency decision, valid for the first six months of 2021, for the regulatory and supervisory framework applicable for central securities depositories established in the United Kingdom.

[2] For more detail about the elasticities used in METRO, see the model documentation (OECD, 2020b).

[3] Similarly, trade agreements between the European Union and other countries are not included in the analysis.

[4] The motivation for the 50% rate on the estimated tariffs is outlined in Kierzenkowski et al., (2018). The simulations increase the NTM-related trade costs from the low levels that existed when the UK was in the EU. However, the analysis does not assume that the trade costs will increase to the same level as when trading with other non-EU partners. Instead the additional costs would be equivalent to half the trade costs that apply to extra-EU trade. The 50% is arguably arbitrary, and lies between two extremes: on the one hand a situation where the UK would not diverge in regulation and all existing provisions would continue to exist, and on the other hand a situation where the UK would be completely diverging from the current state. There are no broad equivalence or mutual recognition mechanism in place that would argue in favour of drastically lower NTM-related trade costs, and at the same time, the current regulatory systems are much aligned so that proof of compliance should not be as costly as for other trade partners. Clearly, the true extent of NTM-related trade costs between the UK and the EU will only be known with more precision when the agreement will have been implemented for some time.

[5] The ad valorem equivalent (AVE) of an NTM is the proportional rise in the domestic price of the good due to the presence of the NTM (Cadot et al., 2018), and it represents the additional cost of importing the good because of the measure. The increase in trade cost due to changes in non-tariffs measures are added as iceberg costs into the model.

[6] This is an updated assumption from Arriola et al. (2020) where trade cost increases in the financial and insurance sectors were the same as those of the other business services sector.

[7] Those estimates appear small in light of the actual border disruptions observed in the first weeks of 2021 when the UK's exit of the single market became a fact. However, those disruptions are likely temporary as exporters and importers adapt to the new administrative requirements. The border cost increases applied in the modelling are intended to reflect the permanent element.