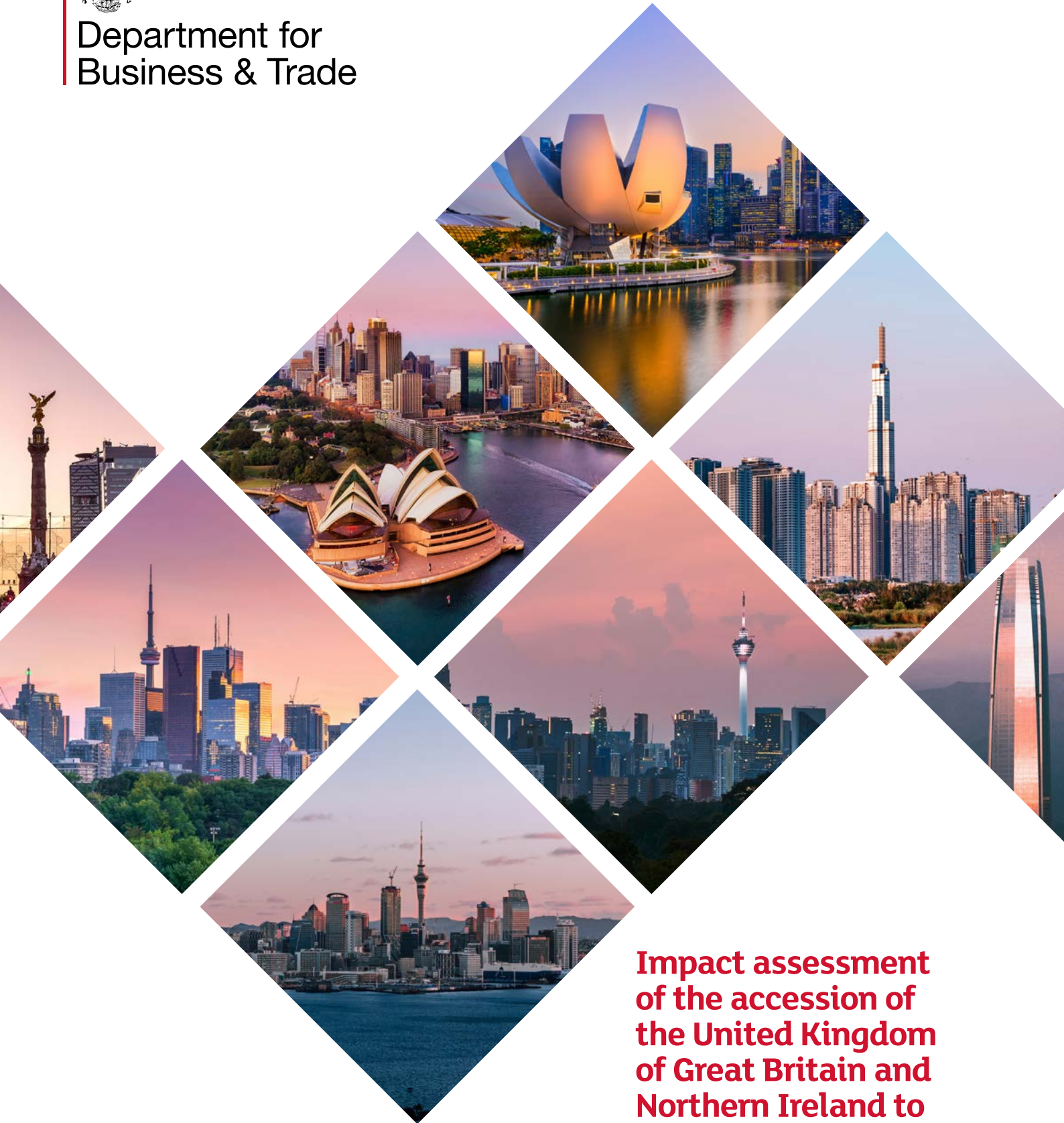




Department for
Business & Trade



**Impact assessment
of the accession of
the United Kingdom
of Great Britain and
Northern Ireland to
the Comprehensive
and Progressive
Agreement for
Trans-Pacific
Partnership**

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Executive summary

The Department for Business and Trade (DBT), with other government departments, has negotiated the United Kingdom's (UK) accession to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). This comprehensive agreement will support UK businesses by making it easier for them to trade with CPTPP. It will facilitate innovation and provide consumers with more choice. The agreement could generate long-term benefits for both the UK and CPTPP, support UK jobs and provide opportunities for growth in sectors across the UK.

CPTPP is one of the largest free trade areas in the world. The current members of CPTPP are Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam. The CPTPP free trade area is populated by half a billion people with a joint gross domestic product (GDP) of £9 trillion in 2022.¹ The combined GDP of the 11 CPTPP members and the UK was around £12 trillion in 2022. This Free Trade Agreement (FTA) spans the Asia-Pacific and the Americas and includes some of the world's largest current and future economies.

CPTPP will also provide the UK with a stepping stone to trade with the wider strategically important Indo-Pacific. It is expansionary at its heart. As new members join, the UK will be able to benefit from its expansion and increased opportunities to trade. Economies including Costa Rica, Ecuador and Uruguay have all formally applied to join CPTPP. Thailand, the Philippines and Republic of Korea have also expressed an interest in joining. The combined GDP of all CPTPP members and the UK could increase to over £14 trillion in 2022 if these other economies were to join CPTPP.² This expanded CPTPP would cover 9% of all UK exports in 2022.³ In the future it is expected that CPTPP could expand even further, providing even greater economic benefits for its members. CPTPP has also been seen as a pathway to a potential pan-Asia-Pacific FTA.

CPTPP is a modern and comprehensive agreement which aims to enhance the existing trading and investment relationship between the UK and CPTPP members. This agreement will make trade easier by reducing or eliminating tariff and non-tariff barriers, leading to more trade and potentially lower costs for consumers. The agreement creates new opportunities for UK businesses, going further in some areas than our existing bilateral FTAs that we currently have with some CPTPP members. It will also increase collaboration and support the integration of global value chains between members, leading to economic opportunities beyond the scope of most UK FTAs.

Trade agreements lead to some degree of reallocation of resources across sectors. Some sectors expand, taking advantage of new opportunities for higher returns following lower barriers to trade and drawing resources from other sectors in the process. Accession to CPTPP is estimated to increase bilateral trade (between the UK and all CPTPP countries) by £4.9 billion when compared to 2040 projected levels of trade. 19 out of 23 UK sectors are expected to expand because of accession, with 4 sectors estimated to experience slower growth relative to the baseline. This is expected to contribute to an estimated increase in UK GDP of £2.0 billion and CPTPP's GDP of £2.4 billion compared to 2040 projections. These

¹ [IMF World Economic Outlook Database](#), April 2023 edition.

² [IMF World Economic Outlook Database](#), April 2023 edition. And Bank of England 2022 average exchange rate. The combined GDP of £14 trillion includes all eleven CPTPP current members, the UK, Costa Rica, Ecuador, Thailand, Philippines, Republic of Korea and Uruguay

³ [ONS, UK total trade: all countries seasonally adjusted data](#), released 27th April 2023

incremental economic impacts are felt each and every year in the long run, once the impacts of the agreement have worked through the economy.

There are also substantial opportunities from the expansion of the agreement as CPTPP acts as a pathway to greater integration in a region that is also growing. This potential future expansion of CPTPP is outside of the direct scope of this agreement and therefore not included in the formal modelling scenario. It is nevertheless an important motivator for the agreement. Academics who have modelled the potential future expansion of members show economic potential arising from CPTPP leading to significantly greater gains to UK GDP. It also suggests CPTPP could help protect UK economic interests in a world of increasing geopolitical fragmentation.⁴ DBT's own illustrative modelling also shows the potential benefits of future expansion.

This impact assessment sets out DBT's assessment of the economic, social, and environmental impacts of the agreement.

The agreement

CPTPP supports the government's strategy of continuing to develop the UK's status as an independent trading nation. CPTPP is a deep and comprehensive FTA that covers trade relations among its Parties, including on goods and services.

It further covers provisions which relate, for example, to regulatory coherence, labour standards and the environment.

Goods trade

- the agreement reduces tariff barriers for exporters. Joining this existing trade agreement means that over 99% of current UK goods exports to CPTPP members will be eligible for tariff-free trade. As membership to CPTPP expands, the UK will be able to export goods to these new parties on preferential terms. It particularly benefits our exports to Malaysia, since at the moment these exports face Malaysia's standard, non-preferential tariffs
- it could reduce import prices for UK businesses and consumers. Joining CPTPP will also eventually remove nearly all tariffs imposed on UK imports from CPTPP, which could mean cheaper import prices on goods in the UK for businesses and consumers. It also retains protections for some products in sensitive sectors for the UK for a number of years
- the agreement provides the opportunity for UK businesses to diversify their supply chains. UK businesses can use inputs from all CPTPP Parties in the production of their goods. This could make it easier for UK exports with supply chains in CPTPP Parties to qualify for the preferential tariffs agreed in this FTA
- it will help reduce the administrative burden for businesses of all sizes across the UK, including through commitments to transparent and efficient customs procedures, agreements on technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures as well as a dedicated small and medium-sized enterprises (SME) chapter

⁴ Petri & Plummer's contributions to "ASEAN and Global Value Chains" (Chapter 6)
<https://www.adb.org/sites/default/files/publication/871976/asean-global-value-chains-resilience-sustainability.pdf>

Services, investment and temporary entry for business persons

- the agreement could provide more export opportunities for UK services providers. The UK is the world's second largest services exporter with service industries accounting for around 80% of total UK economic output in 2022.⁵ CPTPP presents a significant opportunity for the UK's service industries to expand their trading relationship with CPTPP markets. CPTPP sets ambitious rules for trade in services between members and will help prevent barriers that hinder UK firms from selling services in CPTPP markets. This includes:
 - prohibiting discrimination against other Parties' service suppliers
 - prohibiting quantitative restrictions on cross-border trade in services
 - prohibiting requirements that service suppliers must set up an office or be resident in order to supply services
 - setting out rules on the administration of domestic measures, including those that relate to authorisations, and rules on transparency
- CPTPP will provide greater certainty on the terms of services trade for UK service suppliers who exported around £32 billion worth of services to CPTPP countries in 2022⁶
- it could encourage investment between the UK and CPTPP countries. Inward investment stocks to the UK from CPTPP countries were worth at least £181.8 billion in 2021. Outward investment stocks from the UK to CPTPP countries were worth at least £117.3 billion over the same period.⁷ The investment chapter in CPTPP includes provisions that will further deepen those investment relationships between the UK and CPTPP Parties by limiting barriers to overseas investment and ultimately make it easier for UK investors to establish and operate in CPTPP economies. The investment chapter also encourages foreign investments by prohibiting a range of market distorting practices, including discriminatory treatment of foreign investors and the imposition of conditions for the making of investments
- it will also facilitate easier travel for UK business persons to CPTPP countries, providing greater legal certainty on temporary entry routes for UK citizens. This ensures important clarity for individuals and businesses across multiple sectors, paving the way for long-term economic growth and investment

Digital trade

- it includes cutting-edge digital trade provisions that reduce barriers. Remotely delivered services from the UK to CPTPP were worth £23.0 billion in 2021.⁸ CPTPP sets modern rules for digital trade across all sectors and will support UK businesses of all sizes to seek new opportunities in CPTPP markets

Government Procurement

- CPTPP accession will ensure that UK businesses receive fair and non-discriminatory treatment when competing for government contracts of CPTPP members. This will build on the existing comprehensive agreements the UK has with most member countries. It will provide UK businesses with even greater access to opportunities in their government procurement markets in several areas

⁵ [ONS, GDP Output Approach – low level aggregates](https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/ukgdpolowlevelaggregates), released May 2023 (<https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/ukgdpolowlevelaggregates>)

⁶ [ONS, UK total trade: all countries seasonally adjusted data](#), released 27th April 2023

⁷ [ONS Foreign direct investment \(FDI\) totals for inward and outward flows, positions and earnings](#), released 24th January 2023

⁸ [ONS, UK Trade in services by modes of supply: 2021](#), released 5th April 2023. Please note data does not include figures for Brunei, Peru, and Vietnam.

- it will also mark the UK's first ever trade agreement containing government procurement provisions with Brunei and Malaysia. This will create entirely new access to opportunities for UK businesses in the government procurement markets of both countries

Supporting free trade

- the agreement supports free trade and high standards. For example, the agreement includes strong intellectual property protections. It also includes provisions that support free and trusted cross-border data flows and measures to reduce the market-distortive practices of State-Owned Enterprises. The agreement will also enable enhanced engagement between members on other trade-related issues such as labour standards
- the agreement also maintains high standards on issues that matter to UK consumers, such as food standards and the environment. For example, on food standards, all food and drink products imported into the UK will continue to have to comply with our import requirements. On the environment, the agreement seeks to promote mutually supportive trade and environmental policies. It also seeks to promote high levels of environmental protection and to strengthen cooperation in a range of areas

The impact of the agreement

CPTPP members' economies accounted for £113 billion worth of UK trade in 2022, having grown 10% between 2018-2022.⁹ DBT's Global Trade Outlook projections suggest that, in the absence of the agreement, the future growth of CPTPP's import market could lead to an extra £15.9 billion in UK exports by 2040. This represents a 28.4% increase in UK exports to CPTPP in real terms (2021 prices and exchange rates) compared to 2021.¹⁰ Greater access to CPTPP markets and reduced regulatory burdens on goods and services are expected to bring extensive opportunities for UK businesses and consumers.

Macroeconomic impacts – central estimates

To provide a clear assessment of the incremental impacts, the core analysis focusses only on the additional liberalisation gained from accession, above and beyond any existing agreements. Therefore, this analysis does not attempt to capture the benefits from the number of existing agreements that have cumulated to form CPTPP. Even so, it is important to recognise that accession to CPTPP represents the culmination of a programme of negotiations. Collectively this has much greater value than that set out below and we explore this in additional illustrative analysis outlined in section 4. Furthermore, the value of CPTPP goes beyond the sum of the individual agreements that shape it. This value arises from the opportunity for deeper integration, institutional development, and expansion as protection from an increasingly fragmented world.

Our analysis shows that UK trade with CPTPP members could increase by the equivalent of £4.9 billion (3.9%) in the long run. This increase is compared to projected levels of trade in 2040 (in 2021 prices) without the agreement.¹¹ The increase is driven by reductions in regulatory restrictions to trade, tariff reductions, and income and supply chain effects as the

⁹ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

¹⁰ 2040 projections for UK total exports and imports are calculated using the methodology described in DBT's [Global Trade Outlook, February 2023](#).

¹¹ 2040 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook. For bilateral trade between the UK and CPTPP in 2040, it is further assumed that both the UK and CPTPP lose market shares of partner import demand in line with their relative loss of global market shares (as projected in the Global Trade Outlook).

UK economy grows. It does not capture any additional impacts of the increased flexibility to supply chains, which cannot be explicitly captured in the model. This, and other estimates are subject to a high degree of uncertainty. The modelling does not attempt to predict the many other influences that will shape the UK and global economies over this period.

This assessment also shows that UK gross domestic product (GDP) could increase by the equivalent of £2.0 billion in the long run. Like the trade results, the estimate is subject to a high degree of uncertainty.

Real take home pay for UK workers is estimated to increase by around 0.1%, the equivalent of £1.0 billion for the whole country.¹² This is when compared to 2021 estimates of wages without the agreement. The uplift is expected to apply in real terms, whatever the level of future wages.¹³

The aggregated GDP of CPTPP members could increase by £2.4 billion in 2040 (in 2021 prices).¹⁴

The estimated changes outlined above are in addition to any long-term underlying growth. In this context, the long run is typically assumed to be a period of around 10-15 years after implementation.

The point estimates presented do not represent precise estimates. They represent an indication of the direction of impacts and broad orders of magnitude. These estimates are based on certain assumptions about the global economy and the UK-CPTPP trade relationship and are subject to various forms of uncertainty.

There are wider sources of current and future uncertainty that are not reflected in the modelling. These include current uncertainties (such as high inflation and the conflict between Russia and Ukraine) and future uncertainties (such as climate change, globalisation, future health pandemics and technological developments).

CPTPP is set to expand its membership further with several other countries having already expressed an interest in joining. This would, if agreed, increase the economic value of membership and its longer-term strategic value, increasing its collective clout. We can raise the aspirations and standards of those who want to join and establish dialogue with any who do. Plurilateral deals like CPTPP give us the chance to go further and deeper in liberalising our trading arrangements with a group of likeminded countries. They raise ambition in trade policy - reaching more widely than bilateral agreements and moving more quickly than the World Trade Organization (WTO). Through CPTPP, we can create momentum behind ambitious approaches to trade, and support the progress the UK would like to see, ultimately, at the WTO.

DBT's central estimate of a £2.0 billion GDP gain each year in the long run is based on the UK's accession to the 11-member CPTPP. It captures the permanent gain from accession to the current membership only. It does not capture the potential economic benefits that could arise from CPTPP expanding further and acting as a pathway to greater integration in the

¹² This is a long run estimated wage impact, when applied to 2021 wage data.

¹³ This does not take inflation in subsequent years into account. This is not captured in the CGE modelling, and the potential impact of inflation on the results is discussed in Section 7.

¹⁴ Refers to CPTPP members prior to the UK acceding. UK impacts are presented separately.

region and beyond. This is in fact the fundamental strategic reason for pursuing accession to CPTPP.

Illustrative modelling undertaken by DBT shows the potential marginal impact for the UK if other countries join CPTPP. Should Ecuador, Costa Rica, Uruguay, Republic of Korea, Colombia, Philippines, and Thailand join alongside the UK, the modelling estimates that this could boost UK GDP by around £4.3 billion (2021 prices) in the long-run, relative to the absence of the agreement. Alternatively, if the US and the rest of ASEAN countries (Laos, Cambodia, and Indonesia) were to join CPTPP, this could boost UK GDP by £19.5 billion (2021 prices) in the long-run. These results are subject to uncertainty and further details are outlined in section 4. If all the countries above were to join, this could boost UK GDP by £21.4 billion (2021 prices). Note that these are hypothetical scenarios and do not reflect UK government policy on future CPTPP membership.¹⁵ These results are subject to uncertainty and further details are outlined in section 4.

CPTPP represents the culmination of a programme of bilateral and plurilateral negotiations. If we look at the full standalone value of the agreement, compared to a situation where no agreements were in place with member countries, illustrative modelling suggests it could boost UK GDP by around £13.5 billion (2021 prices) every year in the long-run. This result is based on a number of simplifying assumptions and is subject to a greater degree of uncertainty than the core CGE results. It estimates the impact to the UK of joining CPTPP, absent existing bilateral agreements. It does not demonstrate the marginal impact of acceding to CPTPP, but is included here to highlight the overall benefit to the UK of this trading relationship with this group of countries.

Petri and Plummer (2023) estimate the impact of an expanded CPTPP and increased economic cooperation amidst increasing geopolitical fragmentation. Whilst these estimates do not account for some existing UK agreements (post-2017) with CPTPP members in the baseline, they suggest an impact of up to \$42 billion (2014 prices), equivalent to £31 billion (2021 prices), depending on the expanded membership scenario.¹⁶ This analysis is not directly comparable with DBT's estimates above due to differences in non-tariff and tariff assumptions and methodologies, and in the authors' own words "the trends and policy alternatives examined [...] are highly uncertain". Further details on this study are included in section 7.

¹⁵ We understand that the following economies have formally applied to join CPTPP: China, Taiwan, Costa Rica, Ecuador, Uruguay and Ukraine.

¹⁶ This figure is calculated using Petri & Plummer's \$42 billion estimate (2014 prices) and converting this into 2021 £ values using the ONS GDP deflator and the Bank of England exchange rate.

Limitations of Computable General Equilibrium (CGE) modelling

GCE modelling is a globally-used approach to provide indicative results of the order of magnitude of likely marginal macroeconomic impacts, and the relative importance of impacts on sectors. It is an inherently uncertain exercise and like any modelling depends on stylised assumptions. The CGE modelling presented in this impact assessment is subject to several limitations:

- it does not capture the full range of dynamic impacts that may result from the trade agreement such as increases in productivity that may occur through a range of channels, such as knowledge exchanges and improvements in firm productivity in response to the increased competition in UK and other markets resulting from the agreement
- it does not attempt to estimate the value of increased resilience for UK businesses and consumers in the face of regional or global shocks through enhanced and more secure access to a diverse range of markets
- in addition, because CGE models need data on all trade routes and national production across all regions, CGE models operate at a level of aggregation which may miss many of the nuances of supply chains and interlinkages that can provide a comprehensive understanding of the impacts from an FTA

In addition, CGE models do not provide a forecast of future output and trade flows by attempting to capture the effect of policies and changes outside the agreement, that might affect future growth and trade flows, including:

- future changes to the sectoral composition of the UK and CPTPP economies resulting from shocks, the implementation of other policies or changes in the global environment separate to the agreement, as outlined in section 7. This includes uncertainties such as the impact of, and response to, Russia's invasion of Ukraine, climate change, changes in globalisation, the pandemic, and changes to CPTPP demographics.
- the impacts of recent and future policy choices or international trade agreements which may influence the value of the agreement

Future changes to UK and CPTPP economies and global trends

The modelling uses the latest available Global Trade Analysis Project (GTAP) dataset - 2017 - at the time of the analysis, as the benchmark dataset and therefore does not account for several trends or changes in trends that have appeared in subsequent years which could influence the impact of UK accession to CPTPP. The model does not take into account:

- global trends such as the increasing importance of Asia and Africa to the global economy
- changing demographics and the growing global middle class
- geo-political developments and their impacts on global value chains and UK-CPTPP trade in general

While these factors are likely to affect the impact of the agreement, they go beyond the scope of the CGE model. Some of these trends are discussed in DBT's Global Trade Outlook. Wider uncertainties are also discussed in section 7 of this impact assessment.

Sectoral impacts

Our analysis shows that most of the GDP gains are driven by the reduction in non-tariff measures (NTMs) between the UK and CPTPP members. Non-tariff measures are measures other than tariffs and tariff-rate quotas that can act as a barrier to international trade (like regulations, rules of origin and quotas). Some of the sectoral results are driven by the growth of the most liberalised sectors increasing the demand for inputs such as labour. Subsequent increases in take home pay can lead to resources being allocated away from other sectors. This means that certain sectors can become less important for the UK economy over time even if they benefit directly from provisions of the deal.

Our analysis is conducted using a CGE modelling framework. While being considered best in class, the standard framework nevertheless relies on a range of assumptions, such as fixed labour force participation. These assumptions can have important implications particularly for the general equilibrium effects described above. In addition, these impacts only materialise in the long run as the economy has time to adjust. However, the modelling does not account for other structural changes that may affect the economy in the long run and could impact sectoral results. These factors need to be taken into account as they introduce uncertainty to the sector results.

Our analysis shows the strongest gross value added (GVA) contribution to estimated growth on a 2021 basis is concentrated within services and industry sectors (broadly classified). 19 out of 23 UK sectors are expected to expand as a result of the accession, by more than they would have done without accession, with 4 sectors estimated to grow less than they would have done otherwise.

Goods trade

Reduced tariffs boost market access and increase choice for businesses seeking to source inputs from CPTPP countries. They also help to widen choice and can lower prices for consumers. However, this will also expose some UK businesses to increased competition from CPTPP exporters.

Businesses will be able to access preferences on UK goods exports to CPTPP countries. On current exports, this would reduce the annual tariff duties by around £119 million if exports use all available preferences.¹⁷ Businesses will be able to access preferences on UK goods imports from CPTPP. On current imports, this would reduce the annual tariff duties by around £33 million if imports use all available preferences.¹⁸ This is the estimated annual reduction in tariff duties based on liberalisation at the end of the tariff staging period. These are over and above existing bilateral agreements (e.g., Japan, Australia and New Zealand FTAs). The estimates include new tariff liberalisation with Malaysia and Brunei relative to trading on most favoured nation (MFN) terms. Amongst the benefitting businesses are SMEs which are well-represented in sectors that benefit the most from the agreement.

¹⁷ Estimated reduction in annual tariff duties paid on current exports calculated after all staging is complete. They are based on 2017-2019 average trade flows and do not reflect changes in the UK's trading pattern since then, including the UK's exit from the EU. These estimates assume full utilisation of all available preferences, which is unlikely to be in the case in practice.

¹⁸ Estimated reduction in annual tariff duties paid on current imports calculated after all staging is complete. They are based on 2017-2019 average trade flows and do not reflect changes in the UK's trading pattern since then, including the UK's exit from the EU. These estimates assume full utilisation of all available preferences, which is unlikely to be in the case in practice.

The negotiated agreement will also reduce non-tariff measures, lowering the costs of accessing CPTPP markets, and facilitating trade.

Reductions in goods NTMs and tariffs make accessing the CPTPP market cheaper, which can facilitate higher exports from some UK sectors. The goods sectors that expand the most in GVA in absolute terms are the manufacture of motor vehicles (+£183 million) and textiles, apparel and leather (+£90 million). The reductions in tariffs and NTMs negotiated lead to higher exports in these sectors by £712 million and £186 million respectively. The goods sectors most at risk in terms of absolute GVA impacts are manufacture of electronic equipment (-£67 million compared to the baseline) and other transport equipment (-£24 million).¹⁹ This is mainly due to increased import competition.

Sectoral results are subject to a high degree of uncertainty. This is due to the limitations of any economic modelling to fully capture the complexities of reality or to account for future global developments.

Consumers could also benefit from the removal of tariffs on UK imports of CPTPP goods through lower import prices. The extent to which consumers could benefit depends on the extent to which businesses pass on savings. The agreement will see the removal of tariffs on products currently imported from CPTPP such as tariffs on fruit juices from Chile and Peru, honey and chocolate from Mexico, and vacuum cleaners from Malaysia.

The estimated gains to CPTPP members are driven by expansions in the manufacture of other transport equipment, and textiles and wearing apparel sectors.

Services trade

Services sectors are among the main beneficiaries of the agreement. In 2022 services accounted for 43% of the UK's total trade with CPTPP countries. The top services exports to and from CPTPP countries were other business services (£9.7 billion in exports and £7.1 billion in imports) and financial services (£6.7 billion in exports and £1.6 billion in imports).²⁰ 'Other business services' captures professional services, including auditing, accounting and legal services. The UK's accession enables all parties to reduce services trade restrictions, reduce legal uncertainty over the terms of trade and increase services trade.

These reductions in services trade restrictions facilitate higher exports to CPTPP. UK exports of communications are estimated to increase by +£99 million, and business services exports are estimated to increase by +£55 million. UK imports from CPTPP countries increase most in the wholesale and retail trade (+£93 million) and financial services (+£82 million) sectors.²¹

Higher exports and expansions in goods and services sectors stimulate higher output in services sectors overall. On services, the modelling shows that the largest GVA expansions in absolute terms come from three main sectors. These are other services 'transport, water, dwellings' (+£187 million), construction (+£119 million) and public services (+£76 million). This is driven mainly by income and supply-chain effects as other parts of the UK economy, particularly manufacturing sectors, grow as a result of the agreement. This is as opposed to them expanding directly as a result of improved access under the agreement. Expansion of public services is not driven by any structural changes to the NHS. Instead, it is a reflection of

¹⁹ Long run changes in GVA are presented in 2021 prices.

²⁰ [ONS, UK trade in services: service type by partner country, non-seasonally adjusted](#), 2022, released 27th April 2023

²¹ Long-run changes in imports or exports by sector are presented in 2021 prices.

households demanding more goods and services as the economy grows. Reductions in regulatory burdens to trade in services are also central driving factors.

Joining CPTPP will lead to greater opportunities for UK financial services firms through a reduction in barriers from cross-cutting services provisions and specific commitments.

Competition

The overall structure of the UK economy remains broadly unchanged by the agreement. There will be wider structural changes that occur in the economy that are not taken into account in this assessment, in order to isolate the impacts of the deal alone. However, part of the gains results from a reallocation of resources away from some sectors and towards the growing sectors, as set out above.²² The economic benefits of FTAs do not arise without reallocation of resources within the economy (sometimes referred to as the gains from greater specialisation). The process of economic adjustment can give rise to adjustment costs for affected sectors, businesses, and their employees. There is a risk that these adjustment costs are more likely to be felt by businesses in regions where these sectors are concentrated.

Impacts on UK nations and English regions

All UK nations and English regions could see an increase in output from UK accession to CPTPP. Growth in the UK's manufacturing sectors is the core driver of estimated differential effects across UK nations and regions.

Modelled expansions to services sectors accounts for positive growth across all UK nations and English regions. This partly reflects growth in non-tradeable services sectors. These sectors expand as a result of higher demand from manufacturing sectors which use their services as intermediate inputs.

Some regions grow relatively more due to their greater concentration of expanding manufacturing sectors. The economies of the West Midlands and East Midlands are estimated to expand by around £320 million and £210 million respectively relative to 2019 values. This is based on a 0.22% and 0.19% modelled increase in their GVA respectively. London is estimated to expand by 0.15%, the lowest relative to all other UK nations and regions, this is nonetheless equivalent to around a £700 million increase in GVA.

GVA in Scotland, Wales and Northern Ireland is also estimated to increase as a result of the agreement. Scotland and Wales are estimated to see an increase in GVA of around £240 million and £110 million respectively relative to 2019 values. This is based on a 0.16% modelled increase in both Scotland's and Wales' GVA. Northern Ireland's GVA is estimated to increase by around £70 million relative to 2019 values, which is also based on a 0.16% increase.

²² In our CGE model factors of production, i.e. capital and labour, are allowed to reallocate across sectors without any frictions, resembling a long-run equilibrium. However, as in every modelling exercise, this might be an oversimplifying modelling assumption and over the short to medium term it might not be a comprehensive description of the reality for a variety of reasons (e.g. sector-specific and non-transferable skills).

Wider Impacts

An FTA could have wider effects on economic and social development of third party countries as well as environmental impacts.

The GDP of most other developing countries is estimated to be largely unaffected as a result of the FTA, with the exception of Thailand. There is a small negative impact on Thailand of less than -£0.1 billion (compared to 2021 levels) as a result of trade reallocation. However, this reduction in GDP does not imply that its economy will not grow over the long-term.

The increase in economic activity and trade arising from FTAs can also entail consequences for the environment. Other things equal, increased economic activity is typically associated with increases in greenhouse gas emissions and implications for environmental outcomes such as air pollution, water-quality, and biodiversity.

The net increase in global greenhouse gas (GHG) emissions as a consequence of the UK's accession to CPTPP is likely to be negligible. It is estimated that global emissions could increase by around 1.03MtCO₂ (0.003%). This mainly reflects an increase in UK and CPTPP GHG emissions, which are estimated to increase by 0.5 MtCO₂e (0.12%) and 1.45 MtCO₂e (0.05%) respectively.²³ These estimates do not capture transport emissions. The analysis does not account for reductions in emissions from the baseline year or projected reductions in emissions in the future.

Trade flows between the UK and CPTPP are estimated to increase by 3.9% relative to the baseline. Our modelling suggests that this could be associated with around a 4% increase in transport emissions between the UK and CPTPP - or 0.13 MtCO₂e to 0.15 MtCO₂e respectively.²⁴ For comparison, total UK GHG emissions in 2019 were equivalent to 547 MtCO₂e.²⁵

The agreement is not expected to have a significant impact on wider environmental issues, such as biodiversity, deforestation, and water pollution. The extent of any impacts will depend on how domestic and international policies mitigate this risk.

Next steps

Ongoing monitoring and evaluation (M&E) of the implementation and impacts of the agreement is an important part of ensuring that the predicted impacts materialise. They are also an important part of ensuring that the benefits are maximised for businesses, workers, and consumers. M&E activities help to ensure that the new trade opportunities are fully realised. They also help to ensure that the full range of impacts, intended and unintended, are understood and inform future policy development. DBT will monitor the implementation and conduct a comprehensive ex-post evaluation for the agreement. This is outlined in Section 8.

²³ Million tonnes of CO₂ emissions. On average each year.

²⁴ Million tonnes of CO₂ emissions. On average each year.

²⁵ [ONS, Atmospheric emissions: greenhouse gases by industry and gas](#), released June 2022

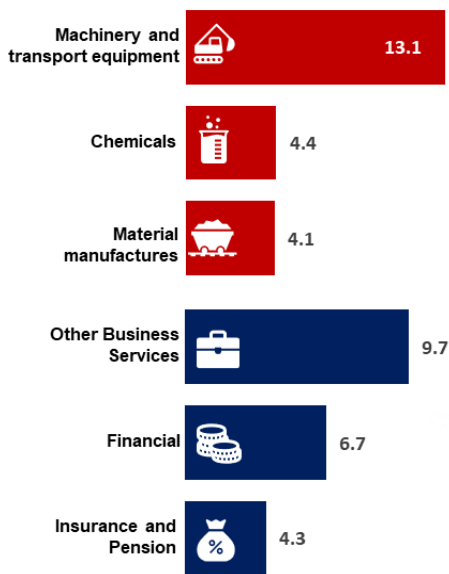
Figure 1: Existing trade in numbers (based on 2022 data)

Figures for 2022 unless stated otherwise

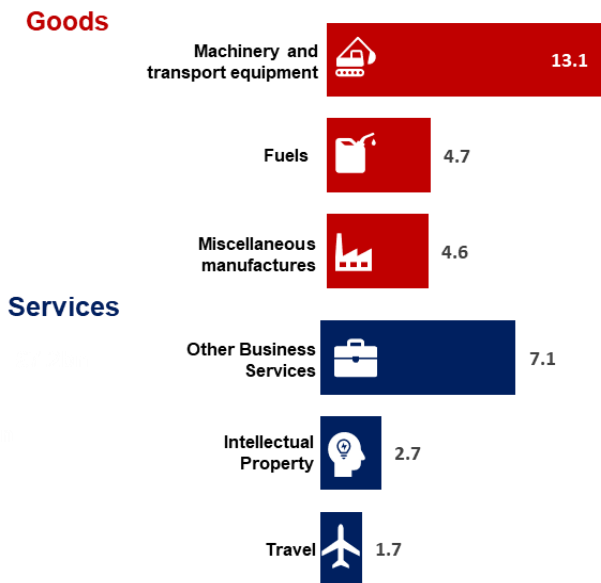


Source: ONS, April 2023 and IMF April, 2023

Key UK exports to CPTPP in 2022, £bn

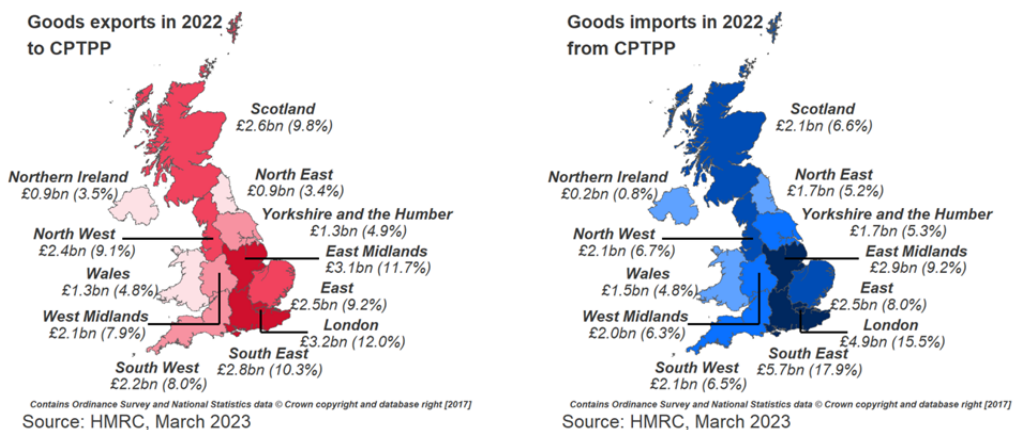


Key UK imports from CPTPP in 2022, £bn



Source: ONS, February 2023

Regional trade with CPTPP



Foreign Direct Investment

<p>£181.8bn The value of FDI stock from CPTPP to the UK in 2021</p>		<p>£117.3bn The value of FDI stock from the UK to CPTPP in 2021</p>
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Source: ONS, March 2023

Background

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a Free Trade Agreement (FTA) establishing one of the largest free trade areas in the world. The current CPTPP membership includes 11 economies: Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam. These economies are located across the Asia-Pacific, Latin America and Caribbean, and North America. CPTPP has entered into force in all 11 countries. The UK currently has bilateral FTAs with 9 out of the 11 CPTPP signatories (excluding Malaysia and Brunei). The term “CPTPP” in this document refers to all 11 CPTPP signatories.

In July 2018, the government launched a public consultation to inform the negotiations. In June 2021, the government published negotiation objectives, a response to the public consultation and a scoping assessment. The UK government launched CPTPP accession negotiations in June 2021, resulting in signature of the final agreement in Auckland on 16 July 2023. The UK will formally join the CPTPP at the point of its entry into force, whose conditions and timeline are set out in the accession protocol.

The aim of this final impact assessment is to provide Parliament and the public with a comprehensive assessment of the potential long run impacts of the negotiated agreement.

This final impact assessment updates the analysis undertaken in the scoping assessment, applying an updated modelling approach and adjusting the inputs to better approximate the negotiated outcome. Details of these changes are included in annexes 1 and 2.

Rationale

This section explains the economic and strategic benefits of acceding to CPTPP.

CPTPP is a deep and comprehensive FTA and joining it creates opportunities for the UK because:

1. the agreement represents an opportunity for the UK to gain improved access to one of the largest free trade areas in the world, with a combined GDP of £9 trillion in 2022. CPTPP is designed to expand and could be the stepping stone to a future even larger Free Trade Area. The more CPTPP expands, the greater the opportunity for UK businesses to benefit
2. the agreement will enhance an already strong trade and investment relationship and improves access to a growing region
3. acceding to CPTPP could secure increased trade and investment opportunities, and could help diversify our trading links and supply chains, embedding open trade and integration
4. by joining CPTPP, the UK will help create an even larger free trade area that could exercise greater influence over the rules and standards of the global economy
5. CPTPP provides the opportunity for the UK to influence the future development of a major multilateral agreement and to shape global trading rules and provide the framework for international cooperation in the region

Gateway to Asia Pacific

CPTPP is a strategically important group of countries, and joining is a stepping stone to integration and influence across the entire Indo-Pacific region. From the moment the UK becomes a Party to the agreement, membership will provide enhanced access to existing CPTPP markets, but in the longer term, it can provide a pathway to deeper and broader access in this economically significant area.

Joining CPTPP will allow the UK to access one of the largest trade agreements in the world. CPTPP members had a combined GDP worth around £9 trillion and a combined population of over 500 million in 2022.²⁶ The agreement spans the Asia Pacific, the Americas and includes some of the world's largest current and future economies.

Accession to CPTPP puts the UK at the heart of a dynamic group of countries, as the world economy increasingly centres on the Pacific region. Even without acceding, UK exports to current CPTPP countries could increase in real terms by £15.9 billion by 2040. This represents a 28.4% increase in UK exports to CPTPP in real terms compared to 2021.²⁷ Accession will further bolster this growth.

²⁶ [IMF World Economic Outlook Database](#), April 2023 edition.

²⁷ [DBT Global Trade Outlook, February 2023](#). 2040 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook. For bilateral trade between the UK and CPTPP in 2040, it is further assumed that both the UK and CPTPP's share of partner import demand evolves in line with their share of global import demand (as projected in the Global Trade Outlook).

Accession could see over 99% of current UK goods exports to CPTPP being eligible for tariff-free trade and a reduction in other barriers to trade across four continents.²⁸ In 2022, trade between UK and CPTPP was worth £113 billion, representing around 7% of total UK trade and 12% of non-EU trade in 2022.²⁹

Joining CPTPP also provides great opportunities for the UK as the world's second-largest services exporter.³⁰ CPTPP sets ambitious rules for services trade between members in areas of key UK interest. For example, advanced provisions that facilitate digital trade and modern rules on data will encourage more professional services providers to enter these markets. Joining will provide legal certainty for UK service suppliers, who exported £32.2 billion worth of services to CPTPP members in 2022.³¹ Membership will help reduce barriers which hinder UK companies providing services in these markets and ensure they are treated no less favourably than local firms.

The e-commerce chapter in CPTPP sets modern rules for digital trade across all sectors of the economy. The comprehensiveness and depth of CPTPP's e-commerce chapter provides a sound platform for the UK to help shape the emerging digital trading rulebook and helps support businesses of all sizes across the UK. The chapter is well aligned with UK ambitions, including in its facilitation of the free flow of data whilst ensuring the UK's high standards of personal data protection are maintained.

Acceding to CPTPP supports a core objective of the government's March 2023 Integrated Review Refresh, which committed to pursuing deeper engagement in the Indo-Pacific, in support of shared prosperity, security and stability.³²

CPTPP membership acts as a gateway to the wider Indo-Pacific region which is expected to account for the majority (54%) of global growth between 2021 and 2050. By 2035, around half of the world's 2.7 billion middle class consumers are expected to be in the Indo-Pacific.³³ This presents new opportunities to sell more of the high-quality goods and services that the UK excels at producing. Acceding to the CPTPP will help the UK engage more deeply with the region, from a trade and wider foreign policy perspective.

The more CPTPP expands, the greater the opportunity for UK businesses to benefit. Expansion is in its DNA (the CPTPP includes a provision that allows for future accessions) – economies including Costa Rica, Ecuador and Uruguay have all formally applied to join CPTPP. Thailand, the Philippines and Republic of Korea have also expressed an interest in joining. The combined GDP of all CPTPP members and the UK could increase to over £14 trillion in 2022 if these other economies were to join CPTPP.³⁴ This expanded CPTPP would cover 9% of all UK exports in 2022.³⁵ As a member, the UK will be able help shape CPTPP's future development as it grows.

²⁸ Subject to meeting rules of origin requirements and once staging is complete. These figures relate to existing average annual CPTPP goods imports from the UK between 2017-19. These figures do not relate to potential future trade.

²⁹ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

³⁰ UNCTAD data source for market share: [Goods and Services \(BPM6\): Exports and imports of goods and services, annual](#). Some UNCTAD data may be based on estimates.

³¹ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

³² [Integrated Review Refresh 2023: Responding to a more contested and volatile world](#), released March 2023

³³ [DBT Global Trade Outlook, February 2023](#)

³⁴ [IMF World Economic Outlook Database](#), April 2023 edition. And Bank of England 2022 average exchange rate. The combined GDP of around £14 trillion includes all eleven CPTPP current members, the UK, Costa Rica, Ecuador, Thailand, Philippines, Republic of Korea and Uruguay

³⁵ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

Some of the countries wishing to join are also projected to see large cumulative growth between 2021 and 2050 with the Philippines (303%) and Costa Rica (119%) having higher projected growth than that of the World (88%). Other potential joiners such as Ecuador and Thailand are projected to grow at 82% and 80% respectively. Uruguay and Republic of Korea are also expected to grow from their 2021 positions where they accounted for 0.1% and 1.9% respectively of world GDP.³⁶

Illustrative modelling undertaken by DBT shows the potential marginal impact for the UK if other countries join CPTPP. Should Ecuador, Costa Rica, Uruguay, Republic of Korea, Colombia, Philippines, and Thailand join alongside the UK, the modelling estimates that this could boost UK GDP by around £4.3 billion (2021 prices) in the long-run, relative to the absence of the agreement. Alternatively, if the US and the rest of ASEAN countries (Laos, Cambodia and Indonesia) were to join CPTPP, this could boost UK GDP by £19.5 billion (2021 prices) in the long-run. If all the countries above were to join, this could boost UK GDP by £21.4 billion (2021 prices). Note that these are hypothetical scenarios and do not reflect UK government policy on future CPTPP membership.³⁷ These results are subject to uncertainty and further details are outlined in section 4.

External analysis shows, as CPTPP expands and further integrates, the benefits for the UK would be expected to increase. Analysis by Petri & Plummer (2023) assesses the scenario where by 2024, all 11 original members of CPTPP will have ratified, as well as the UK and the Republic of Korea.³⁸ Under this scenario UK incomes are estimated to increase by \$33 billion (2014 prices), equivalent to £24 billion in 2021 prices, compared to a scenario without the agreement. This increases to \$42 billion (2014 prices), equivalent to £31 billion in 2021 prices, if Indonesia, the Philippines, and Thailand were also to join in the future and would continue to grow especially as larger economies join the agreement.

The modelling carried out in this analysis is not directly comparable to DBT's modelling used to calculate the headline GDP results. Further detail is outlined in section 7 below. These results are included here to present the wider body of analysis that is pertinent to the UK's decision to join CPTPP. These results demonstrate that CPTPP could protect UK economic interests as geopolitical fragmentation widens and countries increasingly group together resulting in fragmentation of the global economy.

The more like-minded countries join CPTPP, the greater the opportunity for UK businesses to benefit. Joining CPTPP will naturally bring the UK closer to countries in the Asia-Pacific Economic Cooperation (APEC). According to APEC, the region is home to 38% of the world's population and represents approximately 48% of trade in goods and services as well as 62% of world GDP in 2021.³⁹ Between 1989 and 2018, total trade for APEC members increased over 7 times, with two-thirds of this trade occurring between its members economies.⁴⁰

CPTPP's influence is not limited to its own expansion but is regarded as a pathway to greater regional integration. The UK has the potential to use its CPTPP membership as a stepping

³⁶ The growth figures quoted are cumulative real GDP growth figures between 2021-2050 as projected by the [DBT Global Trade Outlook, February 2023](#)

³⁷ We understand that the following economies have formally applied to join CPTPP: China, Taiwan, Costa Rica, Ecuador, Uruguay and Ukraine.

³⁸ Petri & Plummer (2023) assumes a scenario where CPTPP currently comprises of 9 of the 11 existing members, expanding to include Malaysia, Chile, the Republic of Korea and the UK in 2024. In reality, Malaysia and Chile have already ratified the agreement, however this is not captured in the design of the analysis.

³⁹ [APEC at a Glance](#), February 2023

⁴⁰ [APEC Achievements and Benefits](#), September 2021

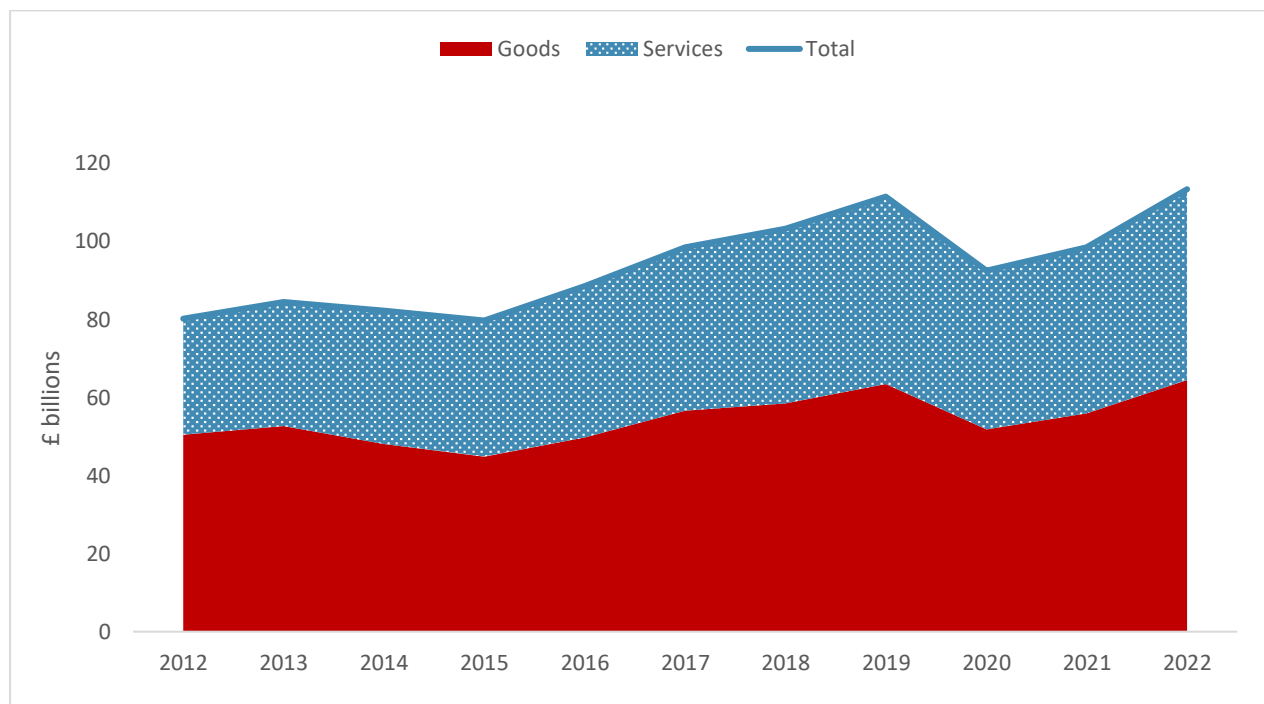
stone, to position itself within a network of trade agreements across the Asia-Pacific region, potentially even to a pan-Asia Pacific FTA.

Enhancing a strong trade and investment relationship

Trade between CPTPP and the UK has grown over the last decade, driven by growth in both goods and services. In 2022, trade between the UK and CPTPP was worth £113 billion, making the agreement as a whole equivalent to the UK's 4th largest trading partner.⁴¹ Between 2018 and 2022, trade with CPTPP has been growing at 2.4% annually on average. This compares to the growth of 5.6% for goods and services to the world over the same period.

Services trade with CPTPP was worth £49 billion (43% of total trade with CPTPP) in 2022, with sectors such as financial and business services making up a high proportion of trade with the members of the agreement.⁴²

Figure 2: UK trade (exports and imports) in goods and services with CPTPP, 2012 - 2022



Source: [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

The agreement reduces tariff barriers for importers and exporters. The agreement also reduces non-tariff measures for businesses. On goods, it will help reduce the administrative burden for businesses of all sizes across the UK, including through commitments to transparent and efficient customs procedures, agreements on technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures as well as a dedicated SME chapter. On

⁴¹ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

⁴² ONS, UK trade in services by partner country (non-seasonally adjusted), released 27th April 2023

services, the reductions represent the outcome of commitments beyond existing GATS obligations and are linked to less legal uncertainty for service providers trading with CPTPP.⁴³

As a free trade area connecting a wide group of economies, CPTPP creates opportunities to deepen our trading links across the Americas and Asia-Pacific region. Existing CPTPP members are wide and varied, providing the UK with a range of different opportunities with the different countries. CPTPP membership will complement and reinforce existing bilateral trade and investment agreements the UK has already signed (Australia, Japan, Canada, Singapore, Vietnam, Chile, Peru, Mexico, and New Zealand – with more expansive arrangements currently being negotiated with Canada and Mexico).

It is up to businesses to make the best decision for them when trading with CPTPP countries with which the UK also has bilateral deals. This freedom of choice opens opportunities for businesses to adapt easily to a changing global context, embrace agility within wider geostrategic business planning, and build resilience into their supply chains.

The UK trades a broad range of goods with CPTPP and has a Normalised Revealed Comparative Advantage (NRCA) in complementary sectors, including financial and business services, as shown by Table 1 below.⁴⁴ The agreement offers the opportunity for continued specialisation. The UK trades along the lines of its comparative advantage, for example, financial services and professional services are some of the UK's key exports. In 2022, the UK exported nearly £6.7 billion of financial services to CPTPP – around 21% of the UK's total services exports to CPTPP.⁴⁶ Both CPTPP as a whole and the UK are strong exporters of motor vehicles. CPTPP also has a comparative advantage in the manufacture of electrical equipment.

⁴³ Annex 7 of the [UK-CPTPP Scoping Assessment, June 2021](#) provides further detail on these reductions.

⁴⁴ [Normalised Revealed Comparative Advantage formula retrieved from: Yu R., Cai J., and Leung P. 2009](#). The Normalised Revealed Comparative Advantage Index, *The Annals of Regional Science*, 43(1): 267-282.

⁴⁵ The NRCA is a measure used to assess a country (or bloc's) specialisation and export potential. A result above 0 for a commodity shows that a country's share of the world exports for that commodity is higher than their share of total world exports, indicating they have a comparative advantage in the export of that commodity. This measure allows for comparison of the relative strength of comparative advantage across commodities and countries.

⁴⁶ [ONS, UK trade in services: service type by partner country, non-seasonally adjusted](#), 2022, released 27th April 2023

Table 1: Export specialisation (as measured by NRCA) by sector

Broad sector category	GTAP 23 Sector	UK	CPTPP
Agri-foods	Agriculture, forestry, and fishing	-0.63	0.83
	Beverages and tobacco products	0.23	-0.09
	Other processed foods	-0.23	0.12
	Semi-processed foods	-0.39	0.20
Industry	Chemical, rubber, plastic products	-0.14	-3.41
	Energy	-3.93	0.38
	Manufacture of electronic equipment	-1.85	5.34
	Manufactures	-0.77	0.65
	Manufacture of motor vehicles	0.50	5.98
	Manufacture of machinery and equipment n.e.c	-1.16	1.45
	Manufacture of other transport equipment	0.98	-0.26
	Manufacturing n.e.c	-0.36	-1.07
	Paper and printing products	-0.05	-0.12
	Textiles, apparel, and leather	-1.01	-2.52
Services	Business services	2.77	-1.87
	Communications	0.78	-1.63
	Construction	0.00	-0.13
	Financial services	2.43	-0.94
	Insurance	0.76	-0.53
	Other services (transport, water, dwellings)	0.42	-0.93
	Personal services	0.01	-0.20
	Public Services	0.84	0.53
	Wholesale and retail trade	0.82	-1.79

Source: DBT calculations using GTAP11 data, 2017. n.e.c. means not elsewhere classified. It is used to denote entities that do not fit into existing classification categories. For presentational reasons, all figures have been multiplied by 1,000. This does not affect the interpretation of the results.

CPTPP members are an important destination and source for international investment to and from the UK. In 2021, the stock of UK foreign direct investment (FDI) in CPTPP member countries was worth at least £117 billion, while CPTPP FDI in the UK was worth at least £182 billion.⁴⁷ The agreement contains provisions that make it easier for UK investors to establish and operate in CPTPP countries.

Joining CPTPP is expected to support jobs and create opportunities for businesses of all sizes, in all regions and nations of the UK. In 2022 UK nations and regions exported a total of £29.0 billion of goods to CPTPP, with London, East Midlands and the South East being the largest goods exporters to CPTPP. The South East, London and the East Midlands also imported the most goods.⁴⁸ Businesses across these areas will have access to the preferences available to us upon joining. The dedicated chapter on SMEs and provisions that improve trade

⁴⁷ [ONS Foreign direct investment \(FDI\) totals for inward and outward flows, positions and earnings](#), released 24th January 2023

⁴⁸ HMRC Regional Trade Statistics, March 2023

facilitation for SMEs will help reduce the costs that these businesses face when trading with CPTPP countries.

Diversifying supply chains

Joining CPTPP could offering UK businesses opportunities to diversify supply chains and strengthen our economic resilience.

The range of members with diverse economies and complementary specialisations suggest that there will be scope to increase the UK's integration of value chains with CPTPP members. Accession to CPTPP should improve access to inputs, which is an important consideration for UK businesses, and creates opportunities to continue widening our trading links over time across Asia-Pacific and the Americas.

Accession to CPTPP provides benefits to UK businesses to include inputs from all CPTPP countries in their products without losing the originating status of their final products for purposes of application of preferential tariffs. Cumulation across CPTPP could make it easier for some businesses to benefit from tariff reductions, providing them with alternatives to the existing bilateral FTAs. For example, UK automotive manufacturers could sell car engines to a car maker within the agreement who could then sell the final car on preferential tariff terms to any member country subject to meeting rules of origin. Exporters may find it easier, in some cases, to qualify for preferential tariff treatment under CPTPP compared to under the bilateral FTA with that country. This could help benefit goods exports and could boost export facing manufacturing sectors in all members of CPTPP.

Strengthening the rules-based system

Accession to CPTPP would help to secure the UK's future place in the world in a network of countries committed to free and rules-based trade. This would provide the opportunity for the UK to influence the future development of a major plurilateral agreement which can shape the trading rules and provide the framework for international cooperation in the region. It would also send a powerful signal that the UK as an independent trading nation will continue to champion free and fair trade, fight protectionism, and remove barriers to trade at every opportunity.

CPTPP will bring us together with a group of economies promoting free trade and high trading standards, in a region where the contest between rules-based trade and unfair practices is particularly intense. CPTPP contains, for example, strong intellectual property protections, and provisions that support free and trusted cross-border data flows.

CPTPP includes strong rules against the unfair trade practices used by some countries, such as giving unreasonable, market-distorting, advantages to State Owned Enterprises, restricting imports for protectionist reasons, discriminating against foreign investors, and unduly forcing companies to hand over their private information. These strong rules benefit UK business and underpin the global rules-based trading system. The UK joining CPTPP will help strengthen the international consensus against such practices.

CPTPP sets high labour and environmental standards. Its rules commit members not to derogate from labour or environmental laws in order to gain a trade advantage. The environment chapter recognises the sovereign right of each member to establish its own levels of domestic environmental protection and priorities. This is in line with the UK's strong support of the rule of law and need to set autonomous own standards and regulation.

Enhancing our global influence

The UK joining CPTPP will help create an even larger free trade area that could exercise greater influence over the rules and standards of the global economy. The UK is the sixth largest economy in the world by GDP and has a market of over 67 million consumers. The UK's accession will create an even stronger incentive for others to join this high-standards agreement, which could further amplify its impact.

Joining CPTPP also gives the UK a new and powerful means of engaging countries with a combined population of over 500 million.

Expansion of CPTPP can raise the global influence of the agreement and help to shape the future of the global trading system. The UK's accession to the agreement can further increase the economic and global importance of the agreement, raise the economic incentives for other economies to join and to provide the opportunity for the UK to influence the direction of future expansion of the agreement.

The agreement

This section sets out some of the key provisions included in the agreement and summarises the rationale for these provisions. The full text of the agreement is available online.

Goods trade

- the agreement reduces tariff barriers for exporters. Joining this existing trading agreement means that over 99% of current UK goods exports to CPTPP will be eligible for tariff-free trade.⁴⁹ As CPTPP membership expands the UK will be able to export goods to these new members on beneficial terms
- it could reduce import prices for UK businesses and consumers. Joining CPTPP will also eventually remove nearly all tariffs imposed on UK imports from CPTPP, while retaining protections for some products in sensitive sectors for the UK for a number of years. Lower tariffs can mean cheaper import prices on goods in the UK for businesses and consumers
- the agreement provides the opportunity for UK businesses to diversify their supply chains. UK businesses can use inputs from all CPTPP Parties in the production of their goods. This could make it easier for UK exports with supply chains in CPTPP Parties to qualify for the preferential tariffs agreed in this FTA
- it will help reduce the administrative burden for businesses of all sizes across the UK, including through commitments to transparent and efficient customs procedures, agreements on technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures as well as a dedicated SME chapter

Services and investment

- the agreement will provide more export opportunities for UK services providers. The UK is the world's second largest services exporter with service industries accounting for around 80% of total UK economic output in 2022.⁵⁰ CPTPP presents a significant opportunity for UK's service industries to expand its trading relationship with CPTPP markets
- CPTPP sets ambitious rules for trade in services between members and will help prevent barriers that hinder UK firms from selling services in CPTPP markets. CPTPP will provide greater certainty on the terms of services trade for UK service suppliers who exported £32.2bn worth of services to CPTPP countries in 2022⁵¹
- it will also facilitate travel for UK business persons to CPTPP countries, providing greater legal certainty on temporary entry routes for British citizens. This ensures important clarity for individuals and businesses across multiple sectors, paving the way for long-term economic growth and investment. It will encourage investment between the UK and CPTPP countries. Inward investment stocks to the UK from CPTPP countries were worth at least £181.8 billion in 2021. Outward investment stocks from the UK to CPTPP countries were worth at least £117.3 billion over the same period.⁵² CPTPP's investment chapter includes provisions that will help further deepen those investment relationships by limiting barriers to overseas investment and ultimately making it easier for UK investors to establish and operate in CPTPP economies

⁴⁹ Subject to meeting rules of origin requirements and once staging is complete. These figures relate to existing average annual CPTPP goods imports from the UK between 2017-19. These figures do not relate to potential future trade.

⁵⁰ [Service industries: Key Economic Indicators](#) House of Commons Library

⁵¹ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

⁵² [ONS Foreign direct investment \(FDI\) totals for inward and outward flows, positions and earnings](#), released 24th January 2023

Digital trade

- it includes cutting-edge digital trade provisions that help reduce barriers. Remotely delivered services from the UK to CPTPP were worth £23.0 billion in 2021.⁵³ CPTPP sets modern rules for digital trade across all sectors of the economy and will support UK businesses of all sizes to seek new opportunities in CPTPP markets

Government procurement

- CPTPP accession will ensure that UK businesses receive fair and non-discriminatory treatment when competing for government contracts of CPTPP members. This will build on the existing comprehensive agreements the UK has with most member countries. It will provide UK businesses with even greater access to opportunities in their government procurement markets in several areas
- it will also mark the UK's first ever trade agreement containing government procurement provisions with Brunei and Malaysia. This will create entirely new access to opportunities for UK businesses in the government procurement markets of both countries

Goods market access

- joining CPTPP means that over 99% of current UK goods exports to CPTPP members will be eligible for tariff-free trade.⁵⁴ The CPTPP agreement offers additional tariff liberalisation with the CPTPP members that the UK has existing bilateral agreements with. It also offers extensive tariff liberalisation with Brunei and Malaysia, with whom the UK does not currently have a Free Trade Agreement. Businesses will be able to export their products to CPTPP members using whichever preferential regime they prefer
- removing or reducing tariffs makes it easier and less expensive to trade physical products between our countries
- the agreement will see the majority (99.8% or £25.9 billion) of current UK goods exports to CPTPP be eligible for tariff-free trade. This includes on priority UK goods such as whisky and cars⁵⁵
- tariffs will be eliminated on UK exports of whisky to Malaysia (reduced from around 80% to 0% within 10 years).⁵⁶ UK car manufacturers will benefit from the staged removal of tariffs of 30% on UK exports of cars to Malaysia within 7 years. Exporters of chocolate will benefit from zero tariffs on exports to Mexico and Malaysia immediately upon entry into force. Tariffs will also be eliminated sooner on some UK exports compared with under existing bilateral agreements, such as with exports of chocolate, engines and medicines to Vietnam
- the UK has guaranteed access to various CPTPP tariff rate quotas which will provide improved access to CPTPP markets for UK exporters, including dairy with Canada, Japan and Mexico
- the UK has also reached agreement to 'catch up' on CPTPP members' tariff staging, which means benefitting from the same reduced tariffs that all other CPTPP members do, despite them having joined CPTPP a number of years before the UK

⁵³ [ONS, UK Trade in services by modes of supply: 2021](#), released 5th April 2023. Please note data does not include figures for Brunei, Peru, and Vietnam.

⁵⁴ Subject to meeting rules of origin requirements and once staging is complete. These figures relate to existing average annual CPTPP goods imports from the UK between 2017-19. These figures do not relate to potential future trade.

⁵⁵ Subject to meeting rules of origin requirements and once staging is complete. Currently, around 98.1% of UK goods exports to CPTPP will be eligible for tariff-free trade once bilateral agreements are fully implemented.

⁵⁶ Updated DBT estimate of the ad valorem equivalent (AVE) of Malaysia's MFN whisky tariff.

- the agreement will also see the majority (99.9% or £40.4 billion) of current UK goods imports from CPTPP be eligible for tariff-free trade.⁵⁷ The agreement will remove tariffs on products currently imported from CPTPP including fruit juices from Chile and Peru, honey and chocolate from Mexico, and vacuum cleaners from Malaysia
- while there are clear benefits from liberalisation under the agreement for consumers and businesses, the agreement includes a number of protections for sensitive UK sectors. The protections the UK has negotiated mean that increased access to the UK market for sensitive agricultural produce will be staged over a significant period of time, giving producers in sensitive sectors time to adjust to any new trade flows. The UK has also agreed permanent annual limits on the volume of the most sensitive agricultural goods that can be exported to the UK at a reduced, or zero, tariff from major producing countries. That includes permanent limits on the amount of beef, pork, chicken, sugar and milled rice that can be imported tariff-free from major producers of these goods in CPTPP
- for those goods not covered by product-specific quantitative restrictions, a general transitional safeguard mechanism will also apply to provide a temporary safety net for industry if they face serious injury, or threat of serious injury, from increased imports as a result of the agreement

Rules of origin

- to help UK exporters access preferential tariffs, CPTPP provides a single set of rules of origin that define whether a good is 'originating'
- where the UK also has a bilateral FTA in place with that partner, traders could choose which agreement they wish to trade under. In practice, when businesses face the choice of applying preferences from two agreements, they do not only compare the tariff rates, but will also consider the administrative processes involved, including meeting the rules of origin requirements
- CPTPP allows for full cumulation, encouraging more trading of finished and intermediary goods across Asia-Pacific. The CPTPP rules of origin allow traders to cumulate content from other CPTPP members to meet the rules of origin and take advantage of its members' ambitious tariff liberalisation commitments
- exporters may find it easier, in some cases, to qualify for preferential tariff treatment under CPTPP compared to a bilateral FTA. This could help support UK efforts to diversify supply chains and increase our economic resilience by deepening our trading links across the Asia-Pacific and Americas
- more liberal rules of origin for cars have been agreed with Malaysia. This could support increased market access in a key UK manufacturing sector, as there is no existing bilateral agreement with Malaysia and tariffs on UK exports of cars to Malaysia are high at 30%

⁵⁷ Subject to meeting rules of origin requirements and once staging is complete. Currently, around 97.8% of UK goods imports from CPTPP will be eligible for tariff-free trade once bilateral agreements are fully implemented. For further detail see section 4.6

Customs and trade facilitation

- the agreement includes a chapter on Customs Administration and Trade Facilitation which builds on the UK's commitments under the WTO Trade Facilitation Agreement (TFA)
- the customs provisions of this FTA will help facilitate trade by ensuring that the UK and CPTPP Parties' customs procedures are efficient, consistent, transparent and predictable whilst also allowing each Party to maintain effective customs control
- all Parties commit to release goods within clear timeframes to provide greater certainty for traders and reduce costs where possible. This means that if all requirements for release are met, goods will be released within 48 hours of arrival where possible
- advance rulings on customs valuation, tariff classification and origin must be issued as soon as possible and within 150 days. Rulings shall be valid for at least 3 years. Information about customs procedures will be available for traders to access online, and review mechanisms will be made available to traders in respect of customs authority decisions. These commitments will increase confidence in the way the UK and CPTPP Parties trade together, ensuring transparency and predictability for all traders at, and away from, the border
- the provisions on automation commit Parties to making electronic systems available to customs users and allow for the electronic submission of customs declarations. This should ensure that data and documentation requirements are as simple as possible for traders

Services trade

- CPTPP contains modern rules governing trade in services, including for key UK exports such as professional and business services
- these modern rules remove many barriers to market access and ensure UK services and service suppliers will be treated no less favourably than local services and service suppliers as well as no less favourably than those from any other CPTPP member or any other country
- one of the main deterrents to services trade is uncertainty over the terms of trade. Accession to CPTPP provides more legal certainty to UK service suppliers by binding existing commitments, guaranteeing existing market access, and providing clarity on rules through improved regulatory transparency commitments. This gives UK businesses more certainty on their terms of trade across a wide range of economic sectors
- CPTPP also restates the fundamental right of the UK Government and the Devolved Administrations to decide how to run public services – including enabling the UK to protect the NHS - a fundamental principle of our trade policy

Financial services

- the agreement includes a standalone financial services chapter, which creates the conditions, across regulatory regimes, for financial services firms to have greater confidence when entering and operating in CPTPP Parties' markets
- the chapter ensures that firms can provide new products and innovative services to CPTPP markets on the same basis as domestic firms. It also commits Parties to promoting regulatory transparency in financial services
- the UK will benefit from specific commitments on portfolio management services. This allows portfolio managers, which the UK has historic strengths in, to manage funds across the world from the UK

Electronic commerce (E-Commerce)

- the comprehensiveness and depth of CPTPP's E-Commerce chapter provides an excellent platform for the UK to help shape the emerging digital trading rulebook with influential partners and support UK businesses of all sizes. Of our bilateral agreements with CPTPP members, CPTPP's commitments for Electronic Commerce go beyond a significant portion of these, such as Vietnam, Chile, Mexico, and Canada. Additionally, CPTPP also provides for preferential Electronic Commerce commitments with countries that the UK does not have a bilateral FTA with – Malaysia and Brunei
- in acceding to CPTPP, the UK will gain from disciplines that help to confront and prevent digital trade barriers, safeguarding gains across all sectors of the economy. Such measures include preventing the imposition of customs duties on electronic transmissions and the content within them, commitments to boost cooperation with members on vital digital trade issues like cybersecurity as well as guarantees on paperless trading
- data flows underpin modern trade. UK businesses stand to benefit from increased certainty when operating in these markets, allowing them to plan their business growth, safe in the knowledge that they can gather, process, and move data between the UK and other CPTPP jurisdictions without being subject to needless red tape. These commitments include facilitating the free flow of data between the UK and CPTPP Parties, preventing data localisation requirements in CPTPP Parties, and safeguarding personal information. The commitments on data will not change or weaken the UK's high-standard domestic legislation on personal data protection. Additionally, onward transfers to third parties will continue to be governed by the UK's Data Protection Act 2018
- the commitments will help generate trust in digital trade, such as preventing barriers to the use of electronic signatures, facilitating the interoperability of electronic authentication services between CPTPP Parties, and minimising the receipt of unsolicited commercial electronic messages (otherwise known as spam)

Temporary entry for business persons

- the Temporary Entry for Business Persons chapter facilitates travel for UK business persons to CPTPP countries, providing greater legal certainty on temporary entry routes for British citizens. This ensures important clarity for individuals and businesses across multiple sectors, paving the way for long-term economic growth and investment
- through CPTPP, professionals from the UK will have greater certainty when travelling for another CPTPP country for business. This includes a range of business activity, including:
 - fly-in, fly-out business activities (like attending a conference or meeting)
 - transfers to a branch or subsidiary
 - supporting an investment
 - supplying a service as part of a contract; and
 - supplying a service as a self-employed entrepreneur
- in 2021, 9% (£4 billion) of services trade between the UK and selected CPTPP countries was delivered through the temporary movement of professionals for business purposes⁵⁸
- Commitments on Temporary Entry also act as a vital enabler of the wider trade in services, goods, and investment. Our trade in services exports to CPTPP countries

⁵⁸ [ONS, UK Trade in services by modes of supply: 2021](#), released 5th April 2023. Please note data does not include figures for Brunei, Peru, and Vietnam. In addition, the dataset does not include information on Mode 3.

alone were worth £32.2 billion in 2022 – not including the valuable impact these commitments also have on the trade in goods and investment flows⁵⁹

- UK citizens seeking to travel to support an investment will now have clearer routes to access to most CPTPP countries, including, Canada, Mexico, Singapore, Vietnam, Peru and Chile. While in many instances the access is not new, the UK's accession to CPTPP provides greater long-term certainty. This will support the near £66 billion the UK has already invested in these Parties as of 2021⁶⁰
- the UK's offer to CPTPP Parties, which is compatible and deliverable through the UK's points-based immigration system, also ensures that UK businesses are able to access talent and expertise from highly skilled business persons across the Trans-Pacific region on a temporary basis

Investment

- CPTPP's investment chapter includes liberalisation provisions that will help further deepen the UK's investment relationships with CPTPP economies by limiting barriers to overseas investment and ultimately making it easier for UK investors to establish and operate in CPTPP economies
- UK investors are also provided with robust guarantees on the treatment they will receive when accessing and operating in CPTPP markets with their investments. These include protections from unfair or arbitrary treatment
- a modern and transparent Investor-State Dispute Settlement (ISDS) mechanism will ensure that UK investors can access an independent international tribunal should they not receive such treatment

Intellectual property (IP)

- the agreement includes ambitious intellectual property provisions that support the UK economy through adequate, effective and balanced protection and enforcement of IP rights and that encourage innovation and creativity. This includes provisions on copyright, trademarks, designs, enforcement, patents and geographical indications
- the UK's IP regime achieves an effective balance between rewarding creators and innovators and reflecting wider public interests such as ensuring access and use of IP on reasonable terms. Joining CPTPP has not impacted this balance as it provides for a baseline standard on which countries have flexibility to build on
- the UK will not make any domestic changes regarding grace periods on patents until the necessary amendments to the relevant international conventions have been made. The UK has therefore ensured our accession to CPTPP is consistent with our existing international obligations, such as the European Patent Convention (EPC). The UK will promote international harmonisation on the grace period and will report annually to other CPTPP Members regarding progress on this matter

Sanitary and phytosanitary (SPS) measures

- for trade in goods, sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT) are the most common non-tariff measures in CPTPP countries that can affect trade. These measures usually address domestic public policy objectives

⁵⁹ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

⁶⁰ [ONS Foreign direct investment \(FDI\) totals for inward and outward flows, positions and earnings: 2020 and 2021](#)

and can vary significantly in content by country. TBT measures notified by CPTPP members mostly address efforts to protect human health and safety⁶¹

- the CPTPP SPS chapter builds on the Parties' WTO obligations by including additional provisions that facilitate trade whilst ensuring protection of human, animal and plant life and health. The UK and individual CPTPP Parties will continue to maintain independent SPS regimes and as such imports into the UK will still have to meet existing food safety and biosecurity standards in the UK
- this Chapter includes trade facilitative commitments such as those related to transparency, information exchange and consultation that could make it easier for exporters to trade. The chapter further facilitates trade by defining and simplifying the mechanism for how equivalence of Parties' SPS measures can be agreed to make it easier for producers to export. It also does this by defining the process for how regional pest outbreaks can be managed to maintain trade flows
- provisions related to the development and review of SPS measures ensure that Parties' measures are either
 - aligned with international standards or
 - based on a risk assessment utilising objective scientific evidence and that Parties allow an opportunity for comment

Additional provisions seek to reduce the requirement for import checks by ensuring that they are risk-based and transparent, and seek to minimise red tape by encouraging the simplification of export health certificates. These provisions, and the chapter as a whole, are consistent with the UK's existing approach to SPS measures and controls

Technical barriers to trade

- the TBT Chapter includes national treatment for conformity assessment bodies (CABs).⁶² Approximately £10 billion in UK exports to CPTPP members were affected by conformity assessment procedures in 2021, although a proportion of this did not necessarily involve the use of CABs.⁶³ Under national treatment, CPTPP members permit CABs in other CPTPP members to assess compliance with the relevant technical regulations of the importing member. These CABs would still need to satisfy the requirements of authorities in the importing member. By enabling products to be assessed in the UK against overseas technical regulations, prior to export, NTCABs can reduce costs to UK manufacturers. NTCABs does not affect the regulatory requirements for products sold in the UK
- the TBT Chapter establishes a TBT Committee, which can enhance cooperation and information exchange between CPTPP members. This can provide a route to address issues faced by UK businesses of all sizes (including SMEs) when exporting to CPTPP markets
- the Chapter includes seven sector-specific annexes: wine & distilled spirits, information and communications technology, pharmaceuticals, cosmetics, medical devices, proprietary formulas for pre-packaged foods, and organic products. These annexes can help address common market access issues arising in these sectors

⁶¹ DBT calculations using WTO e-ping notification data (accessed December 2022).

⁶² Conformity assessment means any procedure used to determine that relevant requirements in technical regulations or standards are fulfilled. It includes activities such as testing, inspection and certification. The organisations that make these checks are called conformity assessment bodies.

⁶³ DBT calculations using ITC MacMap regulatory requirement data (accessed August 2022), 2021 partner country import data, and 2021 HMRC trade data.

Government procurement

- CPTPP includes a chapter on government procurement that contains provisions for the transparency and accessibility of government procurement information. It ensures integrity in procurement practices and facilitates participation by SMEs. This largely replicates the provisions of the WTO Agreement on Government Procurement (GPA), of which the UK is a member
- the UK's market access obligations for government procurement cover the procurement of goods, services and construction activities by central and sub-central government entities and public utilities above specific thresholds. This mostly replicates the UK's coverage in the GPA, and generally does not exceed the access provided in our other international agreements
- as in the GPA, the UK takes a broadly reciprocal approach to market access, providing more extensive coverage for CPTPP members that match the UK's ambition, while limiting coverage for members that do not
- the UK currently does not have any international agreements that include government procurement obligations with Malaysia and Brunei. This means that the UK's accession to CPTPP will, for the first time under an international agreement, ensure that UK businesses receive fair and non-discriminatory treatment when competing for government contracts in Malaysia and Brunei
- the UK already has international agreements that include government procurement obligations with Australia, Canada, Chile, Japan, Mexico, New Zealand, Peru, Singapore and Vietnam. The UK will gain additional access in a few areas; for example, Canada, Japan and Peru expand their coverage of the procurement of services in CPTPP

Small and medium-sized enterprises (SMEs)

- the agreement includes a dedicated SME Chapter in which all Parties acknowledge the importance of supporting SMEs and enabling them to take advantage of opportunities created by the agreement
- the provisions are aimed at improving trade facilitation for SMEs which could help reduce the costs that these businesses face and thereby positively impact their propensity to export. For example, provisions within the Chapter require Parties to share the agreement online, along with summaries, and highlight provisions useful for SMEs, ensuring accessibility
- the Chapter also commits all Parties to cooperating in a dedicated Committee on SMEs. Through the Committee, the Parties commit, amongst other things, to (i) sharing information on their experiences supporting SME exporters, for example through training programmes; and (ii) exploring further capacity building for their SMEs

Environment

- the CPTPP Environment Chapter recognises Parties' sovereign right to regulate for their own levels of domestic environmental protection. This includes in the pursuit of reaching net zero and other environment goals
- CPTPP contains commitments not to waive, derogate from, or fail to enforce environmental laws in order to promote trade or investment. These provisions are binding and enforceable, and subject to the dispute resolution mechanism of the agreement. This demonstrates how our shared ambition for competitiveness and preserving the environment go hand in hand

- the agreement reaffirms commitments by CPTPP members to implement multilateral agreements which they have signed up to
- the Chapter strengthens cooperation between Parties in areas including marine pollution, ozone depleting substances, sustainable fisheries, illegal wildlife trade and biodiversity, environmental goods and services, transitioning to a low emissions economy, and addressing deforestation and forest degradation
- the Chapter also establishes an Environment Committee to help facilitate this cooperation and to oversee the implementation of environment chapter, meeting every two years
- the CPTPP also supports trade in environmentally beneficial products. Under CPTPP there will be no tariffs on UK exports of new electric vehicles and wind turbine towers, which support the UK and CPTPP Parties' transition to low carbon economies
- the UK has agreed a joint statement on the environment with several Parties, which emphasises our shared objectives to tackle environmental challenges such as climate change, biodiversity loss, and pollution
- the UK has also agreed a joint bilateral statement with Malaysia setting out our shared commitment to work together to promote sustainable production of commodities and to conserve forests. The UK and Malaysia have also committed to regularly share information with one another about ongoing domestic developments related to the environment and sustainable supply chains and production. This includes updates to the Malaysian Sustainable Palm Oil certification scheme

Labour standards

- the Labour Chapter reaffirms CPTPP Parties' obligations as members of the International Labour Organization (ILO) and requires Parties have laws governing acceptable conditions of work, including minimum wages, hours of work, and occupational health and safety
- the Labour Chapter also prohibits Parties from derogating from protections for workers as set out in the agreement, or from failing to enforce them, in order to promote trade and investment
- the Chapter promotes enhanced co-operation and consultation on a range of labour issues. The Chapter also provides for the application of the agreement's dispute settlement procedure, as well as a range of mechanisms to facilitate implementation of the Chapter, including public submissions. This means UK workers can be confident that their jobs will not be threatened or undercut by unfair labour practices and businesses can be confident of a fair-trading environment

Trade remedies

- the Trade Remedies Chapter maintains CPTPP Members' existing rights and obligations under the WTO Agreements regarding anti-dumping, countervailing and global safeguard measures
- these provisions ensure that CPTPP Members can protect their domestic industries from unfair trading practices or unforeseen surges in imports
- the Chapter also provides for the application of transitional safeguard measures if, as a result of tariff liberalisation under the terms of the agreement, imports increase in such quantities that they cause or threaten to cause serious injury to domestic industry

Competition policy

- the Chapter promotes open and fair competition which benefits businesses and consumers
- it contains provisions requiring that all Parties have comprehensive competition regimes, as part of a transparent regulatory environment. It maintains procedural rights for people and businesses under investigation by independent competition authorities, such as ensuring they have the right to be legally represented

State-owned enterprises (SOEs) and designated monopolies

- the Chapter promotes open and fair competition between private enterprises and businesses owned by CPTPP signatories', benefitting businesses and consumers by aiming to prevent SOEs from distorting trade because of their relationship with government
- it reassures businesses of CPTPP signatories' long-term commitment to guarantee that SOEs operate in accordance with commercial practices. This includes any adverse effects from distortive practices in the territories of third Parties

Anti-corruption

- CPTPP provisions support the UK's objectives by addressing the trade distorting effects of corruption on global trade and fair competition. The anti-corruption provisions within the agreement acknowledge each member's resolve to combat bribery and corruption in international trade and investment and reinforce international obligations. Such as those within the United Nations Convention Against Corruption

Regulatory coherence

- the Regulatory Coherence Chapter ensures all Parties have and maintain an evidence-based, coordinated and transparent process when developing regulation
- this will help create a more predictable regulatory environment, which may help UK traders to feel more confident doing business with other CPTPP members
- the Chapter establishes a Regulatory Coherence Committee which will, amongst other things, monitor the implementation of the agreement and facilitate regulatory cooperation. Enhanced regulatory cooperation may allow for a more stable regulatory landscape between the Parties, helping to remove non-tariff trade barriers for businesses

Overall impacts of the UK's accession to CPTPP

This section presents estimates of the long run impacts of the agreement on GDP, trade, and sectoral output in the UK

These are estimated using the DBT's Computable General Equilibrium (CGE) model, which provides a comparative static analysis of the impact of the agreement in the long run. The estimates from the modelling are applied to economic projections of UK GDP from the Office for Budget Responsibility (OBR) and the global economy from DBT's Global Trade Outlook. These are used to generate a pound value for the expected impact of the agreement (expressed in 2021 prices). While CGE modelling is a standard approach to assessing the impact of trade agreements, the modelling may not capture the full range of dynamic impacts that result from the agreement. The results set out the potential long run marginal economic impacts of the UK's accession to CPTPP compared against a baseline without the agreement, assuming no other changes. This analysis is not a forecast of the UK economy or trade with CPTPP members and does not model any transitional or short run impacts.

The main expected macroeconomic impacts shown in in the modelling are:

- a long run boost to UK GDP. The agreement is expected to increase long-run UK GDP by around £2.0 billion each year when compared to projected levels of GDP in 2040 in the absence of the FTA. This estimate and the projections to which they are applied are both subject to uncertainty. The point estimates are not precise estimates and should be interpreted as indicative of the direction and broad scale of impacts⁶⁴
- UK exports are estimated to rise as the agreement creates more opportunities for UK exporters. As barriers to trade are removed and the cost of importing UK goods is lowered for CPTPP firms, UK exports to CPTPP are estimated to increase by £2.6 billion (3.6%) when applied to projected levels in 2040 in the absence of the FTA
- UK businesses and consumers are set to benefit from greater access to CPTPP products. Imports of CPTPP goods and services are estimated to increase by £2.3 billion when compared to projections of 2040 levels. While increased imports can enhance competition, a significant share of the estimated increase in imports from CPTPP are expected to replace imports from other countries as businesses switch to better value and easier to source inputs from countries within the agreement
- better paid jobs. The modelling estimates an increase in wages for UK households by around £1.0 billion every year in the long run, when compared to 2021 levels
- opportunities across a wide range of sectors. Increased growth in the UK is driven by expansions across a broad range of services and manufacturing sectors; the modelling shows that 19 out of 23 sectors contribute to increased output as they take advantage of

⁶⁴ GDP is measured as the sum of consumption, investment, government spending and net exports (i.e. exports less imports). The increase in exports to CPTPP is larger than the increase in GDP due to: i) the increase in imports (which reduces GDP metric though benefits both consumers and businesses) and ii) some reallocation of existing exports destined to other countries.

the opportunities in the agreement. The sectoral results are subject to a high degree of uncertainty

- opportunities across the UK. Wales, Scotland and Northern Ireland are all estimated to see an increase in output as a result of the UK's accession. The same applies to each of the English regions, with consumers across the UK expected to benefit from tariff reductions on imports from CPTPP

Economic gains from trade agreements

International evidence suggests free trade agreements, by reducing the costs of trade, have a range of macroeconomic and social impacts. They also have important distributional consequences across economic sectors, groups, and individuals.

Free trade agreements generate economic gains through a variety of channels,⁶⁵ such as:

- gains through increased specialisation across sectors. Countries have limited resources available to produce goods and services, and some countries may be relatively more effective at producing certain types of products. Specialisation means that countries focus on producing goods which they face lower opportunity costs for producing relative to other countries. This means that by specialising in certain types of production, they forego less of other types of goods. Trade makes it feasible for countries to specialise in producing goods where they are more efficient, driving higher employment and lower import prices across countries
- gains through driving a more efficient allocation of resources within sectors. Enhanced openness to trade can spur innovation and the expansion of the most efficient firms within sectors. This could drive up the average productivity, which could benefit workers through higher wages if businesses become more profitable. At the same time, consumers could benefit from increased product variety and lower import prices, as they have access to more competitive goods sourced from abroad
- dynamic gains through trade-induced increases in productivity. FTAs benefit businesses who can produce more efficiently when they produce higher quantities of goods (known as economies of scale). There are also benefits from higher investment and research and development stimulated by access to larger markets. This is coupled with reductions in inefficiencies due to increased competition, or from positive spillovers between firms

There may also be distributional impacts, in which different groups of businesses and people are affected in different ways by the FTA. These impacts depend on factors such as the structure of each of the economies involved and what each country is relatively specialised in producing. They also depend on sectoral patterns of trade in each country as well as the physical and institutional infrastructures in each country. In addition, the distributional impacts are affected by the ability of individuals and firms to adjust to increased trade and short- and long-term domestic policies.

⁶⁵ These channels, in the context of trade liberalisation more generally, are outlined in greater detail in the UKTPO Briefing Paper (July 2019): 'Winners and Losers from International Trade: What do we know and what are the implications for policy'.

Approach to assessing macroeconomic impacts

The scale of the macroeconomic and sectoral impacts is estimated using Computable General Equilibrium (CGE) modelling undertaken by DBT. The modelling is a comparative static approach. It compares the level of economic variables such as GDP, trade, and wages before and after the effects of the agreement have worked through the economy. The estimated changes are in addition to any long-term underlying growth. In this context, the long run is typically assumed to be a period of around 10-15 years after implementation.

Technical developments to the modelling since the 2021 Scoping Assessment

DBT's modelling is subject to ongoing development, informed by the report of the Modelling Review Expert Panel.⁶⁶ For any assessment as far as possible we use the latest data, techniques and assumptions available at the time.

Since the CPTPP scoping assessment was published, a number of updates have been made to the methodology used for CGE modelling. These include:

- updating the underlying data in the modelling to the latest data available at the time of modelling in the GTAP 11 database (year 2017) to more closely reflect the pattern of global trade (section 4.3)⁶⁷
- updating the tariff schedules to better reflect the tariffs in existing bilateral arrangements (section 4.3)
- updating the inputs to better approximate the UK's accession to CPTPP (section 4.4)
- updates to trade elasticities to better capture the responsiveness of individual sectors to reductions in trade costs.

These updates mean that the modelling results in the impact assessment are not directly comparable to the CPTPP Scoping Assessment. Further detail of these changes are included in Annex 1.

Data and baseline

The impacts of the agreement are assessed against a baseline where the UK has not acceded to CPTPP.

The underlying data used for the modelling is taken from the GTAP11 dataset relating to 2017. The dataset is widely used in trade policy analysis and is the latest available data at the time of modelling.⁶⁸

The UK and CPTPP members' trading relationships with other countries have changed since 2017, which may affect the estimated impact of the UK's accession to CPTPP. This is partially addressed in the modelling by incorporating the following FTAs between the UK and trading partners into the modelled baseline:

- Japan, Canada, Vietnam, Singapore, Australia, and New Zealand

⁶⁶ [Trade modelling review expert panel: report \(January 2022\)](#)

⁶⁷ In this modelling exercise we rely on the latest available third release of GTAP 11 database.

⁶⁸ In this modelling exercise we rely on the latest available third release of GTAP 11 database.

Changes to CPTPP countries' trading relationship with other countries over the period 2017 to 2021 have also been incorporated, including both new agreements or agreements being implemented over the period:

- US-Mexico-Canada (USMCA), US-Japan FTA, Australia-China FTA, Australia-Republic of Korea FTA, New Zealand-Republic of Korea FTA, Chile-Thailand FTA, upgraded Chile-China FTA, Canada-Republic of Korea FTA, Canada-EU CETA, Japan-EU EPA, Vietnam-EU FTA, Vietnam-Republic of Korea FTA, Republic of Korea-China FTA, and Singapore-EU FTA

The UK's trade relationship with the EU has changed since 2017. For the purposes of this analysis, stylised assumptions are used to represent the trading relationship between the UK and EU based on a free trade agreement, with zero tariffs and average NTM costs.⁶⁹

Since 2017, there have also been changes to the UK's tariffs levied on countries with which they do not have an FTA. These are Most Favoured Nations (MFN) rates, and we apply the United Kingdom Global Tariff (UKGT) to relevant countries in the baseline.

For intra-CPTPP tariffs, bilateral tariffs between each CPTPP member were generated for the year 2021. This accounts for bilateral FTAs between member countries and the CPTPP agreement itself.⁷⁰

Where the UK already has an FTA with a CPTPP member, these have been incorporated into the baseline. This includes recent FTAs, such as the UK-Australia and UK-New Zealand FTAs. The results presented therefore represent the incremental impact of the CPTPP agreement over and above existing bilateral agreements. However, FTAs that are being negotiated (such as the UK-India FTA) have not been included in the core baseline. A sensitivity scenario with India in the baseline is presented in the Uncertainty and Sensitivity Analysis section (section 7).

Inputs

To estimate the impact of the agreement using a CGE model, inputs are required for the following:

- changes in tariffs
- changes to trade costs associated with changes to non-tariff barriers in goods sectors and regulatory restrictions on services

The inputs have been updated since the scoping assessment to better approximate the change in the trade costs resulting from the agreement. The approach to generating inputs is set out in Annex 2 alongside a table of inputs.

DBT gathers intelligence from companies, trade associations and academics for insights into how sectors operate and to inform negotiations. Where applicable, this information is fed into the modelling exercise to refine the input assumptions to best reflect qualitative and quantitative evidence.

⁶⁹ The detail of the modelled average FTA scenario is described in the Government's publication on the long-term economic analysis of EU Exit. This represents a hypothetical FTA between the UK and EU in the long run. HMG, 'EU Exit Long-term economic analysis' (November 2018).

⁷⁰ [Market Access Map, International Trade Centre, www.macmap.org](https://www.macmap.org), accessed 2022.

Table 2: Inputs

Tariffs	<p>The modelling assumes full liberalisation of all UK tariffs except for beef and processed rice, where 25% of tariffs are retained.</p> <p>For CPTPP countries, the modelling assumes CPTPP members fully liberalise all tariffs except for the following products:</p> <ul style="list-style-type: none">• poultry for Canada and Malaysia• dairy products for Canada, Mexico and Japan• pork, wheat and beef for Japan <p>In these product-country combinations only, the modelling assumes 25% of tariffs are retained, apart from for Canada dairy products. In the case of Canada dairy products, where the market is highly protected, it is assumed 75% of the baseline tariff is retained.</p> <p>Additionally, in a small number of cases, adjustments to the standard GTAP data inputs have been undertaken to ensure the tariff inputs more accurately reflect the trading relationship.</p> <p>The modelling does not account for gradual staging of tariff reductions or transitional tariff rate quotas. The figures described above represent approximations to the net effect of liberalisation.</p>
Non-tariff measures (NTMs) affecting goods trade	<p>The modelling assumes NTMs for industrial goods are reduced in line with estimated reductions observed in the set of deep and comprehensive agreements signed in the past. These are proxied by a 7 in the publicly available DESTA database.</p> <p>The estimated reductions in non-tariff trade costs for each sector are derived from gravity modelling. Further detail on this can be found in Annex 2.</p> <p>The modelling assumes NTMs are reduced in line with a shallower agreement for the agricultural sectors. This is because there are limited provisions in the agreement affecting trade in the agricultural sectors and no new requirements for CPTPP goods to enter the UK market. Therefore, the provisions affecting these sectors are assessed to be more consistent with shallower agreements.</p> <p>The modelling also assumes no reductions in non-tariff trade costs for energy sectors. This reflects the nature of commodity markets as CPTPP is not expected to directly impact the energy sector.</p> <p>The NTM reductions (AVE) in UK goods exports to CPTPP and UK goods imports from CPTPP are 0.2 and 0.3 percentage points respectively. This masks a considerable degree of variation among specific CPTPP trading partners. In Malaysia, for example, the estimated NTM reductions in UK goods exports</p>

	<p>to Malaysia and UK goods imports from Malaysia are 2.8 and 6.2 percentage points respectively.⁷¹</p> <p>In agri-food sectors specifically, estimated NTMs applied to UK exports are reduced by 0.1 percentage points across CPTPP markets. In Brunei and Malaysia's markets, estimated NTMs applied to UK exports are reduced by 1.9 and 1.7 percentage points, respectively. Similarly, estimated NTMs in industrial sectors are estimated to be reduced by 0.2 percentage points across UK exports to CPTPP markets. In Brunei, Malaysia and Mexico's markets, the industry NTM cost reductions are estimated to be 6.0, 2.9 and 2.3 percentage points respectively.⁷²</p>
<p>Regulatory restrictions affecting services trade</p>	<p>The values of existing NTMs are first estimated using gravity modelling, which is explained further in Annex 2. These NTM values are then adjusted to account for where CPTPP goes further than bilateral deals on services liberalisation based on research produced by the London School of Economics (using the OECD's Services Trade Restrictiveness Index Framework). This research provides estimates for reductions in services NTMs for existing CPTPP members, but not for the UK. The modelling therefore assumes that the UK's level of service restrictiveness under CPTPP will be the average of existing high-income CPTPP members. This assumption was made to better approximate the impact of the provisions in the agreement.</p> <p>The NTM reductions (AVE) in UK services exports to CPTPP and UK service imports from CPTPP are 0.4 and 1.1 percentage points respectively. The reductions represent commitments beyond existing GATS obligations and reduce policy uncertainty for service providers trading with CPTPP.</p> <p>For example, the estimated NTM reductions in UK service exports to Malaysia and UK service imports from Malaysia are 2.4 and 2.3 percentage points respectively. Information and communication services and other business services, which accounted for 5% and 21% of UK service exports to Malaysia in 2022.⁷³ These sectors see reductions in bound restrictiveness equivalent to AVEs of 2.3 and 2.2 percentage points respectively. Financial services, which made up 7% of UK service exports to Malaysia in 2022, sees reductions of 3.6 percentage points.⁷⁴</p>

⁷¹ These are trade weighted ad-valorem equivalent reductions in non-tariff measures (NTMs) based on modelling inputs on the reduction in NTMs applied in the Computer Generated Equilibrium model.

⁷² These are trade weighted, ad-valorem equivalent reductions in non-tariff measures (NTMs) based on modelling inputs on the reduction in NTMs applied in the Computer Generated Equilibrium model.

⁷³ [ONS, UK trade in services: service type by partner country, non-seasonally adjusted](#), 2022, released 27th April 2023

⁷⁴ [ONS, UK trade in services: service type by partner country, non-seasonally adjusted](#), 2022, released 27th April 2023

Macroeconomic impacts

Impacts on UK trade, GDP, and wages

Results from the modelling of the agreement point to long run increases in UK trade, GDP and wages (around 10-15 years from the implementation of the agreement). The results do not represent precise estimated impacts. Instead, they indicate the direction and broad orders of magnitude of impacts.

Table 3: Summary of estimates of UK GDP impacts, long run changes against the baseline

UK GDP impact	£bn estimate applied to 2040 projections
Change in UK GDP	£2.0bn

Table 4: Summary of estimates of UK macroeconomic impacts, long run changes against baseline

UK macroeconomic impacts	£bn estimate, applied to 2040 projections	% Change
Change in UK exports to CPTPP	£2.6bn	3.56%
Change in UK imports from CPTPP	£2.3bn	4.17%
Change in total trade between the UK and CPTPP	£4.9bn	3.90%
Change in UK exports to World	£1.1bn	0.14%
Change in UK imports from World	£1.1bn	0.13%

Source: DBT CGE Modelling. Note: Throughout this section, equivalent pound values are provided in 2021 prices. All percentage changes but for the changes in UK trade with World are from CGE modelling; see the methodology in Annex 1 for the derivation of percentage change in UK trade with World. Further details, including numbers based on 2021 values are found in Annex 4.

DBT's projections suggest that, in the absence of the agreement, UK trade (exports and imports) with CPTPP could reach £126.8 billion in 2040. This represents a 28.8% increase in UK trade with CPTPP in real terms (2021 prices and exchange rates) compared to 2021.⁷⁵

The FTA can generate further benefits in addition to this. The modelling estimates that total trade (exports and imports) with CPTPP could increase by a further 3.9% in the long run as a result of the agreement. This is equivalent to £4.9 billion when applied to projected levels of trade in 2040.⁷⁶ This is driven by both the estimated increase in exports and imports to and from CPTPP.

⁷⁵ 2040 projections for UK total exports and imports are calculated using the methodology described in [DBT's Global Trade Outlook \(February 2023\)](#).

⁷⁶ 2040 projections for UK total exports and imports are calculated using the methodology described in [DBT's Global Trade Outlook \(February 2023\)](#). For bilateral trade between the UK and CPTPP in 2040, it is further assumed that both the UK and CPTPP lose market shares of partner import demand in line with their relative loss of global market shares (as projected in the Global Trade Outlook).

The modelling estimates the agreement could increase UK exports to CPTPP by 3.6% in the long run. This is equivalent to a further £2.6 billion of exports when applied to projected levels of exports in 2040. The greatest estimated export increases to CPTPP are primarily in manufacturing sectors, within which, the motor vehicles sector sees the largest increase in exports.

The increased trade between the UK and the CPTPP countries represents businesses and consumers in both the UK and CPTPP having access to relatively more competitive goods and services. However, in a globally integrated trading framework, this also means some reallocation of trade away from the UK's and CPTPP's other major trading partners, affecting the *relative* competitiveness of these other bilateral exports and imports. For instance, UK exports to other partner countries fall meaning that the increase in UK bilateral exports to CPTPP countries is greater than the increase in UK total exports to the world.⁷⁷

Overall, UK exports to the world (including CPTPP) are estimated to increase by 0.14% as a result of the UK's accession to CPTPP. This is equivalent to £1.1 billion when compared to baseline levels in 2040 without the agreement. Increased competition from imports also drives gains from the agreement. As imports increase, this allows production in the UK to shift towards areas of UK comparative advantage, resulting in a more efficient allocation of resources across the economy in the long run.

UK imports from CPTPP are estimated to grow by 29.2% in the absence of the agreement between 2021-2040, reaching £55.0 billion in 2040.⁷⁸ The UK's accession to CPTPP is estimated to boost imports further by 4.2% in the long run as a result of the agreement. This is equivalent to £2.3 billion when applied to projected levels of imports in 2040 in real terms. The greatest estimated import increases from CPTPP are concentrated in manufacturing sectors.

Overall, UK imports from the world (including CPTPP) are estimated to increase by £1.1 billion (or 0.13%) when compared to 2040 levels as a result of the agreement. This shows that around half of the estimated increase in imports from CPTPP represents trade creation as a result of lower tariffs and NTMs.⁷⁹

Reduced trade costs and increased trade lead to higher productivity. This means that businesses can produce more with the same number of workers. This benefits workers who may receive higher wages, and consumers who can consume more and better products.

The agreement could boost UK GDP by around £2.0 billion a year when compared to projected GDP in 2040.⁸⁰ The largest contribution comes from increased consumer spending, estimated to increase by £1.1 billion when applied to 2021 levels.⁸¹

⁷⁷ CGE model estimated that around 56% of the increase in UK exports to CPTPP is associated with the reallocation of UK exports to the rest of the world.

⁷⁸ 2040 projections for UK total exports and imports are calculated using the methodology described in [DBT's Global Trade Outlook \(February 2023\)](#).

⁷⁹ CGE model estimated that around 50% of the increase in UK imports from CPTPP is associated with the reallocation of UK imports from the rest of the world.

⁸⁰ Calculated using OBR, Economic and fiscal outlook – March 2022 long-term economic determinants. The estimated increase is over and above underlying growth of the UK economy. Based upon the OBR's March 2022 long-term economic determinants and March 2023 medium-term determinants, UK real GDP could increase to around £3.3 trillion by 2040 (measured in 2021 prices).

⁸¹ This figure is subject to uncertainty due to differences in the definitions and classification of GDP components between the OBR and the GTAP database. The GTAP database also uses 2017 data and relative GDP components may have changed between 2017 and 2021. Hence, this figure is used to provide context only.

In addition, our modelling estimates a 0.18% long-run increase in business investment in the UK by the estimated increase in return to capital as a result of the agreement. This is equivalent to £699 million annually when applied to 2021 levels.⁸²

Real wages (wages in 2021 prices) are estimated to rise by around 0.11%, equivalent to £1.0 billion annually when applied to 2021 levels. This reflects workers benefitting from higher productivity in the economy.⁸³

Estimates of impacts by sector

The impact of the agreement on different sectors:

Goods

The CPTPP agreement will offer export opportunities for key sectors. These include:

- whisky: Tariffs will be eliminated on UK exports of whisky to Malaysia (reduced from around 80%⁸⁴ to 0% within 10 years). The UK exported £32.2 million of whisky to Malaysia in 2022 in current prices, despite facing Malaysia's MFN tariff of around 80%⁸⁵
- dairy: The UK has secured access to various CPTPP tariff rate quotas which will provide improved access to CPTPP markets for UK exporters, including the dairy markets of Canada, Japan and Mexico. In particular, Canada's cheese quotas provide an extra 16,500 tonnes of shared, tariff-free access, while Mexico's cheese quota provides an extra 6,500 tonnes of shared, tariff-free access. The UK has also agreed staged tariff liberalisation with Chile on dairy products such as cheese, butter, and cream. Access to Canada, Japan and Mexico's dairy TRQs and staged tariff liberalisation by Chile on dairy will allow UK dairy producers to build on the £23.9 million of dairy we exported to these countries in 2022 in current prices (£19.2 million to Canada, £2.6 million to Japan, £1.9 million to Mexico, £0.3 million to Chile).⁸⁶
- cars: UK car manufacturers will benefit from the staged removal of tariffs of 30% on UK exports of cars to Malaysia within 7 years. The UK exported £313.9 million of motor vehicles to Malaysia in 2022 in current prices, despite facing Malaysia's MFN tariff of 30%⁸⁷
- chocolate: Exporters of chocolate will benefit from zero tariffs on exports to Mexico and Malaysia. Tariffs will be eliminated sooner on UK exports of chocolate to Vietnam.

⁸² This figure is subject to uncertainty due to differences in the definitions and classification of GDP components between the OBR and the GTAP database. The GTAP database also uses 2017 data and relative GDP components may have changed between 2017 and 2021. Hence, this figure is used to provide context only.

⁸³ Our analysis models the long-run response of the economy to the FTA under stylized conditions including where the employment remains unchanged. Therefore, under different scenarios, e.g. where employment might fluctuate, the modelled wage impact might differ.

⁸⁴ Updated DBT estimate of the ad valorem equivalent (AVE) of Malaysia's MFN whisky tariff.

⁸⁵ HMRC overseas trade statistics, April 2023.

⁸⁶ HMRC overseas trade statistics, April 2023.

⁸⁷ HMRC overseas trade statistics, April 2023.

- meats: Tariffs will be eliminated on UK exports of beef, pork, and poultry to Mexico. Most Favoured Nation (MFN) tariffs of up to 25% will be eliminated on UK exports of beef to Mexico after staging. MFN tariffs of up to 20% will be eliminated on UK exports of pork to Mexico at entry into force, while MFN tariffs of up to 75% will be eliminated on UK exports of poultry to Mexico after staging. The UK has also agreed staged tariff liberalisation with Peru on beef and poultry meat. Tariffs will be eliminated sooner on UK exports of pork to Vietnam.

Services

- joining CPTPP provides guarantees in market access, predictability, and transparency for UK service suppliers who exported £32.2bn worth of services to CPTPP countries in 2022,⁸⁸ including £631m worth of legal services⁸⁹
- CPTPP guarantees that UK engineering services providers will have the ability to supply services in Chile on the same terms as local suppliers. This will support the £34m of UK architectural, engineering, scientific and other technical services exports to Chile in 2022⁹⁰
- CPTPP will provide improved terms for UK courier services providers in Brunei – allowing them to set up and operate through joint ventures, supporting UK exports of services to Brunei worth £66m in 2022
- the financial services chapter provides additional legal certainty for an industry that represented £10.9bn worth of services exports to CPTPP members in 2022⁹¹

Investment

- closer ties through UK accession could enhance the existing investment relationship between the UK and CPTPP. In 2021 the stock of outward FDI from the UK in CPTPP was at least £117.3 billion. Outward FDI involving UK companies in 2021 included over £43bn invested in financial services, and over £7bn in professional, technical and scientific services.⁹² In 2021, the stock of inward FDI from CPTPP in the UK was at least £181.8 billion⁹³
- if the 11 CPTPP members were a single country, they would be the 4th highest recipient of UK FDI – and that's before UK accession

Modelled Impacts

Export and import growth occur within the CGE model where there is large tariff or NTM liberalisation, and evidence of large historic trade flows by sector. The UK has existing bilateral trade and investment agreements with nine of the eleven CPTPP members, and the majority

⁸⁸ [ONS, UK total trade: all countries seasonally adjusted data](#), released 27th April 2023

⁸⁹ [ONS, UK trade in services: service type by partner country, non-seasonally adjusted](#), 2022, released 27th April 2023. Data not available for Brunei, Peru and Vietnam.

⁹⁰ [ONS, UK trade in services: service type by partner country, non-seasonally adjusted](#), 2022, released 27th April 2023

⁹¹ Data covers both trade in financial services and insurance and pension services.

⁹² [Foreign direct investment involving UK companies \(directional\): outward, released 23rd January 2023](#). Please note figures do not include Brunei, Peru or Vietnam

⁹³ [ONS Foreign direct investment \(FDI\) totals for inward and outward flows, positions and earnings, released 24th January 2023](#)

of tariff and NTM liberalisation is concentrated in Malaysia and Brunei (with which the UK does not have existing agreements), with particularly strong bilateral NTM reductions in manufacturing sectors and relatively smaller bilateral reductions in services sectors.

Sectoral results: uncertainty

CGE modelling results should be read as indicative estimates. Their value is in the relative changes between sectors. Weight should not be put on point estimates, in particular in value terms. Rather, the most appropriate results to use are those presented in a range as they reflect a number of sources of uncertainty.

The sectoral results are subject to the same sources of uncertainty as the aggregate modelling results. This is due to a number of reasons:

- Modelling assumptions: CGE modelling is widely used by international institutions, governments, and recommended by the Trade Modelling Review.⁹⁴ It is able to capture the impacts of many changes resulting from a trade agreement. It is regarded as best in class for the analysis of impacts of changes in trade policy, however when interpreting the results, it is important to bear in mind:
 - CGE models use data on all trade routes and national production across all regions. In broad terms, this comprehensive data, together with sector-specific trade 'elasticities', (assumptions on the relationship between different model variables), are the means to estimate sectoral impacts. The sector-specific elasticities in the GTAP database used for the modelling are identical across countries. Because of this, some of the nuances of particular country-sector specific interlinkages cannot be captured in the modelling
 - CGE modelling, like any modelling, relies on stylised assumptions about resources in the economy in order estimate long run changes. A key assumption often used for CGE modelling is that there is no increase in the labour force possible, and that the economy operates at full employment. This means that the response to the changes in trade barriers from the agreement is for labour and (and other resources) to move between sectors reflecting the relative opportunities offered by the agreement
 - The CGE model is not a forecasting model and does not take in to account other changes which might affect output or trade flows, such as technological progress and change in the economy caused by it
 - It does not account for increases in productivity. The resulting relative growth in sectors that results occurs through knowledge exchanges and improvements in response to the increased competition or through other means such as government policy. In principle this, as well as technological change, could be captured by reflecting changes in sector composition and associated trade flows in the model. But these are very hard to determine

⁹⁴ [Trade modelling review expert panel: report \(January 2022\)](#)

- Data: CGE modelling requires a dedicated analytical database in which the trade flows between countries are consistent. We use the most up-to-date database provided by the GTAP centre – GTAP11 with reference year 2017. While we attempt to reflect the most important changes in trade policy in our modelling baseline, against which the impacts of the trade agreement are estimated, we cannot fully reflect all developments since 2017. Moreover, sectoral trade flows can fluctuate significantly from year to year. The choice of year matters as using data from different years can impact sectoral results.
 - o The GTAP database does not account for economic activity where services are delivered through commercial presence in a foreign country and therefore may underestimate results in sectors where this makes up a large proportion of economic activity.
- Inputs: While tariffs are directly reported as part of the trade negotiations, the Non-Tariff Measures (NTMs), in particular those affecting services trade, are not. Such NTMs and regulatory restrictions to services can be hard to observe directly, meaning academics and trade policy analysts tend to derive NTM reductions using econometric techniques. These estimates may over- or underestimate the magnitude of changes to the NTMs resulting from the agreement.

Sensitivity testing around the central values used in the model, in particular the elasticities used, the NTM estimates, and other assumptions, is conducted to reflect the uncertainty involved in the modelling. The ranges that are derived from this sensitivity testing provide the best guide to potential impacts.

While these limitations apply to the aggregate results and all sectoral results, they are particularly acute for certain sectoral results. Further discussions of uncertainty are included in section 7.

The sectors driving the increase in UK exports to CPTPP (in absolute terms) are the motor vehicles, and textiles, apparel and leather sectors. UK exports to CPTPP in these sectors are estimated to increase by £712 million and £186 million respectively as a result of the agreement. The increase in UK exports of the textiles, apparel, and leather sector is mainly driven by increased exports of leather products.

All sectors see an increase in UK imports from CPTPP as a result of the agreement, with the largest increase concentrated in manufacturing sectors. The sectors with the largest estimated increase in imports from CPTPP (in absolute terms) are the manufacture of electronic equipment sector and manufacture of machinery and equipment sector. UK imports of electronic equipment and machinery and equipment from CPTPP are expected to increase by £288 million and £249 million, respectively, as a result of the agreement. This predominantly reflects trade reallocation, as discussed in section 4.8.

The largest percentage increase in UK exports to CPTPP is in the semi-processed foods sector. This is mainly due to the small existing trade flows between the UK and CPTPP in this sector. The absolute changes in this sector remain relatively small and have minimal impact on sectoral GVA.

Table 5 below summarises the estimated change in UK-CPTPP trade by sector, relative to the baseline, as a result of the agreement.

Table 5: Estimated percentage change in UK-CPTPP trade by sector and pound equivalents

Broad sector category	GTAP 23 Sector	Change in UK exports to CPTPP, %	Change in UK exports to CPTPP, £m 2021	Change in UK imports from CPTPP, %	Change in UK imports from CPTPP, £m 2021
Agri-Food	Agriculture, forestry, and fishing	0.5%	1	1.0%	9
	Beverages and tobacco products	6.8%	77	1.2%	6
	Other processed foods	9.9%	70	5.3%	28
	Semi-processed foods	40.3%	65	15.9%	144
Industry	Chemical, rubber, plastic products	3.3%	166	6.4%	148
	Energy	0.3%	1	0.1%	1
	Manufacture of electronic equipment	1.1%	34	7.9%	288
	Manufactures	5.5%	100	1.3%	107
	Manufacture of motor vehicles	8.4%	712	2.8%	152
	Manufacture of machinery and equipment n.e.c	4.2%	183	8.3%	249
	Manufacture of other transport equipment	0.8%	30	5.8%	121
	Manufacturing n.e.c	9.9%	93	7.2%	75
	Paper and printing products	2.7%	21	5.5%	11
	Textiles, apparel, and leather	18.7%	186	3.6%	84
Services	Business services	0.9%	55	2.1%	41
	Communications	5.7%	99	7.0%	54
	Construction	3.0%	3	4.8%	4
	Financial services	-0.1%	-3	3.5%	82
	Insurance	0.1%	3	2.2%	6
	Other services (transport, water, dwellings)	1.5%	39	3.0%	39
	Personal services	-0.2%	-1	3.7%	7

	Public Services	1.8%	54	2.2%	27
	Wholesale and retail trade	0.1%	1	3.7%	93

Source: DBT CGE Modelling. n.e.c. means not elsewhere classified. It is used to denote entities that do not fit into existing classification categories. Note: For sectoral impacts, equivalent pound values are based on year 2021.

Increase in trade flows leads to changes in output in affected sectors. There are also second-order impacts for sectors which experience changes in demand as a result of trade liberalisation affecting other sectors. Overall, this is estimated to lead to higher production in the UK. Tariff and NTMs liberalisation, in sectors with high trade flows in the baseline leads to significant growth in domestic production in non-traded sectors. The modelling shows that 19 out of 23 sectors contribute to higher growth.

Some sectors see an increase in competition due to resources shifting to expanding sectors instead, increasing costs and decreasing their competitiveness.

As a result of the agreement, manufacturing sectors are estimated to grow in gross value added (GVA) by around £250 million relative to 2021 levels - around 0.14% growth in the long-run.^{95,96} Within the UK manufacturing industry, the automotive sector sees the largest increase in GVA by £183 million (or 1.27%). This is due to a significant increase in UK exports of motor vehicles and parts to CPTPP countries driven by the liberalisation of both tariffs and NTMs. The textiles, apparel, and leather sector experiences the largest increase in percentage terms (increasing by 1.29% or £90 million), with leather products benefitting the most. This is a result of UK businesses enjoying improved access to imported inputs from CPTPP and becoming more competitive in international markets.

With respect to agri-food sectors, the largest expansions in GVA are beverages and tobacco products (0.36% or £34 million) and other processed foods sectors (0.14% or £23 million), as shown in Table 6. The increase is mainly driven by the large decline in tariffs and NTMs and cheaper inputs from other markets. This is particularly so in Malaysia (the modelled decline in tariffs for Malaysia is around 152.5 and 5.5 percentage points for the beverages and tobacco products and other processed foods sectors, respectively).

The direct impact of liberalisation from reducing trade barriers with CPTPP will allow key UK service exporters, including financial service exporters, to benefit. Accounting for indirect impacts and resource reallocation, the CGE results suggest that the services sectors are estimated to make the strongest contribution to the estimated growth in GVA in absolute terms on a 2021 basis at £504 million, around 0.03% growth in the long-run.⁹⁷

The UK's financial services sector is expected to grow in the future, however in the modelling it appears to grow marginally less than it otherwise would have done in the absence of a deal (estimated around 0.05% of GVA or £45 million). Within the isolated confines of a model, the

⁹⁵ Gross value added (GVA) for an industry is the value of the industry's outputs minus the value of intermediate inputs used in production.

⁹⁶ In the National Accounts, GVA is equivalent to GDP less indirect taxes. However, in the results presented from the GTAP model used, the difference between GDP and GVA measures includes both indirect taxes and a so-called technical change. In the GTAP model, as a result of the FTA, firms' output increases meaning that household income - and expenditure - also proportionally increase. Some of this additional income is driven by efficiency gains that result from the reductions in the non-tariff measures in the agreement (so-called technical change). This technical change in the GTAP model is captured at the aggregate economy-wide level but not at the sectoral GVA level.

⁹⁷ As discussed in more detail in the previous footnote, in the GTAP model so-called technical change (that is efficiency gains resulting from the reductions in the non-tariff measures in the trade agreement) is captured at the aggregate economy-wide level but not at the sectoral GVA level. This means that some of the benefits from the NTM reductions are not fully captured by sectoral GVA variables.

comparatively larger liberalisation gained in other sectors leads to a reallocation of resources (capital and labour) over the long run in their direction and away from a sectors like financial services. In practice, this effect is likely to be dwarfed by wider forces shaping employment and investment decisions in the financial services sector over the long run.

The UK's imports of financial services from CPTPP are also estimated to increase by 3.5% (£82 million) due to lower trade barriers. It is also important to note that global import demand for financial services is expected to grow from £478 billion in 2021 to over £550 billion by 2035.

These impacts are related to assumptions such as a fixed labour supply and full labour mobility. Given the modelling attempts to capture impacts in an economy over the long run, it is assumed there will be sufficient time for this resource reallocation to take place.

The largest contributions in absolute terms come from other services (transport, water, dwellings, 0.08% or £187 million), construction (0.12% or £119 million), and public services (0.02% or £76 million). The main driver of the services sector contribution to GVA increase is liberalisation in the goods sector while *direct* services liberalisation plays a relatively small role. Goods liberalisation drives changes in the economy which lead to a higher GVA in the service sectors thanks to the interlinkages of economic activities across the UK. For example, services being the intermediate input into the output of other sectors and as demand for manufacturing increases, demand for the complementary services also increases.

The agreement could provide easier access to goods and services from CPTPP, benefitting consumers with greater choice and lower import prices. This inevitably impacts domestic suppliers through greater competition. While 19 out of 23 sectors are expected to expand as a result of accession, the sectors estimated to contract relative to the baseline include two manufacturing sectors (electronic equipment and transport equipment), one agri-food sector (semi-processed food) and one service sector (financial services). The GVA of manufacture of electronic equipment and the manufacture of transport equipment is estimated to fall by £67 million (0.38%) and £24 million (0.18%) respectively, relative to in the absence of the agreement. This is mainly caused by reallocation of resources away from these sectors to the growing manufacturing sectors (like motor vehicles).

The semi-processed foods sector is expected to experience a reduction of around 0.06% (£5 million). Within the semi-processed foods sector, sectors like other meat products, vegetable oils and fats and processed rice, also experience small reductions in GVA due to reallocation of resources away from these sectors.

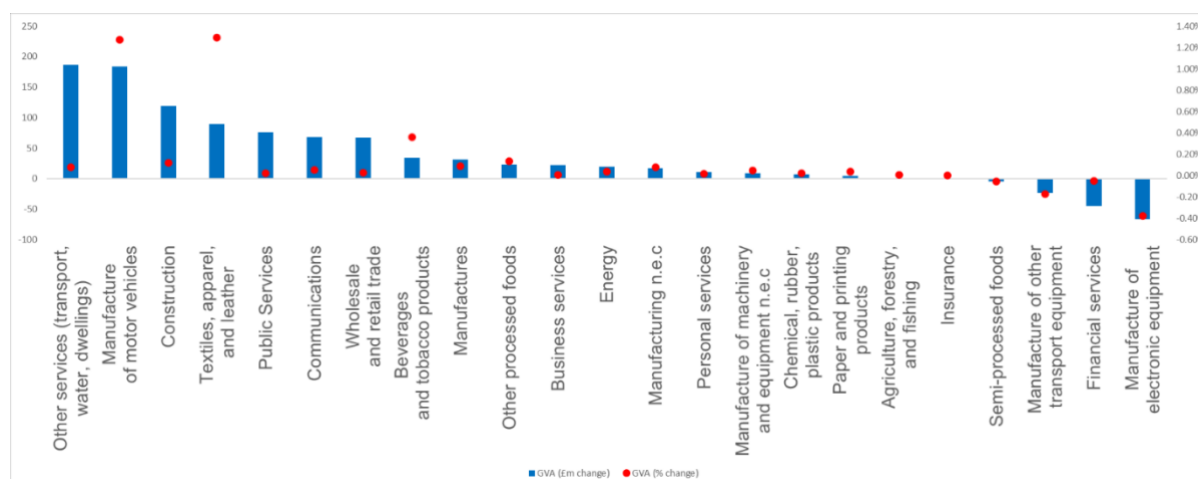
The quantitative estimates from the modelling are set out in Table 6 and Figure 3 below. The results do not represent precise estimated impacts. Instead, they indicate the direction and broad orders of magnitude of impacts relative to a baseline of no agreement.

Table 6: Estimated percentage change in GVA by sector and pound equivalents

Broad Sector category	GTAP-23 Sector	Change in GVA (%)	Change in GVA (£ millions, 2021)	Change in sector share of total UK GVA (percentage point)
Agri-Food	Agriculture, forestry, and fishing	0.01%	1	0.00
	Beverages and tobacco products	0.36%	34	0.00
	Other processed foods	0.14%	23	0.00
	Semi-processed foods	-0.06%	-5	0.00
Industry	Chemical, rubber, plastic products	0.02%	7	0.00
	Energy	0.04%	19	0.00
	Manufacture of electronic equipment	-0.38%	-67	0.00
	Manufactures	0.09%	31	0.00
	Manufacture of motor vehicles	1.27%	183	0.01
	Manufacture of machinery and equipment n.e.c	0.05%	8	0.00
	Manufacture of other transport equipment	-0.18%	-24	0.00
	Manufacturing n.e.c	0.08%	17	0.00
	Paper and printing products	0.04%	4	0.00
	Textiles, apparel, and leather	1.29%	90	0.00
	Business services	0.01%	22	-0.01
	Communications	0.05%	68	0.00
	Construction	0.12%	119	0.00
	Financial services	-0.05%	-45	0.00
	Insurance	0.00%	1	0.00
	Other services (transport, water, dwellings)	0.08%	187	0.00
	Personal services	0.01%	10	0.00
	Public Services	0.02%	76	0.00
	Wholesale and retail trade	0.03%	67	0.00

Source: DBT CGE Modelling. n.e.c. means not elsewhere classified. It is used to denote entities that do not fit into existing classification categories.

Figure 3: Change in GVA by sector and £ million



Source: DBT CGE modelling.

While we note the change in the relative composition of UK sectors is a consequence of trade policy, the scale of this change (as indicated in the CGE modelling) is marginal and is not expected to alter supply chain interactions between UK sectors or the composition of sectors in the economy.

Estimates of impacts by nation and English region of the UK

The distribution of sectors across the country suggests that all nations and regions could see an increase in output from the FTA. The West Midlands, East Midlands and North East are estimated to experience the biggest % increases in output. This reflects growth in output in the manufacture of motor vehicles and textiles, apparel, and leather.

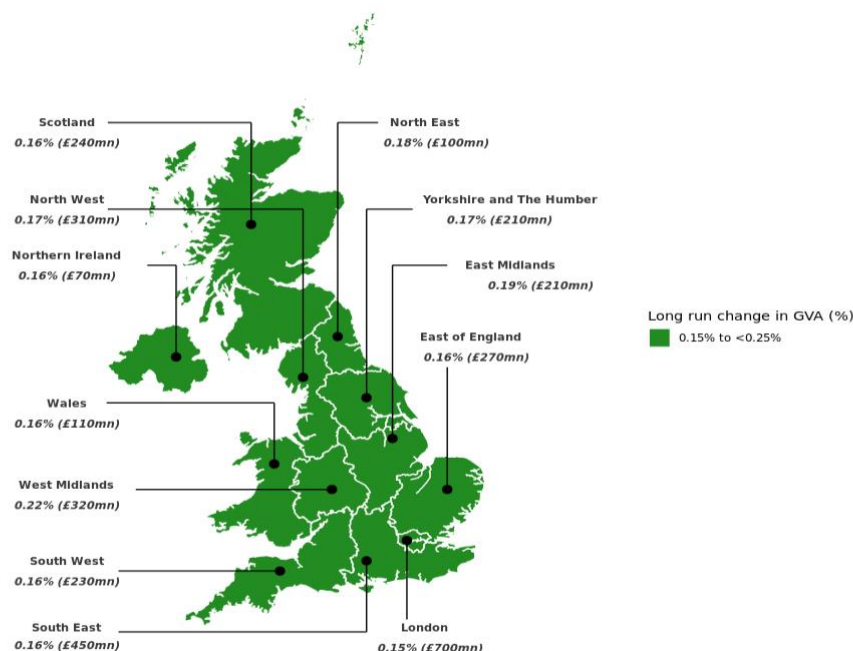
International evidence suggests that trade agreements have the potential to affect various countries and regions within an economy differently. Trade and investment are linked to increased growth and prosperity, although gains are not always evenly distributed within an economy. Trade agreements affect sectors differently, and the sectoral composition of output, employment and productivity vary across regions.

The output of the West Midlands, East Midlands and North East could be set to expand the most in relative terms as a result of the agreement (Table 7). Manufacturing is the main driver of differential impacts across UK nations and regions. UK regions with a greater concentration of manufacturing of motor vehicles and textiles, apparel, and leather are estimated to see the greatest expansions in GVA relative to other nations and regions. Whilst London shows the lowest percentage change in GVA, this translates into the highest pound value change given the relative size of London's economy.

The modelled expansions in GVA in services sectors at the national level are predominantly driven by the expansion of manufacturing industries, as noted in Section 4.6. The apportionment methodology used to estimate regional impacts cannot take account of intra-UK supply chain linkages. Expansions in largely non-tradeable services sectors are likely to be more pronounced in regions that have a high concentration of activity in expanding manufacturing sectors. This is due to supply chain and multiplier effects from additional rounds of consumer spending. As a result, this approach may overestimate potential impacts for regions with a large concentration of services but relatively less activity in key expanding

manufacturing industries, and underestimate impacts for regions with relatively higher activity in these manufacturing industries. Further information on the limitations and assumptions behind this approach are outlined in Annex 5.

Figure 4: Changes in UK nations and regions nominal value added, long run % change



Source: DBT calculations using ONS and NISRA Business Register Employment Surveys 2019, ONS regional GVA estimates 2019.

The methodology weights the UK-wide change in sectoral GVA by regional and sector GVA to provide an indicative estimate of the potential net impact on the regions of the UK. Due to the simplicity of the methodology, values provided in the below table must not be interpreted as precise estimates or forecasts. Instead, they are indicative orders of magnitude based on nominal levels of GVA in 2019. The analysis also assumes that the modelled GVA change in a given sector affects all regions and nations equally, after controlling for the relative size of the industry in the region. There are several simplifying assumptions and limitations of this approach which are outlined further in Annex 5. Similarly, since these results show nominal value added, they are not directly comparable to the macroeconomic impact results presented above.⁹⁸

⁹⁸ The higher impacts for regional GVA compared to the GDP results reflects the fact that GVA includes taxes and subsidies, which are excluded from GDP.

Table 7: % and £ million changes in nominal GVA for UK nations and regions of England, central estimates (rounded to the nearest £10m)

<i>UK nations and regions of England</i>	Main scenario	
	% Change in GVA	Change in GVA £ million, 2019
East of England	0.16%	270
East Midlands	0.19%	210
London	0.15%	700
North East	0.18%	100
North West	0.17%	310
South East	0.16%	450
South West	0.16%	230
West Midlands	0.22%	320
Yorkshire and the Humber	0.17%	210
Northern Ireland	0.16%	70
Scotland	0.16%	240
Wales	0.16%	110

Note: Pound values have been rounded to the nearest £10 million. The point estimates are not precise estimates and should be interpreted as indicative of the direction and broad scale of impacts.

Source: DBT calculations using ONS and NISRA Business Register Employment Surveys 2019, ONS regional GVA estimates 2019.

Impacts on other countries

Impact on CPTPP members

FTAs are mutually beneficial for their parties, and deeper agreements can generate greater benefits. This is because as barriers to trade fall, countries can export more to each other and source cheaper inputs leading to potentially greater productivity and economic benefits.

The agreement is estimated to increase the aggregated GDP of CPTPP-11 members in the long run by around £2.4 billion when compared to projections of CPTPP GDP in 2040.⁹⁹ Summary results for the economic impact on CPTPP are set out in the table below.

⁹⁹ 2040 projections for GDP of CPTPP members are calculated using the methodology described in the [Global Trade Outlook \(February 2023\)](#). International Monetary Fund, World Economic Outlook Database, April 2022 US dollars. Annual average Spot exchange rate, US \$ into Sterling.

Table 8: Estimated long run impact on CPTPP GDP

Aggregate CPTPP GDP impact	£bn estimate applied to 2040 projections
Change in aggregate GDP for CPTPP	£2.4bn

Source: DBT modelling. Projections of CPTPP GDP in 2040 using the methodology as described in the Global Trade Outlook.

Table 9: Summary of estimated long run impacts on CPTPP

Macroeconomic impacts on CPTPP	£bn estimate, % change applied to 2040 projections	% change
Change in CPTPP exports to the UK	£2.3bn	4.2%
Change in CPTPP imports from the UK	£2.6bn	3.6%
Change in total trade between the CPTPP and the UK	£4.9bn	3.9%

Source: DBT modelling.

The economic structures of CPTPP member countries could evolve over time, in ways that cannot currently be predicted. This may lead to different competitive pressures in the long term compared to those reflected in the current modelling. Therefore, the analysis presented above is subject to uncertainty.

UK accession to CPTPP will have different economic impacts for each CPTPP member. The scale of impact depends upon the scale of liberalisation between the UK and the country. Where the UK has already signed a bilateral agreement prior to UK accession, the macroeconomic impacts on the partner economy are likely to be small.

The modelling shows that UK accession to CPTPP could have a positive impact on the GDP of most member countries.

The UK joining CPTPP has the potential to generate positive economic impacts for CPTPP members. Access to cheaper inputs and higher quality products and services alongside greater UK demand for CPTPP exports could further stimulate economic growth in the region. There is potential for productivity growth and competitiveness improvements from the UK's accession to CPTPP.

The modelling indicates that across CPTPP member countries, the three sectors that are expected to benefit the most (in terms of GVA) from the UK joining CPTPP in the long run due to reductions in UK tariffs and regulatory barriers to trade with CPTPP are: manufacture of other transport equipment, textiles and wearing apparel, and financial services.

Impact on trade with the rest of the world

An FTA can lead to lower trade flows with existing trading partners as businesses and consumers source cheaper goods from the FTA partner country. The modelling results show that UK exports to CPTPP could increase by £2.6 billion when applied to projected levels in 2040 in the absence of the FTA. Total UK exports to the world (including CPTPP) only increase

by £1.1 billion. This indicates around £1.5 billion (or 56%) of the increase in exports to CPTPP reflects trade reallocation away from existing partner countries.

The estimated increase in UK imports from the world as a result of UK accession are estimated to be the same as the increase in UK exports to the world. UK imports from CPTPP grow by £2.3 billion as a result of the FTA compared to projected levels in 2040, while total UK imports only increase by around £1.1 billion. This indicates around 50% of the increase in imports from CPTPP reflects trade reallocation away from existing partner countries.

Impact on neighbouring and developing countries

There could be short to medium term detrimental effects on some developing countries' exports to the UK through preference erosion.¹⁰⁰ Developing countries with a higher share of their trade with the UK, or countries exporting products in which the UK or CPTPP countries are highly competitive are more likely to be impacted by goods liberalisation in the agreement. The products identified as at risk of trade diversion away from developing country producers following UK accession to CPTPP are presented in Table 10.¹⁰¹

Table 10: Neighbouring and developing countries' exports identified as being at potential risk of trade diversion from a UK-CPTPP FTA (2019 to 2021 average)¹⁰²

HS6 code and product description	CPTPP Exporters	UK imports from developing countries	CPTPP exports to World	Example countries at risk of impact
030617: Shrimp products	Brunei, Malaysia	£221.9m	£175.3m	Bangladesh
080390: Bananas	Mexico, Peru, Vietnam	£150.2m	£435.7m	Belize, Cameroon, Dominican Republic, Ghana, St. Lucia
080610: Fresh grapes	Chile, Mexico	£176.8m	£852.3m	Namibia, India, South Africa
100620: Husked or brown rice	Vietnam	£145.8m	£31.0m	Pakistan, India, Myanmar
151190 and 151110: Crude palm	Malaysia	£125.8m	£8160.0m	Solomon Islands, Papua New Guinea

¹⁰⁰ Preference erosion occurs when preferential tariff rates to the UK market are extended to other countries, reducing the competitive advantage of exporting countries which already benefit from these preferential rates. This can lead to trade diversion - for example where developing countries could see a reduction of their exports to the UK as a result of CPTPP facing lower tariffs in the UK market.

¹⁰¹ The method for identifying products which may be at risk of trade diversion from preference erosion is detailed in Annex 11. These are products in which a) CPTPP is a highly competitive exporter of that product, b) developing countries export at least 10% of that product to the UK and c) where the developing countries' exports of that product to the world are significant.

¹⁰² On average between 20219-2021, ONS trade data, April 2022

oil or products				
160414: Tuna products	Vietnam	£186.7m	£210.2m	Ghana, Mauritius, Seychelles, Philippines
170114: Sugar cane	Mexico	£97.0m	£307.3m	Belize, Eswatini, Fiji, Mauritius, Guyana, Mozambique, South Africa, Zambia
540782: Textiles	Malaysia	£3.1m	£3.8m	India, Pakistan
Several: Apparel	Malaysia, Brunei	£252.8m	£316.3m	India, Pakistan, Myanmar, Bangladesh, Cambodia, Vietnam, Mauritius, Sri Lanka, Philippines

UK accession to CPTPP has the potential to affect the economies of Least Developed Countries (LDCs), as well as countries geographically close to CPTPP through trade diversion. This is a reduction in other countries' exports as the UK and CPTPP members face lower barriers to each other's markets.

Table 11 GDP impacts on Thailand, India, Ecuador, Pacific Islands and LDC's, relative to 2021 values¹⁰³

	Thailand	India	Ecuador	Pacific Islands	LDCs ¹⁰⁴
£ billion change	-£0.07	£0.00	£0.00	£0.00	£0.00

Source: GDP Figures are based on IMF 2021 WEO nominal GDP

Table 11 shows minimal impact of the UK's accession on the GDP of a selection of neighbouring countries and LDCs. Thailand which does not currently have an FTA or receive preferential access from the UK, is identified as the third party most impacted by the UK's accession to CPTPP due to trade reallocation. Thailand's GDP is estimated to reduce by £73 million as a result of the UK's accession to CPTPP. However, Thailand has expressed an interest in joining CPTPP in the future which would affect the results presented in the table above.

Some of the assumptions used in the CGE model, like full employment, may be weaker when assessing the impacts to developing countries. Further detail on modelling assumptions can be found in Annex 1.

¹⁰³ GDP Change in nominal GDP (2021), GDP Source: IMF WEO April 2023. Values are marked as 0.00 if the model result rounds to less than 0.01 in absolute terms. In addition, this analysis does not reflect the impacts of the UK's Developing Country Trading Scheme (DCTS).

¹⁰⁴ For the full list of the 46 Least developed countries (LDCs) see [UN list of least developed countries | UNCTAD](#). At the time of this analysis, Vietnam traded under the General Framework of the UK's Generalised Scheme of Preferences (GSP). The GSP has now been replaced by the Developing Country Trading Scheme, which came into force in June 2023, for which Vietnam is not eligible as it now trades with the UK under a free trade agreement

Additional illustrative modelling

CPTPP is set to expand its membership further, with several other countries having already expressed an interest in joining. This will not only increase the economic value of membership but also its strategic value, giving the UK even wider influence over progressive approaches to trade policy among a greater number of countries that aspire to join in the future. It will support the UK's economic security and resilience by enabling us to diversify and secure our supply chains and build stronger economic ties with a wide range of countries. Joining CPTPP also supports shared economic security, complementing and reinforcing our existing bilateral relations.

Expansion scenario modelling

To demonstrate the potential benefits of an expanded CPTPP, DBT has undertaken illustrative CGE analysis to estimate the marginal impact to the UK if other potential new countries join CPTPP in future. This modelling estimates the additional benefit from new members joining alongside the UK, taking into account existing agreements with current members. The following scenarios are considered:

1. Should Ecuador, Costa Rica, Uruguay, Republic of Korea, Colombia, Philippines, and Thailand join alongside the UK, the modelling estimates that this expanded CPTPP agreement could boost UK GDP by around £4.3 billion (2021 prices) in the long-run, relative to the absence of the agreement.
2. Alternatively, if the US and the rest of ASEAN countries (Laos, Cambodia and Indonesia) join CPTPP, the marginal impact on the UK's GDP would be equivalent to £19.5 billion (2021 prices).
3. If all the countries in scenarios 1 and 2 above were to join CPTPP, the marginal impact on the UK's GDP would be equivalent to £21.4 billion (2021 prices).

These estimates are based on simplifying assumptions in order to provide an order of magnitude of the likely impacts and as such are subject to a degree of uncertainty. Further detail on the assumptions behind this modelling is outlined in Technical Annex 3. Note that these are entirely hypothetical scenarios and do not reflect UK government policy on future CPTPP membership.¹⁰⁵

External analysis by Petri and Plummer (2023) also shows, as CPTPP expands and further integrates, the benefits for the UK would be expected to increase. Further details on this external study are included in section 7.

Value of CPTPP to the UK if existing bilateral agreements with CPTPP members were not in place

DBT has undertaken illustrative modelling to provide wider insights on the potential value of CPTPP. This modelling considers CPTPP as a standalone agreement. It captures the wider impact of the UK's accession to CPTPP as though the UK did not have a number of bilateral

¹⁰⁵ We understand that the following economies have formally applied to join CPTPP: China, Taiwan, Costa Rica, Ecuador, Uruguay and Ukraine.

agreements already in place with current CPTPP members. These agreements are Australia, New Zealand, Canada, Japan, Singapore, Vietnam, Mexico, Chile and Peru.

In the long-run, relative to the absence of the CPTPP agreement and existing agreements with current CPTPP members the illustrative CGE modelling estimates the CPTPP agreement could boost UK GDP by around £13.5 billion (2021 prices). The aggregate GDP of current CPTPP members is estimated to increase by £14.3 billion (2021 prices).

These results are based on current CPTPP membership and are based on assumptions to remove the impact of existing bilateral agreements. As such it is subject to a degree of uncertainty given additional assumptions have been made. Further detail is outlined in Technical Annex 3.

Impacts by main groups

This section examines the impact of the agreement on the 'main' UK groups, including businesses, consumers and workers. Much of the analysis builds on the CGE modelling results presented in the previous section.

Key messages from this analysis:

- the agreement is expected to benefit UK businesses, consumers and workers. These groups will benefit from the reduction of tariff and non-tariff barriers and facilitation of trade across new and existing supply chains
- UK businesses of all sizes, including small and medium sized enterprises (SMEs), will see increased opportunities to expand in CPTPP members' markets. Businesses will be able to access preferences on UK goods exports to CPTPP members. On current exports, this would reduce the annual tariff duties by around £119 million if exports use all available preferences, relative to existing bilateral trade relationships. SMEs are predominantly located in sectors that don't see a significant change in their share of GVA as a result of the agreement
- As trade barriers are reduced, consumers will benefit directly from increased choice, better product quality and lower prices for some imported goods. UK businesses and consumers may find it cheaper to import final and intermediate goods from CPTPP members
- the modelling suggests some small reallocation of jobs across sectors in the long run. The share of representation of protected groups in relation to ethnicity in sectors where employment is estimated to fall relative to the baseline is broadly in line with the general population, as a result of the agreement. Female workers, workers with disabilities, and workers outside the 25-64 age groups are less concentrated in sectors of estimated reduced employment relative to the baseline
- UK workers are expected to benefit from higher take-home wages. Overall, UK real wages are estimated to increase by £1.0 billion

Impacts on UK businesses

The evidence suggests that the agreement could have positive impacts on businesses in the UK and CPTPP members. This reflects export and investment growth, tariff savings, and gains for SMEs. Many of the provisions in the agreement create opportunities for businesses to grow, expand their exports, and to lower the cost of imports.

Businesses that currently export to CPTPP are expected to benefit from a growth in exports by becoming more price competitive and having more efficient market access into the economy of CPTPP members. Provisions enhancing transparency and providing better information for SMEs could induce new businesses to enter CPTPP markets.¹⁰⁶ Businesses importing goods from CPTPP will directly benefit from lower tariffs. They could also benefit from greater variety of imported inputs to production and final goods from CPTPP, particularly

¹⁰⁶ Where CPTPP goes further than existing bilateral agreements. The CPTPP agreement contains an SME chapter, which includes commitments by partner countries to transparency and provision of SME-friendly advice and support to maximise the potential gains under the agreement.

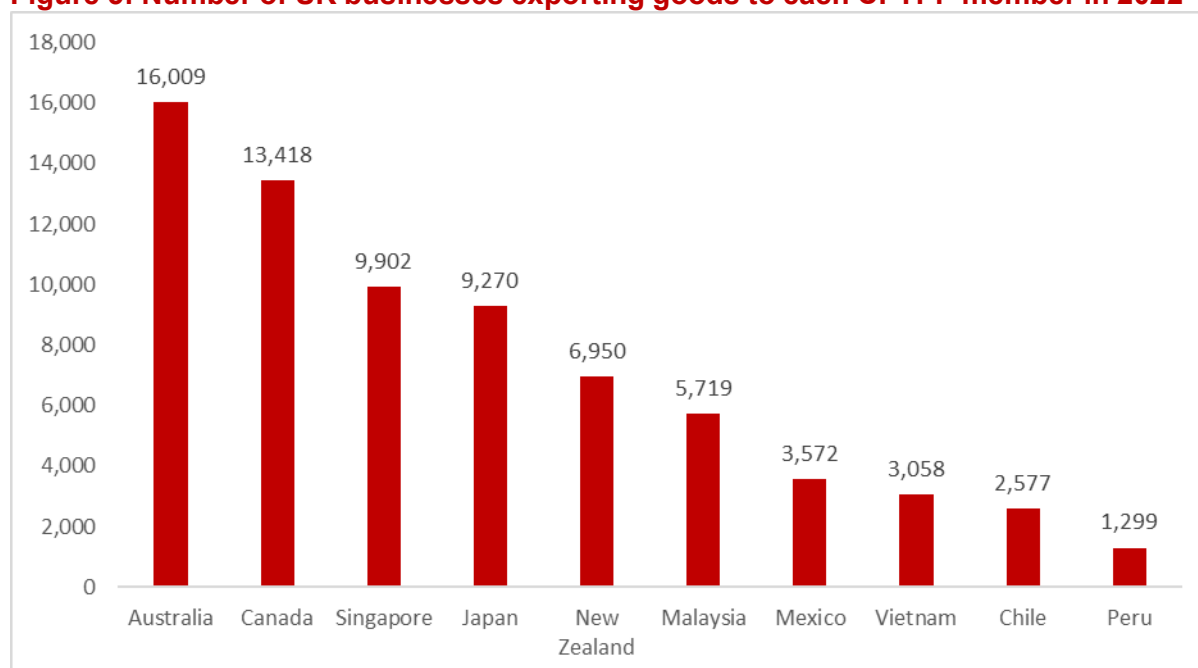
from Malaysia and Brunei. Greater access to global supply chains are an important source and driver of competitive advantage for businesses.

Some UK businesses may experience greater competition from CPTPP exporters. Evidence shows that competition from trade promotes business innovation and growth.¹⁰⁷ Some businesses may expand, creating more jobs, but some businesses may be adversely affected by the increased competition.

In addition, our modelling estimates a 0.18% long-run increase in business investment in the UK by the estimated increase in return to capital as a result of the agreement. This is equivalent to £699 million annually when applied to 2021 levels.¹⁰⁸

CPTPP is an important trading partner for UK businesses. Figure 5 shows the number of businesses that exported goods to CPTPP members in 2022.¹⁰⁹ These existing exporters, particularly those exporting to Malaysia and Brunei, would be expected to benefit from the new trade opportunities offered by tariff liberalisation as well as the reductions in non-tariff measures set out in Section 3. The modelling results estimate a £2.6 billion long run increase in UK exports to CPTPP in the long run, when compared to 2040 projections. The expansion of exports can allow businesses to benefit from economies of scale which lower their operating costs, raise profitability, and increase turnover. This in turn can attract investment and support further expansion.

Figure 5: Number of UK businesses exporting goods to each CPTPP member in 2022¹¹⁰



Source: UK Regional Trade in Goods Statistics, Business Counts, March 2023

¹⁰⁷ CMA, Productivity and competition: A summary of the evidence (July 2015).

¹⁰⁸ This figure is subject to uncertainty due to differences in the definitions and classification of GDP components between the OBR and the GTAP database. The GTAP database uses 2017 data and relative GDP components may have changed between 2017 and 2021. Hence, this figure is used to provide context only.

¹⁰⁹ It is important to note that a single business may be exporting to several CPTPP member countries. As a result, the table is not additive. Source: UK Regional Trade in Goods Statistics, Business Counts, March 2023 . Figures show all businesses which traded in goods, including firms that are predominantly producers of services. Figures are not available for the number of businesses exporting services to CPTPP.

¹¹⁰ Note, it is not possible to estimate a total number of UK businesses exporting goods to CPTPP due to double-counting issues. Data for Brunei is not available in HMRC Regional Trade Statistics.

The scale and distribution of estimated reductions in tariff duties on current UK exports

Section 3 describes the preferential tariffs negotiated under the agreement.

The reductions in tariff duties on UK exports do not accrue directly to UK exporters. While the academic evidence is inconclusive, it is generally accepted that importers in a country bear the direct cost associated with tariffs.¹¹¹ However, UK businesses could benefit from maintaining or increasing competitiveness, particularly when compared to businesses exporting to CPTPP from countries without an FTA.

By sector

The largest estimated annual reductions in tariff duties on current UK exports on entry into force occur in the transport equipment (23% of short-term tariff reductions) and machinery (21%) sectors. In the long-term the largest reductions occur in the prepared foodstuffs, beverages, and tobacco (51% of long-term tariff reductions) and transport equipment (12%) sectors. These estimated reductions in tariff duties are concentrated on trade with Malaysia where no existing bilateral agreement exists.

By nation and region

On entry into force, businesses based in the South East and Scotland are expected to benefit the most from lower tariffs on UK exports to CPTPP, each accounting for 13% of the estimated annual reduction in tariff duties on current UK exports on entry into force.¹¹²

Over the long term, Scotland and London are expected to benefit the most from estimated reductions in tariff duties on current UK exports to CPTPP. Based on the HMRC regional stats, businesses in Scotland and London account for 10% and 12% of UK goods exports to CPTPP in 2022 respectively.¹¹³ Their exports are estimated to benefit from 39% and 17% of the estimated annual reduction in tariff duties on current UK exports once staging is complete.¹¹⁴

A full breakdown of tariff reductions by nation and region is shown in Table 12 in Annex 4.

The scale and distribution of estimated reductions in tariff duties on current UK imports of intermediate and final products

The estimated annual reductions in tariff duties on current UK imports from CPTPP if imports use all available preferences are £42.4 million on entry into force, and £32.7 million in the long term.¹¹⁵ The majority of the duty reductions in the short term come from final goods as can be seen in the table below.¹¹⁶

¹¹¹ Note that tariff reductions apply to goods that meet rules of origin requirements.

¹¹² DBT calculations (2023) using HMRC regional export data to apportion reductions in tariff duties on UK exports to CPTPP by NUTS1 region for 2017-19.

¹¹³ HMRC Regional Trade Statistics. Published: 16 March 2023

¹¹⁴ The methodology for apportioning the gains from tariff reductions to each nation and region is explained further in Annex 5, which also sets out a number of important caveats.

¹¹⁵ Short-term tariff reductions are larger than long-term tariff reductions due to some faster staging under UK's CPTPP schedule than in existing bilateral agreements. In particular, this means short-term tariff reductions with Japan and Vietnam, but negligible long-term tariff reductions with Japan and Vietnam because most lines are staged to 0% in the existing bilateral agreements.

¹¹⁶ Long term refers to the end of the liberalisation period for the UK's CPTPP tariff schedule and the UK's bilateral tariff schedules for existing FTAs with CPTPP countries. Final and intermediate goods are defined using BEC codes where the intermediate and capital classification has been combined to form intermediate goods. Note there are limitations in identifying goods for intermediate use. BEC codes: <http://unstats.un.org/unsd/trade/classifications/bec.asp>

Table 12: Estimated annual reductions in tariff duties on current UK imports from CPTPP, by end use

Type of Good	Short-term annual reduction in tariff duties, £m	Long-term annual reduction in tariff duties, £m
Intermediate goods	15.6	16.3
Final goods	26.7	16.4
Total savings	42.4	32.7

Source: DBT calculations (2023) using Eurostat (2020).

The majority of the estimated reductions in tariff duties on current UK imports of intermediate goods occur in the plastics and rubber products (23% in short term, 28% in long term), fats & oils (26% in short term, 25% in long term) and machinery (17% in short term, 16% in long term) sectors. These estimated reductions in tariff duties on current imports provide benefits for businesses that make use of CPTPP imports in their production processes.¹¹⁷ The breakdown of final goods can be found in the section on consumers.

On entry into force, the largest shares of estimated reductions in tariff duties on current UK imports will affect London, the South East, and the North West on entry into force (14%, 13% and 11% respectively), while over the long term most estimated reductions in tariff duties on current UK imports will affect the South East, East of England, and London (15%, 13% and 12% respectively).¹¹⁸

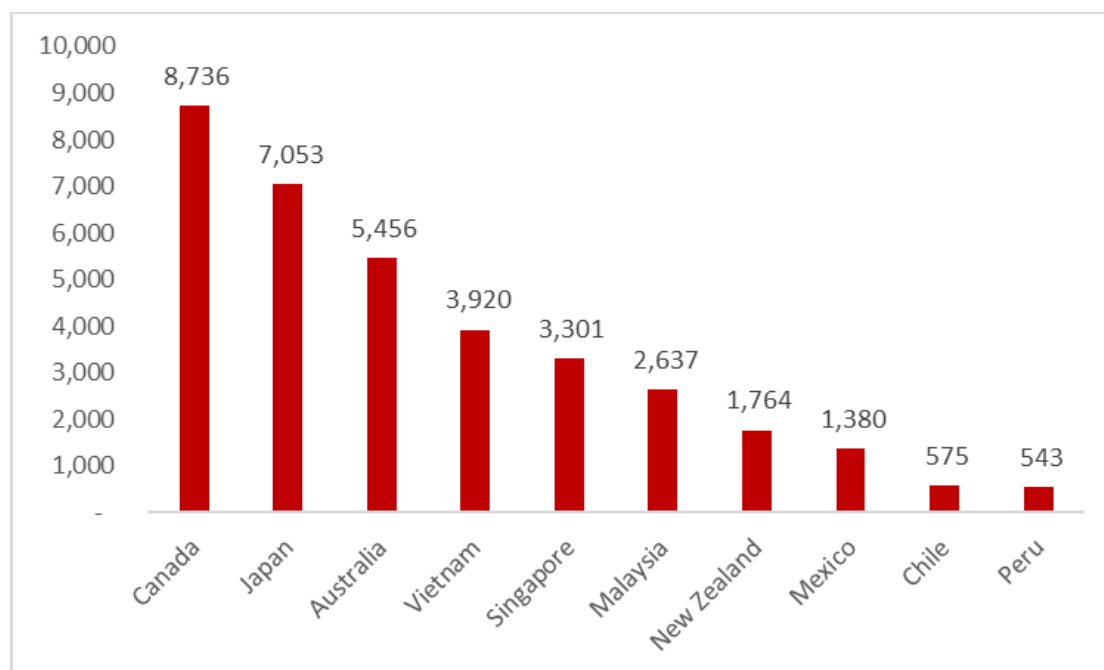
Increased imports and competition

Figure 6 shows the number of businesses that imported goods from CPTPP members in 2022. This agreement is expected to benefit businesses by increasing access to cheaper and expanded varieties of imported inputs. Greater access to global supply chains is an important source of competitive advantage for businesses. The modelling results estimate a £2.3 billion increase in UK imports from CPTPP, when compared to 2021 levels.

¹¹⁷ In some instances, the exporting business may absorb the cost of the tariff, for example when there is a considerable domestic supply of a product, foreign firms may be forced to absorb tariff costs in order to remain competitive in the market or may not trade at all.

¹¹⁸ The methodology for apportioning the gains from tariff reductions to each nation and region is explained further in Annex 5, which also sets out a number of important caveats.

Figure 6: Number of UK businesses importing goods from each CPTPP member in 2022¹¹⁹



Source: UK Regional Trade in Goods Statistics, Business Counts, March 2023

Some businesses may experience greater competition from exporters in CPTPP. The evidence shows that competition from trade promotes business innovation and growth.¹²⁰ Some UK businesses may expand, but others may be adversely affected by the increased competition.

Small and medium sizes enterprises (SMEs)

Accounting for over 99% of all UK businesses, and approximately 50% of all private sector employment and turnover, SMEs are a vital component of the UK economy.¹²¹ SMEs also play an integral role in engaging with the international economy. 97% of businesses exporting goods in 2021 were SMEs, accounting for 44% of total UK exports.¹²² Moreover, SMEs form a key part of the supply chain for larger UK and global firms, by producing intermediate goods used to manufacture other goods. Figure 7 shows the number of UK SMEs exporting goods to each CPTPP member in 2020.

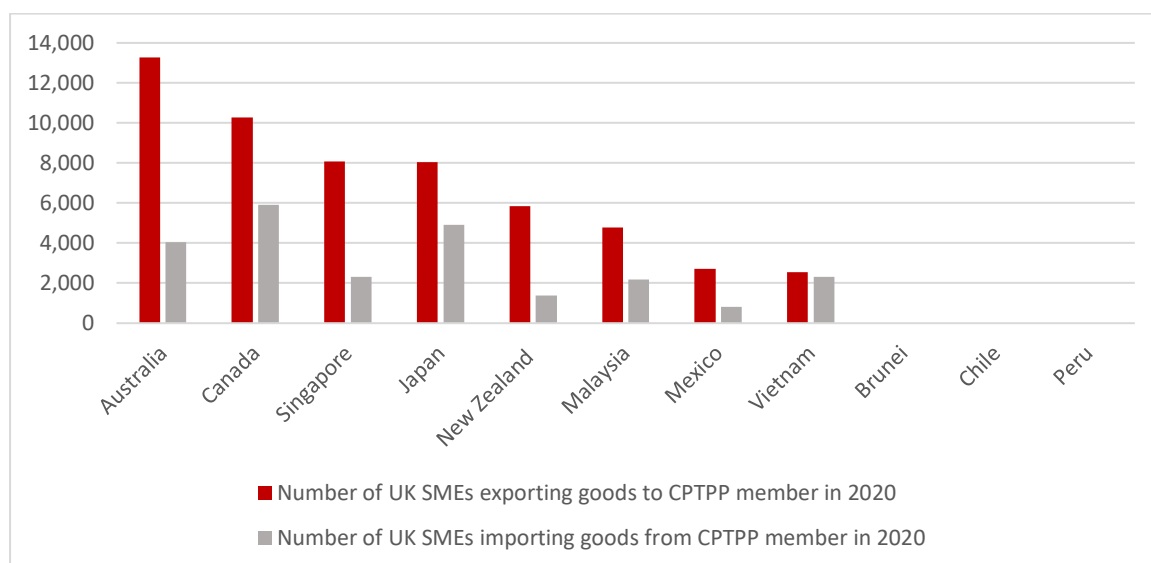
¹¹⁹ Note, it is not possible to estimate a total due to double-counting. Data for Brunei is not available in HMRC Regional Trade Statistics.

¹²⁰ CMA (2015) Productivity and competition: A summary of the evidence.

¹²¹ BEIS, Business Population Estimates 2022.

¹²² HMRC, Trade in Goods by Business Characteristics (2021). Note, the percentage included the 'unknown' category which may include SMEs and firms with over 250 employees.

Figure 7: Number of UK SMEs importing/exporting goods from/to each CPTPP member in 2020 ^{123, 124}



Source: HMRC UK trade in goods statistics by business characteristics (2021), *businesses with unknown sizes not included*. ¹²⁵

SMEs may have more limited financial and human resource capacities than larger businesses. They may be less equipped to overcome the challenges posed by different regulatory frameworks. They also have less access to information to help them navigate through trade regulations and absorb the financial risks associated with international trade. Provisions aimed at improving trade facilitation for SMEs could positively impact their propensity to export. As a result, addressing NTMs in FTAs may have a greater impact on SMEs than on larger businesses.

This agreement includes an SME chapter, which includes commitments on information sharing and co-operation that will help SMEs take advantage of the agreement.

The modelling exercise shows that imports are expected to increase in a number of sectors of the economy as trade liberalisation, via the agreement, raises competition from CPTPP countries. The competitive pressures resulting from increased imports drive innovation and productivity growth within sectors.

Rapid sector or product specific import surges resulting from liberalisation have the potential, in some cases, to adversely affect domestic businesses and generate adjustment costs in the short run. This may be particularly true for SMEs, as they may be less able than larger firms to adapt and innovate in the face of increased competition because of factors such as human resource or capital constraints.

A large proportion of UK SMEs are based in sectors whose share of the economy will increase because of the agreement. Sectors with a contraction in GVA, such as manufacturing of

¹²³ More recent data is available but not for all countries shown.

¹²⁴ Unknowns have been excluded so the estimates could be lower than stated.

¹²⁵ Data for New Zealand was commissioned by DBT from HMRC and are not directly published by HMRC.

electronic equipment and other transport equipment sectors, only contain a small proportion of total SMEs (less than 1.2%).¹²⁶

Table 13 below shows the estimated change in trade by sector in the long run.¹²⁷ In terms of sectoral distribution, SMEs are predominately concentrated in business services (22.9%), construction services (16.4%), public services (15.8%) and wholesale and retail trade (15.6%). The modelling estimates that each of these sectors' output (measured by GVA) will increase as a result of the agreement. The UK's exports and imports to and from CPTPP in business services sector is estimated to increase by 0.9% and 2.1% respectively. This is equivalent to £55 million and £41 million (2021 prices), respectively.

Table 13: Estimated change in trade and distribution of SMEs, by sector

Broad Sector Category	GTAP Sector	Sectoral Distribution of SMEs	Estimated change in GVA £m (2021 price)	Estimated change in imports, £m (2021 price)	Estimated change in exports, £m (2021 price)
Agri-food	Agriculture, forestry, and fishing	2.7%	1	9	1
	Beverages and tobacco products	0.2%	34	6	77
	Other processed foods	0.7%	23	28	70
	Semi-processed foods	0.4%	-5	144	65
Industry	Chemical, rubber, plastic products	0.4%	7	148	166
	Energy	0.4%	19	1	1
	Manufacture of electronic equipment	0.1%	-67	288	34
	Manufactures	0.5%	31	107	100
	Manufacture of motor vehicles	0.1%	183	152	712
	Manufacture of machinery and equipment n.e.c	0.8%	8	249	183
	Manufacture of other transport equipment	0.6%	-24	121	30
	Manufacturing n.e.c	0.2%	17	75	93
	Paper and printing products	1.3%	4	11	21
	Textiles, apparel, and leather	0.4%	90	84	186
Services	Business services	22.9%	22	41	55
	Communications	1.1%	68	54	99
	Construction	16.4%	119	4	3
	Financial services	1.2%	-45	82	-3
	Insurance	0.6%	1	6	3
	Other services (transport, water, dwellings)	8.6%	187	39	39

¹²⁶ SMEs account for 0.4% of businesses in the Semi-processed foods sector, 0.1% in the manufacture of motor vehicles, 0.6% in the manufacture of other transport equipment and 1.2% in the financial services sector.

¹²⁷ The estimated percentage changes in imports and exports covers all UK businesses (i.e., is not specific to SMEs)

Personal services	9.1%	10	7	-1
Public Services	15.8%	76	27	54
Wholesale and retail trade	15.6%	67	93	1

Source: DBT modelling 2022. n.e.c. means not elsewhere classified. It is used to denote entities that do not fit into existing classification categories.

There is a full breakdown of the sectoral distribution of SMEs and SME turnover by sector provided in Table 16 in Annex 8. The data on sectors where SMEs are located is paired with the sectors where output is expected to increase or decrease relative to the baseline as a result of the agreement. The analysis does not take into account whether SMEs may be more or less affected by changes in trade barriers than other businesses.

Voluntary costs for businesses in utilising the agreement

FTAs provide an incentive for businesses to trade under preferences to reduce costs. However, firms may incur one-off familiarisation costs and on-going administrative costs in doing so. These are voluntary, based on the decision to take up preferences.

It is not possible to monetise the precise impact of the one-off cost, however an illustration of the potential impacts on UK businesses that trade with CPTPP has been provided. For this reason, ranges are presented as well as a qualitative description of the costs and activities involved to demonstrate the impact on businesses.

There will be one-off costs to firms, enforcers, and customs and government officials from reading and understanding the text of this agreement.¹²⁸ The costs associated with reading and understanding the text by customs and government officials are likely to be absorbed by existing resources. There are one-off familiarisation costs for UK businesses associated with reading and understanding the relevant treaty provisions. The central estimate of these costs is £12.3 million, with a range between £11.8 million and £12.9 million (2021 price base).¹²⁹

Data on the total number of firms exporting to CPTPP is not available and cannot be calculated from the available data on firms trading with each country as the same firm may trade with more than one CPTPP member. Given the UK already has bilateral agreements with some CPTPP members, businesses (current and potential new ones) exporting to CPTPP countries will need to read and understand the CPTPP text. This is to understand whether they could benefit from trading under CPTPP terms relative to existing bilateral agreements. In order to prevent double counting, the figure only considers firms which export to and import from Australia, which is the CPTPP member country that the largest number of UK firms trade with. This may however be an underestimate. This estimate also does not consider the number of businesses that may start to trade with CPTPP members as a result of the UK's accession to CPTPP. If we only considered firms importing and exporting to Malaysia, with whom the UK does not have a bilateral agreement, the central estimate of these costs would be £3.6 million, with a range between £3.5 million and £3.8 million (2021 price base). Annex 7 sets out further information on the methodology.

¹²⁸ While FTAs are primarily used by businesses, voluntary and other civil society organisations may also benefit. In the UK, organisations can already claim relief on customs duty on foreign goods if they are imported for charitable use, but they may benefit in other ways such as through easier movement of professionals between countries. Non-business organisations that are registered for PAYE or VAT and import or export goods to CPTPP will be picked up by this analysis through the HMRC dataset, but they are not expected to be significant in number.

¹²⁹ These differences reflect differences in estimated reading time.

To trade under preferential tariffs, businesses must follow certain administrative procedures. These procedures can generate on-going compliance costs due to administrative costs and time spent on processes, such as proving compliance with rules of origin.

Recent academic studies estimate the tariff equivalent trade costs associated with rules of origin administration and compliance requirements, with figures ranging from 2% to 6%.¹³⁰ These estimates vary considerably depending on the methodology, time period, and the countries under consideration. Evidence suggests costs for developed markets skew to the lower part of the distribution, but significant uncertainty remains. Therefore, the tariff equivalent trade costs between the UK and CPTPP associated with rules of origin requirements are assumed to range from 2% to 4%. The potential cost to UK business is estimated to be between £11.2 million and £19.8 million per annum, with a central estimate of £15.5 million.¹³¹ Annex 6 provides further detail on the methodology used to estimate the potential familiarisation and administration costs.

Impacts on UK consumers

This section presents the estimated tariff reductions for consumers, the likely impact of the agreement on consumer choice.

The provisions set out in this agreement aim to benefit UK consumers through increased consumer choice, better product quality and lower prices for imported products. As a result of higher real wages for workers, the modelling estimates show that annual real consumer expenditure in the UK (a component of GDP) increases by £1.0 billion in the long run when applied to 2021 levels.¹³²

In general, trade liberalisation can result in lower import prices and lower final consumption prices for households. Lowering trade barriers (such as tariffs), can put downward pressure on the price of imported goods and services, be that for inputs prices paid by firms or final goods. The scale of these impacts depends on the pass-through of tariff and non-tariff barriers reductions through to consumer prices.

Over time, resources reallocate to more productive sectors and the economy grows as a result of the FTA. Workers move to more productive, higher wage sectors which grow in response to additional demand. While this increases the wages paid to households, higher wages can result in higher prices in some sectors.

Overall, the UK's accession to CPTPP could increase real wages by around 0.11% in the long run. These real increases may not be evenly spread across different income groups. Differences in the composition of household expenditure by income groups means that some groups may experience more of a real wage increase than others.

Estimated reductions in tariff duties on current imports for consumers

This section presents the estimated annual reductions in tariff duties on current imports for consumers, and the likely impact of the agreement on consumer choice.

¹³⁰ Ciuriak and Xiao (2014), Should Canada unilaterally adopt global free trade?

¹³¹Based upon 2017-2019 average UK exports to CPTPP.

¹³² This figure is subject to uncertainty due to differences in the definitions and classification of GDP components between the OBR and the GTAP database. The GTAP database uses 2017 data and relative GDP components may have changed between 2017 and 2021. Hence, this figure is used to provide context only.

Estimated annual reductions in tariff duties on current imports of final goods from CPTPP are around £26.7 million on entry into force, and around £16.4 million after all staging is complete over the long term.¹³³

These estimated reductions in tariff duties on current imports of final goods do not account for reductions in tariff duties on imports of intermediate goods that may be passed on to the consumer in the longer term.

By sector and nation and region

Estimated annual reductions in tariff duties on current imports are estimated to be largest on food & non-alcoholic beverages, worth around £7.9 million per year in the long run. It is estimated that these goods make up 14% of the average UK household's total weekly expenditure; 7% of total weekly expenditure is currently spent specifically on imported goods in this category. Out of all UK nations and regions, Northern Irish households spend the highest proportion of total weekly expenditure on food & non-alcoholic beverages at 16%.

Furnishings, household equipment & routine household maintenance are estimated to have the second-highest long-run annual reduction in tariff duties on current imports at £3.3 million, driven predominantly by reductions in tariff duties on current imports from Malaysia. The average UK household spends 8% of total weekly expenditure on these goods; 4% of total weekly expenditure is currently spent specifically on imported goods in this category.

By Income

Estimated reductions in tariff duties on current imports have differential impacts on households based on their income. For some spending categories, low-income households have a higher share of import consumption in that category than high-income households, while this is reversed for other spending categories. Food & non-alcoholic beverages make up 31% of total import consumption of low-income households, relative to 23% of the total import consumption of high-income households. Furnishings, household equipment, & routine household maintenance make up 8% of total import consumption of low-income households, relative to 14% of the total import consumption of high-income households.

Product choice for consumers

Liberalising trade with CPTPP could lead to greater choice for UK consumers as they could have easier access to a wider variety of products than they currently import, as well as new products they would not have purchased before the agreement.

One mechanism by which consumers may get better choice is if reduced tariffs lead to more products entering the UK market. As of 1st January 2024, around 73% of final consumer products (as defined by 8-digit level tariff lines) are estimated to be eligible for tariff-free imports from CPTPP countries.¹³⁴ This could eventually increase to about 98% of final consumer products under the agreement, increasing the choice of products that are eligible for tariff-free imports for the UK consumer.

¹³³ The estimated reductions in tariff duties on current imports are lower in the long run as they are calculated relative to the existing bilateral agreements that also contain staging. These results are based on average trade flows between the UK and CPTPP between 2017 and 2019. The analysis therefore does not account for any changes in consumer behaviour which may change the value or composition of goods imported once the agreement is implemented. They are calculated by mapping the negotiated tariff schedule to consumer expenditure categories.

¹³⁴ This estimate accounts for consumer products that are eligible for tariff-free imports due to existing bilateral agreements or zero MFN tariffs.

Tariff pass-through

The extent to which consumers benefit from lower tariffs will depend on tariff pass-through. This captures the extent to which a reduction in tariffs translates into lower prices on final goods which consumers purchase. The tariff pass-through depends on factors such as competition in the market and the responsiveness of supply and demand.

The rate of pass-through is further found to be sensitive to the direction of the tariff (in other words whether the tariff is increased or decreased), its magnitude, and the wider macroeconomic environment (such as inflation).

Impacts on the labour market and UK workers

Workers can benefit from the agreement in several different ways. Where FTAs can boost productivity within firms and sectors, and across the economy, this is likely to increase employment opportunities and worker incomes. Where FTAs lower consumer prices, this is likely to benefit workers in the form of higher real wages as they could purchase more even if nominal wages were constant.

Trade liberalisation can also affect the structure of the economy over time. This can generate transitional costs for workers, who may move between jobs and sectors, as changes in the pattern of trade cause some sectors to expand and others to decline. The UK has one of the most dynamic and flexible labour markets in the world, which helps to facilitate adjustment and reduce transitional costs for workers.

The model estimates long run impacts, which is the time taken for the economy to fully adjust to the agreement. The model does not estimate the magnitude of any potential short run impacts and adjustments. Short run adjustment costs are the loss of production and income after a change in trade policy like an FTA, which are caused as resources are reallocated towards expanding sectors of the economy. Adjustment costs to workers can include short term unemployment, lower wage during the transition, obsolescence of skills and training costs.¹³⁵ Irrespective of the approach and the broadness of the definition of adjustment costs, most academic studies on international trade conclude that trade-induced adjustment costs are relatively small compared to the long-run gains to workers from trade liberalization.¹³⁶ Studies find that most workers are not adversely affected by trade liberalisation¹³⁷, however it is very difficult to identify those workers who are adversely affected.¹³⁸ As set out below, the share of workers that change economic sectors due to CPTPP accession is estimated to be approximately 1% of the share of workers that change economic sectors over a comparable period for other reasons.

As is common in modelling exercises, it is assumed that both the supply of labour and overall rates of employment and unemployment in the economy are fixed in the long run (i.e. in other words they are assumed to be unaffected by the agreement). This is appropriate as over the long term, the labour market would be expected to adjust to any structural changes and FTAs do not influence the underlying drivers of the long run employment rate.

The modelling estimates that real wages in the UK (nominal wages adjusted for impact of inflation) increase by around £1.0 billion in the long run, when compared to 2021 levels.

¹³⁵ Jansen, M., Peters, R., & Salazar-Xirinachs, J. M. (2011). Trade and Employment: From Myths to Facts Trade. International Labour Office.

¹³⁶ Trade Adjustment Costs and Assistance: The labour market dynamics, Joseph Francois, Marion Jansen, and Ralf Peters 2011

¹³⁷ Traiberman, S. (2019). Occupations and import competition: Evidence from Denmark. American Economic Review, 109(12), 4260-4301.

¹³⁸ Trade Adjustment Costs and Assistance: The labour market dynamics Joseph Francois, Marion Jansen, and Ralf Peters 2011

Impact on sectoral employment

The modelling shows a marginal shift in the distribution of employment across sectors over the long run.¹³⁹ It suggests that any reallocation of employment across sectors in the long run will be modest, with changes in the sector shares of employment all below 0.02%. This suggests a slight rebalancing away from business services (reduce in sector share by 0.01%) towards sectors like the manufacture of motor vehicles (increase in sector share by 0.01%) and the construction sector (increase in sector share by 0.01%). These changes reflect the limited structural changes that are expected in the economy overall. The shifts reflect a marginal shift to an existing growth path, rather than an expansion or contraction to today's employment levels.

Modern, dynamic economies change continuously in response to global developments. This causes an ongoing process of worker and job transition in the labour market. Lower trade barriers and greater import competition could accelerate this ongoing process.

It is important to note that the modelled changes in employment composition do not necessarily represent the movement of individuals across sectors. Some of the employment changes are likely to occur through the process of natural 'churn', for example as retired workers exit the labour market and new entrants enter the labour market in expanding sectors.

Industrial turbulence indices can be used to quantify the proportion of all jobs in the economy which change sector over a given period.¹⁴⁰ Analysis suggests that the magnitudes of the changes to the composition of employment across sectors resulting from the agreement are small in comparison with regular changes in the labour market from natural churn. Regular changes to the composition of employment across sectors occur as workers move to jobs in different sectors to take advantage of higher wages or better conditions or a result of redundancy. They also occur due to individuals retiring and new entrants joining the labour market. The agreement is estimated to lead to a movement of less than 1% of jobs – averaged across all sectors, manifesting over a 10 to 15 year period. This compares to an average movement of jobs across all sectors of around 17% over the last 15 years.¹⁴¹

The transition of employment across sectors has the potential to generate long run gains for workers, for example leading to higher wages. Some workers may also incur short term adjustment costs and periods of transitional unemployment. The UK has a dynamic and flexible labour market, helping to facilitate adjustment and reduce the transition costs for workers.

It is, however, important to assess the potential scale of adjustment costs and to ensure that the potential for adjustment costs is not concentrated disproportionately among regions or certain groups in the labour market.

¹³⁹ Employment is according to the ILO definition as specified by the relevant LFS indicator (ILODEFER). That is, a person is considered employed if they are 16 or over/16-64 and have been engaged for at least one hour within a 7-day reference period in any activity to produce goods or services. This also includes employed persons "not at work" i.e., those who did not work in the reference period due to temporary absence or working patterns.

¹⁴⁰ Industrial turbulence indices are calculated as: $1/2 \sum (|\Delta E_i / E|)$ where ΔE_i is the change in employment in each sector, and E is overall employment in the economy. (Layard, Nickell and Jackman (1991) "Unemployment" Chapter 6.

¹⁴¹ DBT calculation using ONS JOBS03: Employee jobs by industry (2022). The average is based on the 15 years to March 2022.

Assessing the implications for the broad scale of adjustment costs for labour

For sectors which see a slight shift in employment, historic data shows that annual movements are regularly of a much larger scale than the likely impacts from the agreement. Annual Survey of Hours and Earnings (ASHE) data shows that at least 2% of employees move from any given sector to a new sector each year. This compares to the less than 0.02% we would expect to see over the long run as estimated by CGE modelling. This gives some indication that any adjustments due to the agreement could be absorbed through labour market churn.

The long run movement of labour across sectors within the UK contributes to the estimated output and wage gains from increased specialisation resulting from UK joining CPTPP. Over time, regional comparative advantage may change in response to global trends, and the location of production and employment may evolve over the 15-year time horizon of the economic modelling.

Employment impacts for protected groups

Employment in some sectors is estimated to fall slightly as workers move over time to sectors in which returns and wages are higher as a result of the agreement. Sectorial representation of protected groups in relation to ethnicity in declining sectors is broadly in line with the general population. Sectorial representation in relation to disability and age is less in line with the general population, with disabled workers and workers outside the 25-64 age groups less represented in sectors where employment is expected to fall relative to the baseline as a result of the agreement.¹⁴² Females are less concentrated in sectors where employment is estimated to fall relative to the baseline.

A summary of the employment impacts for protected groups is given below.

Sex

- 47% of those in employment in the UK are female and 53% are male¹⁴³
- 65% of the workforce in sectors estimated to account for lower long-run employment relative to the baseline are male, and 35% are female
- recently published experimental analysis by the DBT and Fraser of Allander Institute shows that, in 2016, 64% of jobs directly and indirectly involved in exports were held by men, with the remaining 36% filled by women¹⁴⁴

Ethnicity

- 12% of the overall workforce are from an ethnic minority background and 88% are white
- this is broadly in line with the employment share (at 11.8% for ethnic minority workers) in sectors expected to see a fall in employment as a result of the deal

¹⁴² Race is a protected characteristic under the Equality Act 2010. For the purpose of this analysis, we utilise data regarding ethnicity to consider this protected characteristic.

¹⁴³According to DBT Analysis of the ONS three-year pooled Annual Population Dataset (2016-2018).

¹⁴⁴ FAI research on behalf of DBT 'Estimating the relationship between exports and the labour market in the UK (2021).

Age

- 12% of those in employment in the UK are aged 16-24, 84% are 25-64, and 4% are over 65
- in sectors where employment is estimated to fall relative to the baseline, the share of workers who are aged 16-24 and over 65 is around 9% and 2% respectively

Disability

- around 13% of those in employment in the UK report that they have a disability (as defined by the Equality Act 2010)¹⁴⁵
- in sectors where employment is estimated to fall relative to the baseline, the share of workers with a disability reduces to 10%

There are several limitations to this analysis. For example, the analysis is based on the structure of the UK workforce from 2016 to 2018. This means it does not capture changes to the composition of the workforce in the long run which is the timeline of the CGE modelling results.

Workers in sectors where employment is estimated to be lower than in the absence of the agreement may not necessarily be adversely affected by the agreement. For example, workers who remain in the sector could benefit from increases in wages, owing to higher productivity. In addition, some of the adjustment may take place as workers leaving the labour market are not replaced, with new entrants more likely to find employment in sectors where employment is higher. Any workers who do transition across sectors may incur short-term adjustment costs. However, they could ultimately benefit from higher wage jobs in other sectors of the economy. A more detailed breakdown of the demographic in this section is available in Annex 9.

¹⁴⁵ It is possible that non-response to this question in the Annual Population Survey affects the estimated proportion.

Environment Impacts

1. the environment chapter of the agreement supports high environmental standards in both the UK and CPTPP countries. It does so by reaffirming the right to regulate to meet Net Zero and committing Parties to not derogate from environmental laws in a manner affecting trade. The environment chapter also ensures that all Parties have recourse to dispute settlement where relevant. The CPTPP agreement strengthens cooperation with partners on the environment and affirms members' commitment to implement multilateral environment agreements to which they are Party. All CPTPP members are Party to the Paris Agreement
2. the overall effect on global emissions is likely to be negligible. It was estimated that global emissions could increase by around 1.03 MtCO₂e (0.003%) in the long run when compared to baseline levels reflecting increased trade and investment and new global trading patterns. However, this quantitative analysis does not take account of the reduction in emissions since the baseline year (2017), the projected decline in greenhouse gas (GHG) emissions as countries meet net-zero commitments, emissions from land-use change or the adoption of environmentally friendly production techniques by businesses resulting from the FTA. For context, UK emissions are projected to fall by at least 66% over the same period based on the UK's net zero pathway
3. the UK's accession to CPTPP could increase transport-related emissions associated with increased trade flows. Emissions associated with maritime and aviation freight are estimated to increase by around 0.13-0.15 MtCO₂e on average each year until 2035, which is around a 4% increase against the baseline. These estimates, however, do not take into account decarbonisation policies, and business practices to reduce emissions
4. overall, additional carbon leakage risks from CPTPP accession alone in the long run are small since the UK already holds bilateral FTAs with all CPTPP members other than Brunei and Malaysia. Although all CPTPP members have announced pledges to reach net zero by 2050, there may still be different emissions reduction pathways over the next 10-15 years, which could affect the carbon leakage risk
5. the agreement provides opportunities to increase trade in environmental goods, which can speed the development and uptake of environmentally-friendly production techniques. Accession to CPTPP will facilitate the eventual liberalisation of all environmental goods between the UK and CPTPP countries
6. the agreement is not expected to have a significant impact on wider environmental issues such as biodiversity, deforestation and water pollution, although the extent of any impacts will depend on how domestic and international policies mitigate these risks

The potential impact of an FTA on the environment

Trade liberalisation increases economic growth, raising economic activity and its associated environmental impacts. It may change the mix of a country's production and consumption. If the sectors which expand are more emissions intensive, other things equal, this could result in negative environmental impacts. The opposite is also true. It may change the location of

global production across countries, affecting the distance goods travel and the environmental impacts associated with transporting them from producers to consumers. It can promote the transfer and adoption of more efficient and environmentally friendly production techniques, facilitating the move towards low-emission economies. It can help towards creating a global circular economy by promoting reuse, repair and recycling.

6.2 Greenhouse gas emissions and climate change policy

The UK is the world's 6th largest economy, with a GDP of nearly £2.5 trillion in 2022¹⁴⁶ and CO₂ emissions accounting for around 1% of global emissions in 2019.¹⁴⁷ CPTPP countries recorded a combined GDP of around £9.4 trillion in the same year.¹⁴⁸ Together, CPTPP countries accounted for around 9% of global CO₂ emissions in 2019.¹⁴⁹ Aggregate CPTPP CO₂ emissions were 3161 MtCO₂e¹⁵⁰ in 2019, compared to 339 MtCO₂e for the UK.^{151 152}

The UK and CPTPP member states have made commitments to reduce GHG emissions. In 2019 the UK became the first G20 country to legislate binding commitments to bring net GHG emissions to zero by 2050 to end its contribution to global warming. UK emissions have fallen by around 48% between 1990-2021, faster than any other G7 economy, and are projected to fall by at least 66% by 2035 (compared to the level of emissions in 2017) based on the UK's net zero pathway.¹⁵³

All CPTPP members are signatories to the Paris Agreements and nearly all have pledged to reach net zero emissions under the Paris Agreement. This includes Malaysia, Australia, Canada, Chile, Japan, New Zealand, Vietnam, and Peru.¹⁵⁴ In November 2022, Singapore announced to reach this goal by 2050.¹⁵⁵

6.3 Quantitative estimates of the impact of the UK's accession to CPTPP on emissions

The estimated impact on GHG emissions is derived using the GTAP-E model. Further detail on this model can be found in Technical Annex 10.

The overall effect of the UK's accession to CPTPP on global emissions is likely to be negligible. Based on 2017 data it is estimated that global CO₂ emissions (including the UK and CPTPP countries) could increase by around 1.03 MtCO₂e (0.003%) in the long run due to an increase in UK and CPTPP emissions and a reduction in third country emissions as a result of the agreement.

These figures are likely to be an overestimate because they do not account for the following:

- a) the modelling uses 2017 emissions data in the baseline and as a result does not capture the impact of falling emissions over the last 5 years

¹⁴⁶ [IMF World Economic Outlook Database](#), April 2023 edition.

¹⁴⁷ [OECD Data: Air and GHG Emissions](#) (accessed March 2022).

¹⁴⁸ [IMF World Economic Outlook Database](#), April 2023 edition.

¹⁴⁹ [OECD Data: Air and GHG Emissions](#) (accessed March 2022).

¹⁵⁰ Million tonnes of CO₂ emissions.

¹⁵¹ When compared to G20 countries, the aggregated CPTPP CO₂ emission is less than USA and China but higher than other polluting countries such as the EU, India and Russia.

¹⁵² [OECD Data: Air and GHG Emissions](#) (accessed March 2022).

¹⁵³ [Committee on Climate Change, Progress in reducing emission, June 2022](#)

¹⁵⁴ [Net zero tracker, 2022.](#)

¹⁵⁵ [Climate Action Tracker, 2022.](#)

- b) there is a projected decline in greenhouse gas emissions in various sectors or declines in emissions intensity that can be expected to follow from government policies on decarbonisation policies and policies to deliver net zero
- c) the adoption of environmentally friendly production techniques by businesses, either through technology transfer or investment can be expected to lead to a decline in GHG emissions and emission intensity over the long-term - for context, the UK's emissions are projected to fall by at least 66% by 2035 (compared to the level of emissions in 2017) based on the UK's net zero pathway

The estimates also do not take into account the impact on transport emissions, which are assessed in section 6.4, or emissions due to changes in deforestation or land use.

UK-based GHG emissions

Subject to the limitations noted above, as a result of economic growth and changes in economic activity from the UK's accession to CPTPP, UK CO₂ emissions could increase by around 0.5 MtCO₂e (0.12%) in the long run when compared to baseline levels.¹⁵⁶ This is small compared to the emissions reduction of at least 66% expected by 2035 (compared to the level of emissions in 2017) based on the UK's net zero pathway. This is small compared to the emissions reduction of at least 66% expected over the same period based on the UK's net zero pathway.

The UK's accession to CPTPP does not affect the composition of CO₂ emissions attributable to firms and households. The increase in firms' production activities account for around 82% of the increase in UK CO₂ emissions from the accession to CPTPP. The remaining is associated with increased energy consumption from households.

The increase in firms' consumption of domestic and imported energy account for around 23.6% and 58.6% of the increase in UK CO₂ emissions, respectively. The increase in households' consumption of domestic and imported energy account for 3.8% and 13.9% respectively.

CPTPP-based emissions

Subject to the limitations noted above, as a result of economic growth and changes in economic activity from the UK's accession to CPTPP, CO₂ emissions in CPTPP could increase by around 1.45 MtCO₂e (0.05%) in the long run.

The estimated impacts vary across CPTPP member states. Malaysia is driving around two-thirds of the estimated increase in CPTPP CO₂ emissions, which is consistent with the economic results.

Around 91% (1.32 MtCO₂e) of the increase in CPTPP CO₂ emissions is attributed to firms' production activities. The remaining 9% (0.13 MtCO₂e) is associated with increased energy consumption from households.

Third countries based emissions

Subject to the limitations noted above, there is an estimated fall in third countries' CO₂ emissions, equivalent to around 0.91 MtCO₂e (0.003%) in the long run. The EU, China and the US show the most prominent fall in CO₂ emissions at 0.20 MtCO₂e (0.007%), 0.16 MtCO₂e (0.002%), and 0.20 MtCO₂e (0.004%) respectively. Regional patterns underlying the global emissions estimates are consistent with the economic results. Countries experiencing

¹⁵⁶ The baseline is constructed from a 2017 GTAP database.

economic growth as a result of the UK's accession to CPTPP are estimated to have rising CO₂ emissions.

6.4 Quantitative estimates of the impact on trade-related transport emissions resulting from the UK's accession to CPTPP

Estimates suggest that the increase in emissions associated with increased maritime and aviation freight could be between around 0.13 MtCO₂e and 0.15 MtCO₂e each year between 2020-2035. This represents a 4% increase against the baseline. However, as noted above, it does not take into account changes in emission intensity or decarbonisation initiatives and is likely to be an overestimate.

Environmental results: trade-related transport uncertainties

The analysis does not take account of:

- any improvements we may expect to see in the emissions intensity of transport over time, either in the baseline or resulting from the UK's accession to CPTPP
- future decarbonisation of international shipping or other policies, nor a decline in transport emissions with third countries as a result of the UK's accession to CPTPP

More details on methodology can be found in Technical Annex 10.

The scale of emissions associated with international trade in goods is determined by factors such as distance, weight of the good (rather than value), and mode of transport. For example, maritime transport has far fewer emissions than aviation when transporting the same weight of goods over the same distance.

The UK is committed to being at the forefront of tackling maritime emissions. The UK was a leading voice in the negotiations at the International Maritime Organization (IMO) in 2018, resulting in the first ever GHG strategy for the sector, agreeing a target of reducing emissions by at least 50% by 2050.¹⁵⁷

Estimates suggest that the increase in emissions associated with increased maritime and aviation freight could be between around 0.13 MtCO₂e and 0.15 MtCO₂e each year between 2020-2035. This represents a 4% increase against the baseline, not taking into account changes in emission intensity or decarbonisation initiatives. This compares to UK total GHG emissions in 2019 of around 547 MtCO₂e.

Table 14: Estimated impact of the UK's accession to CPTPP on trade-related maritime and aviation freight emissions

	Emissions from UK exports			Emissions from UK imports			Total
	Aviation	Maritime	Total	Aviation	Maritime	Total	
Average annual change (MtCO ₂ e)	0.02	0.02 – 0.02	0.04 – 0.04	0.02	0.08 – 0.09	0.09 – 0.11	0.13 – 0.15
Change relative to baseline (%)	3%	3%	3%	3%	5%	4%	4%

Source: DBT modelling. The range for maritime emissions is based on a sensitivity analysis of increasing the distance travelled by 25% to reflect the fact that ships do not always taking the shortest route.

¹⁵⁷ DfT, 2019. Clean Maritime Plan.

The increase in transport emissions of 4% against the baseline is consistent with what we would expect given modelling results also estimate around a 4% increase in bilateral trade between the UK and CPTPP members. The increase is driven by the expected increase in the volume of bilateral trade and the estimated change in the composition of goods traded and associated modes of transport used.

A large proportion of services trade does not involve any transport at all.¹⁵⁸ While increases in the movement of people could increase transport emissions and this impact is yet to be quantified, it is expected to be small.

6.5 Carbon Leakage

Carbon leakage is the movement of production and associated emissions from one country to another due to different levels of decarbonisation effort through carbon pricing and climate regulation. By reducing trade barriers, an FTA could facilitate higher levels of trade and carbon leakage in sectors where climate regulation differ between the UK and its trading partners in the future.

Overall, additional carbon leakage risks from CPTPP accession alone in the long run are small since the UK already holds bilateral FTAs with all CPTPP members other than Brunei and Malaysia.¹⁵⁹ Although all CPTPP members have announced pledges to reach net zero by 2050, there may still be different emissions reduction pathways over the next 10-15 years, which could affect the carbon leakage risk.

In principle, products which are emissions-intensive (with differential emissions intensities compared to the UK), experience a significant reduction in trade barriers from CPTPP accession and are likely to directly compete with UK production are exposed to carbon leakage risks. However, as Malaysia has pledged to reach net zero by 2050, and sectors with significant barrier reductions and high trade, such as Malaysian and UK wearing apparel products, are unlikely to compete, any carbon leakage risk in this sector is expected to be minimal in the long run.

The extent to which land use change could lead to carbon leakage remains difficult to assess. This is due to the lack of granular data on emissions from land use change and deforestation, and on the degree of substitutability between similar products growing in different climates.

6.6. Opportunities for increased trade in environmental goods

Environmental goods and services refer to products and services with an environmental end use or benefit. Increased trade in environmental goods and services encourage the take up of more environmentally-friendly production techniques, resulting in positive environmental and climate outcomes.

There is no internationally agreed-upon definition of environmental goods. This impact assessment follows the OECD's approach in using the Combined List of Environmental

¹⁵⁸ Of all the Modes for Services trade Mode 4 is the most significant in terms of actual passenger travel and likely to be the main driver of transport emissions. According to experimental data, Mode 4 trade made up around 11% of cross-border services trade (excluding Investment) with CPTPP Countries in 2019 and 8% in 2020.

* Data for Brunei, Malaysia, Peru, and Vietnam are not available, so we use the rest of the countries as a proxy for the whole of CPTPP

¹⁵⁹ Assessment of carbon leakage risks are based on additional liberalisation above and beyond any existing bilateral agreements.

Goods.¹⁶⁰ The UK currently imposes tariffs on environmental goods imports from five CPTPP countries, affecting 67 products.^{161,162} These tariffs will no longer apply to CPTPP members, creating an opportunity for cheaper imports of such goods into the UK.

Through joining CPTPP, remaining tariffs will be removed on all UK exports of environmental goods to CPTPP members - notably 135 product lines to Malaysia and Brunei. Malaysia currently applies the highest tariffs on UK exports of environmental goods. These average 12.0% across 135 non-liberalised products and reach up to 30.0% on products such as insulating glass units (e.g., for double glazing) and heat pumps, whilst Brunei currently imposes tariffs of 5.0% across 4 environmental products.

The marginal impact of trade liberalisation in environmental goods is likely to be small given the number of goods liberalised, although there will be fewer tariff and non-tariff barriers to trade in environmental goods and UK exports to CPTPP members. It is difficult to quantitatively assess the impacts of liberalisation on environmental and climate outcomes, although the role of environmental goods and services in facilitating transitions to net zero is recognised internationally.

Under the CPTPP Environment chapter, there are further provisions to strengthen cooperation between CPTPP members to address any potential barriers to trade in environmental goods and services.

6.7 Impacts on natural capital and nature loss

Increased economic activity, as well as increased production or trade in particular sectors or products, can be associated with other environmental issues beyond GHG emissions. However, the evidence below and CGE modelling results suggest these impacts are not likely to be significant.

Air quality

The release of pollutants into the air can harm the environment, living organisms and public health. The Environmental Performance Index (EPI) shows that UK air quality is better than the global average and ranks 14th out of 180 countries, while all CPTPP countries score above the global median (34.8), except for Mexico (34.2) and Vietnam (26.5).¹⁶³ Out of the 11 CPTPP countries, only Malaysia, Brunei and Singapore have not signed up to the UN Climate and Clean Air Coalition, which facilitates policies and practices to reduce climate pollutant emissions.^{164,165} Brunei, Malaysia, Singapore and Vietnam are all part of the ASEAN Agreement on Transboundary Haze Pollution.¹⁶⁶

In the UK, significant negative impacts on air pollution are not expected. CPTPP accession leads to GVA changes in the following sectors associated with air pollution: textiles and wearing apparel (1.29%) manufacture of motor vehicles (1.27%), energy (0.04%), manufactures (0.09%), agriculture, forestry and fishing (0.01%), semi-processed foods (-

¹⁶⁰ OECD, 2019. REPORT ON A SET OF POLICY INDICATORS ON TRADE AND ENVIRONMENT, Joint Working Party on Trade and Environment.

¹⁶¹ HS6 product level aggregation.

¹⁶² As of 01/01/2023. These five countries are Malaysia (67 products), Brunei (67 products), Vietnam (5 products), Japan (3 products) and Singapore (1 product). In the case of Vietnam, Singapore and Japan, these products are already scheduled to undergo staged liberalisation in future as part of the UK's bilateral FTAs with these countries.

¹⁶³ Yale Centre for Environmental Law & Policy, [Environmental Performance Index 2022](#), 2022, p.70

¹⁶⁴ UNEP, [Climate and Clean Air Coalition](#), 2019.

¹⁶⁵ UNEP, <https://www.ccacoalition.org/en/content/our-work>, 2019.

¹⁶⁶ ASEAN, [Asean Agreement on Transboundary Haze Pollution](#).

0.06%) and other services (0.08%). However, the UK has implemented a mix of regulatory frameworks and encouraged investment in cleaner processes and a shift towards cleaner forms of energy to tackle air pollution.^{167,168}

In Malaysia (the largest CPTPP country with which no bilateral agreement already exists) significant impacts on overall air quality issues are not expected. The most prominent sources of air pollution in the country are energy generation, transport, and industrial processes.¹⁶⁹ The GVA changes in sectors which are linked to these activities are: textiles and wearing apparel (3.47%), manufacture of motor vehicles (0.74%), energy (0.02%) and other services (0.30%). There are limited GVA increases in most of these sectors. Better regulations, monitoring, and evaluation programs to improve air quality are currently being implemented in Malaysia, which may help to further mitigate any impacts.^{170,171}

Marine habitats and fisheries

Global trade in seafood has increased dramatically in recent decades and is amongst the most highly traded food commodities.¹⁷² The sustainability of fisheries can impact marine ecosystems. Out of all CPTPP countries, New Zealand and Brunei rank the lowest on the EPI fisheries indicator, which measures the health and sustainability of fisheries, at 127th and 126th, respectively.¹⁷³ The majority of CPTPP members are signatories to UNCLOS¹⁷⁴ and PSMA¹⁷⁵ and all have ratified at least some parts of the MARPOL convention.¹⁷⁶

Fish stocks and marine environments are likely to be broadly unaffected by the UK's accession to CPTPP based on CGE results. CPTPP countries show a 0.01% increase in the fishing sector's GVA, and a 0.02% GVA increase in sectors containing fish products. The UK fishing sector remains largely unchanged and the sector containing fish products increases by 0.14%.

Water quality & use

Many economic sectors use water intensively and can affect water quality. The UK has low water scarcity issues compared to the global average, ranking joint 6th out of 180 countries in the EPI for water resources.¹⁷⁷ However, the UK does experience localised water stress, notably in Southern and Eastern England due to increased abstraction demands.¹⁷⁸ While most CPTPP countries score above the EPI global median for Water & Sanitation (47.6), water pollution is still an issue in Vietnam, Mexico, Chile and Malaysia.¹⁷⁹

The overall impact of the agreement on UK water resources and quality is likely to be marginal. In the UK, CPTPP accession leads to GVA changes in the following sectors associated with high water use: textiles, wearing apparel and leather (1.29%), motor vehicles (1.27%), construction (0.12%), agriculture, forestry and fishery (0.01%), semi-processed foods (-

¹⁶⁷ Department for Environment, Food & Rural Affairs, [Air quality factsheet](#), 2021.

¹⁶⁸ Department for Business, Energy & Industrial Strategy, [Net Zero Strategy: Build Back Greener](#), 2021.

¹⁶⁹ Malaysia's Department for the Environment, [Environmental Quality Report](#), 2020, p.160.

¹⁷⁰ Greenpeace, [The State of Air Quality in Malaysia](#), 2022.

¹⁷¹ Hirota, K. [Policy for Better Air Quality in Asia. Proposal for a Policy Evaluation Method for four ASEAN Countries](#), 2008.

¹⁷² Asche and D. Smith, WTO, [Trade and Fisheries: Key Issues for the World Trade Organization](#), 2021.

¹⁷³ Yale Centre for Environmental Law & Policy, [Environmental Performance Index 2022](#), 2022, p.123

¹⁷⁴ United Nations Convention on the Law of the Sea

¹⁷⁵ Agreement on Port State Measures

¹⁷⁶ International Convention for the Prevention of Pollution from Ships

¹⁷⁷ Yale Centre for Environmental Law & Policy, [Environmental Performance Index 2022](#), 2022, p.150.

¹⁷⁸ [WRAP. Freshwater availability and use in the United Kingdom, 2011, p.27.](#)

¹⁷⁹ Yale Centre for Environmental Law & Policy, [Environmental Performance Index 2022](#), 2022, p.79.

0.06%) and energy (0.04%). The UK has committed to improving water use and quality in the 25 Year Environment Plan.

In CPTPP countries overall, we do not expect to see significant impacts on water quality as a result of UK accession. This is because the sectors that are estimated to expand the most are industrial rather than agricultural sectors, which are relatively less water polluting.^{180 181} The UK's accession to CPTPP leads to GVA changes among CPTPP members in the following sectors associated with high water use: textiles, wearing apparel and leather (0.08%), manufacture of other transport equipment (0.12%), agriculture, forestry and fishing (0.01%), semi-processed foods (0.03%) and energy is unchanged respectively.

Land use & deforestation

Forestry is the largest source of national carbon sequestration in the UK, removing 18 million tonnes of CO₂e in 2020.¹⁸² Conversely, deforestation is the second largest source of CO₂ emissions internationally, and a leading cause of biodiversity loss, air and water pollution, and soil erosion.¹⁸³

Deforestation in CPTPP countries, where it occurs, has been driven by production of commodities such as cattle, timber and palm oil.¹⁸⁴ The majority of CPTPP members are not considered to be at risk of deforestation, except Malaysia which has experienced a 29% reduction in tree cover over the last 20 years.¹⁸⁵ This has been driven by agricultural commodities which accounted for 93% of Malaysia's tree cover loss since 2001, implying that international trade plays a key role in the country's deforestation.¹⁸⁶

In Malaysia, some small and concentrated effects may occur, however significant negative impacts on land use and deforestation are not expected. The CGE modelling suggests that the UK's accession to CPTPP leads to marginal GVA changes in the following sectors linked to deforestation: agriculture, forestry and fishing (0.08%) and semi-processed foods (-0.13%). Proposed due diligence legislation in the UK - which will require larger businesses to ensure that certain forest risk commodities have not been produced on land that is illegally occupied or used – is intended to limit the UK's impact on commodity-driven deforestation. CPTPP members have also introduced certification schemes such as Malaysia Sustainable Palm Oil (MSPO) which accredits plantations that produce palm oil sustainably in line with national requirements.

Malaysia committed to halting and reversing forest loss and land degradation by 2030 at COP 26¹⁸⁷ and signed the Forestry, Agriculture and Commodity Trade dialogue (FACT dialogue) to protect forests whilst promoting sustainable trade in agricultural commodities.

As part of the CPTPP process, the UK and Malaysia have agreed a bilateral statement setting out a shared commitment to work together to promote sustainable production of commodities and to conserve forests. The UK and Malaysia have also committed to regularly share information with one another about ongoing domestic developments related to the

¹⁸⁰ <https://waterfootprint.org/media/downloads/Report50-NationalWaterFootprints-Vol1.pdf>

¹⁸¹ <https://waterfootprint.org/en/resources/waterstat/product-water-footprint-statistics/>

¹⁸² Forest Research, [Forestry Statistics 2021](#), p.159.

¹⁸³ Van der Werf, G.R. et al, [CO₂ Emissions from Forest Loss](#), 2009, p.737.

¹⁸⁴ Joint Nature Conservation Committee, [commodityfootprints.earth](https://www.jncc.gov.uk/information-and-consultation/commodity-footprints-earth).

¹⁸⁵ Malaysia Deforestation Rates & Statistics | GFW (globalforestwatch.org)

¹⁸⁶ Global Deforestation Rates & Statistics by Country

¹⁸⁷ [Action on forests and land use, HMG](#)

environment and sustainable supply chains and production. This includes updates to the Malaysian Sustainable Palm Oil certification scheme.

Addressing deforestation and forest degradation is also mentioned in the CPTPP agreement as an area of cooperation in the move to a low emissions economy.

Palm oil and Deforestation

CGE modelling estimates that Malaysian GVA in the vegetable oils and fats sector, which contains palm oil, slightly declines as a result of UK accession to CPTPP.¹⁸⁸ Whilst Malaysia's exports to the UK are expected to increase in this sector, Malaysia's exports to other regions are expected to decrease, leading to a net decrease in exports overall. Therefore, assuming all else remains equal, the UK's accession to CPTPP is not expected to lead to a net increase in overall Malaysian palm oil production. These results are sensitive to the modelling assumptions. For example, the CGE model assumes that sectors cannot expand production by using additional land, which could mean in principle that the growth of some agricultural sectors may be underestimated. It is therefore difficult to say conclusively what the additional impacts would be on deforestation.

However, the most recent data for Malaysia (2012-2018) shows that palm oil related deforestation has declined by 60% whereas output has increased by 4% over the same period.¹⁸⁹ ¹⁹⁰ Given the UK accounts for around 1% of Malaysia's global palm oil exports, and 72% of UK imports of palm oil are certified as sustainable, any associated environmental impacts may be limited.¹⁹¹ ¹⁹²

Waste management

As economies grow and industrialise, other factors remaining equal, they produce more solid waste as a result of production and consumption. The volume of solid waste and effective waste management processes – such as those determining the collection and treatment of waste products – are an important determinant of the impact of increased economic activity on the environment.

Significant impacts on waste are not expected as a result of the UK's accession to CPTPP. The construction sector is an intensive producer of waste,¹⁹³ although CGE modelling shows that GVA in the construction sector is broadly unchanged in CPTPP countries (0.01%) and increases by 0.12% in the UK. Manufacturing sectors can also produce waste, although UK GVA changes in the manufacture of electronic equipment (-0.38%), machinery and equipment (0.05%) and other transport equipment (-0.18%) suggest this would not have any negative impacts. Based on the UK's commitment to policies such as the 25 Year Environment Plan, additional waste from the FTA could be mitigated via increased resource efficiency and tackling illegal waste exports.¹⁹⁴

¹⁸⁸ Assuming the same share of palm oil products in the vegetable, oils and fats sector is the same as in HMRC 2017-2019 average

¹⁸⁹ <https://commodityfootprints.earth/>

¹⁹⁰ <https://www.fao.org/faostat/en/#data/QCL>

¹⁹¹ DBT analysis using HMRC trade data by preference and ITC trade map, volume (kt), 2022

¹⁹² [2021: UK Roundtable on Sourcing Sustainable Palm Oil – Annual Progress Report \(published in 2022\)](#)

¹⁹³ DEFRA, [ENV23 - UK statistics on waste](#)

¹⁹⁴ UK Government, [A Green Future: Our 25 Year Plan to Improve the Environment](#), 2018.

Biodiversity and ecosystems

Biodiversity is the variety of ecosystems and species, and their genetic diversity.¹⁹⁵ The main causes of biodiversity loss globally are over-exploitation of natural resources,¹⁹⁶ pollution of ecosystems, climate change, land-use change and invasive non-native species.¹⁹⁷

On average, the CPTPP countries score lower than the UK on Yale University's Environmental Performance Index (EPI) in terms of the actions taken to protect biodiversity and habitats.¹⁹⁸ Also, several of the CPTPP countries contain very high biodiversity and natural capital resources that are at risk from increased production and consumption.¹⁹⁹

Significant impacts on UK biodiversity are not anticipated as a result of the UK's accession to CPTPP, but some very small effects may occur in Malaysia. The agriculture, forestry and fisheries and semi-processed food sectors have stronger links to biodiversity loss due to land-use change. Modelling estimates indicate that GVA in these sectors will be largely unchanged in Brunei. In Malaysia they will change by 0.08% and -0.13% respectively.

UK initiatives help to protect biodiversity in Malaysia and Brunei. For example, at COP26, the UK pledged with 140 countries including Malaysia and Brunei, to co-operate to end and reverse forest loss and land degradation by 2030 to protect global biodiversity.²⁰⁰ Both the UK and CPTPP countries have signed multilateral agreements to address biodiversity, such as the Convention on Biological Diversity and Convention on International Trade in Endangered Species.²⁰¹ There is also a provision within the CPTPP agreement that recognises the importance of multilateral cooperation and promotes exchanging information to protect biodiversity and achieve sustainable development.

¹⁹⁵ [The Convention on Biological Diversity](#)- defines biodiversity as the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystem.

¹⁹⁶ IPBES, [Models of drivers of biodiversity and ecosystem change, 2022](#).

¹⁹⁷ Land use change includes land clearing, the intensification of agricultural methods, and urbanisation.

¹⁹⁸ Yale Centre for Environmental Law & Policy, [Environmental Performance Index 2022](#), 2022, p.104.

¹⁹⁹ Convention on biological diversity, [Country profiles](#), 2022.

²⁰⁰ COP26, [COP26 The Glasgow Climate Pact](#), p.7.

²⁰¹ Convention on Biological Diversity, signed 1992, and Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES), signed 1973.

Uncertainty and analytical limitations

Many of the results throughout this Impact Assessment are presented for clarity as central point estimates. However, the modelling aims to provide an indication of the direction of impacts and broad orders of magnitude, rather than precise estimated impacts.

The scale of macroeconomic impacts, as well as the distribution across sectors, are subject to a high degree of uncertainty from various sources.

Uncertainty relating to the model and key parameters

The estimated size and scale of estimates for the macroeconomic impacts depends upon the:

- model structure
- underlying data
- key structural parameters (such as elasticities)
- input assumptions (the assumed scale of trade cost reductions)

These influence the estimates and are all subject to uncertainty.

For example, the elasticities in the model attempt to capture the extent to which businesses and consumers respond when faced with lower trade costs and a new set of relative prices in the economy. The model structure is the largest influence on the estimated impacts as this determines the ways in which businesses and consumers are assumed to respond to the FTA.

Sensitivity checks have been undertaken to investigate the robustness of the main estimates to changes in these factors.

These checks vary:

- some of the core parameters within the model, such as elasticities
- the scale of assumed reductions in the non-tariff measures reductions
- the method of implementation of non-tariff measures reductions in the model

See Annex 1 for more details.

Varying elasticities

A statistical simulation was used to generate thousands of estimates for the impact of the agreement based upon alternative, randomly sampled, values for trade elasticities. These elasticities determine the strength of business and consumer responses to reductions in trade barriers.

The estimated results are found to be robust (not highly sensitive) to large changes to trade elasticities.

Varying input assumptions

A statistical simulation was also used to generate hundreds of estimates for the impact of the agreement based upon alternative, randomly sampled, values for the input assumptions, in other words, the assumed reductions in non-tariff measures.

This sensitivity indicates, at the sector level, that the estimated results are found to be robust to the assumed changes in NTMs.

Changing the method of the implementation of non-tariff measures reductions in the model

A sensitivity analysis was conducted to test the method of implementing the non-tariff barrier reductions in the model. This relates to the nature of NTMs, and the extent to which they may generate any benefits in the economy. This sensitivity test suggests that the applied assumption represents a conservative approach to the modelling.

The estimates of NTM changes are typically implemented in a CGE model as a pure efficiency cost (in other words, an NTM reduction is not associated with any changes in revenue flows) or as a revenue-generating tariff-equivalent, or as a mixture of the two. Some CGE analyses assume that all NTMs are pure efficiency costs, often due to implementational simplicity. However, it is unlikely that all NTMs have only pure efficiency effects and the extent to which NTMs are revenue-generating is debated, depending critically on the nature of the specific NTM in question. Based on the empirical precedent in our modelling, it is assumed that 30% of NTMs are revenue generating, whilst the remaining 70% are an efficiency cost: a so-called 70:30 Deadweight Ratio (DWR).

Limitations

The sensitivity analysis did not account for uncertainty in model structure, nor the uncertainty associated with the underlying projections. None of the estimates account for the full range of potential dynamic impacts of the agreement, nor exogenous factors (described further below) which could exert a greater influence on the eventual impact of the agreement. These factors are, by nature, difficult to quantify. They mean that it is possible, or even likely, that the eventual impacts of the agreement fall outside of the ranges suggested by the sensitivity exercises discussed above (which only capture the impact of uncertainty from modelling parameters or assumptions).

Data quality

The CGE modelling uses the GTAP-11 dataset, which uses the latest available data from 2017. While this is the most recent GTAP dataset available, there have been several changes in trade over the period since 2017 which have the potential to affect the scale and distribution of impacts in the long term. However, recent trade flows are heavily affected by COVID-19 impacts, which are expected to have dissipated in the long-run time horizon that forms the basis of the modelling.

Overall trade

Total trade between the UK and CPTPP members increased between 2018 and 2022 from £103.2 bn to £113.4bn. In 2018, UK trade in goods with CPTPP accounted for £58.5 billion (56.7%) and services were worth £44.7 billion (43.3%). This composition was relatively similar in 2022 with UK trade in goods with CPTPP accounting for £64.5 billion (56.9%) and services for £48.9 billion (43.1%).²⁰²

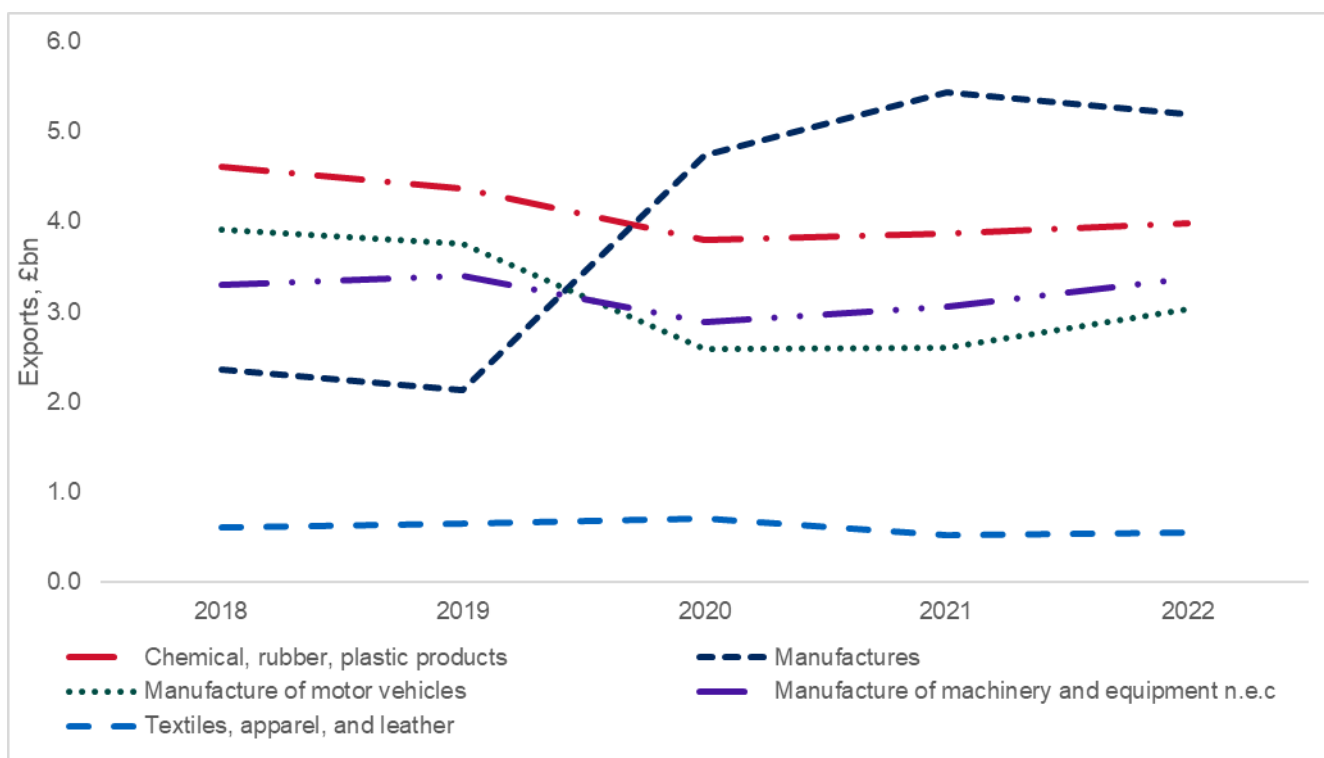
Sectoral changes

The graph below shows recent trends in UK exports to CPTPP in the 5 sectors expected to be the most impacted as a result of the UK's accession to CPTPP. The CGE modelling estimates a £0.7 billion increase in exports of the manufacture of motor vehicles, the largest

²⁰² [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

increase of all sectors. However, since 2018, exports in the manufacture of motor vehicles to CPTPP have fallen from £3.9 billion to £3.0 billion.²⁰³ If these changes are due to short term supply chain challenges in the motor vehicle industry after the pandemic, they are unlikely to impact long run predictions. Other sectors are subject to similar uncertainty. For example, the CGE model estimates that exports in manufactures (comprised of wood products, ferrous metals, metal products, mineral products and metals) will increase by £0.1 billion by 2040, while exports in this sector have risen 120% to £5.2 billion since 2018. It is unclear what proportion of these changes are part of a longer-term trend rather than short term responses to the pandemic.

Figure 8: UK exports to CPTPP – developments in key sectors since 2018



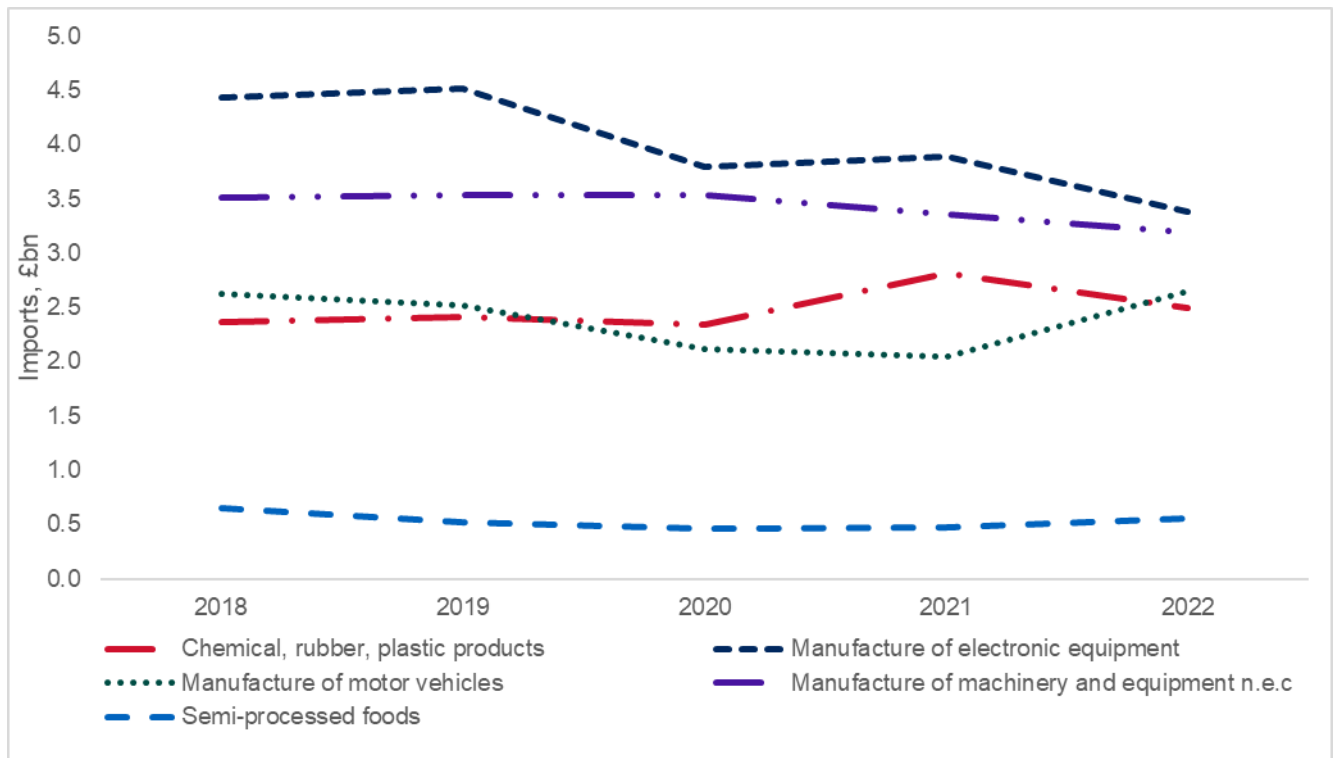
Source: HMRC Overseas Trade Statistics: March 2023.

Figure 9 below looks at UK imports in sectors that are expected to increase following the UK's accession to CPTPP. The CGE results suggest that imports in both the manufacture of electronic equipment and the manufacture of machinery and equipment are estimated to increase (£0.3 billion and £0.2 billion respectively). Both these sectors saw a decline in imports during the pandemic and recent imports data indicates that these sectors are yet to recover to pre-pandemic and 2018 levels of trade. Additionally, imports in the manufacture of motor vehicles are estimated to increase by £0.2 billion. Imports in this sector fell significantly during the pandemic but in 2022 recovered above pre-pandemic levels to £2.7bn. On the other hand, imports in chemical, rubber and plastic products and semi-processed foods have remained stable.²⁰⁴

²⁰³ HMRC Overseas Trade Statistics: March 2023.

²⁰⁴ HMRC Overseas Trade Statistics: March 2023.

Figure 9: UK imports from CPTPP – developments in key sectors since 2018



Source: HMRC Overseas Trade Statistics: March 2023.

Country level changes

Trade patterns across CPTPP members have also evolved over the last few years and clearly have been impacted by the pandemic. It is therefore hard to disentangle temporary impacts of COVID-19 from long run trends.

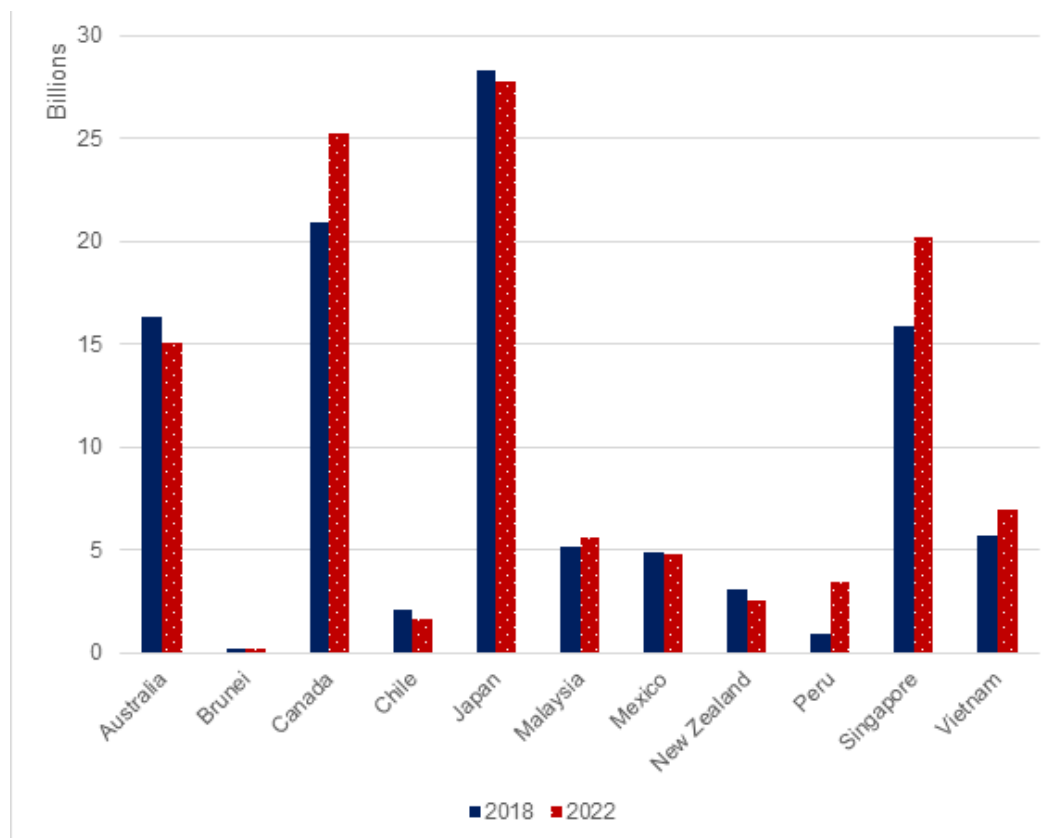
In comparison to other CPTPP members, Japan had the highest share of total UK trade with CPTPP - 24% in 2022. Total trade between the UK and Japan was around the same between 2018 and 2022 with the exception of the pandemic years.²⁰⁵

A significant portion of the estimated economic impacts from UK accession to CPTPP arise from Malaysia. Total trade with Malaysia has stayed relatively stable over the 2018-2022 time period, worth £5.1 billion (£3.2 billion in goods and £1.9 billion in services) in 2018 and £5.6 billion (£4.0 billion in goods and £1.7 billion in services) in 2022. The composition of this trade has, however, changed in this time period with trade in goods having grown on average by 5.8% each year and trade in services having fallen on average by 3.7% each year. Proportions of trade with other CPTPP members has changed to varying degrees too since 2018, as shown by Figure 10. For example, Canada and Singapore now make up relatively more of the total trade between the UK and CPTPP, amounting to £25.2 billion and £20.2 billion respectively, up from £20.9 billion and £15.9 billion in 2018.²⁰⁶

²⁰⁵ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

²⁰⁶ [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

Figure 10: Trade comparison with CPTPP partners, 2018 and 2022



Source: [ONS, UK total trade: all countries seasonally adjusted data](#), 2022, released 27th April 2023

Uncertainty relating to the baseline and core CPTPP membership

Sensitivity: accounting for a UK-India FTA in the baseline

Our modelling baseline accounts for major bilateral and multilateral trade agreements that are currently in force and that are expected to potentially have an impact on the estimated impacts from UK joining the CPTPP. At the time of conducting the modelling, the prospective UK-India FTA did not fall under these criteria. As a sensitivity scenario we estimate the economic impacts of UK joining the CPTPP accounting for UK-India FTA in the baseline.

If we account for UK-India FTA in the baseline, the estimated increase of UK GDP (of £2.0bn) and CPTPP GDP (of £2.4bn) remain unchanged. The estimates of real GDP gains are not affected to the second decimal point, neither for the UK, nor for CPTPP.

Additional external evidence: expansion of the agreement

The core scenario considers all signatories as members (CPTPP-11), however CPTPP is designed to expand which would have an impact on the GDP gains. External analysis by Petri and Plummer (2023) shows significant impacts on UK gains. The box below sets this out in more detail.

Example external analysis on the impact of an expanded CPTPP in a scenario in which there is increased geopolitical-fragmentation of the global economy

The core estimates presented in this Impact Assessment are of the marginal impact of UK accession to CPTPP on GDP. Results from the illustrative modelling if CPTPP were to expand in future are outlined in

Section 4. Further technical detail is included in Annex 3. Note that these are hypothetical scenarios and do not reflect UK government policy on future CPTPP membership.²⁰⁷

Analysis by independent researchers, Petri and Plummer (2023), estimates the potential benefits from the UK joining CPTPP under different scenarios and based on different assumptions could be around £31 billion, depending on the future membership expansion scenario.²⁰⁸

The study included the following scenarios:

- **CPTPP 2.** This scenario assumes that, by 2024, all 11 original members of CPTPP will have ratified, as well as the UK and the Republic of Korea.²⁰⁹ Under the CPTPP 2 scenario, joining CPTPP is estimated to increase UK-incomes in 2035 by \$33 billion (2014 prices) compared to a scenario without the agreement. This is equivalent to £24 billion in 2021 prices.²¹⁰
- **CPTPP 3.** In this scenario CPTPP is assumed to expand beyond the CPTPP2 scenario to include Indonesia, the Philippines and Thailand in 2027. The CPTPP 3 scenario increases the benefit of the UK joining CPTPP by increasing UK incomes in 2035 by \$42 billion (2014 prices). This is equivalent to £31 billion in 2021 prices.²¹¹ In both these scenarios the UK is the largest beneficiary in absolute income from greater integration.

In contrast to the core analysis presented in this Impact Assessment, the analysis by Petri and Plummer (2023) does not include factors that affect the estimation of marginal benefits of the UK's accession to the CPTPP. It likely overestimates these benefits because it fails to attribute some UK gains from trading with CPTPP members to other, recently completed UK agreements with them. Petri and Plummer (2023) focused on broad global issues, not UK accession to the CPTPP, and it was based on data from 2020 and earlier. Thus, its baseline did not yet include several UK agreements with CPTPP members that came into force later. In addition, the expansion scenarios modelled by Petri and Plummer (2023) differ from those modelled by DBT in the illustrative analysis. Nonetheless, their work also highlights the importance to the UK of its economic connections with this region and suggests further benefits were the agreement to expand in the future. DBT understands that Petri-Plummer are updating their study and plan to release new results shortly.

There are a number of differences in the methodology and modelling assumptions between Petri and Plummer (2023) and DBT's core analysis described in section 4.5 as well as modelled expansion scenarios described in section 4.9, therefore the results are not directly comparable. The key differences include:

1. CGE model structure: DBT uses the GTAP static CGE model whilst they use a dynamic version of this model with further modifications
2. Modelling baseline: the Petri & Plummer (2023) modelling baseline reflects the isolation of the Russian Federation economy and an increase in resource costs due to the Russian invasion of Ukraine – both significantly lowering global GDP. DBT has not explicitly captured this in the

²⁰⁷ We understand that the following economies have formally applied to join CPTPP: China, Taiwan, Costa Rica, Ecuador, Uruguay and Ukraine.

²⁰⁸ Scenarios for a Global "New Normal" and ASEAN Global Value Chains – Petri & Plummer, March 2023. This analysis was commissioned by the Asian Development Bank.

²⁰⁹ Petri & Plummer (2023) assumes a scenario where CPTPP currently comprises of 9 of the 11 existing members, expanding to include Malaysia, Chile, the Republic of Korea and the UK in 2024. In reality, Malaysia and Chile have already ratified the agreement, however this is not captured in the design of the analysis.

²¹⁰ This figure is calculated using Petri & Plummer's \$33 billion estimate (2014 prices) and converting this into 2021 £ values using the ONS GDP deflator and the Bank of England exchange rate

²¹¹ This figure is calculated using Petri & Plummer's \$42 billion estimate (2014 prices) and converting this into 2021 £ values using the ONS GDP deflator and the Bank of England exchange rate.

modelling baseline. Also, the Petri & Plummer analysis assumes that Malaysia and Chile do not enter the agreement till 2024.

3. Modelling database: the Petri & Plummer (2023) analysis is carried out using the GTAP 10.1 database (reference year 2014) while DBT analysis uses the GTAP 11 database (reference year 2017).

Furthermore, the expansion scenarios modelled by Petri and Plummer (2023) are different from those modelled by DBT in the core analysis. Petri and Plummer's "CPTPP2" is based on 9 CPTPP members in the baseline and then adds 4 more (Malaysia, Chile, Republic of Korea and UK) while DBT's core modelling is based on the 11 current CPTPP member countries (9 plus Malaysia and Brunei) and adds the UK. This is a further reason why the two sets of modelling results are not directly comparable.

An uncertain future - exogenous factors affecting the eventual impact of the agreement

The CGE modelling provides ex ante estimates of the direction and broad orders of magnitude of the long-run impacts. The modelling is based on data from 2017 and like many approaches to economic modelling, assumes 'all else remains equal'. That means that it assumes that factors outside of the modelling framework remain the same. However, there are many geopolitical trends and changes to the UK and global economy which might continue over the long run (c.15 years and beyond). These are likely to affect the eventual long-run impacts of the agreement in quantitatively important ways, including the extent to which the predicted impacts materialise. These factors include:

Current uncertainties

- any long-term impacts of the conflict between Ukraine and Russia. The modelling assumes that the world readjusts to previous patterns. It also does not account for the impact of sanctions, which will remain in place until HM Government is satisfied with Russia's change of action and intent towards Ukraine
- persistent high rates of inflation. Persistently high inflation could reduce demand for UK exports in CPTPP countries if nominal wages in those countries are not increasing in line with inflation, reducing real take home pay. If domestic inflation is higher than for other countries, the UK's competitive advantage could be reduced. Finally, high inflation could lead countries to impose higher interest rates, thus impacting their current and future GDP. If these factors materialised, the CGE estimates could overestimate the true impacts of the UK's accession to CPTPP
- a recession in the short-term. Academic research has highlighted that world trade growth slows by two percentage points for every one percentage point fall in world GDP. However, trade typically rebounds strongly after a global downturn. The modelling captures long-run impacts, and therefore does not account for the short-run implications of a recession. It is also a static model and does not consider dynamic long-run changes to the economy that can materialise

Future uncertainties

- climate change. While there is significant uncertainty around the economic effects of climate change and achieving net zero, the impacts are likely to be large. It could affect the size of the UK economy, and those of its partners. For example, recent international modelling work estimates the economic cost of climate change to the UK could be at

least 1% of GDP per year by 2045.²¹² Academic forecasts have also estimated that if temperatures are held at 1°C above pre-industrial levels it will cost the Malaysian economy 3.1%, Singapore economy 2.7%, Vietnam economy 2.2% and the Brunei economy 1.2% of GDP in the long run.²¹³ Some CPTPP members may also be particularly vulnerable to extreme weather events which can raise the cost of trade. While these risks are large and significant, they will predominantly impact GDP independent of the UK's accession. This means the modelling results could come to overstate the true impacts of UK accession to CPTPP

- urbanisation. Given the diverse nature of CPTPP member economies, urbanisation rates similarly vary. For example, in 2021, around 38% of the Vietnamese population was living in urban areas.²¹⁴ There is increasing urbanisation in the Indo-Pacific region in countries like Malaysia and Vietnam.²¹⁵ Urbanisation is linked to higher productivity and higher living standards as cities offer economies of scale, agglomeration benefits and act as hubs for trade. So rising urbanisation rates are expected to continue to provide a tailwind to economic growth in the decades ahead. This means the CGE modelling results might underestimate the true impacts of UK accession to CPTPP
- growth of middle class. By 2035, around half of the world's 2.7 billion middle class consumers are expected to be in the Indo-Pacific.²¹⁶ As living standards rise and households have more disposable income, their consumption patterns tend to shift away from necessities towards more luxury goods and services. So as members of CPTPP become richer, demand for higher-value traded goods and services is likely to rise. This could shift import demand towards UK sectors of comparative advantage such as motor vehicles. Therefore, the CGE model estimates could be an underestimate of the total impacts on trade
- current and future pandemic. The experience of Covid-19 demonstrated the impact of global pandemics on the economy. While the immediate impacts of Covid-19 are likely to have disappeared in the long run, there could be additional impacts of future pandemics. Any future pandemic could create a similar, sudden shock to the global economy which results in reduced global trade and GDP. This could reduce the impacts of the trade agreement relative to the CGE modelling results depending on prevalence and severity of the pandemic, and the extent of any long-term impact
- globalisation and protectionism. Future multilateral trade agreements through the WTO (or other international organisation) could reduce trade costs and increase integration of global supply chains. The effects on this on the impact of UK accession are uncertain. It could stimulate additional trade in value chains that stretch across both the UK, CPTPP and third countries. It could reduce the impact where these alternate

²¹² Third UK Climate Change Risk Assessment, January 2022 This could occur through mechanisms such as deterioration of soil health and agricultural productivity, water availability and energy supply. In addition, the Committee on Climate Change's (CCC)'s latest estimates put the net cost of achieving Net Zero at less than 1% of GDP through to 2050, UK Sixth Carbon Budget, December 2020.

²¹³ Kompas, T., Pham, V. H., & Che, T. N. (2018). The effects of climate change on GDP by country and the global economic gains from complying with the Paris Climate Accord. *Earth's Future*, 6, 1153– 1173.

²¹⁴ World Bank Data

²¹⁵ Confederation of British Industry, *Joining the CPTPP: Opportunities and Challenges for UK Business*, May 2021

²¹⁶ DBT defines the Indo-Pacific as three DBT HM Trade Commissioner regions: South Asia, Asia Pacific, and China & Hong Kong. Projections of the size of the global middle class by 2035 can be found in the DBT Global Trade Outlook, February 2023

agreements prove more attractive than CPTPP and therefore dampen its long-run effects. Any additional fragmentation or geopolitical tensions which undermine the stability of the global trading system could have the opposing effects, with the net impact on the value of UK accession to CPTPP also being uncertain

- future technology. technological developments can reduce trade costs, improve production practices, and create markets for new goods and services, all of which affect trade patterns. For example, a more rapid adoption of digital technologies could increase the tradability of services and reduce the role of distance. This may affect the volume and composition of trade captured in the CGE modelling, with greater exports and imports from services sectors in particular. The ONS estimates that 79% of UK services exports to CPTPP countries (excluding Brunei, Peru, and Vietnam as data is not available) were supplied remotely in 2021, whilst around 82% of UK services imports from CPTPP countries (excluding Brunei, Peru, and Vietnam) were supplied remotely

Many of the factors described above will also be closely linked – such as climate change and the impacts on globalisation. This could amplify the impacts of sources of uncertainty not reflected in modelling.

Plans to monitor and evaluate the agreement

Monitoring and evaluation (M&E) activities which monitor the implementation and assess the impact of FTAs are crucial to ensuring that the benefits for businesses and consumers are maximised. They ensure new trade opportunities created by FTAs are fully grasped and that lessons are learnt which inform the design of our future trade policies.

For this agreement:

- DBT will include the results of monitoring in a biennial FTA monitoring report
- DBT will publish a comprehensive ex-post evaluation for the agreement within 5 years after the UK's accession. The evaluation report will synthesise findings from monitoring, evaluation, and stakeholder engagement activities to assess the impact of the agreement and answer DBT's core evaluation questions. Following the report's publication, DBT will conduct engagement activities and consider whether there is a need to follow up with further evaluation activities or take any direct action to improve the agreement's implementation

The biennial monitoring report will:

- take a focussed approach, outlining the evolution of trade flows between the UK and CPTPP partners and (subject to data availability) measure the utilisation of the agreement
- where possible, discuss the extent to which short-term changes in trade flows can be attributed to the FTA itself rather than wider factors
- provide an overview of the work of the committees established to facilitate co-operation on implementation and to enhance utilisation

The monitoring report will provide DBT's analytical evidence base to inform and engage Parliament, the public, and other interested stakeholders on progress with the implementation of this agreement, its potential emerging impacts, and whether its utilisation can be enhanced.

The evaluation report will:

- aim to show how, why and for whom the UK's accession and its implementation has generated outcomes. It will highlight where and how the agreement has worked well and, if applicable, where and how it has worked less well
- where possible, seek to identify ways to improve the performance of the agreement for the UK
- combine findings from monitoring, evaluation and stakeholder engagement activities to assess the impact and effectiveness of the agreement since the UK's accession and its implementation. It will seek to answer a set of detailed evaluation questions across a range of thematic areas (see below for examples of potential evaluation themes). The evaluation report will synthesise these findings to answer three overarching evaluation research questions covering the five years following the UK's accession:

A. How effective and efficient is the agreement and its implementation in achieving the UK's trade policy aims and in delivering benefits to UK businesses and consumers?

B. How, if at all, can the agreement and its implementation be improved to maximise benefits for UK businesses and consumers?

C. What can we learn from the agreement, its implementation and its impacts to improve the design and implementation of UK's future agreements, and to assess their likely benefits?

An inclusive and participatory process will be at the heart of this evaluation, providing structured opportunities for a wide range of stakeholders to share views and provide evidence. Data gathered through stakeholder engagement will feed into and inform evaluation reports. Following publication of the evaluation report, DBT will further engage stakeholders to take stock of the findings and consider whether further actions could be taken to improve utilisation and maximise FTA benefits.

The evaluation will be proportionate to the agreement's size, content, context, and the expected scale of learning. Proportionality means that DBT's evaluations for some FTAs may not deploy the full range of analytical techniques or deploy them to the same extent as for other FTA evaluations DBT may conduct.

For this evaluation, DBT expects to deploy a mixed methods analytical approach that makes best use of the strengths of a range of quantitative and qualitative research methods and analytical techniques. This approach helps to make evaluations comprehensive and helps to generate more insightful and actionable findings. The evaluation will make best use of:

- econometric analysis
- surveys
- qualitative research such as in-depth interviews or focus groups
- deep dives via sector specific case studies

The evaluation will cover a broad range of impacts, including but not limited to impacts on:

- trade in goods and services & investment flows
- consumers, businesses (including SMEs) and workers
- nations and regions of the UK
- the environment

In addition, M&E activities will focus in greater depth on a number of specific sectors. Sector selection will be informed by analysis and evidence. For example, sectors may be selected if ex-ante analysis suggests that they may be particularly affected by aspects of the agreement or if monitoring activities show that they have been.

**Technical annexes
accompanying the impact
assessment of the agreement
between the United Kingdom of
Great Britain and Northern
Ireland and CPTPP**

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Annex 1: Description of Computable General Equilibrium (CGE) model

The macroeconomic analysis in this assessment uses a Computable General Equilibrium (CGE) model; model code is freely available to download from GTAP centre at the Purdue University (referred to as a GTAP model throughout this annex).²¹⁷ The UK government has procured licensed access to the most recently available GTAP database, an analytical database necessary to operate the model. The following section highlights key features and assumptions underpinning the GTAP model. For a full technical description of the model and database please see the original model documentation.²¹⁸

GTAP Database

The modelling uses the GTAP 11 database, the latest available GTAP database at the time of the analysis, which draws on data from 2017. Where appropriate, the baseline data are updated to reflect changes to tariffs and significant developments in trade policy since 2017. This is particularly relevant for the estimation of the marginal impacts from the UK joining CPTPP. However, not all changes in the pattern of trade between 2017 and today can be fully reflected in the updated baseline data.

The GTAP 11 database's sectoral coverage is 65 sectors. We use the full 65 sectors for the modelling as this helps explain the drivers of the results in more detail as many sectors see sector specific results related to their elasticities and trade flows. It can also help with avoiding aggregation bias at the modelling level. For example, avoiding the need for additional trade weighting of tariff and NTM inputs.

For brevity and presentation purposes, sectoral results are aggregated to 23 sectors in the main body of the impact assessment. Table 1 shows how the sectors provided in the source data and used in the modelling are grouped together for the presentational purposes of this impact assessment analysis.

²¹⁷ For this analysis DIT used RunGTAP user interface, which itself relies on GEMPACK software.

²¹⁸ Erwin L. Corong, Thomas W. Hertel, Robert McDougall, Marinos E. Tsigas, Dominique van der Mensbrugge, 2017. "The Standard GTAP Model, Version 7" Journal of Global Economic Analysis. Vol 2 No 1

Table 1: Sector aggregation²¹⁹

23 Sector name	GTAP 11 abbreviations (65 Sectors)	GTAP Sector description
Agriculture, forestry, and fishing	Pdr	Paddy rice
	Wht	Wheat
	Gro	Cereal grains nec
	v_f	Vegetables, fruit, nuts
	Osd	Oil seeds
	c_b	Sugar cane, sugar beet
	Pfb	Plant-based fibers
	Ocr	Crops nec
	Ctl	Bovine cattle, sheep and goats, horses
	Oap	Animal products nec
	Rmk	Raw Milk
	Wol	Wool, silk-worm cocoons
	Frs	Forestry
	Fsh	Fishing
Semi-processed foods	Cmt	Bovine meat products
	Omt	Meat products nec
	Vol	Vegetable oils and fats
	Mil	Dairy products
	Pcr	Processed rice
	Sgr	Sugar
Other processed foods	Ofd	Food products nec
Beverages and tobacco products	b_t	Beverages and tobacco products
Energy	Coa	Coal
	Oil	Crude Oil
	Gas	Gas
	Oxt	Other Extraction (formerly omn Minerals nec)
	p_c	Petroleum, coal products
	Ely	Electricity
	Gdt	Gas manufacture, distribution
Textiles, apparel, and leather	Tex	Textiles
	Wap	Wearing apparel
	Lea	Leather products
Paper and printing products	Ppp	Paper products, publishing
Chemical, rubber, plastic products	Chm	Chemical products
	Bph	Basic pharmaceutical products
	Rpp	Rubber and plastic products
Manufactures	Lum	Wood products
	Nmm	Mineral products nec
	i_s	Ferrous metals
	Nfm	Metals nec
	Fmp	Metal products
Manufacture of motor vehicles	Mvh	Motor vehicles and parts

²¹⁹ Where used, nec stands for not elsewhere classified.

Manufacture of other transport equipment	Otn	Transport equipment nec
Manufacture of electronic equipment	Ele	Computer, electronic and optical products
Manufacture of machinery and equipment n.e.c	Eeq	Manufacture of electric equipment
	Ome	Machinery and equipment nec
Manufacturing n.e.c	Omf	Manufactures nec
Construction	Cns	Construction
Wholesale and retail trade	afs	Accommodation, Food and service activities
	Trd	Trade
Other services (transport, water, dwellings)	Wtr	Water
	Otp	Transport nec
	Wtp	Water transport
	Whs	Warehousing and support activities for transportation
	Atp	Air transport
	Dwe	Dwellings
Communications	Cmn	Communication
Financial services	Ofi	Financial services nec
Insurance	Ins	Insurance (formerly isr)
Business services	Rsa	Real estate activities
	Obs	Business services nec
Personal services	Ros	Recreational and other services
Public services	Edu	Education
	Hht	Human health and social work activities
	Osg	Public Administration and defense

Model structure and assumptions

The model is based upon a set of structural assumptions rooted in economic theory, describing the interactions between households, firms, and governments in the domestic economy, and the trade linkages between different countries.

The specification of the CGE model used in this assessment is based on the standard GTAP model (version 7), which relies on an Armington trade theory specification. This specification captures the impacts arising from increased specialisation across and within countries (according to Ricardian comparative advantage). However, it does not capture the full range of other channels through which a trade agreement may generate economic gains like, for instance, the entry and exit of firms and products into and out of the export markets or the adjustment of firms' mark-ups in the response to changes in trade costs.

Key features of the model include:

- full employment of labour: the model assumes that in the long run the economy fully adjusts to new trade policy and displaced workers would be reallocated to jobs in other sectors.²²⁰ The model assumes a fixed labour supply which means that the wage rate is flexible and adjusts to restore the equilibrium following the changes in trade barriers triggered by the FTA. This full employment closure rule is a common assumption employed in CGE modelling as there is no well-established theoretical framework linking the functioning of labour markets to how trade policy is assessed in CGE

²²⁰ As argued by Petri and Plummer (2017), the assumption is used in most applied models of trade agreements.

models. It implies that the overall level of equilibrium employment in the long run is not affected by the FTA, but workers gain from increased wages due to higher productivity and a more efficient allocation of labour and other resources. It should be interpreted as indication on which sectors are likely to observe increases and decreases in employment as a result of the FTA

- the capital supply in the model is not fixed, allowing for capital stock accumulation to occur by assuming a fixed rate of return to capital (i.e., capital supply can adjust). The rate of return to capital is parametrised using the GTAP database
- perfect labour mobility between sectors in the same country but not across skill types or between different countries
- countries are primarily linked via trade in goods and services; there are no migration or international capital flows.²²¹ The primary trade policy levers impacting these links are tariffs, non-tariff measures, and regulatory restrictions on services

Developments compared to the CPTPP scoping assessment

DBT's modelling, like any modelling, is subject to ongoing developments, such as when new data becomes available or new evidence supports recalibration of the model.

This CPTPP impact assessment's analysis uses the same model specification (Armington specification) as the CPTPP scoping assessment analysis that was published in June 2021. However, there are several differences between the two assessments.

The scoping assessment analysis relied on HMG's previous CGE model (GETRADE) whilst the CPTPP impact assessment's analysis now uses the GTAP CGE model. The change of the modelling software has been informed by the discussions of the Modelling Review Panel.²²²

Other changes between the CPTPP scoping assessment and this final analysis include: the update of the modelling database (from GTAP10.1 to GTAP11), updates to the inputs to better approximate the potential impact of the UK joining CPTPP, and updates of some model parameters linked to the move from GETRADE to GTAP model (parameter values are now directly sourced from GTAP database).

Sensitivity analysis

Modelling exercises are inherently uncertain and present a stylised representation of the trading relationship in order to gauge the broad range of possible results from a trade agreement. Technical sensitivity analysis was conducted by varying the core parameters within the model, the expected non-tariff measures (NTM) reduction estimates, and some of the model's structural assumptions.

Specifically, the sensitivity of the GDP estimate was analysed in response to the changes in:

- i.the elasticity of substitution between imports from different countries (so-called Armington trade elasticity)
- ii.the assumption on the method of NTMs implementation in the model (technical and rent generating NTMs ratio)
- iii.the estimates of UK-FTA partner NTMs

²²¹ The standard GTAP model and associated analytical databases do not allow us to quantify the impact of the accession to the CPTPP on foreign direct investment flows.

²²² The full report from Trade Modelling Review Panel is published here: <https://www.gov.uk/government/publications/trade-modelling-review-expert-panel-report-and-recommendations>

This sensitivity analysis is similar to that used in the previously published scoping and impact assessments. In addition, model sensitivity test results accounting for the UK-India FTA in the baseline are also presented.

Sensitivity check: trade elasticities

The values of the trade elasticities may be important determinants of the outcomes for any CGE modelling. High values of the elasticities lead to a relatively greater response of model outcomes to a given reduction in trade barriers, and vice versa. The modelling relies on the set of elasticities estimates incorporated into the most recent version of the GTAP database (the third release of GTAP 11 database).

To test the robustness of the core scenarios a sensitivity simulation was run, varying the values of trade elasticities by 50%, following Hertel (2003). Using RunGTAP's built-in sensitivity tool (Systematic Sensitivity Analysis), the above changes were applied through a percentage variation under a triangular distribution. Sensitivity simulations are typically computationally intensive exercises. Given the complexity of the modelled multilateral agreement the sensitivity tests on trade elasticities and on the values of NTMs were conducted on a simplified version of the model including 19 sectors.²²³

The estimated results are found to be robust (not highly sensitive) to large changes to trade elasticities.

Sensitivity check: technical and rent generating ratio

Typically, NTMs in CGE models are modelled as a pure loss of efficiency (so-called deadweight rent assumption). The implementation of this approach is referred to as iceberg costs, which models the NTMs in terms of lost imports. The idea is that some of the product is lost between the buyer and the seller (akin to an iceberg melting on its journey). However, there is an alternative approach to modelling the nature of NTMs. One could argue that (a fraction of) NTMs are rent generating, i.e., similar in nature to tariffs, enabling a redistribution of income back into a CGE model and, thus, increasing the welfare losses from NTMs removal.

In line with the analysis in previous scoping assessments (on the potential impacts of a UK FTA with Australia, New Zealand, and accession to CPTPP) and impact assessments (UK FTAs with Australia, New Zealand, and India), the core scenarios assume a 70:30 ratio (iceberg: rent-generating) when implementing NTM changes within CGE models. This means that 70% of the NTM liberalisation is expected to materialise as output gains to relevant importers and 30% of the NTMs ad-valorem reductions are assumed to be rent-generating.²²⁴

In CGE modelling applications the share of rent-generating NTMs varies from 0% to 40%, i.e. the ratio assumptions vary from 100:0 to 60:40. Most studies assume 0%, typically for the sake of analytical simplicity, meaning 100% of the NTM liberalisation is expected to materialise as lower iceberg costs with no impact on revenue.

Sensitivity analysis assesses the impact of changing the core iceberg-rent generating ratio of 70:30, to 100:0, where it is assumed that NTM liberalisation will fully materialise as only output gains to relevant importers.²²⁵

²²³ That is, in a sensitivity simulation the parameter of interest which would otherwise have a value of 1, will be sampled from a range 0.5 – 1.5.

²²⁴ This split is based on best estimates following an internal literature review and engagement with external academics.

²²⁵ A sensitivity test on the other extreme, i.e., 60:40 ratio, was not conducted as it is not expected to materially change the results. Moreover, this assumption is rarely used in the literature.

Sensitivity check: NTM estimates

As is the case for any impact assessment, there remains a great deal of uncertainty surrounding the depth of NTM liberalisation. Unlike for tariffs, where one can compare possible outcomes based on historical precedence, NTM inputs are derived from an econometric estimation and are subject to additional modelling uncertainty.

To test the robustness of the core results to the applied NTM estimates, a sensitivity simulation was run, varying the values of the NTM changes and allowing them to deviate 50% below and above their input estimates in the core scenario. As in the case of the Armington elasticity robustness check, RunGTAP's built-in sensitivity tool (Systematic Sensitivity Analysis) was used, and the above changes were applied through a percentage variation under a triangular distribution. Again, for modelling convenience and given the complexity of the modelled multilateral agreement, this sensitivity test was conducted on a simplified version of the model including 19 sectors.

This test suggests that estimates are relatively robust to the assumed changes in NTM values, with the estimated gains for the UK being relatively more sensitive than the estimated gains for the CPTPP as a whole.

Sensitivity check: accounting for UK-India FTA in the modelling baseline

Our modelling baseline accounts for major bilateral and multilateral trade agreements that are currently in force and that are expected to potentially have an impact on the estimated impacts from UK joining the CPTPP. At the time of conducting the modelling, the prospective UK-India FTA did not fall under these criteria. However, we have modelled a sensitivity scenario where we estimate the economic impacts of UK joining the CPTPP accounting for UK-India FTA in the baseline.

If we account for UK-India FTA in the baseline, the GDP estimated impacts for the UK (£2.0 billion) and CPTPP (£2.4 billion) remain unchanged.

Method for calculating pound figures

The results presented throughout the impact assessment have been expressed in pound sterling values (£). These are derived from the modelling outputs which are expressed in percentage change terms. The method and data used to convert the percentage figures to pound values are detailed in Table 3.

The modelling estimates percentage changes which represent changes resulting from the FTA relative to a baseline of no agreement in the long run (when the economy returns to equilibrium). The conversion to £ values allows the contextualisation of results in terms relatable to today's economy.

Any long-term economic projection is subject to high bands of uncertainty – particularly in the current economic environment when the impact from the coronavirus pandemic and supply chain trends on the UK and global economy remains highly uncertain. In addition, while the CGE model is based on 2017 data and hence reflects the structure of the UK and global economy in that year, the actual sectoral structure of the economy could look very different by 2040. In order to isolate the marginal impact of the trade deal, these calculations do not take such variations into account and instead rest on the assumption that the structure of UK and CPTPP trade remains broadly the same in 2040 as it was in 2017. This is likely to have a significant impact on the results. A discussion of the potential impact of structural shocks is outlined in Section 7 of the impact assessment.

Some of the methods used assume that the CGE model percentages can be applied to 2040 data from a different source. In practice, consistent data sources should be used for projecting modelling outputs.

GDP

For UK GDP, £ values (expressed in 2021 prices) are calculated by applying the percentage change from the modelling to a projected level of real GDP in 2040. Based upon the OBR's medium and long-term economic determinants, UK real GDP could increase by around £900 billion by 2040, in 2021 prices. This provides the best source for estimating the value of the long run increase in GDP in £ values. This is because the 'long run' is typically assumed to be around 10-15 years following the implementation of an agreement.

For CPTPP, GDP £ values (expressed in 2021 prices) are calculated by applying the percentage change from the modelling to projections of CPTPP GDP in 2040 set out by DBT's Global Trade Outlook.²²⁶

Bilateral Trade

For bilateral trade impacts, £ values (expressed in 2021 prices) are calculated by applying the estimated percentage changes to the DBT's projections set out in DBT's Global Trade Outlook.²²⁷ The GTO projections are supplemented by additional assumptions regarding the evolution of the UK and CPTPP's market shares.

Trade with the world

To account for trade reallocation, an alternative method to the one used for bilaterals is used to calculate the impact on trade with the world.

The CGE results estimate that trade with the members of the agreement increase by more than total trade with the world. This is as a result of the agreement causing a reduction in trade with countries that are not part of the agreement, a process known as trade reallocation. Therefore, to calculate the £ value changes in trade with the world, the CGE results are used to estimate the percentage of the increase in bilateral trade that is new trade. This is equal to the percentage of change in bilateral trade that is not reallocated away from other countries. This percentage is then applied to the change in bilateral trade which is calculated as described above.

Table 2 shows the results of this approach in the impact assessment, in comparison to the scoping assessment scenarios using this approach.

²²⁶ DBT, Global trade outlook – February 2023 report.

²²⁷ Ibid.

Table 2: Comparison of results between impact and scoping assessment

	Impact assessment	Scoping assessment – Scenario 1
Increase in UK exports to CPTPP	£2.6bn (3.6%)	£1.7bn (3.0%)
Increase in UK exports to the world	£ 1.1bn (0.1%)	£2.0bn (0.3%)
Share of increase in exports to CPTPP that is trade reallocation	£1.5bn (56%)	
Increase in UK imports from CPTPP	£2.3bn (4.2%)	£1.6bn (3.0%)
Increase in UK imports from the world	£1.1bn (0.1%)	£1.7bn (0.2%)
Share of increase in imports from CPTPP that is trade reallocation	£1.2bn (50%)	

Source: DBT CGE Modelling

Note: An alternative method, described above, is used to calculate the change in trade with the world for the impact assessment compared to the scoping assessment. Scoping assessment results are presented in 2019 prices, whilst the impact assessment results are in 2021 prices and use 2040 projections.

Sectoral GVA

Sectoral £ impacts are calculated by converting the GVA impacts in dollar terms (\$) from the CGE model into pound sterling (£) at the 2017 USD-GBP exchange rate.²²⁸ These are then inflated to 2021 levels, in line with the GDP deflator of UK GDP between 2017 and 2021.

Regional GVA

Indicative estimates of the percentage and £ changes in regional GVA are calculated by combining the CGE estimated percentage change in sector impacts with 2019 ONS sectoral GVA data. The data used to convert the percentage figures to pound sterling values are detailed in Table 3. A more detailed explanation of the impact on regional GVA can be found in Annex 5.

Imports/exports by sector

When the impact assessment presents the sectoral results in £ terms (i.e., GVA and trade flows), they are relative to a baseline of 2021. DBT reports the change in UK exports and imports to CPTPP at the GTAP23 sector level.

CGE modelling in the impact assessment uses 2017 GTAP database, however, 2021 sector specific trade flows are not available in this data source. Therefore, to estimate the £ changes in trade growth by sector as a result of the agreement, 2021 ONS estimates of bilateral trade are used.²²⁹ The percentage growth in bilateral trade from the CGE modelling is applied to the ONS 2021 data to determine a projected change in bilateral trade (in 2021 £ value). This figure is then apportioned by individual sectors, reflecting how much of the change in UK trade with

²²⁸ Bank of England Data, average annual spot exchange rates.

²²⁹ ONS, UK total trade: all countries, seasonally adjusted (January 2023)

CPTPP was driven by the sector in question. For example, if 2021 UK exports to CPTPP are estimated at £1,000 million, and the CGE modelling estimates UK exports to CPTPP to grow by 10% due to the FTA, the calculated change in 2021 UK exports is £100 million. Furthermore, in this hypothetical example, if the CGE model suggested that 50% of the change in UK exports to CPTPP is derived from manufacturing, 40% from services, and 10% from agriculture, the decomposition of the 2021 change in UK exports to CPTPP is presented as: £50 million from manufacturing, £40 million from services, and £10 million from agriculture.

Table 3: Data sources used to convert CGE modelling impacts into pound sterling values

Key Metric	Data Used
GDP	CGE model % impacts ONS GDP data ²³⁰ Bank of England exchange rate ²³¹ OBR medium- and long-term economic determinants (for 2040 estimates) ²³² Global Trade Outlook projections of CPTPP GDP (for 2040 estimates) IMF World Economic Outlook, GDP in current prices \$ ²³³
UK total trade and trade with CPTPP (Exports and Imports)	CGE model % impacts UK total trade: all countries, seasonally adjusted, 2022 ²³⁴ Global Trade Outlook projections of UK total exports and imports (for 2040 estimates) ²³⁵ For bilateral trade between the UK and CPTPP in 2040, it is further assumed that both the UK and CPTPP's share of partner import demand evolves in line with their share of global import demand (as projected in the Global Trade Outlook).
Wages	CGE model % impacts UK sector (S.1): Wages and salaries (D.11): Resources: Current price: £million: Seasonally adjusted ²³⁶
GVA by sector	CGE model \$ impacts Bank of England exchange rate ²³⁷

²³⁰ ONS, GDP – data tables (March 2023).

²³¹ Bank of England Data, average annual spot exchange rates.

²³² OBR, Economic and fiscal outlook (March 2023).

²³³ International Monetary Fund, World Economic Outlook Database, April 2022.

²³⁴ ONS, UK total trade: all countries, seasonally adjusted (April 2023).

²³⁵ DBT, Global trade outlook – February 2023.

²³⁶ UK sector (S.1): Wages and salaries (D.11): Resources: Current price: £million: Seasonally adjusted (December 2022)

²³⁷ Bank of England Data, average annual spot exchange rates.

	ONS GDP data ²³⁸
GVA by region	See annex with regional methodology
Household spending and business investment	% CGE impacts OBR Economic and fiscal outlook ²³⁹

²³⁸ ONS, GDP – data tables (March 2023).

²³⁹ OBR Economic and fiscal outlook (March 2023).

Annex 2: Modelling Inputs

This section outlines the method and assumptions to derive the NTM estimates to be used as inputs for the Computable General Equilibrium (CGE) modelling.

Non-tariff measures (NTMs) inputs for goods and services

NTMs, including regulatory restrictions for services, are any policy measures outside of tariffs, that can influence trade by changing what can be traded at what cost. Not all NTMs are aimed at restricting trade and can serve legitimate policy objectives. However, they can have an impact on trade flows.

NTMs, including regulatory restrictions for services, can be hard to observe directly. Therefore, for this assessment they are estimated using an econometric gravity model. Building upon best practice in the academic literature, a gravity model is used to provide estimates of the levels of non-tariff measures in goods and services in various countries. Gravity modelling is an econometric framework for estimating the determinants of international trade patterns. It is consistently able to explain patterns of international trade.

The estimates are expressed in ad valorem equivalent (AVE) terms, that is, in terms of the equivalent tariff that would create a similar cost and therefore, have the same impact on trade flows as the NTM. Therefore, a 10% NTM will cause the equivalent change in trade flows as a 10% tariff. However NTMs and tariffs are not modelled in the same way; while tariff changes affect the price of importing a good in the model, NTM changes are modelled differently; NTMs enter the model as productivity changes or reductions as a proxy for the impact these measures have. Quotas are treated as a type of tariff in the modelling, entering into the average AVE tariff calculation and not the AVE NTM.

The gravity models use data from the GTAP database on the trade flows between 121 countries for 30 sectors for the years 2004, 2007, 2011, and 2014.²⁴⁰ It is important to note that these trade flows are shaped by historic trading arrangements; however, we limit their impacts on our estimates through a carefully considered econometric specification which only provide inputs for the CGE model. We do not directly estimate the impact of the deal using this model.

Econometric inputs for goods sectors

The Design of Trade Agreements (DESTA) database of historic FTAs is used to consider the depth of CPTPP for goods sectors.²⁴¹ This data is used to estimate the changes in the NTMs for each goods sector. Different estimates are derived to reflect differences in FTA ambition. These changes are used in the gravity model to estimate the impact of the changes and are shown in the equation below as $DESTA_{ijt}$.

To account for asymmetric impacts between trading partners, an estimate of the AVE MFN level of NTMs is included in the regression, interacted with the DESTA variable. This gives the interpretation of β_3 in the regression below as being the impact of the FTA ambition for a given starting level of NTMs. These MFN NTMs are estimated econometrically within the same framework using the methodology of Fontagne et al. (2011).²⁴²

²⁴⁰ GTAP Database, <https://www.gtap.agecon.purdue.edu/databases/default.asp> The GTAP data base was chosen as it includes trade and tariff data for all countries in the world on a consistent basis at the 65-sector level.

²⁴¹ Dür, Andreas, Leonardo Baccini and Manfred Elsig. 2014. "The design of international trade agreements: Introducing a new database". Review of International Organizations, vol. 9, pp. 353-375

²⁴² Lionel Fontagné & Amélie Guillin & Cristina Mitaritonna, 2011. "Estimations of Tariff Equivalents for the Services Sectors," Working Papers 2011-24, CEPII research center.

CPTPP is given the maximum score of 7 in the DESTA database. This score is used across industrial goods sectors in the modelling. UK accession to CPTPP is not expected to result in significant reductions in NTMs affecting trade in agri-food sectors. As such, most agricultural sectors are given a score of 1, in line with the set of shallower agreements in the database. Where there is some tariff protection on agricultural sectors, protection is also retained on NTMs.²⁴³ CPTPP is not expected to directly reduce NTMs in oil and gas due to the nature of the commodity markets covered in the sector and this is reflected in the model inputs.

Box 1: Econometric model specification for goods sectors

The specification for the econometric model used is shown below, where y_{ijt} is bilateral trade, π_{it} and ω_{jt} are sets of exporter-time and importer-time fixed effects respectively, and δ_{ijt} is a vector of standard trade-predicting variables. GDP_{jt} is importer GDP which is included with a coefficient constrained to unity. Also included are dummy variables for EU and EEA membership and a measure of tariff barriers, which is necessary to separately identify NTM changes.

To obtain NTM estimates for goods, we use the following specification:

Adjustment to baseline tariffs

As described in section 4, the modelling uses tariffs from the 2017 GTAP 11 P3 dataset and assumes that the majority of tariffs are removed in the long run. The following adjustments have been made to baseline tariff ad valorem equivalent rates (AVEs) to reflect the trading relationship more accurately. Adjustments are made using the GTAP altermax procedure.²⁴⁴

For consistency, adjustments relating to tariff rate quotas (TRQs) have largely followed the methodology²⁴⁵ used to compile the GTAP dataset where possible.

Table 4: Main run – UK baseline tariffs

Tariff	Rationale	GTAP 2017	Update
UK CMT ³ tariff applied to Australia	Our own calculations estimate a higher tariff AVE than in the 2017 GTAP dataset. We therefore update for this figure, which is then reduced to 0% in the baseline to simulate the UK-Australia FTA before the UK's accession to CPTPP.	18%	29%
UK CMT tariff applied to New Zealand	As in the impact assessment for the UK-New Zealand FTA, tariffs are weighted according to gravity modelled estimates of beef and sheepmeat imports in a scenario with no tariff barriers to overcome endogeneity and aggregation issues.	1%	19%

²⁴³ It is important to note that some barriers and trade costs faced by firms particularly in agriculture are not necessarily marginal, such a ban or a quota. However, most trade models are unable to capture this. As a result, value equivalence estimates are used as a best approximation.

²⁴⁴ https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=315

²⁴⁵ This method approximates tariff AVEs for tariff rate quota (TRQs). It applies the in quota rate to quotas with a fill rate below 90%, the average of the in and out of quota rate for TRQs with fill between 90-98%, and the out of quota rate for TRQs with fill above 98%.

	This tariff is reduced to 0% in the baseline to simulate the UK-New Zealand FTA before the UK's accession to CPTPP.		
UK CMT tariff applied to Canada and Mexico	There are low/no imports from Canada or Mexico over the time period resulting in a trade weighted 0% tariff. We use the in-quota rate from the Erga Omnes beef TRQ as the representative barrier faced by these partners.	0%	20%
UK PCR ⁴ tariff applied to Vietnam ⁵	To account for the UK-Vietnam FTA that came into force after 2017, we update the tariff to approximate access provided in the sector. As the FTA is relatively new and we therefore do not have a sense of steady state utilisation and fill rates. We use the in-quota rate from the Erga Omnes rice TRQ as a representative barrier.	19%	15%

Main run – Canadian dairy (MIL) baseline tariffs

Canada's dairy market is highly protected, and tariffs are high (for example, cheese tariffs are 245.5%). These high tariffs are not reflected in the tariffs seen in the GTAP database. Additionally, the UK, EU, US and New Zealand signed FTAs providing access to the sector since 2017 which we have endeavoured to reflect in the modelled baseline.

To recalculate the AVE faced by the UK, EU, US and New Zealand before their FTAs with Canada, we use the MFN (out of quota rates) for cheese with these partners and additionally for butter with New Zealand to produce trade weighted MIL tariffs. To simulate access from bilateral agreements, the trade-weighted average of the in quota rate (0%) and out of quota rate (245.5%) are used for the post-FTA AVEs. Using the average rather than in quota rates ensures a level of tariff protection remains for these countries.

Table 5: Canadian dairy (MIL) baseline tariffs

Canada's MIL tariff applied to	GTAP 2017, %	Out of quota rate weighted tariff, %	Average of out of quota and in quota rate weighted tariff, %
UK	<0.1	265	139
EU	0.6	242	126
US	30	138	124
NZ	6	239	141

Additional illustrative modelling – UK baseline tariffs

In the illustrative modelling for a scenario without existing UK agreements with CPTPP members, we additionally adjust the UK's MFN WHT tariff applied to Canada. GTAP

estimates this tariff to be 27%, however the vast majority of UK wheat imports from Canada are in tariff free lines. We therefore apply a 0% tariff instead.

Econometric inputs for services sectors

The benefits of services liberalisation can come both from ‘applied liberalisation’ (liberalisation in the actual restrictions affecting services trade) or through ‘bound liberalisation’ (commitments to maintain liberalisation at a given level in the future).²⁴⁶ The difference between the bound and applied restrictions to services trade is often known as ‘water’. FTAs primarily aim to reduce this ‘water’ as countries’ applied regimes tend to be lower than their bound regimes. In other words, FTAs aim to ‘lock-in’ countries’ applied regimes and reduce future policy space which in turn provides greater legal certainty to businesses.

The NTM estimates aim to account for the reduction in this ‘water’ or increased legal certainty secured from the FTA.

To derive the NTM inputs for services sectors, we first estimate equation (2):

$$(2) y_{ijt} = \exp(\beta_1 EU_{ijt} + \beta_2 EEA_{ijt} + \beta_3 FTA_{ijt} + GDP_{jt} + \delta_{ijt} + \pi_{it} + \omega_{jt}) + \varepsilon_{ijt}$$

The measure of MFN NTMs are captured using the importer-time fixed effects methodology laid out in Fontagne et al. (2011). This method aims to estimate Ad Valorem Equivalent (AVE) NTMs that would create observed trade distortions, controlling for standard trade-predicting variables and using a ranking of estimated fixed effects. Once NTMs have been estimated for each country in the database, we assume that 1/3 of NTMs are “actionable” and can be impacted by the FTA. These actionable NTMs are reduced in proportion to reductions in water, or increased legal certainty, arising from the FTA as well as any applied liberalisation (methodology is outlined below).

STRI methodology for services

Services sectors are scored using the OECD’s Services Trade Restrictiveness Index (STRI) methodology.²⁴⁷ The STRI is an evidence-based index that provides a score between 0 (Open) and 1 (Closed) for how restrictive a country is to services trade in 22 sectors. Each sector score is determined by several individual policy measures.

The STRI represents the actual level of restrictiveness that a country imposes on imported services, whereas we also include an estimate of the bound level of restrictiveness which we refer to as the GATS Trade Restrictiveness Index (GTRI). Preceding an FTA, the GTRI is equal to the terms of the GATS schedule that countries have committed to, whereas following an FTA it reflects the terms of the agreement in the areas of market access and national treatment.

The STRI is calculated based on FTA provisions to derive an estimate for CPTPP and for baseline FTAs. For the new bilateral FTAs that the UK is negotiating with some CPTPP members, the STRI coding reflecting CPTPP terms is used for both the baseline and the scenario. The interpretation of GATS commitments and their mapping to the STRI are based

²⁴⁶ Ciuriak, D., Dadkhah, A. Lysenko, D. The Effect of Binding Commitments on Services Trade, World Trade Review, Volume 19 , Issue 3 , July 2020 , pp. 365 - 378

²⁴⁷ STRI policy simulator available at <https://sim.oecd.org/>

on legal and policy judgments made by the LSE and are outlined in Annex 7 of the scoping assessment.²⁴⁸

For the UK, STRI equivalents for its GATS commitments are not available through the mapping conducted by the LSE. We therefore constructed a GATS score consistent with the LSE STRI methodology.

To produce a UK GATS score DBT analysts used an average GATS score from the following high-income CPTPP countries: Australia, Canada, Japan, New Zealand, and Singapore. DBT analysts sense-checked the GATS score assumption against several alternative approaches and found the results to be broadly consistent.

The difference between the GTRI and STRI is taken as a proxy for water and used in a composite index alongside the applied STRI. A change in water is assumed to have a 42% impact on NTMs compared to a change in the applied rate, in line with results found in the literature.²⁴⁹ The percentage change in the composite index as a result of CPTPP is used to scale the actionable NTM estimates outlined above to produce the final AVE services inputs.

Table 6: Average sectoral applied percentage point reductions in tariffs

Sector	UK imports from										
	Australia	Brunei	Canada	Chile	Japan	Mexico	Malaysia	New Zealand	Peru	Singapore	Vietnam
Agri-food	0.0	0.0	0.6	3.5	0.4	1.8	6.1	0.0	0.3	0.9	0.1
Industry	0.0	0.4	0.0	0.0	0.2	0.0	1.3	0.0	0.0	0.2	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sector	UK exports to										
	Australia	Brunei	Canada	Chile	Japan	Mexico	Malaysia	New Zealand	Peru	Singapore	Vietnam
Agri-food	0.0	4.2	3.6	0.5	1.5	3.3	19.5	0.0	0.1	0.0	0.0
Industry	0.0	0.0	0.6	0.0	0.2	0.0	5.9	0.0	1.1	0.0	0.0
Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: DBT analysis

Table 7: Applied percentage point reductions in NTMs

Sector	UK imports from										
	Australia	Brunei	Canada	Chile	Japan	Mexico	Malaysia	New Zealand	Peru	Singapore	Vietnam
Agri-food	0.0	2.9	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0
Industry	0.0	6.2	0.0	0.9	0.0	2.9	6.4	0.0	0.0	0.0	0.0
Services	0.0	2.4	1.2	0.7	1.0	1.4	2.4	0.0	2.2	1.8	2.5

Sector	UK exports to										
	Australia	Brunei	Canada	Chile	Japan	Mexico	Malaysia	New Zealand	Peru	Singapore	Vietnam
Agri-food	0.0	1.9	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0
Industry	0.0	6.0	0.0	0.7	0.0	2.3	2.9	0.0	0.0	0.0	0.0
Services	0.0	1.8	0.5	1.5	0.5	0.5	2.3	0.0	1.2	0.1	0.3

Source: DBT analysis

²⁴⁸ <https://www.gov.uk/government/publications/uk-approach-to-joining-the-comprehensive-and-progressive-agreement-for-trans-pacific-partnership-cptpp>

²⁴⁹ Ciuriak, D., Dadkhah, A. Lysenko, D. The Effect of Binding Commitments on Services Trade, World Trade Review, Volume 19, Issue 3, July 2020, pp. 365 - 378

Annex 3: Additional Illustrative CGE Modelling

All additional illustrative CGE modelling relies on the same GTAP 11 database with reference year 2017 as the core CGE analysis presented in the IA (the latest available GTAP database at the time of the analysis).

Standalone impact of accession to CPTPP on the UK in the absence of existing UK agreements with current CPTPP members

To provide wider insights on the potential impacts of CPTPP, DBT conducted illustrative CGE modelling considering CPTPP as a standalone agreement.²⁵⁰ It captures the wider impact of the UK's accession to CPTPP as though the UK did not have a number of bilateral agreements already in place with current CPTPP members. These agreements include Australia, New Zealand, Canada, Japan, Singapore, Vietnam, Mexico, Chile and Peru. Consequently, this modelling rests on a different set of assumptions to the core CGE modelling.

The data in the GTAP 11 database used is likely to largely reflect the UK's bilateral agreements with Mexico, Chile and Peru given these entered into force before 2017. It would not capture UK's agreements with the other members that were agreed after 2017. Consequently, to estimate the standalone impact of joining CPTPP, we have adjusted the base data by simulating a removal of these agreements (i.e. Mexico, Chile and Peru).

To implement this the following assumptions have been made:

Tariffs

Baseline tariffs: trade-weighted Most Favoured Nation (MFN) tariffs have been calculated for the UK with each CPTPP member:

- for UK tariffs with Australia, New Zealand, Canada, Japan, Singapore, Vietnam, Mexico, Peru and Chile, the UK Global Tariff (UKGT) trade-weighted by 2018-2020 bilateral imports from each country is used
- for each of Mexico, Chile and Peru's tariffs with the UK, MFN tariffs trade-weighted by 2018-2020 bilateral imports from the UK are used. For other members' tariffs with the UK, existing GTAP tariffs are retained which reflect MFN tariffs prior to the latest agreements

Several adjustments to particular country-sector combinations have been made to ensure TRQs in certain sectors are suitably reflected. These include CMT (which includes beef and sheep meat) with Australia, New Zealand, Canada and Mexico and Canada's MIL (dairy) tariff

²⁵⁰ CGE modelling of Free Trade Agreements can often suffer from what is known as the "small shares" problem – when existing trade flows are small even deep liberalisation leads to only small changes in trade volumes. In this illustrative modelling, given the nature of the scenario being modelled, in some instances this issue is likely to have an exacerbated effect especially where Tariff Rate Quotas are important. We have not made any further modelling refinements, as the modelling is purely illustrative.

applied to the UK, EU, US and New Zealand. These are the same adjustments made in the core CGE modelling (see Annex 2).

Modelled scenario: For the modelled scenario of the UK's accession to CPTPP, additional access to the UK market has been included, over and above that offered by joining CPTPP alone, reflecting the access which has already been negotiated through bilateral agreements. This includes tariff liberalisation on cattle meat (includes beef and sheep meat) with Australia, New Zealand, Japan, Singapore and Vietnam, and on processed rice for Canada, New Zealand and Singapore.

While the UK's bilateral agreements with members and its accession to CPTPP are distinct agreements, there are some interlinkages between them. For example, there is no beef or sheep meat access to Australia or New Zealand in the CPTPP agreement as access was provided in the bilateral agreements.

NTMs

Baseline NTMs: To derive the trade flows for the baseline against which joining CPTPP is assessed, existing trade flows are 'shocked' to account for estimated NTM changes associated with moving from FTA access with Mexico, Chile, and Peru to no agreement. For trade between the UK and other CPTPP members, no NTM adjustments are made relative to the GTAP data to provide the baseline, since these unadjusted trade flows currently do not account for agreements signed after 2017 (i.e. those with Australia, New Zealand, Canada, Japan, Singapore, and Vietnam). These NTM changes are estimated using the same methodology for goods and services set out in Annex 1.

Modelled scenario NTMs: For the modelled scenario of UK accession to CPTPP, the same modelling approach as in the core IA has been taken, except that the assumed NTM changes are equivalent to moving directly from having no agreement to CPTPP terms with all CPTPP members.²⁵¹

Expansion scenario modelling

To demonstrate the potential benefits of an expanded CPTPP, DBT's additional CGE analysis estimates the marginal impact on the UK should the UK and other potential new countries join CPTPP in future. This modelling, in line with core Impact Assessment analysis, includes the relevant existing agreements in the baseline. However, given the modelling considers a wide set of countries that might potentially join CPTPP, the updated baseline additionally reflects any relevant agreements under the following approach:

²⁵¹ As in the core IA modelling, no additionality is assumed between UK and Australia and New Zealand beyond the bilateral agreements. That means the final level of NTM restrictiveness on those relationships after CPTPP is assumed equal to that achieved under the respective bilateral agreements.

Tariffs:

Baseline tariffs: All tariffs are taken from the GTAP database except:

- where there is no existing bilateral FTA, the UK's MFN tariffs are updated to UKGT tariffs, incorporating GSP tariffs where appropriate
- the Republic of Korea-Costa Rica and Australia-Indonesia FTAs have been incorporated into the baseline (both post-2017 FTAs and cover significantly large trade flows for the countries covered by the modelled scenario)
- tariffs have been updated in a few instances where staging in pre-2017 FTAs was not being sufficiently reflected in existing tariffs for agreements covering significantly large trade flows for the countries covered by the modelled scenario

As with other scenarios, any updates to tariffs are trade-weighted by bilateral imports from each country using 2018-20 trade data.

Modelled scenario: When modelling the UK's accession to CPTPP against this baseline, the same scenario assumptions as the core CGE analysis in the IA have been used, extended to the additional countries being modelled. The modelling assumes that the UK eliminates all tariffs with all current CPTPP members and potential new joiners, except for on beef and processed rice where 25% of the baseline is retained. The modelling assumes that all current CPTPP members and potential new joiners fully liberalise with each other and with the UK, except:

- Canada's tariffs on other meat products and dairy with the UK
- Japan's tariffs on beef, dairy, other meat products and wheat with the UK
- Malaysia's tariffs on other meat products with the UK
- Mexico's tariffs on dairy with the UK
- In these product-country combinations only, the modelling assumes 25% of tariffs are retained, apart from for Canada dairy products. In the case of Canada dairy products tariffs, where the market is highly protected, it is assumed 75% of the baseline tariff is retained.

NTMs

For goods and services NTMs, the same broad approach to NTMs as the core CGE modelling has been applied, outlined in Annex 1. Simplifying assumptions have been made where specific data is missing for expansion scenario countries and their existing agreements.

Baseline NTMs: NTM changes associated with agreements signed after 2017 are accounted for.

In goods sectors, publicly available DESTA depth scores are used to estimate NTM reductions associated with expansion scenario countries' agreements with each other, the UK, and existing CPTPP members.

In services sectors, all existing agreements are assumed to reduce estimated actionable NTMs by 5% and the baseline is shocked to account for this where agreements are signed after 2017. This simplifying assumption is made in the absence of more detailed information from STRI codings of individual agreements signed by each expansion scenario country. The same assumption is made in the core CGE modelling for intra-CPTPP country pairs.

Modelled scenario NTMs: For each pair of countries in the scenario, the marginal increase in agreement depth associated with moving from the baseline trading relationship to CPTPP is modelled.

In goods sectors, the same DESTA approach as the core modelling is used for the expansion countries, with the difference between the DESTA score of any existing agreement and CPTPP representing the marginal change in depth for the scenario.

In services sectors, the same STRI scores as the core CGE modelling are used to represent the final level of liberalisation for the UK and existing CPTPP members with each other and expansion countries. In the absence of final STRI levels for each expansion country, CPTPP STRI scores from existing CPTPP members are applied as a proxy. The proxies used reflect similarities in GDP per capita and region:

Expansion Country	Proxy
Ecuador	Peru
Costa Rica	Mexico
Uruguay	Chile
Thailand	Vietnam
Philippines	Vietnam
Republic of Korea	Japan
Colombia	Peru
United States	Canada
Laos	Vietnam
Indonesia	Malaysia
Cambodia	Vietnam

Annex 4: Supplementary results

This annex provides additional detail to the analysis set out in the main Impact Assessment.

Additional macroeconomic results

Table 8: GDP results

	2040 £ change on baseline (in 2021 prices)	£ change on baseline (compared to 2021 in 2021 prices)
Change in UK GDP	£2.0bn	£1.5bn

Table 9: Macroeconomic results

	Percentage change on baseline	2040 £ change on baseline (in 2021 prices)	£ change on baseline (compared to 2021 in 2021 prices)
Change in UK exports to CPTPP	3.6%	£2.6bn	£2.0bn
Change in UK imports from CPTPP	4.2%	£2.3bn	£2.3bn
Change in UK exports to World	0.14%	£1.1bn	£1.0bn
Change in UK imports from World	0.13%	£1.1bn	£1.0bn
Change in Real wages	0.11%	Not Available	£1.0bn

Source: DBT CGE Modelling

Note that these % changes are calculated using the method described to calculate the change in trade with the world in Annex 1. The changes in the other GDP components are a direct output of the CGE model.

Additional results on tariff savings and SMEs

Table 10: Top 10 HS sections, ranked by scale of estimated short term annual reductions in tariff duties on current UK goods exports to CPTPP

17: Transport equipment	15.8	14.5
16: Machinery	14.5	11.9
07: Plastics and rubber	8.3	9.7
15: Base metals and articles	5.7	5.7
06: Chemical products	4.8	3.8
13: Stone, cement	4.4	4.4
04: Prepared food, beverage and tobacco	4.0	60.2
10: Paper, printed products	3.5	2.4
01: Animal products	2.3	2.1
11: Textiles and textile products	1.4	1.4

Source: DBT Calculations (2023).

Notes: Short term refers to entry into force of the agreement. Long term refers to the end of the tariff liberalisation staging period.

Table 11: Share of estimated annual reductions in tariff duties on current UK goods exports to CPTPP, by nations and regions of the UK

Region	Goods exports as % of all UK goods exports to CPTPP	Proportion of reduction in tariff duties affecting each nation and region in the short term, %	Proportion of reduction in tariff duties affecting each nation and region in the long term, %
East	9%	9%	6%
East Midlands	12%	7%	4%
London	12%	11%	17%
North East	3%	3%	2%
North West	9%	11%	6%
Northern Ireland	3%	5%	4%
Scotland	10%	13%	39%
South East	10%	13%	8%
South West	8%	6%	4%
Wales	5%	2%	1%
West Midlands	8%	10%	5%
Yorkshire and The Humber	5%	8%	5%

Source: DBT Calculations (2023). Columns may not sum to 100% due to rounding. Excludes Brunei due to lack of availability in HMRC regional export data. Goods exports by nation and region as a % of all UK goods exports to CPTPP from HMRC Regional Trade Statistics, March 2023.

Table 12: Shares of estimated annual reductions in tariff duties on current UK goods imports from CPTPP, by nations and regions of the UK

Region	Goods imports as % of all UK goods imports from CPTPP	Proportion of reductions in tariff duties affecting each nation and region in the short term, %	Proportion of reductions in tariff duties affecting each nation and region in the long term, %
East of England	8%	11%	13%
East Midlands	9%	10%	9%
London	16%	14%	12%
North East	5%	6%	3%
North West	7%	11%	10%
Northern Ireland	1%	2%	2%
Scotland	7%	5%	5%
South East	18%	13%	15%
South West	6%	10%	12%
Wales	5%	1%	1%
West Midlands	6%	7%	9%
Yorkshire and the Humber	5%	9%	10%

Source: DBT calculations (2023). Columns may not sum to 100% due to rounding. Excludes Brunei due to lack of availability in HMRC regional import data. Goods imports by nation and region as a % of all UK goods imports from CPTPP from HMRC Regional Trade Statistics, March 2023.

Additional results on consumer impacts

Table 13: Top estimated annual reductions in tariff duties on consumer goods imported from CPTPP

Type of Consumer Good	Proportion of household spending on imports, %	Estimated annual reductions in tariff duties in long term, £ million
Food and non-alcoholic beverages	55%	7.9
Furnishings, household equipment and routine household maintenance	55%	3.3
Clothing and footwear	73%	2.0
Recreation, sport and culture	37%	1.4
Personal care, social protection and miscellaneous goods	9%	0.7
Total final consumer goods tariff savings	24%	16.4

Source: DBT analysis (2023), UK input-output analytical tables, ONS (2021) and Living Costs and Food Survey (LCF), ONS (2022).

Notes: This includes the proportion of an average households' weekly expenditure that is spent on imports by combining UK household expenditure survey data with UK Input-Output Analytical Tables (IOATs). Tariff reductions

for passenger vehicles as defined by the Harmonised System (HS-8703) are split between 'Recreation and Culture' and 'Transport' in line with the mapping of COICOP to HS categories of goods according to Eurostat's Reference and Management Of Nomenclatures.

Table 14: Comparison of estimated annual reductions in tariff duties on current imports from CPTPP to average UK household weekly expenditure by nation

Type of Consumer Good	Estimated annual national reductions in tariff duties in long term, £ million	Estimated proportion of total weekly household spend owing to imports, %				
		UK	England	Wales	Scotland	Northern Ireland
All expenditure groups	16.4	33.3%	33.1%	34.2%	34.7%	36.2%
Food and non-alcoholic beverages	7.9	7.4%	7.3%	7.9%	7.8%	9.0%
Furnishings, household equipment and routine household maintenance	3.3	4.3%	4.3%	4.3%	4.1%	4.3%
Clothing and footwear	2.0	3.2%	3.1%	3.0%	3.6%	4.7%
Recreation, sport and culture	1.4	4.1%	4.1%	4.6%	4.0%	3.4%

Source: DBT analysis (2023), UK input-output analytical tables, ONS (2021) and Living Costs and Food Survey (LCF), ONS (2022).

Table 15: Comparison of estimated annual reductions in tariff duties on current imports from CPTPP to average UK household weekly expenditure by income level

Type of Consumer Good	Estimated annual national reductions in tariff duties in long run, £ millions	Estimated proportion of total weekly household spend owing to imports, %		
		All households	Lowest 20%	Highest 20%
All expenditure groups	16.4	28.8%	25.0%	29.1%
Food and non-alcoholic beverages	7.9	7.2%	7.6%	6.8%
Furnishings, household equipment and routine household maintenance	3.3	3.9%	2.0%	4.1%
Clothing and footwear	2.0	2.3%	1.7%	2.5%
Recreation, sport and culture	1.4	2.8%	1.7%	3.0%

Source: DBT analysis (2023), UK input-output analytical tables, ONS (2021) and Living Costs and Food Survey (LCF), ONS (2022).

Annex 5: Method for assessment of impacts on regions and nations

This annex describes the data and method used to assess the implications of the agreement for the regions and nations of the UK, including sensitivity analysis.

This method uses the differing composition of economic activity across UK regions and nations to consider how regions could be positively or negatively impacted based on the modelled sectoral changes in GVA.

Methodology

The impact on nations and regions of the UK are estimated by apportioning the estimated sectoral impacts from the CGE model to the nations and regions of the UK. These are apportioned using nominal GVA data and, where necessary, employment shares for each sector within each nation and region (NUTS-1) of the UK.³⁷

The methodology weights the UK-wide change to each sector's output from the CGE modelling (denoted as UK Impact_s below) by the share of the sector's GVA that is produced in each region. This is then summed across all sectors to calculate the overall impact for each region (where *r* stands for NUTS1 region and *s* stands for sector)

$$Regional\ Impact_r = \sum_s^S Share\ of\ GVA_{rs} \times UK\ Impact_s$$

The apportionment approach means that the uncertainties affecting the sectoral impacts also affect the sub-national impacts. In addition, due to data availability, the national and regional impacts may be subject to aggregation bias, and thus subject to additional uncertainty. That is, with more detailed sectoral modelling we might get different results for regional impacts using this approach.

Location Quotients

The location quotient is calculated by dividing a sector's employment share in a region by the employment share in the UK. A value of one indicates that an industry's share of employee jobs in the region is the same as its share of employee jobs nationally. A value greater than one means that the industry makes up a larger share of employee jobs in the region than the national levels, indicating that the nation or region is particularly specialised in a sector).

Location quotients are calculated using data from the ONS' Business Register and Employment Survey, the official source of employee and employment estimates by geography and industry.

There is some evidence to support the presence of regional multipliers resulting from changes in trade. These occur when tradeable sectors and exporters pay higher wages and the expansion of trade leads to the creation of jobs in other non-tradeable sectors, through a 'local employment multiplier effect'.

To calculate the regional impact, the approach multiplies the region by sector GVA value by each sector's location quotient and the modelled CGE change for that sector. This location quotient attempts to proxy for potential second order effects in each region. The sectoral

changes are then constrained to ensure that the overall change in a sector matched the sectoral change from the CGE results, as shown below:

$$Regional\ Impact_r = \sum_s^S Share\ of\ GVA_{rs} \times UK\ Impact_s \times Location\ Quotient_{rs} \times Constraint_s$$

where r = NUTS1 UK regions, s = sector.

Estimates using the location quotient are shown below in Table 16. Values presented below should be treated as indicative orders of magnitude based on 2019 nominal GVA. Due to uncertainty around the degree to which the location quotient is an accurate proxy for multiplier effects, results presented below are taken as the average between the location quotient approach and simple approach.

Table 16: Indicative change in UK regional value added, long run % change (LQ Average).

Region	Impact assessment scenario	
	%	£ (millions)
East of England	0.15%	250
East Midlands	0.20%	230
London	0.16%	730
North East	0.18%	100
North West	0.15%	280
South East	0.14%	420
South West	0.15%	220
West Midlands	0.27%	390
Yorkshire and The Humber	0.16%	210
Northern Ireland	0.15%	60
Scotland	0.16%	230
Wales	0.16%	100

Source: DBT Internal Calculations.

Note: Pound values have been rounded to the nearest £10mn.

Limitations

The aim of the analysis is to provide a high-level overview of potential impacts on UK nations and regions using an intuitive analytical approach. The results should not be treated as forecasts. The analysis is subject to the same limitations as CGE modelling in general, and in addition relies on several simplifying assumptions:

- the analysis is based on sector results at an aggregate level, so will not fully reflect differences in patterns of production across nations and regions of the UK. Similarly, due to data limitations, regional apportionment of sector results is carried out at a higher level of aggregation than the level used in the sectoral results presented in Section 4 of the impact assessment
- the analysis does not explicitly consider the varying trade patterns of individual sectors across each part of the UK, i.e., it assumes the same sectors in each region trades the same
- the analysis assumes that the long-term structures of regional economies are consistent with GVA and employment data from 2019
- the analysis assumes that the UK sector GVA change produced by the CGE model is the same for that sector in all nations and regions
- the analysis assumes that the regional share of GVA remains constant over the modelling horizon and does not give any insight into how regions adjust to a new long-term equilibrium position
- the modelling does not explicitly take account of any impacts arising from the Windsor Framework

Annex 6: Method for assessment of impacts on tariffs

This annex sets out the method for estimating the value of reductions in tariff duties for UK businesses and consumers on current imports from CPTPP, and the value of reductions in tariff duties for UK businesses on current exports to CPTPP.

International trade statistics that detail trade flows are reported in a different way to how tariff reductions are set out in agreements. Therefore, some analysis is required to estimate overall reductions in tariff duties.

Once reductions in tariff duties on current trade have been estimated, it is possible to apportion these reductions across UK nations and regions, based upon historic trade flows.

Annual reductions in tariff duties have been estimated both for the short term (on entry into force of the agreement) and for the long term (once all staging is complete).²⁵² Additional assumptions have been made about staged or reduced non-ad valorem tariff rates in existing bilateral agreements, and about tariff rate quotas when calculating these reductions.²⁵³

These estimates assume full utilisation of all available preferences, which is unlikely to be the case in practice.

Method for estimating reductions in tariff duties

UK exports to Partner Country

The total value of UK exports that will become eligible for tariff-free access under the agreement is calculated using average annual CPTPP import data (2017-2019) from ITC Trade Map or data exchange data (where available).²⁵⁴

To estimate annual reductions in tariff duties on current UK exports in the short term, for each tariff line, the difference is calculated between:

1. Current estimated duties, calculated by multiplying the current tariff rate (as of 1st Jan 2024), whether MFN tariff rate (for Brunei and Malaysia) or preferential tariff rate (for Australia, Canada, Chile, Japan, Mexico, New Zealand, Peru, Singapore, and Vietnam), and average annual imports from the UK (2017-2019) for each CPTPP country sourced from ITC Trade Map or data exchange data (where available), and
2. Estimated duties under the CPTPP schedule, calculated by multiplying the proposed 1st Jan 2024 tariff rate under the CPTPP schedule of each CPTPP country, and average annual imports from the UK (2017-2019) for each CPTPP country sourced from ITC Trade Map or data exchange data (where available).

To estimate annual reductions in tariff duties on current UK exports in the long term, for each tariff line, the difference is calculated between:

1. Estimated terminal duties, calculated by multiplying the terminal tariff rate, whether MFN tariff rate (for Brunei and Malaysia) or terminal preferential tariff rate (for Australia, Canada, Chile, Japan, Mexico, New Zealand, Peru, Singapore, and Vietnam), and

²⁵² For short-term comparisons, it is assumed that the agreement enters into force on 1st Jan 2024.

²⁵³ For preferential tariff rate quotas, the in-quota rate is used on the assumption that the tariff rate quota is not binding. Lines with staged or reduced non-ad valorem tariff rates in existing bilaterals are omitted from short-term tariff reduction estimates due to the lack of suitable ad valorem equivalent (AVE) estimates.

²⁵⁴ Data exchange trade data used for Australia, Mexico and New Zealand only.

- average annual imports from the UK (2017-2019) for each CPTPP country sourced from ITC Trade Map or data exchange data (where available), and
2. Estimated terminal duties under the CPTPP schedule, calculated by multiplying the proposed terminal tariff rate under the CPTPP schedule of each CPTPP country, and average annual imports from the UK (2017-2019) for each CPTPP country sourced from ITC Trade Map or data exchange data (where available).

UK imports from Partner Country

The total value of UK imports that will become eligible for tariff-free access under the agreement, whether in the short term or over the long term, is calculated using average annual trade flow data (2017-2019) sourced from HMRC.

The data is aggregated into the UN's 'Broad Economic Categories' (BEC) via the conversion table developed by the UN. The BEC classification of goods is then assigned to the two basic kinds of domestic end-use categories as laid out in the System of National Accounts (SNA), namely – intermediate or final goods.²⁵⁵

To calculate annual reductions in tariff duties on current UK imports in the short term, for each 8-digit Combined Nomenclature (CN8) tariff line, the difference is calculated between:

1. Current estimated duties, calculated by multiplying the current tariff rate (as of 1st Jan 2024), whether UK Global Tariff (UKGT) tariff rate (for Brunei and Malaysia) or existing preferential tariff rate (for Australia, Canada, Chile, Japan, Mexico, New Zealand, Peru, Singapore and Vietnam), and average annual UK imports (2017-2019) from each CPTPP country sourced from Eurostat, and
2. Estimated duties under the UK's CPTPP schedule upon entry into force, calculated by multiplying the proposed entry into force tariff rate under the UK's CPTPP schedule, and average annual UK imports (2017-2019) from each CPTPP country sourced from Eurostat.^{256 257}

To calculate annual reductions in tariff duties on current UK imports in the long term, for each CN8 line, the difference is calculated between:

1. Estimated terminal duties, calculated by multiplying the terminal tariff rate, whether UKGT tariff rate (for Brunei and Malaysia) or terminal preferential tariff rate (for Australia, Canada, Chile, Japan, Mexico, New Zealand, Peru, Singapore and Vietnam), and average annual UK imports (2017-2019) from each CPTPP country sourced from Eurostat, and
2. Estimated terminal duties under the UK's CPTPP schedule, calculated by multiplying the proposed terminal tariff rate under the UK's CPTPP schedule, and average annual UK imports (2017-2019) from each CPTPP country sourced from Eurostat.

It is important to note that reductions in tariff costs facing importers also reflect an equivalent reduction in government tariff revenues on these products, which may be offset by increased tax revenues from higher economic activity in the UK.²⁵⁸

²⁵⁵ See accompanying manual of the 5th revision of BEC

<https://unstats.un.org/unsd/trade/classifications/bec.asp>. For the purposes of this analysis, goods that are allocated as "Capital Goods" are treated as "Intermediate", as they are likely to be purchased by businesses.

²⁵⁶ The Combined Nomenclature (CN) classifies goods at 8-digit level. The first 6 digits are based on the Harmonized System (HS), a global system for classifying goods developed by the World Customs Organisation. The CN expands the HS subheading code by 2 further digits.

²⁵⁷ UK imports from CPTPP entering under MFN-0% as reported by Eurostat's data by import regime are excluded from the tariff reduction calculations.

²⁵⁸ The cumulative impacts of tariff savings in UK production are captured through the CGE model changes.

Apportioning reductions in tariff duties by UK nations and regions: data and methodology

The approach takes the following steps:

- data is collated from various sources:
 - DBT calculations of estimated annual reductions in tariff duties on current trade on a tariff line/CN8 basis²⁵⁹
 - HMRC regional trade in goods estimates of imports and exports for all UK regions and nations (NUTS1) by each CPTPP country and commodity (SITC Rev. 4 at 2-digit level), annual average for 2017-2019²⁶⁰
 - Mappings of HS6 (HS 2017) to SITC Rev. 4
- estimated annual reductions in tariff duties are mapped from HS6 to SITC Rev. 4 at 2-digit level
- a trade in goods pattern is estimated for each SITC 2-digit commodity by UK nations and regions using a three-year average of trade flows (2017 to 2019) between UK nations and regions and each CPTPP country
- trade not assigned to a UK nation or region was removed from calculations.
- estimated annual reductions in tariff duties by each CPTPP country for each SITC 2-digit commodity are apportioned across UK nations and regions according to the pattern of trade
- estimated annual reductions in tariff duties by each CPTPP country are then aggregated to estimate the total annual reduction in tariff duties in each UK nation and region for each CPTPP country and for CPTPP as a whole

Apportioning reductions in tariff duties for consumers: data and methodology

The approach takes the following steps:

- data is collated from various sources:
 - DBT calculations of estimated annual reductions in tariff duties on current imports on a CN8 basis
 - ONS household expenditure data by region and income quintile
 - ONS input-output data on domestic use and imports by CPA category
 - mappings of CN8 (CN 2020) to CPA (Classification of Products by Activity), and CPA to COICOP (Classification of Individual Consumption by Purpose)
- estimated annual reductions in tariff duties are mapped from CN8 to either a 2-digit or a 4-digit CPA code, depending on whether a CPA to COICOP mapping exists at the 4-digit level
- estimated annual reductions in tariff duties are mapped from CPA to COICOP and aggregated into the 2-digit COICOP categories
- UK imports and domestic use, taken from ONS Input Output tables, are mapped from CPA to COICOP, and import penetration is calculated for each 2-digit COICOP category

²⁵⁹ The first 6 digits are based on the Harmonized System (HS), a global system for classifying goods developed by the World Customs Organisation. Each CPTPP country will have its own national tariff classification which expands the HS subheading code by at least 2 digits.

²⁶⁰ Available for all CPTPP countries except for Brunei which is not included in HMRC's regional trade in goods statistics.

- ONS data on the share of each COICOP category in expenditure by both region and income quintile are multiplied by import penetration to impute the share of imports in each consumption category by quantile and region
- estimated annual reductions in tariff duties are apportioned across nations given the relative expenditure on imports across each nation and COICOP category

Limitations

Following a similar approach widely applied in the literature, the calculations aim to provide an indication of the magnitude of direct reductions owing to tariff liberalisation.²⁶¹ They are subject to a number of limitations:

- they are based upon current trade patterns and do not take into account the likely changes in trade patterns resulting from the price changes. Therefore, these estimates may understate the gains to businesses and consumers from reduced tariffs if trade were estimated to increase after price effects
- they assume the current pattern of trade (from the annual average of 2017-2019) is in line with future trade patterns
- the proportion of the estimated reductions in tariff duties passed through to consumers is not known. Some businesses may consume final goods or may not fully adjust the prices of their products/services to UK consumers
- the tariff reductions on final consumer goods are estimated by mapping harmonised system classifications (HS) of goods imported from the partner country into COICOP. Due to mapping limitations, tariff reductions classified in COICOP categories may not sum to 100% of other consumer goods tariff reduction estimates
- the analysis is based on the UK's current tariff levels and does not take into account any future changes to its MFN tariff levels
- tariff gains on UK exports are mapped according to the export pattern using historical trade data. UK exporters in these nations and regions will experience increased competitiveness due to a reduction in partner country tariffs; the direct benefits of reductions in tariff duties may also be realised by firms and consumers in the partner country
- tariff gains from imports are mapped to regions according to the import pattern, this does not account for inter-UK trade and may distort the picture as to where the actual gains are realised
- UK import and export data at the SITC 2-digit commodity code level might not pick up regional variation at the product level

²⁶¹ For example, see, "Consumer benefits from EU trade liberalisation: How much did we save since the Uruguay Round?" Lucian Cernat, Daphne Gerard, Oscar Guinea and Lorenzo Isella - Chief Economist Note, DG Trade, Issue 1, February 2018.

Annex 7: Method for assessment of the impacts on businesses

This annex describes the data and method used to assess various costs that businesses incur in order to take advantage of an FTA:

- one-off familiarisation costs – These are the one-off costs to firms, enforcers, and customs and government officials from reading and understanding the text of this agreement
- on-going costs associated with Rules of Origin Compliance – These are the ongoing costs businesses will incur when proving that the origin of their exports meet requirements necessary to access the preferential tariff rates of the agreement.

Data and method

One-off familiarisation costs

The method to estimate the one-off familiarisation costs to businesses is as follows:

- HMRC data shows the number of UK businesses that import goods from, and export goods to, the partner country ²⁶²
- data is not available on the number of UK businesses that import and export services with the partner country. However, data on UK trade flows provides the proportion of UK imports and exports with the partner country that are services.²⁶³ The estimated number of UK businesses that trade with the partner country is scaled up by this factor to give the number of UK business that import and export services
- HMRC published a report in 2015 on a business survey of the tax administration process. The survey evidence shows that 60% of businesses seek advice from an agent to complete tax affairs. The same survey provides the average cost of using an agent of £296.²⁶⁴ It is therefore assumed that around 40% of businesses familiarise themselves by reading guidance and 60% of businesses use an external agent at a cost of £296
- it is assumed that those 40% of businesses would invest time to read the agreement text. There are established methods to estimate the time cost to businesses associated with reading guidance. The average number of words an individual can read per minute is 228. The same study shows the standard deviation around this is 30 words per minute which is used to estimate a range in this methodology ²⁶⁵
- measures of employee earnings is based on 2019 data from the Annual Survey for Hours and Earnings (ASHE). ONS data shows that for an employee, the median hourly earing are £14.05. Non-wage costs are assumed to be around 18%.²⁶⁶ The estimated total cost to businesses is therefore around £17 per hour

²⁶² HMRC, Regional trade statistics analysis: fourth quarter 2021 - data tables (April 2022).

²⁶³ ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2022.

²⁶⁴ HMRC, Understanding tax administration for businesses, HM Revenue and Customs Research Report 375, (July 2015). Note: this has been rebased to 2021 prices in line with consumer price inflation from the 2015 cited price of £265.

²⁶⁵ Trauzettel-Klosinski and Dietz (2012), 'Standardized Assessment of Reading Performance: The New International Reading Speed Texts IReST', IOVS Volume 53 Issue 9.

²⁶⁶ RPC guidance note on 'implementation costs'. Data source: Eurostat.

- the cost of reading the agreement text is the number of words in the agreement text divided by the number of words an individual can read per hour (13,680 for the central estimate) and multiplied by the total cost to businesses per hour (£17)
- therefore, the total one-off familiarisation costs are: (total number of businesses trading with the partner country) x ((60% x £296) + (40% x cost of reading the agreement text))

On-going costs associated with rules of origin compliance

There is a wide range of academic literature on the impact of rules of origin compliance on trade flows and a range of estimates on the potential associated trade cost to businesses.

Academic studies estimate the tariff equivalent trade costs associated with rules of origin administration and compliance requirements ranges between 2% to 6%.²⁶⁷ These estimates vary depending on the methodology, time period, and the countries under consideration. Evidence suggests costs for developed markets skew to the lower part of the distribution, but significant uncertainty remains. Therefore, the tariff equivalent trade costs between the UK and developed markets associated with rules of origin requirements are assumed to range from 2% to 4%.

Limitations

The limitations to precisely estimate the one-off familiarisation cost are:

- the method assumes that the proportion of businesses using an agent, as well as the associated costs, are equivalent for businesses managing their tax affairs and business seeking to utilise and FTA for exporting
- to avoid double counting, only firms which export and import from Australia are considered. Firms which export and import to Malaysia are also considered separately.
- the method does not consider the number of new businesses that may begin trading with the partner country as a result of the agreement
- data is not available on the number of business that trade in services with the partner country, and an estimated number is based on the share of UK trade in services with the partner country

Limitations for costs associated with rules of origin compliance:

there is limited literature on the trade costs with rules of origin administration and compliance that is specific to UK trade with the partner country

²⁶⁷ Ciuriak & Xiao (2014) 'Should Canada unilaterally adopt global free trade?'

Annex 8: Method for assessment of the impacts on small and medium-sized enterprises (SMEs)

This annex describes the data and method used to assess the implications of the agreement for SMEs.

Small and medium-sized enterprises can be defined as:

- firms employing fewer than 50, and fewer than 250 employees respectively
- firms not exceeding either (a) an annual turnover of £44 million or (b) an annual balance-sheet total of £38 million

Analysis shows the variation of SMEs across different sectors and compares them with the estimated pattern of impacts across sectors set out in the impact assessment.

SMEs represent a key component of the UK economy: in 2021 these made up over 99% of the total number of private sector businesses, representing 61% of private sector employment and 52% of private sector turnover.²⁶⁸

Data and method

Information on the characteristics of UK businesses comes from the BEIS Business Population Estimates (BPE) database. The BPE combines a number of data sources on the business population (UK Business: Activity, Size and Location (ONS), Business Demography (ONS) and Small and Medium Enterprise Statistics (BEIS)) to generate estimates of number, employment, turnover and other characteristics for all active private sector businesses, including sole-traders and unregistered businesses. Business characteristics by sector are then mapped from the Standard Industrial Classification (SIC) 2007 used by the BPE to the GTAP 11 sector definitions used in the CGE modelling.

Table 17: SMEs in the profile of UK businesses

Business size (number of employees)	Number of Businesses	% of Total Businesses	Employment	% of Employee Proportion	Turnover (£m)	% Turnover Proportion
None	4,174,920	74.7%	4,539,000	16.8%	302,520	6.8%
1-49	1,372,705	24.6%	8,320,000	30.8%	1,286,776	28.9%
50-249	35,620	0.6%	3,474,000	12.9%	720,540	16.2%
>249	7,655	0.1%	10,639,000	39.4%	2,139,335	48.1%
All Businesses	5,590,900	100.0%	26,972,000	100.0%	4,449,171	100.0%

Source: BEIS Business Population Estimates (2021).

²⁶⁸ BEIS, Business Population Estimates 2021, (October 2021).

The BPE shows that the concentration of SMEs varies markedly across sectors of the economy. The table below gives the distribution of SMEs across the economy using the sector definitions used by GTAP database. SMEs are present in all sectors of the economy, but four sectors, as defined by GTAP, – construction, business services, public services, and retail and wholesale trades – are estimated to make up over two-thirds of the total number of UK SMEs.

Table 18: SMEs across sectors by number and turnover

GTAP Sector	Sectoral Distribution of SMEs	SMEs Turnover by Sector	Estimated Contribution to Turnover		
		(£m)	Micro/S mall	Medium	Large
Agriculture, forestry, and fishing	2.7%	41,299	80.0%	9.7%	10.3%
Beverages and tobacco products	0.2%	10,776	15.7%	18.2%	66.1%
Other processed foods	0.7%	32,327	15.7%	18.2%	66.1%
Semi-processed foods	0.4%	16,163	15.7%	18.2%	66.1%
Chemical, rubber, plastic products	0.4%	16,163	15.7%	18.2%	66.1%
Energy	0.4%	36,599	15.0%	9.3%	75.7%
Manufacture of electronic equipment	0.1%	5,388	15.7%	18.2%	66.1%
Manufactures	0.5%	21,551	15.7%	18.2%	66.1%
Manufacture of motor vehicles	0.1%	5,388	15.7%	18.2%	66.1%
Manufacture of machinery and equipment n.e.c	0.8%	37,715	15.7%	18.2%	66.1%
Manufacture of other transport equipment	0.6%	26,939	15.7%	18.2%	66.1%
Manufacturing n.e.c	0.2%	10,776	15.7%	18.2%	66.1%
Paper and printing products	1.3%	34,041	24.2%	17.3%	58.5%
Textiles, apparel, and leather	0.4%	16,163	15.7%	18.2%	66.1%
Business services	22.9%	432,292	44.3%	17.2%	38.5%
Communications	1.1%	23,266	29.7%	16.7%	53.7%
Construction	16.4%	260,019	59.6%	12.9%	27.5%
Financial services	1.2%	-	-	-	-
Insurance	0.6%	-	-	-	-
Other services (transport, water, dwellings)	8.6%	165,335	35.7%	14.2%	50.1%
Personal services	9.1%	91,047	30.4%	12.5%	57.1%
Public Services	15.8%	143,680	42.7%	14.9%	42.4%
Wholesale and retail trade	15.6%	882,915	35.1%	17.6%	47.3%

Source: DBT Internal Analysis of BEIS Business Population Estimates (2021). Note: No turnover data available for Financial or Insurance sectors.

The data on which sectors SMEs belong to (as above), are paired with the sectors where output is expected to increase or decrease relative to the baseline as a result of an FTA. This provides a preliminary assessment of whether SMEs are concentrated in industries where GVA decreases relative to the baseline. For the purpose of identifying which sectors have a higher concentration of SMEs, the analysis focuses on sectors in which employment changes by more than +/- 0.05% relative to the baseline.

Limitations

The preliminary analysis is in line with best practice in this area but requires several simplifying assumptions and is subject to several limitations:

- this approach does not take into account whether SMEs may be more or less affected by changes in trade barriers than other businesses
- mapping the Standard Industrial Classifications to the sector aggregations used in the GTAP modelling requires several simplifying assumptions which could result in biases in the estimated distribution of SMEs across GTAP sectors
- BEIS BPE data captures data on unregistered and sole traders, however it does not allow for disaggregation between small and micro businesses and there is no available turnover data for the finance or insurance sectors

Annex 9: Method for assessment of impacts on groups in the labour market (CPTPP)

This annex describes the data and method used to assess the implications of the agreement for various groups in the labour market including sex, ethnicity, disability and age.²⁶⁹

The international evidence suggest that trade agreements and trade liberalisation have the potential to affect various sectors of the economy and groups differently.²⁷⁰ This is because consumption patterns and employment patterns can differ systematically across groups.

The method analyses the characteristics of the workforce within sectors where employment is predicted to decline relative to the baseline over the long run due to the FTA.

Data and Method

Sectors in the CGE model are defined by the GTAP 11 database used. These sectors are mapped from GTAP to the Standard Industrial Classification (SIC) 2007 sectoral definitions used by the Annual Population Survey (APS). The APS is a combined survey of households in Great Britain that draws on data from the Labour Force Survey.

The table below presents data from an average of the years 2016-2018 of the APS, showing estimates of the proportions of those employed in each of the 23 GTAP sectors with various characteristics.

Table 19: Proportion of employment by sector and protected characteristics²⁷¹

GTAP Sectors (23 disaggregation)	Female	Male	Disabled	Ethnic Minority	Age 16-24	Age 65 and over
Agriculture, forestry, and fishing	27.4%	72.6%	14.5%	1.4%	10.0%	18.3%
Beverages and tobacco products	26.5%	73.5%	6.8%	5.8%	9.0%	1.2%
Other processed foods	37.9%	62.1%	11.4%	15.0%	9.0%	2.1%
Semi-processed foods	31.3%	68.7%	7.9%	12.1%	10.2%	2.6%
Chemical, rubber, plastic products	32.4%	67.6%	9.5%	8.0%	8.7%	2.4%
Energy	21.2%	78.8%	10.1%	6.7%	8.5%	2.0%
Manufacture of electronic equipment	30.4%	69.6%	8.2%	10.9%	7.6%	2.8%
Manufactures	16.4%	83.6%	10.5%	5.0%	10.8%	4.0%
Manufacture of motor vehicles	13.0%	87.0%	10.4%	9.1%	9.1%	2.4%
Manufacture of machinery and equipment n.e.c	18.7%	81.3%	11.3%	6.1%	8.3%	3.3%
Manufacture of other transport equipment	13.2%	86.8%	10.4%	4.7%	9.6%	2.6%

²⁶⁹ Sex, disability and age are a subset of those characteristics protected under the Equality Act 2010. For the purposes of this analysis, we utilise data regarding ethnicity to consider the protected characteristic of race. Other characteristics are not analysed due to a lack of data covering their demographics across sectors of the economy.

²⁷⁰ The characteristic that has been studied in the greatest depth is sex. (UNCTAD, 2017) uses a method similar to the one used in this annex and (OECD, 2018) extends this approach to look at how women are affected as a result of impacts to global value chains.

²⁷¹ Employment is defined as set out in ILODEF. For further information see Labour Force Survey User Guide: Details of LFS variables 2019.

Manufacturing n.e.c	31.3%	68.7%	12.1%	8.5%	8.0%	3.9%
Paper and printing products	36.9%	63.1%	12.1%	8.8%	7.1%	4.6%
Textiles, apparel, and leather	49.6%	50.4%	11.6%	16.6%	9.7%	4.8%
Business services	40.2%	59.8%	11.4%	13.6%	8.7%	4.5%
Communications	26.4%	73.6%	11.4%	14.0%	9.5%	0.9%
Construction	12.4%	87.6%	11.0%	5.5%	9.8%	3.7%
Financial services	42.5%	57.5%	9.3%	16.1%	8.3%	1.6%
Insurance	46.7%	53.3%	10.2%	9.1%	11.8%	1.6%
Other services (transport, water, dwellings)	25.6%	74.4%	12.2%	16.6%	7.7%	4.5%
Personal services	54.8%	45.2%	13.3%	9.1%	18.4%	5.1%
Public Services	68.6%	31.4%	13.8%	12.2%	7.6%	3.4%
Wholesale and retail trade	48.4%	51.6%	13.6%	14.2%	24.6%	3.5%

Source: ONS Annual Population Survey

Notes: Employment is defined as set out in ILODEFR. For further information see Labour Force Survey User Guide: Details of LFS variables 2019.

The CGE modelling provides estimates of the changes in share of overall employment accounted for by each sector of the UK economy resulting from a free trade agreement. For the purposes of estimating potential impacts on different groups in the labour market, the analysis focuses on sectors in which employment changes by more than +/- 0.05 relative to the baseline.

Limitations

The aim of the analysis is to estimate the long run changes in employment in sectors according to population group. This provides a proxy for whether the labour market impacts of the agreement may result in a disproportionate impact on specific groups.

The analysis requires several simplifying assumptions and is subject to the following limitations:

- the data from the Annual Population Survey only allows descriptive analysis of the composition of sectors where individuals with various characteristics are employed, not inferential analysis of how these individuals or employers will respond to sectoral shocks. The analysis therefore cannot make inference about how groups will be impacted
- the analysis uses the available data sources to describe the characteristics of workers in sectors which may increase or decrease their employment relative to the baseline under an agreement. It does not assess the welfare impacts of any agreement on various groups
- mapping the employment data, which is recorded in the Annual Population Survey by Standard Industrial Classification to the sector aggregations used in the GTAP modelling could result in biases in the estimated distribution of employment across the GTAP sectors
- the proportions estimated above are based on a snapshot of the demographics. By only using the years available the analysis does not take into account trends that may be present in the proportions
- the analysis is based on the structure of the UK workforce from 2016-2018, whereas the CGE modelling results reflect the UK economy in the long run when the composition of the workforce may have changed

Annex 10: Method for assessment of environmental impacts (emissions)

This annex sets out the methodology for estimating the impact of the FTA on Green House Gas (GHG) and transport emissions. It also provides the environmental performance indicators (EPI) for CPTPP members.

Greenhouse gas emissions

To estimate the impacts from the FTA on UK and CPTPP greenhouse gas emissions, an extension to the core CGE model is used, known as GTAP-E. This model has been used as part of DBT's development work to incorporate recommendations from the Modelling Review.²⁷² GTAP-E differs from DBT's previous assessment of environmental impacts, which used an 'off-model approach', as it allows for the estimation of partner and global impacts, as well as accounting for emissions from household consumption of energy. GTAP-E also uses additional assumptions, such as inter-fuel and fuel-factor substitution, which are not present in DBT's previous approach. Much of the increase in the estimated impact on UK emissions between Scoping Assessment and Impact Assessment is a result of the improvements made to the environmental modelling by moving to GTAP-E. These improvements and additional assumptions are outlined further below.

GTAP-E background

GTAP-E incorporates carbon emissions from the combustion of fossil fuels, as well as a mechanism to trade these emissions internationally. The database provides carbon dioxide (CO₂) emissions data distinguished by fuel and by user for each of the 141 countries/regions in the Global Trade Analysis Project (GTAP) database.²⁷³

It uses GTAP 11 and data on different energy sources compiled by the International Energy Agency (IEA).

GTAP-E is widely used in other countries, by international institutions and by academics (World Bank, United Nations, IMF). Further information on the mechanics behind GTAP-E can be found in Burniaux and Truong.²⁷⁴ Using the GTAP-E model, the following impacts have been captured as a result of a UK-CPTPP FTA:

UK emissions

GTAP-E assumes energy substitution is an important factor in assessing energy-environment-economy linkages. Energy is modelled as a primary input, instead of being an intermediate input. The production structure therefore captures energy as an additional factor of production (in GTAP, energy is an intermediate input). This impact is captured on two levels: first, allowing for the possibility of substitution between alternative fuels and secondly, allowing for the substitution between energy and capital as factors of production (jointly creating the energy-capital composite). The energy-capital composite is then substitutable with other factors of production (i.e., labour, land and natural resources). If the demand for the energy-capital composite increases, there might still be an increased overall demand for energy inputs. This reflects short-term complementarity between energy and capital.

²⁷² <https://www.gov.uk/government/publications/trade-modelling-review-expert-panel-report-and-recommendations>

²⁷³ <https://www.gtap.agecon.purdue.edu/default.asp>

²⁷⁴ "GTAP-E: An Energy-Environmental Version of the GTAP Model", https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=923

This is supported by the economic literature, which suggests that physical capital and energy could be substitutes or complements in production, often depending on the time horizon.²⁷⁵ They are more likely to be complements in the short or medium term, and substitutes in the long term as firms have more time to adjust their technologies. The GTAP-E model also assumes the energy market is perfectly competitive in the long-run.

Being a fully specified general equilibrium model, GTAP-E accounts for the impacts originating in both supply side (production) and demand side (consumption) of the economy (it is a top-down approach).²⁷⁶ It therefore estimates the emissions changes related to household consumption of energy (gas, petrol etc.) Further information on the mechanics behind GTAP-E can be found in Burniaux and Truong.²⁷⁷

Partner country emissions

GTAP-E provides a single consistent framework to estimate the impact of an FTA not just on UK emissions but also partner country and global emissions. Therefore, the modelling results are used to produce an estimate for the impact on the CPTPP as an aggregate, as well as for the UK. It is also able to capture the impact of changes in wider trade patterns such as a reallocation away from third countries.

Limitations of the quantitative assessment of environmental impacts

Quantitative assessment of the environmental impact is based on the estimated economic impact of the new trade policy. Consequently, the environmental assessment conducted in this analysis inherits the limitations of the economic modelling.

With respect to the environmental modelling, there are caveats concerning the interpretation of the results:

- results do not take into account the projected decline in greenhouse gas emissions in various sectors or declines in emissions intensity that might be expected to follow from government policies. For example, the decarbonisation or policy measures to deliver the UK's net zero commitment, and firm and consumer behaviour
- it is a top-down approach to energy modelling and therefore does not include a detailed specification of energy technologies
- the current reference year for GTAP-E is 2017. UK CO₂ emissions have declined significantly since 2017. According to ONS data, total UK CO₂ emissions have fallen by around 16% between 2017 and 2020 (from 475 Mt CO₂e in 2017 to 400 MtCO₂ e in 2020)²⁷⁸
- the current static version of GTAP-E does not account for the technique effect – where trade opening can lead to the adoption of more environmentally friendly production techniques, either through technology transfer or investment which can lead to a decline in CO₂ emissions and emission intensity over the long-term

²⁷⁵ See Burniaux & Truong, 2002. Rutherford & al, 1997.

²⁷⁶ The top-down approach to energy modelling starts with a detailed description of the macro economy and then derives from there the demand for energy inputs in terms of the demand for various sectors' outputs through highly aggregate production or cost functions.

²⁷⁷ "GTAP-E: An Energy-Environmental Version of the GTAP Model", https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=923

²⁷⁸ ONS, Greenhouse gas emissions in the United Kingdom, 1990 to 2019 and (provisional) 2020.

Transport emissions

Method

The impact of a new trade agreement on aviation and maritime emissions is estimated using the CGE-based economic analysis and HMRC trade data as inputs.

HMRC trade data gives the tonnage of goods transported via each mode of transport. Published forecasts in aviation and maritime traffic are used to estimate projected traffic by mode. The estimated output changes from the CGE-based economic analysis are linked to HMRC Overseas Trade Statistics to convert the impact of the deal to tonnage and added to traffic projections to estimate the effects of the bilateral agreement on aviation and maritime traffic. Using the distance between trading partners and emissions factors for specific ship types and freighter aircraft, this traffic impact is converted into an emissions impact.

Updates to the methodology for the CPTPP transport emissions

The methodology used to estimate the impact of transport emissions has been updated since previous publications to improve the robustness of the estimates.

- The overall distance that goods are estimated to travel in the baseline between the UK and CPTPP is approximated using a weighted average. In the baseline, the distance between the UK and each CPTPP member is weighted by the proportion of trade with each CPTPP member. To estimate the impact of the UK's accession to CPTPP, distances are weighted by the change in bilateral trade between the UK and each CPTPP member.
- The rate at which the forecast aviation traffic changes is determined by published data by region. As CPTPP is comprised of countries from multiple regions, countries within it have different forecast projections. The overall forecast changes in aviation traffic, used for the baseline calculation, are therefore determined by using a weighted average based on the proportion of trade with the CPTPP country and its respective forecast growth rate.
- To estimate maritime emissions, a maritime emissions factor is calculated for each CPTPP member. The overall emissions factor for CPTPP is approximated using a weighted average. In the baseline, the emission factors for each CPTPP member are weighted by the proportion of trade with the UK. To estimate the impact of the UK's accession to CPTPP, the emission factors are weighted by the change in bilateral trade with the UK.

Sensitivity analysis: Indirect emissions

Whilst the main results capture the direct impact of transport emissions, the below table also captures the indirect impact of other non- CO₂ aviation emissions, such as water vapour, contrails, and nitrogen oxides.

Table 20: Estimated impact of CPTPP FTA on trade-related maritime and aviation freight emissions, including indirect aviation emissions.

	Emissions from UK exports			Emissions from UK imports			Total
	Aviation	Maritime	Total	Aviation	Maritime	Total	
Average annual change, 2020 - 2035 (MtCO ₂ e)	0.03	0.02 – 0.02	0.05 – 0.06	0.03	0.08 – 0.09	0.10 – 0.12	0.016 – 0.18
Change relative to baseline (%)	3%	3%	3%	3%	5%	4%	4%

The range for maritime emissions is based on a sensitivity analysis of increasing the distance by 25% to reflect ships not always taking the shortest route.

Limitations of the transport emissions method

As with production emissions, the impact of the UK-CPTPP FTA on transport emissions is based on the CGE results and therefore inherits the same limitations of the economic modelling.

The scope of this assessment does not include the impact on transport emissions from changes in trade with third countries.

The methodology uses several simplifying assumptions:

- Services are negligible (that is, ignore the movement of people driven by the UK's accession to CPTPP and examines goods only);
- Significant technological change has a negligible impact in the medium-term (that is, no consideration is made for long-haul electric aircraft and hydrogen-powered cargo ships becoming available), and emissions intensity doesn't change over time. Emissions intensity (CO₂e emissions per tonne per km) is expected to improve over time under business-as-usual conditions reflecting technological change and global climate ambitions. With emissions savings coming from more modest improvements from cleaner fuels, energy efficiency savings and engine upgrades. However, robust estimates of future changes in emissions factors for maritime and aviation are not available. Using current emissions factors is a conservative approach that will likely overestimate the change in emissions.
- The analysis also does not include the impact on transport emissions from changes in trade with third countries.

Environmental Performance Index (EPI)

Air quality indicators

Table 21: Air Quality

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	14.0	33.0	6.0	32.0	8.0	50.0	13.0
EPI	78.6	61.5	91.1	61.7	88.0	48.4	78.9
10-year change	7.0	3.6	4.7	-0.7	5.5	4.2	1.7

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	62.0	94.0	4.0	71.0	25.0	130.0
EPI	43.7	34.2	93.2	41.5	69.2	26.5
10-year change	5.1	2.3	4.0	3.7	5.1	4.2

Source: [Environmental Performance Index \(EPI\)](#), 2020

Notes: Air quality is a composed indicator made of household solid fuel use; PM2.5 average exposure, and PM2.5 exceedance of WHO thresholds.

Table 22: PM2.5 Exposure

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	18.0	26.0	1.0	27.0	8.0	48.0	17.0
EPI	71.0	59.8	100.0	57.8	92.2	46.4	73.8
10-year change	12.2	2.5	4.9	-7.7	10.5	2.0	-1.4

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	105.0	84.0	1.0	59.0	30.0	104.0
EPI	28.2	34.4	100.0	40.4	56.0	28.4
10-year change	5.4	0.6	3.5	2.9	2.9	4.1

Source: [Environmental Performance Index \(EPI\)](#), 2020

Table 23: Ozone Exposure

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	29.0	47.0	18.0	27.0	55.0	35.0	38.0
EPI	68.3	60.4	78.1	68.8	56.3	65.8	63.8
10-year change	6.9	-5.2	-11.8	-1.1	1.9	5.6	6.1

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	100.0	119.0	24.0	20.0	46.0	106.0
EPI	42.7	38.8	71.3	77.1	60.9	41.3
10-year change	-14.6	4.8	-10.9	-20.1	-19.9	3.3

Source: [Environmental Performance Index \(EPI\)](#), 2020

Notes: To ground-level ozone pollution.

Table 24: Household Solid Fuels Exposure

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	1.0	49.0	22.0	44.0	1.0	64.0	1.0
EPI	100.0	73.0	98.1	75.2	100.0	59.1	100.0
10-year change	0.0	6.7	7.5	6.9	0.0	8.4	3.2

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	51.0	90.0	26.0	88.0	21.0	113.0
EPI	70.2	39.4	96.9	40.3	99.3	24.9
10-year change	8.4	5.0	6.4	10.8	11.0	6.0

Source: [Environmental Performance Index \(EPI\)](#), 2020

Notes: 10-year change figure is not available for the UK and Canada

Water quality indicators

Table 25: Sanitation and Drinking Water

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	1.0	32.0	25.0	27.0	24.0	38.0	17.0
EPI	100.0	73.1	87.1	85.7	88.1	68.1	95.1
10-year change	1.0	2.5	1.7	1.6	2.9	3.6	1.0

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	59.0	73.0	29.0	103.0	21.0	74.0
EPI	57.6	52.9	80.4	43.1	93.3	52.8
10-year change	2.7	4.9	2.0	2.2	0.7	4.4

Source: [Environmental Performance Index \(EPI\)](#), 2020

Notes: This indicator measures how well countries protect human health from environmental risks on two indicators: unsafe drinking water and unsafe sanitation.

Table 26: Water Resources

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	6.0	41.0	11.0	92.0	30.0	24.0	23.0
EPI	99.0	52.0	92.9	5.8	67.4	71.9	74.8
10-year change	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	75.0	56.0	21.0	47.0	1.0	134.0
EPI	12.6	25.2	79.9	41.0	100.0	0.3
10-year change	0.0	0.0	0.0	0.0	0.0	0.0

Source: [Environmental Performance Index \(EPI\)](#), 2020

Notes: A score of 100 indicates that a country has 100% of its population connected to a sewer system and 100% of household wastewater is treated, mitigating threats to aquatic ecosystems. Please note the 10-year change figure is not available on this metric

Forestry indicators

Table 27: Ecosystem Services

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	102.0	117.0	119.0	117.0	70.0	78.0	88.0
EPI	23.6	20.8	20.1	20.7	29.8	28.4	26.8
10-year change	-3.3	-2.7	-6.1	0.4	10.4	10.7	-7.4

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	174.0	60.0	87.0	85.0	173.0	172.0
EPI	2.6	32.7	26.9	27.6	5.0	8.5
10-year change	-14.3	4.3	-1.4	-2.7	-11.4	-12.6

Source: [Environmental Performance Index \(EPI\)](#), 2020

Table 28: Tree cover loss

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	109.0	107.0	161.0	59.0	84.0	99.0	46.0
EPI	11.1	11.4	0.0	20.7	14.5	12.6	23.7
10-year change	0.1	-4.2	-11.8	0.4	0.1	-0.9	-2.2

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	152.0	95.0	107.0	69.0	144.0	155.0
EPI	3.1	13.5	11.3	18.4	5.0	2.4
10-year change	0.0	-3.6	-2.0	-6.6	-11.4	-8.4

Source: [Environmental Performance Index \(EPI\)](#), 2020

Notes: 10-year change figure is not available for Malaysia

Waste management

Table 29: Controlled Solid Waste

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	15.0	51.0	18.0	41.0	24.0	48.0	23.0
EPI	96.0	74.2	95.0	85.5	92.3	75.7	92.7
10-year change	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	81.0	50.0	34.0	84.0	6.0	110.0
EPI	47.9	74.6	89.5	42.0	99.3	22.0

10-year change	0.0	0.0	0.0	0.0	0.0	0.0
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Source: [Environmental Performance Index \(EPI\)](#), 2020

Biodiversity and Ecosystems

Table 30: Biodiversity and Habitat

	UK	CPTPP	Australia	Brunei	Canada	Chile	Japan
Rank	23.0	86.0	22.0	89.0	72.0	77.0	26.0
EPI	81.5	59.2	82.1	58.5	62.9	61.3	80.8
10-year change	23.4	12.1	31.3	2.3	19.1	24.5	7.4

	Malaysia	Mexico	New Zealand	Peru	Singapore	Vietnam
Rank	106.0	57.0	40.0	98.0	154.0	149.0
EPI	51.9	69.8	76.6	54.5	25.3	27.9
10-year change	16.4	23.4	-2.1	3.7	0.6	6.2

Source: [Environmental Performance Index \(EPI\)](#), 2020

Annex 11: Method for assessment of impact on developing countries

This annex describes the data and method used to assess the effect of the agreement on developing countries. For this analysis, we define developing countries as those in the African, Caribbean and Pacific (ACP) group, including those trading under Economic Partnership Agreements (EPAs) with the UK, or those trading under the UK's Generalised Scheme of Preferences (GSP). This analysis was completed based on eligibility to the UK's GSP as in early 2023. Since June 2023, GSP has been replaced with the Developing Countries Trading Scheme, which has made some changes to eligibility.

Together, the UK and CPTPP economies traded approximately \$440 billion of developing country merchandise trade annually.^{279 280} The UK annually imported goods worth £32.0 billion from developing countries including £7.6 billion from India, £5.0 billion from South Africa, and £2.6 billion from Bangladesh. The UK's goods imports from CPTPP economies were slightly less than developing country imports at approximately £30.6 billion or 6% of the UK's imports from the world.^{281 282 283}

These countries may therefore experience preference erosion when the UK signs a Free Trade Agreement (FTA). This is because the FTA would reduce their relative competitiveness due to the greater market access agreed between the UK and FTA partners. This can lead to UK demand shifting away from the developing countries' products and towards the FTA partners' products. Reduced demand for developing country exports could negatively impact their economy's trade balance, foreign reserves and GDP. It may also reduce demand for goods and industries that can drive future development and growth.

Table 31 shows the sectors in which there are products exported from developing countries to the UK at risk of trade diversion, including total UK imports from developing countries and trade from individual developing countries in those products. Overall, in the context of total trade flows, these risks from preference erosion are not expected to be substantial.

²⁷⁹ Generalised Scheme of Preferences countries, Economic Partnership Agreement countries and Africa/Caribbean/Pacific countries

²⁸⁰ On average between 2019-2021, World Integrated Trade Solution, August 2022 – using both direct and mirror data.

²⁸¹ Generalised Scheme of Preferences countries, Economic Partnership Agreement countries, ACP countries – excluding Vietnam as this country has been included in the CPTPP total

²⁸² On average between 2019-2021, ONS trade data, April 2022

²⁸³ Approximately £475.4 billion annually on average between 2019-2021, ONS trade Data, April 2022

Table 31: Developing country exports identified as being at potential risk of trade diversion from a UK accession to CPTPP (2017 to 2019 average)

HS6 code and product description	CPTPP Exporters	UK imports from developing countries	CPTPP exports to World	Example countries at risk of impact
030617: Shrimp products	Brunei, Malaysia	£221.9m	£175.3m	Bangladesh
080390: Bananas	Mexico, Peru, Vietnam	£150.2m	£435.7m	Belize, Cameroon, Dominican Republic, Ghana, St. Lucia
080610: Fresh grapes	Chile, Mexico	£176.8m	£852.3m	Namibia, India, South Africa
100620: Husked or brown rice	Vietnam	£145.8m	£31.0m	Pakistan, India, Myanmar
151190 and 151110: Crude palm oil or products ²⁸⁴	Malaysia	£125.8m	£8160.0m	Solomon Islands, Papua New Guinea
160414: Tuna products	Vietnam	£186.7m	£210.2m	Ghana, Mauritius, Seychelles, Philippines
170114: Sugar cane	Mexico	£97.0m	£307.3m	Belize, Eswatini, Fiji, Mauritius, Guyana, Mozambique, South Africa, Zambia
540782: Textiles	Malaysia	£3.1m	£3.8m	India, Pakistan
Several*: Apparel	Malaysia, Brunei	£252.8m	£316.3m	India, Pakistan, Myanmar, Bangladesh, Cambodia, Vietnam, Mauritius, Sri Lanka, Philippines

Source: FCDO analysis using HMRC trade data.

* 610120, 610322, 610332, 610342, 610429, 610439, 610590, 610829, 611212, 611420, 611699, 620449, 620690, 620719, 620799, 620829, 620990, 630229, 630720, 640590

²⁸⁴ Preference erosion risk relating to palm oil will depend on whether UK palm oil imports from Malaysia are of crude palm oil or of processed palm oil, with greater preference erosion risk for Papua New Guinea and the Solomon Islands if imports of crude palm oil from Malaysia increase.

Data and method

This analysis provides an indication of whether the market access agreed as part of the FTA is likely to negatively impact on the trade flows of developing countries receiving preferential market access to the UK. It does this by identifying products at the HS6 code level that are particularly vulnerable to preference erosion.

To determine whether trade diversion may occur because of tariff reductions between the UK and the FTA partner, we first analyse trade data from the FTA partner to determine the competitiveness of their exports. Then we analyse and contrast developing countries trade flows to determine their value of exports and the relative importance of the UK market for those goods. Products which are competitive for the partner country, have a positive UKGT rate and are at risk of preference erosion for developing countries are identified.

Criteria to identify competitive goods of the FTA partner

FTA partner exports of a good at HS6 are defined as competitive if any of the following indicators are met:²⁸⁵

- partner's global exports exceed UK total imports
- more than 1% of UK imports of the good are imported from the partner
- global exports from the partner are greater than 1% of total global imports
- revealed comparative advantage is greater than 1, indicating that the partner exports a higher proportion of the good than the global average ²⁸⁶

Criteria for goods at risk of preference erosion for developing countries

Developing countries' exports of a good at HS6 are defined as "at risk of preference erosion" if:

- exports to the UK account for more than 10% of global exports of that product, indicating reliance on the UK market ²⁸⁷

And either of the following two criteria are also met:

- exports exceed 1% of the country's total exports
- annual average exports are greater than US\$1m

Products which meet both sets of the above criteria are highlighted as potentially at risk of trade diversion from an agreement that proposes to liberalise these product lines. The list of sensitive products is then analysed to identify any missing goods, for which trade diversion risks were expected but the trade data had not flagged. A reduced list of prioritised products has been presented in Table 31 based on a combination of factors that deem them more sensitive than others, such as more of the criteria being true, higher values of both partner exports to the world and developing country imports to the UK as well as factors such as partner's existing presence in the UK market. Source data is scrutinised to interrogate partner country competitiveness and developing country trade flows, and other information sources are consulted to assess the full risk of preference erosion.

²⁸⁵ FTA partner's trade data sourced from TradeMap, averaged from 2017-2019.

²⁸⁶ Calculated as the product share of the FTA partner's global exports divided by the product share of global imports, using TradeMap data, averaged from 2017-2019.

²⁸⁷ Developing country global exports sourced from UN Comtrade, averaged from 2017-19, using mirror data (world imports from developing countries).

Limitations

There are limitations with this analysis. We only consider static competitiveness threats rather than dynamic considerations of emerging industry and trade expansion across developing country partners. We cannot fully predict the extent to which a change in relative tariffs faced by the developing country and by the FTA Partner would lead importing firms in the UK to switch from suppliers in one country to another.

The analysis focuses on the long-term risk of the proposed FTA's changes in tariffs. It assumes a worst-case scenario by comparing pre-agreement tariff rates with the FTA partner compared to the terminal rates applicable in the FTA. This means that any intervening period where tariffs are reduced in stages which might lessen the effects on developing countries as firms and businesses reacting over time have not been included in the calculations for the preference erosion risks. Similarly, there may be changes in UK import regulations that may affect the trade flows in certain goods – for example, the UK's standards requirements or Sanitary and Phytosanitary (SPS) assurance schemes. Such changes have not been included in the calculation of the long run preference erosion risks.

The presence of globally competitive producers in the FTA Partner country is one factor, however using Revealed Comparative Advantage may be an imperfect measure of the FTA Partner's competitiveness in a certain sector. In some cases, where preferential access is not being used, developing countries are already more competitive than other producers.

Other factors that shape how the market will respond include price elasticity, the availability of substitutes, the transaction costs involved in changing suppliers. These are not considered in this static analysis.

Whilst trade diversion has the potential to affect the economies of least developed countries, analysis by DBT (table 11 in the main impact assessment) shows that the UK's accession to CPTPP does not impact the GDP of LDCs.

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