Department for International Trade

Impact assessment of the Free Trade Agreement between the United Kingdom of Great Britain and Northern Ireland and New Zealand

Contents

Executive summary

The Department for International Trade (DIT) has negotiated a free trade agreement (FTA) between the United Kingdom (UK) and New Zealand.

It is a modern and comprehensive agreement which aims to enhance the long-lasting trading and investment relationship between the two countries. This agreement will remove tariff and non-tariff barriers to make trade easier. The agreement is estimated to generate long term benefits for both countries, support UK jobs and provide opportunities for growth in sectors across the UK.

The agreement aims to strengthen existing ties between the UK and New Zealand. In addition to boosting goods and services trade, it could help to increase collaboration in areas including:

- digital
- intellectual property (IP)
- animal welfare
- trade for development
- trade and gender equality
- consumer protection
- the environment

This agreement is also another step towards UK accession to the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), of which New Zealand is an important member. The CPTPP free trade area is populated by half a billion people with a joint gross domestic product (GDP) of £8.4 trillion in 2020. Accession would deepen the UK's access to this sizeable market.

This impact assessment sets out our assessment of the economic, social, and environmental impacts of the agreement.

The agreement

Following the conclusion of the UK-Australia FTA, the agreement with New Zealand is the UK's second trade deal negotiated from scratch since leaving the EU. This agreement fulfils the government's manifesto commitment to secure a free trade agreement with New Zealand. It also contributes to the commitment of having 80% of UK trade covered by FTAs.

This is a modern and comprehensive agreement, with elements that go further than the UK or New Zealand have committed to before.

The agreement removes tariffs on all UK exports to New Zealand at entry into force, worth more than £17 million in annual tariff reductions, and removes and reduces regulatory barriers.

It includes a commitment new to New Zealand's FTAs, securing access for business persons employed by a UK enterprise to provide services under contract in specified sectors when travelling to New Zealand. This includes, but is not limited to audit, legal services and management consultancy.

The agreement will increase investment opportunities in both countries, making it easier for UK investors to expand their footprint and become more profitable in New Zealand. Raising screening thresholds for UK investors will lead to savings for UK businesses, who owned £900 million worth of foreign direct investment in New Zealand in 2020.[1]

The agreement promotes trade in environmental goods and services, with the largest environmental goods list with liberalised tariffs in any FTA to date. It removes tariffs on goods such as electric vehicles and wind turbine parts. The Environment chapter affirms our commitments under the Paris Agreement,[2] including the temperature goals and contains ambitious commitments on transitioning away from fossil fuels. Further environmental commitments are also included, for example on fossil fuels, to end electricity generated from unabated coal and take steps to eliminate harmful fossil fuel subsidies where they exist.

It includes a Consumer Protection chapter, the first of its kind under the UK's new trade deals. This represents an important milestone in how FTAs promote consumer trust and welfare. It prioritises the importance of promoting access to redress mechanisms, and commits both countries to protecting consumers against commercial activities that are misleading, fraudulent, deceptive and unfair.

1 ONS, Foreign direct investment involving UK companies: 2020.
2 The Paris Agreement done at Paris on 12 December 2015 and adopted by the Conference of the Parties to the UNFCCC at its 21st session (referred to as the "Paris Agreement" hereafter).

UK public support for a UK-New Zealand free trade agreement is high. DIT's Public Attitudes to Trade Tracker (PATT) shows that 64% of people are in support of a deal, while only 5% oppose.[3]

The agreement maintains high standards on issues that the PATT shows matter to UK consumers, such as food standards and animal welfare.

For example on food standards, all food and drink products imported into the UK will continue to have to comply with our import requirements. Hormone-treated beef from the rest of the world will continue to be banned. The UK's independent food regulators – the Food Standards Agency and Food Standards Scotland – will continue to ensure all food imports meet our high standards.

On animal welfare standards, the agreement includes non-regression and non-derogation clauses. This means both countries are committed to not lowering their animal welfare standards.

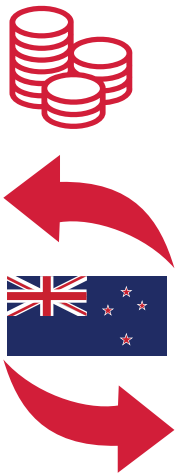
As well as removing barriers to trade, the agreement will see the UK and New Zealand working more closely together to raise global standards. This includes through increased bilateral cooperation and in multilateral fora including the World Trade Organization (WTO).

The impact of the agreement

UK and New Zealand trade was worth £2.3 billion in 2020, having grown 13% between 2014 and 2019.[4] UK goods exports to New Zealand are highest in the machinery, manufacturing and chemical sectors, while the top services exports include insurance, telecommunications, and intellectual property. Import demand for New Zealand is expected to grow by 41% in real terms between 2019 and 2035.[5]

Greater access to New Zealand markets and reduced regulatory burdens on goods and services are therefore expected to bring extensive opportunities for UK businesses and consumers.

Central estimates for the impacts of the agreement



Change in GDP
↑ £0.8 billion

Exports to New Zealand
↑ £0.7 billion

Imports from New Zealand
↑ £1.0 billion

Total Exports to the World
↑ £0.7 billion

Total Imports from the World
↑ £0.6 billion

Source: DIT modelling. £ values in 2035 terms, projected in constant 2019 prices. The central point estimates above do not represent precise estimates. They instead provide an indication of the direction of impacts and broad orders of magnitude.

Note: The change in imports from the world are lower than the change in imports from New Zealand as new imports from New Zealand displace imports from other countries.

3 DIT, Public attitudes to trade tracker (September 2021).
4 ONS, UK total trade: all countries, non-seasonally adjusted, July to September 2021.
5 2035 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook, (September 2021).

Macroeconomic impacts

Our analysis shows that bilateral trade between the UK and New Zealand could increase by the equivalent of **£1.7 billion** in the long run. This increase is compared to projected levels of trade in 2035 (in today's prices) without the agreement.[6] This is based on a central estimate of a 59% increase in trade resulting from the FTA. The increase is driven by reductions in regulatory restrictions to trade, tariff reductions, and income and supply chain effects as the UK economy grows.

This assessment also shows that UK gross domestic product (GDP) could increase by around **£0.8 billion** in the long run. This is when compared to projected levels of GDP in 2035 (in today's prices) without the agreement.[7] The estimate indicates the value of a 0.03% increase in GDP (as a central estimate) as a result from the FTA in 2035. The estimate is subject to a high degree of uncertainty.[8]

In the central estimates, take home pay for UK workers is estimated to increase by around **£200 million** in the long run. This is when compared to 2019 estimates of wages without the agreement. This is based on a central estimate of a 0.03% increase in wages.

These estimates are based on certain assumptions about the global economy and the UK-New Zealand trade relationship, and are subject to various forms of uncertainty. Our sensitivity analysis varies some of the main modelling parameters used in the analysis. However, it does not account for the full range of factors that could determine the impact of the agreement. It suggests the estimated impact on long run GDP could vary between 0.02% and 0.03% (0.023% and 0.034% respectively, to three decimal places). However, as the analysis does not capture important sources of uncertainty, the actual long run impacts could fall outside of this range. The point estimates and ranges presented do not represent precise estimates; they represent an indication of the direction of impacts and broad orders of magnitude. The sources of uncertainty are discussed in section 7.

Businesses will benefit from the elimination of tariffs on 100% of New Zealand's tariff lines at entry into force.[9] As a result, duties on UK goods exports to New Zealand could fall by around £17 million annually. Amongst the benefiting businesses are also small and medium sized enterprises (SMEs), who are well-represented in sectors that benefit the most from the agreement. Consumers could also benefit from the removal of tariffs on UK imports of New Zealand goods. From the day the agreement enters into force, tariffs on 96.7% of tariff lines for UK imports from New Zealand will be zero. Most of the remaining tariffs are gradually reduced to zero over time. This boosts access and also increases choice for businesses seeking to source inputs from New Zealand. However, this will also open up some UK businesses to increased competition from New Zealand exporters.

Sectoral impacts

A wide range of sectors may benefit from access to provisions in the agreement, while some sectors could face increased international competition.

Our analysis shows services sectors are expected to make the strongest contribution to the estimated growth in gross value added (GVA) on a 2019 basis.

On services, the largest contributions in absolute terms come from three main sectors. These are wholesale and retail services (+£105 million), public services (+£82 million), and other services (transport, water, dwellings) (+£82 million). This is driven mainly by income and supply-chain effects as other parts of the UK economy, particularly manufacturing, grow as a result of the agreement. Reductions in regulatory restrictions to trade in services are also central driving factors.

On goods, the largest contributions come from the UK's advanced manufacturers, with expansions in the manufacture of machinery (+£46 million) and motor vehicles (+£43 million). This is driven by reductions in tariffs and non-tariff measures.

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 gives rise to adjustment costs for affected sectors, businesses, and their employees. The overall structure of the UK economy remains broadly unchanged by the agreement. However, part of the gains results from a reallocation of resources away from agriculture, forestry, and fishing (around -£48 million) and semi-processed foods (around -£97 million). This supports growth in the services sectors set out above, as well as certain manufacturing sectors.

Just as the UK is competitive in the business and financial services sectors, New Zealand is a competitive producer of agricultural products. The modelling suggests the potential for the deal to increase import competition for some agricultural products, notably cattle meat (beef/sheep). The potential and scale of any long run increase in imports are uncertain (box 2). Increased imports of these products could bring benefits

6 2035 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 New Zealand in 2035, it is further assumed that both countries lose market shares of partner import demand in line with their relative loss of global market shares (as projected in the Global Trade Outlook).
7 As with all modelling exercises, both the point estimates and the projections which they are applied to are subject to uncertainty.
8 For context, this amounts to £0.6 billion when compared to 2019 GDP.
9 Tariff reductions apply to goods that meet Rules of Origin requirements.

for consumers across the whole UK via lower prices and increased choice. However, there is a risk that any adjustment costs which do arise are borne by firms facing competition from foreign imports in areas with highly concentrated production.

The agreement includes mitigations which place upper limits on the potential for increases in imports in the near-term. For example, beef and lamb producers could be protected through measures including tariff rate quotas (TRQs) and product specific safeguards that last 15 years. These quotas will automatically apply the UK Global Tariff to imports above a certain volume threshold. Beef producers will be protected by a TRQ from years 1 to 10. From years 11 to 15 a product-specific safeguard should have a similar effect, imposing tariffs of up to 20% – above a volume threshold. For sheepmeat, a transitional TRQ will apply from years 1 to 15. Furthermore, in a given year, trade can only occur under this sheepmeat quota once New Zealand's WTO sheepmeat quota has reached 90% utilisation. A general bilateral safeguard mechanism will provide further temporary protections should industry face serious injury from increased imports as a direct consequence of the FTA. This applies to all products, including those within a TRQ. There are also TRQs for several other products, such as UK imports of butter, cheese, and apples.

Impacts on UK nations and regions

The agreement is expected to provide opportunities across the UK thereby supporting the levelling up of UK towns and communities. In the central estimates:

- the greatest proportional gains are expected in the **West Midlands** and the **North East,** equivalent to around £47 million and £17 million each year on a 2019 basis. The **North West** and **South East** are also expected to benefit by around £54 million and £85 million respectively. London is expected to receive the largest absolute gains of around £131 million
- **Wales**, **Scotland** and **Northern Ireland** combined could see an increase in GVA of around £52 million from the agreement

In the central estimates for sub-national impacts, all nations and regions of the UK are expected to increase output as a result of the agreement. The sub-national impacts are subject to a high degree of uncertainty. Sensitivity analysis shows that impacts on certain nations and regions of the UK are sensitive to assumptions regarding the presence and scale of local economic effects. If large local economic effects occurred, this could increase the net GVA gain in the North East, West Midlands and Yorkshire and the Humber. Conversely, similar effects could result in a net GVA loss for Northern Ireland.

The environment

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

The analysis suggests that overall greenhouse gas emissions associated with the production of goods and services in the UK are not estimated to change from the agreement. However, the agreement is expected to lead to an increase in emissions associated with the transport of goods from increases in trade with New Zealand. The estimates suggest that the increase in emissions associated with transport of goods could be around 0.13 and 0.14 $MtCO_2e$ each year. This is roughly a 50% increase in transport emissions associated with trade with New Zealand. This is very small when compared to UK production emissions in 2018 of around 500 $MtCO_2e$. The estimates do not account for the future decarbonisation of international shipping. This is the form of transport used to carry 97% of goods trade (by volume) between the UK and New Zealand.

The agreement includes an ambitious environment chapter, to encourage mutually supportive trade and environment policies. This reaffirms both Parties' commitments to the Paris Agreement and preserves the UK's right to regulate to meet its net zero climate commitments. It also contains commitments on a wide range of environmental issues, including fossil fuels, deforestation and marine pollution.

Next steps

The predicted impact of the agreement on the UK economy has been assessed using Computable General Equilibrium (CGE) modelling. This modelling provides an indication of the relative orders of magnitude of the impacts. This is a widely used approach to quantify the impacts of free trade agreements and regarded as the best in class. However, the analysis does not capture the full range of potential dynamic impacts of the agreement and the predicted impacts are inherently uncertain.

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. DIT will monitor the implementation and conduct a comprehensive ex-post evaluation for the agreement (section 8).

Figure 1A: Existing trade in numbers

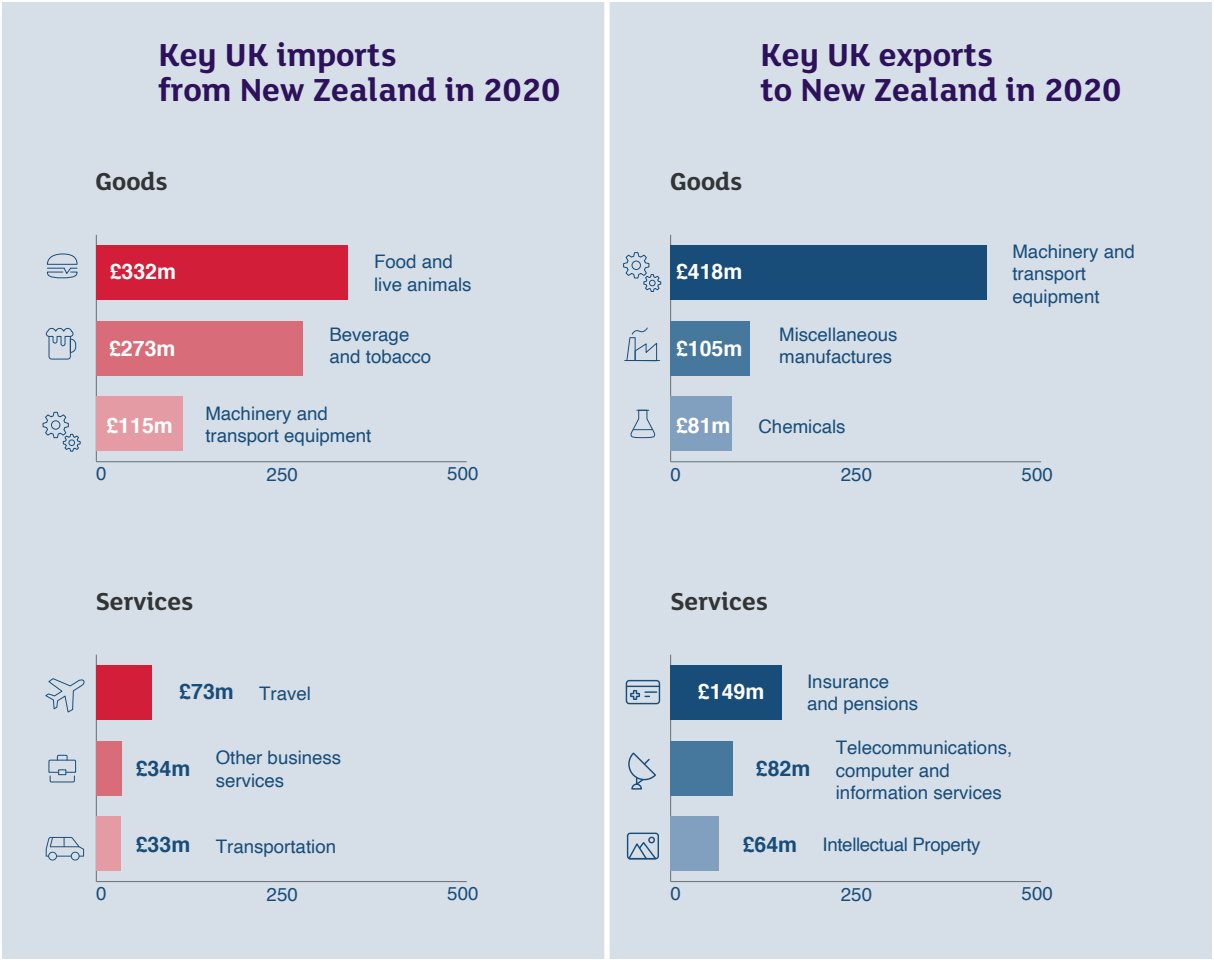
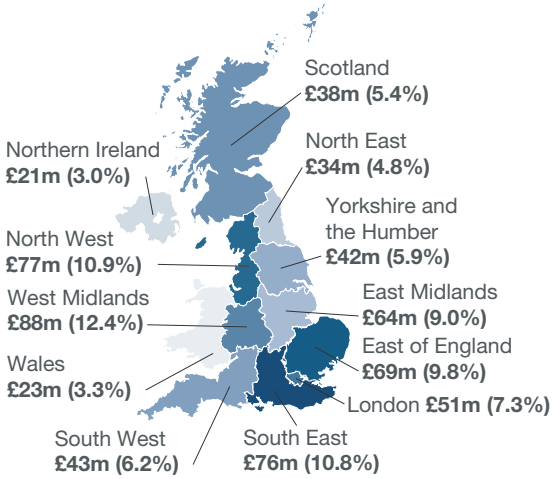


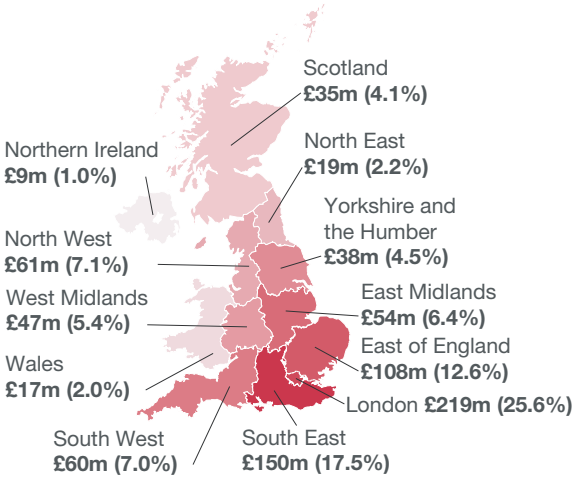
Figure 1B Regional trade with New Zealand

Regional trade with New Zealand

Goods exports in 2020 to New Zealand



Goods Imports in 2020 from New Zealand



Foreign Direct Investment	
£806m the value of FDI from New Zealand to the UK in 2020	**£900m** the value of FDI from the UK to New Zealand in 2020

Jobs Supported	
9,000 direct jobs supported by UK exports to New Zealand	**7,000 indirect jobs** supported by UK exports to New Zealand

1. Background

The UK and New Zealand have negotiated a free trade agreement (FTA) which aims to enhance the UK and New Zealand's trade and investment relationship.

In July 2018, the government launched a public consultation to inform the negotiations. In June 2020, the government published negotiation objectives, a response to the public consultation and a scoping assessment.

The government launched negotiations with New Zealand in June 2020, resulting in signature of the final agreement in February 2022.

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.

Certain chapters of this FTA may require primary legislation for implementation (for example Procurement). When this legislation is laid in Parliament, an assessment of its impacts will be published.

2. Rationale

This section explains key elements in the rationale for undertaking a trade agreement with New Zealand.

The FTA is an ambitious agreement which aims to create key opportunities for the UK:

- **the agreement provides further opportunity for the UK to work more closely with a key ally in areas of strategic interest.** It strengthens ties with a like-minded partner in economic fora such as the WTO, and allows greater cooperation on areas such as digital trade, the environment and trade and gender equality
- **a comprehensive FTA is expected to bolster an established trade and investment relationship,** by delivering meaningful tariff and non-tariff barrier reductions across goods and services, leading to long term economic benefits across all nations and regions of the UK including jobs and economic growth
- **the agreement is designed to enhance already strong people to people ties,** simplifying business travel between the two countries including making it easier for UK professionals to practise in New Zealand
- **it illustrates our commitment to and the reorientation of our trading relationships towards the wider Indo-Pacific region.** It also demonstrates a long term commitment to a founding member of CPTPP

Enhancing cooperation on strategic priorities

Securing a comprehensive FTA with New Zealand improves our wider relationship with an important geo-strategic ally. We already work closely with New Zealand in multilateral fora like the United Nations and the Commonwealth and are both members of the Five Eyes intelligence alliance. Securing a deal with a like-minded partner with mutual interests on progressive issues such as sustainable trade is an important signal of our approach to trade policy. New Zealand is also an influential voice and valuable partner in areas such as WTO reform.

The provisions in this deep and comprehensive FTA between the UK and New Zealand can further strengthen strategic and economic cooperation between two countries:

- **the environment** – this FTA includes a comprehensive chapter on the environment that reinforces our commitment to the Paris Agreement temperature goals and our efforts to meet net zero by 2050. It also sets out areas of cooperation including on the growth of a clean economy, highlighting the role the UK and New Zealand are playing as global leaders in this space
- **digital** – this chapter in the agreement details the steps the UK and New Zealand have pledged to take to reduce barriers in digital trade. This includes specific commitments on trade facilitation, safeguards for businesses and data flows
- **labour** – this chapter in the agreement reaffirms commitments to international standards and labour protections to ensure open and fair competition. The parties also commit to not derogate from their labour standards with a view to boosting competitiveness. It contains provisions addressing other areas of trade and labour, including on gender equality in trade and the workplace, tackling modern slavery in supply chains, and promoting quality employment and decent working conditions. The chapter includes mechanisms for domestic stakeholders to provide input on the implementation of the chapter and allows for the use of the dispute settlement mechanism
- **animal welfare** – the forward-looking provisions in the chapter reflect the UK's commitment to upholding our high standards on animal welfare. We have agreed a non-regression and non-derogation clause to not weaken animal welfare standards for farmed animals in order to encourage trade or investment between New Zealand and the UK

Opportunity for a modern and comprehensive FTA...

The UK-New Zealand FTA is a modern, comprehensive and deep trade agreement. It removes tariffs on all UK goods exports at entry into force. It is tailored to the UK's strengths, guaranteeing access for services providers and the tech industry that sustain millions of jobs across the country.

The agreement is expected to help firms enjoy increased market access opportunities when trading with New Zealand. In the absence of an FTA, UK firms trade with New Zealand on Most Favoured Nation (MFN) terms.[10] This reduces market access opportunities relative to business in countries that have an FTA with New Zealand. For example:

- tariffs – UK exports will no longer be subject to tariffs on goods including buses, gin, clothing, biscuits and wine, reducing costs in the New Zealand import market, a market which is expected to grow by around 41% by 2035.[11] At the same time high-quality products from New Zealand will become more affordable, including Marlborough Sauvignon Blanc, Pinot Noir, Pinot Gris and Riesling wines, Manuka Honey, wagyu beef and kiwi fruit
- tariff reductions can also support the levelling up agenda. 80% of the gains from tariff reductions on exports apply to goods originating outside of London and the South East – with 17% of the gains accrued by the West Midlands alone[12]

Modern provisions include a novel chapter on trade and gender equality that aims to support women to fully access the opportunities of free trade. Our countries have agreed to work together to break down systemic barriers that prevent women from participating equitably in the global economy and promote the importance of a gender perspective in the UK and New Zealand's trade and investment relationship.

...building on comparative advantage and economic gains from enhancing an established trade and investment relationship

The UK trades a broad range of goods with New Zealand and has a comparative advantage in complementary sectors, including financial and business services. The agreement offers the opportunity for continued specialisation. Both the UK and New Zealand already trade along the lines of their comparative advantage. For example, financial services are one of the UK's key exports. The UK exported £62 million of financial services to New Zealand in 2020 – around 10% of the UK's total service exports to the country.[13] Food and animals are one of the UK's highest imports from New Zealand – accounting for 38% of the total. Road vehicles are the UK's most exported good to New Zealand – which is also an area of comparative advantage for the UK. Industries in which both economies are specialised will offer opportunities for intra-industry trade and strengthened supply chains.

10 Tariffs are normally applied on an MFN basis. This means that there can be no discrimination in duties applied to goods from any World Trade Organization member, unless there is a preferential trade agreement.
11 2035 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook, (September 2021).
12 A full breakdown is available in Annex 3.
13 UK trade in services: service type by partner country, non-seasonally adjusted (October 2021).

Table 1: Relative export specialisation by sector[14]

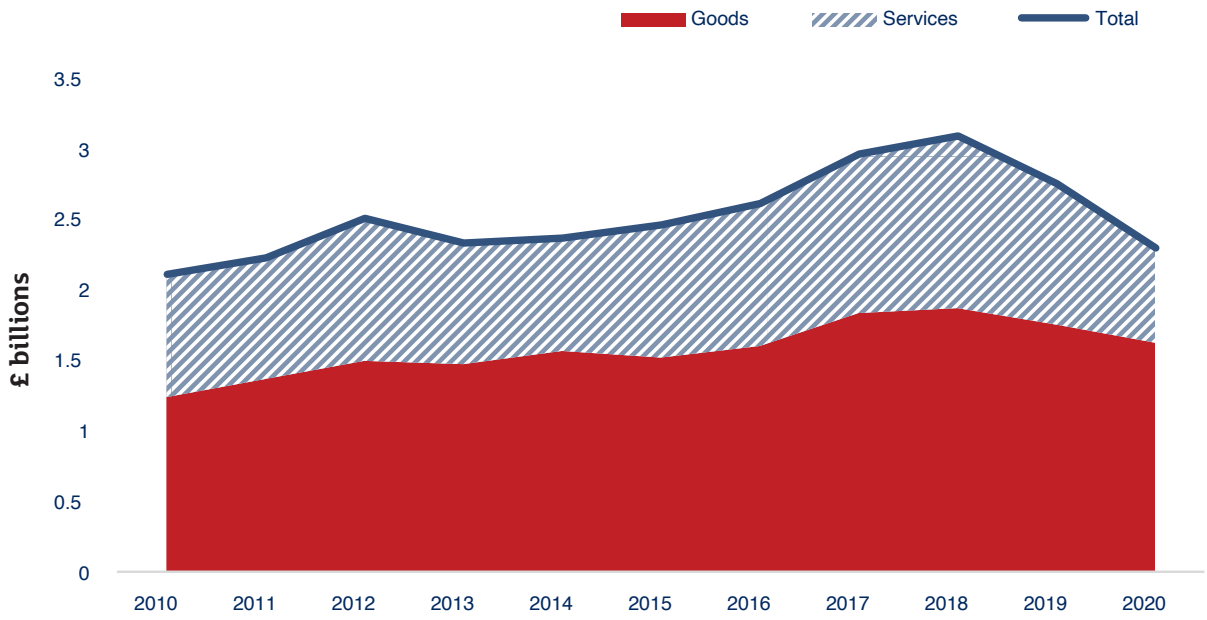
		UK RCA	NZ RCA
Agri-foods	Agriculture	-0.60	0.20
	Beverages and tobacco products	0.26	0.07
	Semi-processed foods	-0.38	0.82
	Processed foods	-0.19	0.10
Industry	Chemical, rubber, plastic products	0.19	-0.13
	Electronic equipment	-1.78	-0.24
	Energy	-3.34	-0.28
	Manufactures of materials	0.75	-0.06
	Motor vehicles and parts	0.69	-0.16
	Other machinery and equipment	-0.99	-0.18
	Other manufacturing	-0.22	-0.04
	Other transport equipment	0.60	-0.05
	Paper and printing products	0.00	0.02
	Textiles, apparel, and leather	-0.96	-0.09
Services	Business services	2.53	-0.05
	Communications	0.66	0.00
	Construction	-0.08	-0.01
	Financial services	2.07	-0.03
	Insurance	0.44	-0.01
	Other services (transport, water, dwellings)	0.11	0.04
	Personal services	0.22	0.05
	Public services	0.02	0.01
	Wholesale and retail trade	-0.01	0.02

Source: GTAP10 and DIT calculations (2021)

The UK and New Zealand have an established trade relationship and the agreement offers the opportunity to develop this. Total trade between the two countries was £2.3 billion in 2020. It was growing between 2010 and 2018, but fell in in 2019 and again in 2020 due to the impact of the coronavirus pandemic. DIT's projections suggest that the New Zealand import market could grow by around £20 billion between 2019 and 2035.[15] This represents a 41% increase in the size of the import market in real terms (today's prices) compared to 2019. Between 2019 and 2035, DIT projections suggest New Zealand GDP could also increase by 41% in real terms. The agreement aims to provide opportunities for UK businesses to expand into new markets in New Zealand.

14 23 Sectors are an aggregation of the 65 GTAP Sectors. 'Normalised Revealed Comparative Advantage formula retrieved from: Yu R., Cai J., and Leung P. (2009). 'The Normalized Revealed Comparative Advantage Index, The Annals of Regional Science', 43(1): 267-282.
15 2035 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook, (September 2021).

Figure 2: UK Trade (exports and imports) in goods and services with New Zealand 2010 to 2020



Source: UK total trade: all countries, non-seasonally adjusted, July – September 2021

New Zealand is also an important market for the UK's inward and outward foreign direct investment (FDI). In 2020 the stock of UK FDI in New Zealand was worth £900 million, while New Zealand FDI in the UK was worth £806 million. Elements of the agreement, including raising investment screening thresholds, are aimed at strengthening the investment relationship.

An FTA with New Zealand is expected to support jobs across the UK. Regulatory barriers will be reduced for the 5,900 UK SMEs who export goods to New Zealand.[16] These businesses employed 233,000 people in 2020. A dedicated SMEs chapter in the agreement includes practical support and participation in trade promotion programmes targeted at SMEs.

It is expected to generate opportunities for businesses in all UK nations and regions. In 2020 the West Midlands, North West and South East of England exported the greatest share of goods to New Zealand, while London, the South East and East of England imported the most goods.[17]

Strengthening people to people ties

The people of the UK and New Zealand have long-lasting, close economic and cultural links. We are united by a shared language, values, and history, and a common approach to trade that promotes high standards and the rule of law. Both countries are committed to reaching net zero by 2050, and cooperate closely on national security through alliances such as Five-Eyes.

Links between the UK and New Zealand are strengthened by the high proportion of UK-born people living in New Zealand. In 2018, 5.6% of New Zealand's population were born in the UK – or around 264,000 people. This makes those born in the UK the largest group of overseas born residents in the country.[18]

Personal travel has historically been a particularly important component of our trade with New Zealand. In 2019 around 188,000 visits were made to the UK by New Zealand residents in total.[19]

UK professionals such as lawyers and auditors will also be able to operate in New Zealand more easily thanks to the agreement. Both the UK and New Zealand take commitments that will facilitate the entry and temporary stay of a wide range of business persons. For example, it will be easier for UK lawyers and other professionals to supply services in New Zealand, allowing UK companies established in New Zealand to bring British talent with them.

16 HMRC, Trade in Goods by Business Characteristics.
17 HMRC Regional Trade Statistics (data extracted from the interactive tables in July 2021).
18 StatsNZ, 2018 Census totals by topic – national highlights.
19 ONS, Travel trends estimates: overseas residents in the UK (May 2020).

Reorientation towards the Indo-Pacific region

An FTA with New Zealand – a founding member of CPTPP – provides another major step towards UK accession to the agreement, and demonstrates the UK's commitment to the Indo-Pacific region. The UK is negotiating to join CPTPP, a free trade area of 11 Indo-Pacific nations, including New Zealand, covering £8.4 trillion in GDP.[20] It will increase the UK's access to a growing market which includes some of the world's fast-growing economies. CPTPP members' economies accounted for £110 billion worth of UK trade in 2019. DIT's projections suggest the potential for UK exports to CPTPP members to increase by 55% in real terms by 2035 (from £57 billion to £88 billion) in the absence of an agreement.[21]

Analysis by DIT suggests that joining CPTPP could increase UK trade by around £3.3 billion in the long run relative to 2019 levels. This translates into higher wages for UK workers, with take-home pay estimated to increase by around £800 million relative to 2019 levels.[22] These benefits would be felt across the UK, supporting the levelling up agenda. The greatest relative gains would be experienced in the West Midlands, Scotland, and Northern Ireland.

20 IMF World Economic Outlook, April 2021, 2020 data.
21 DIT, Global trade outlook – September 2021 report.
22 DIT, UK approach to joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (June 2021).

3. The agreement

Summary

This section sets out some of the key provisions included in the agreement and summarises the rationale for government intervention for these provisions.

This comprehensive trade agreement aims to increase trade in goods and services and enhance investment and productivity, for the benefit of businesses, workers, and consumers.

The agreement includes tariff-free trade for all UK exports to New Zealand at entry into force, worth around £17 million annually on current trade alone. It will also eventually remove all tariffs imposed on New Zealand imports to the UK, while retaining protections for some products in sensitive sectors for the UK for a number of years.

It will minimise red tape for businesses across the UK, including through Good Regulatory Practice (GRP), modern rules of origin, commitments to transparent and efficient customs procedures and agreements on technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures.

There will be greater opportunities for UK investors looking to invest in New Zealand. New Zealand have agreed to increase investment screening thresholds for UK investors, which will generate savings for UK investors who owned £900 million worth of foreign direct investment in New Zealand in 2020.[23]

It will tackle barriers to digital and online trade, through specific commitments on electronic contracts and e-authentication, as well as guarantee the free flow of trusted data between the UK and New Zealand. In 2019, 40% of £651 million services exported to New Zealand were delivered digitally.[24]

Unprecedented commitments from New Zealand will mean UK service suppliers will be able to deliver service contracts more easily in person. It will also be easier for UK lawyers and other professionals to work in New Zealand.

It will encourage greater trade and investment in low carbon goods, services and technology, through the liberalisation of tariffs. The agreement also reinforces both countries commitments to the Paris Agreement and our efforts to meet net zero.

Goods Market Access – cutting tariffs

The agreement will see the liberalisation of all tariffs, making it cheaper for businesses to trade. This will help to boost goods trade, which accounts for a significant share of total UK-New Zealand trade. In 2020, 60% of total UK exports to New Zealand and 83% of total UK imports from New Zealand were goods.[25]

Tariff-free trade for UK exports

New Zealand will eliminate all tariffs on UK exports on the day the agreement enters into force, covering all £752 million goods exports in 2020. Prior to the agreement, over 38% of UK exports to New Zealand were subject to tariffs. As a result, imports of goods from the UK into New Zealand will become more competitive, providing UK businesses an advantage over international competitors in the New Zealand market, a market which is expected to grow by 41% by 2035.[26]

Duties of up to 10% will be eliminated on UK exports to New Zealand, including products such as buses, motorhomes, clothing and footwear. Tariffs of up to 5% on UK agri-food products, such as gin and chocolate, will also be eliminated.[27]

23 ONS 'Foreign direct investment involving UK companies: 2020'
24 ONS 'Trade in Services by Modes of Supply, UK:2019'
25 ONS, UK total trade: all countries, non-seasonally adjusted, July to September 2021.
26 2035 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook, (September 2021).
27 MacMap (2019). Ad valorem equivalent rates calculated for specific duties.

Based on historic trade flows, the total annual tariff reductions on UK exports to New Zealand are estimated to be worth around £17 million at entry into force. This is without considering potential increases in UK exports to New Zealand resulting from this agreement.

Tariff removal on imports

The agreement also liberalises tariffs on UK imports from NZ. Whilst 51.8% of current UK imports from New Zealand can already enter tariff free under the UK Global Tariff regime, the agreement will allow a further 41.2% of current UK imports from New Zealand to enter tariff free immediately.[28] The agreement also establishes the phased elimination of tariffs on 7% of current UK imports from New Zealand.[29]

The agreement will see the removal of tariffs on products currently imported from New Zealand such as wine, honey, and kiwi fruit. This could make popular New Zealand products more affordable for British consumers.

Based on historic trade flows, the total annual tariff reductions on UK imports from New Zealand are estimated to be up to approximately £35.0 million on entry into force, and £39.7 million at the end of applied staging (on the basis that existing imports into New Zealand from the UK do not change).

Box 1: Protections for sensitive sectors in the UK

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. These measures apply to exports of goods from New Zealand to the UK and include:

- **beef and sheepmeat:** Transitional Tariff Rate Quotas (TRQs) will allow for a phased increase in the volume of tariff free beef and sheepmeat that can be imported to the UK, before these products are fully liberalised after year 15:
  - increasing TRQ volume for beef over 10 years, rising in equal instalments from 12,000 tonnes upon entry into force to 38,820 tonnes in year 10. Out of quota tariffs will remain at most-favoured-nation (MFN) rates until year 10 and then be eliminated
  - subsequently, a product specific safeguard for beef will be implemented between years 11-15, imposing tariffs of up to 20% on beef above a rising trigger volume which will open at 43,056 tonnes in year 11 and increase to 60,000 tonnes by year 15
  - increasing TRQ volumes on sheepmeat of 35,000 tonnes per year in years 1-4, rising to 50,000 tonnes in years 5-15. Out of quota tariffs will remain at MFN until after year 15 and then be eliminated
- **dairy:** tariffs on cheese and butter will be gradually eliminated in equal instalments over 5 years. During this time, tariff free quotas will be offered. The cheese quota will open at 24,000 tonnes increasing in equal instalments to 48,000 tonnes in year 5. The butter quota will open at 7,000 tonnes increasing in equal instalments to 15,000 tonnes in year 5. Both products will be tariff free and quota free from year 6 onwards
- **fresh apples:** apples imported between 1 January to 31 July will be tariff free from entry into force. Tariffs between 1 August and 31 December will be fully liberalised in equal instalments over 3 years. During this time a seasonal duty-free transitional quota will be available, set at 20,000 tonnes a year for 3 years

In addition to these product-specific measures, a general bilateral safeguard mechanism will also apply to all goods 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.

Modern Rules of Origin

Modern Rules of Origin will allow UK products to qualify for the preferential tariffs agreed in this FTA even if they incorporate imported ingredients and parts. This reflects modern production processes and the existing and future global value chains of UK businesses, whilst also maintaining protections on key UK sensitive sectors. The rules ensure that only products made in the UK and New Zealand benefit under the agreement particularly in areas where there may be a risk of circumvention or illegitimate competition. Most businesses looking to use the preferential tariffs will not need to significantly change their supply chains. However, businesses that are unable to meet the rules of origin agreed in this deal, will still be able to export their products to New Zealand using non-preferential tariffs.

28 This also includes sheepmeat imports from New Zealand, which is currently imported tariff free under a World Trade Organisation Tariff Rate Quota. This quota is underfilled and is therefore not binding. Additional protections (tariff rate quotas) for sheepmeat have been agreed as part of the agreement. Sheepmeat accounted for 28.2% of UK imports from New Zealand between 2017-19.
29 These figures relate to existing average UK imports from New Zealand, between 2017-19. These figures do not relate to potential future trade.

The commitments agreed in this deal will ensure that administrative procedures will be efficient, minimising costs and red tape by making it simple for traders to prove the originating status of goods. UK exporters will be able to make use of inward processing relief for imported materials and still qualify for preferential treatment when exporting to New Zealand. Product specific rules for most non-agricultural goods include a regional value content (RVC) option. Businesses exporting and importing non-agricultural goods will also be able to use 'build-up' or 'build-down' value calculations to determine whether their good is originating in the UK/New Zealand. These two methods for calculating the RVC of a good are more flexible than the method used in prior EU and UK continuity agreements.

The agreement does not include requirements for ingredients to be wholly obtained when used in processed foods – instead a change in tariff classification rule tailored to each agricultural product has been agreed. Firms will not need to additionally consider 'insufficient processing' requirements when determining whether goods qualify for reduced tariffs. This means that as long as firms meet the product specific requirement, they will qualify for the reduced tariff.

Transparent and efficient customs procedures

The customs provisions of this FTA will help facilitate increased bilateral trade by ensuring that New Zealand and UK customs procedures are efficient, consistent, and transparent, while also allowing the UK and New Zealand to maintain effective customs control.

Goods will be released from customs within clear timeframes to provide certainty for graders and reduce costs, where possible. This means that if all requirements have been met, UK exports must be released as soon as possible after arrival, but as a maximum within 48 hours for perishable goods and expedited shipments, such as fast-tracked parcels. Advance rulings on tariff classification and origin must be issued within 90 days. Paperwork needed to release goods will be minimised where possible, and there will be no requirement to use a customs broker when importing or exporting goods. 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 we trade together, ensuring transparency and predictability at, and away from, the border.

New Zealand and the UK also commit to considering further simplifying procedures, including by reducing data requirements for traders fulfilling certain defined criteria.

Sanitary and phytosanitary (SPS) measures

New Zealand and the UK already have a Sanitary Agreement in place that recognises the equivalence of sanitary measures (covering trade in animals and products of animal origin) maintained by both Parties for the protection of public and animal health. The UK and New Zealand have agreed to amend the Sanitary Agreement to cover composite products. Therefore, the FTA SPS chapter focuses on phytosanitary measures (covering plants, plant products, and processed plant-based foods). The chapter builds on the Parties' WTO obligations by including additional provisions that facilitate trade while ensuring protection of human and plant life and health. Imports will still have to meet the same respective food safety and biosecurity standards in New Zealand and the UK. Both the UK and New Zealand will continue to maintain independent SPS regimes.

The chapter includes provisions on how equivalence of UK and New Zealand SPS measures can be agreed where they achieve the other country's standards to make it easier for producers to export, and how regional pest outbreaks can be managed to maintain trade flows. Transparency commitments are included to promote the exchange of information. Effective mechanisms have been put in place to collaboratively resolve any issues at a technical level in the unlikely event that they occur. The agreement also includes commitments to cooperate on combatting antimicrobial resistance both bilaterally and in relevant international fora.

Animal welfare

The Animal Welfare chapter sets out how New Zealand and the UK will uphold their respective animal welfare standards and cooperate to promote the development of animal welfare standards in international fora. The chapter includes recognition of animals as sentient beings and acknowledges both Parties' right to regulate on animal welfare and to set their respective policies and priorities for the protection of animal welfare.

The chapter includes a commitment on non-derogation, and a best endeavours non-regression commitment to not weaken animal welfare standards for farmed animals in a manner which materially impacts trade.

Technical barriers to trade

The agreement aims to address technical barriers to trade by promoting use of international standards. It also incorporates core principles of the WTO with respect to restricting discriminatory practices and ensuring that regulation is conducted in the least trade restrictive manner. Commitments to best practice on marking and labelling and conformity assessment should provide increased certainty for industry.

The agreement will also make it easier to establish when UK and New Zealand product laws are equivalent to each other. This will streamline our regulatory relationship and pave the way to reduce the number of products which need to meet two different sets of regulations.

Businesses are also expected to benefit from increased mutual cooperation in the development of technical regulations, standards, and conformity assessment. In particular, the UK and New Zealand will aim to increase cooperation on medicines, including veterinary medicines, medical devices and cosmetic products.

New Zealand and the UK have also agreed to a Wine and Distilled Spirits Annex which includes provisions on wine labelling which should increase certainty and reduce burdens in exporting to multiple markets for industry. The Annex will also commit the UK to recognise wine-making practices which New Zealand producers can use for wine imported into the UK. These practices have been assessed by the UK as meeting its quality and safety requirements. A side letter sets out the mechanism to assess further specific wine-making practices requested by New Zealand. The Annex also contains provisions which commit New Zealand to support a quality whiskey/whisky definition, and ensures that both Parties commit to mandatory and enforceable lot codes. A side letter affirms existing protections in New Zealand for Scottish localities for Whisky.

Services trade – guaranteed market access

The agreement includes highly ambitious provisions on services trade. This will help to boost services trade, which was worth £677 million in 2020, 29% of total trade between the UK and New Zealand. In 2020 UK services exports to New Zealand were worth £502 million, 40% of total UK exports to New Zealand and increased by 49% from 2009 to 2019.[30] The agreement creates significant opportunities for services trade to recover strongly from Covid through guaranteed access in areas such as mobility, transport, professional services, and commitments on domestic regulation. It provides for full market access for service suppliers except where specific reservations are made.

Increased certainty for services trade

Provisions have been agreed on services trade ensuring that service suppliers from both countries will benefit from market access comparable to New Zealand and the UK's best FTAs while also preserving both countries' ability to regulate in the public interest.

Specifically, the agreement ensures that New Zealand and UK businesses will benefit from the same treatment granted to local businesses. Where New Zealand grants access to service suppliers from other countries which goes beyond what New Zealand and the UK agreed, this access will be extended to UK service suppliers too.

Both countries have made additional commitments which reduce barriers to UK and New Zealand businesses operating in the other country's territory. This includes agreeing not to limit the number of businesses able to operate in a sector and not to require businesses to take a specific corporate form or to establish a physical presence before they can provide services in a market.

Both countries will take only limited exceptions to these obligations.

Standalone annexes and chapters will make sector-specific provisions for financial services, professional services, telecommunications, international maritime transport services, and express delivery services. There will also be a dedicated chapter for domestic regulation. Commitments in these chapters and annexes go beyond existing WTO commitments and reflect or exceed countries' best precedents in FTAs.

Opportunities for professionals

The agreement includes a dedicated professional services annex, including provisions to facilitate the recognition of professional qualifications in each other's jurisdiction. New Zealand and the UK will encourage their respective relevant bodies to operate a route to recognition for professionals with qualifications obtained in New Zealand and the UK who want to practice their profession in the other territory. The agreement also supports the UK's world-leading legal sector, through provisions which ensure that UK and New Zealand lawyers can continue to provide legal advisory services related to their respective home jurisdiction, foreign law (not including host jurisdiction), and international law, as well as to provide arbitration, mediation and conciliation services related to international, foreign, or their home jurisdiction law in the other country's territory without needing to requalify into the local legal profession. Relevant dialogues and architecture services provisions will encourage engagements and facilitate further collaborations between the UK and New Zealand relevant bodies.

30 ONS, UK total trade: all countries, non-seasonally adjusted, July to September 2021.

Dedicated provisions on financial services

In 2020, financial services was the UK's 4th largest services export sector to New Zealand and was worth £62 million.[31] The chapter goes beyond CPTPP in including additional cross-border commitments – including for general insurance and portfolio management services - and precedent-setting commitments to promote sustainable finance and diversity in finance through the sharing and promotion of best practice.

The core non-discrimination rules ensure that both UK and New Zealand firms cannot be treated unfairly when providing services in the other Parties' market. New Zealand and the UK also commit to facilitating the transfer of data internationally and prohibiting unjustifiable localisation of financial data, subject to certain exceptions, for example to protect privacy or personal data, or for public policy purposes. The agreement also supports innovation in financial services with commitments on the provision of new financial services. The agreement recognises the importance of transparency in facilitating the ability of financial service suppliers to gain access and operate in each other's markets.

Dedicated provisions on international maritime transport services (IMTS)

Provisions on IMTS throughout the agreement, including an unprecedented IMTS annex, ensure non-discriminatory treatment of UK shipping companies and UK-flagged vessels through sector-specific obligations – for example in accessing ports and related services – as well as agreed market access for both UK and New Zealand flagged vessels.

Dedicated provisions on express delivery services (EDS)

The agreement also includes a specific annex on EDS that ensures a level playing field for current or prospective UK service suppliers operating in the New Zealand market. For example, the annex prevents any cross-subsidisation of New Zealand Post's competitive EDS by services delivered under their universal service obligation.

A standalone domestic regulation chapter

The chapter on domestic regulation reflects both countries' support for ambitious rules which build on the WTO Joint Initiative. This seeks to address 'behind the border' barriers to ensure businesses have greater certainties of procedural fairness when seeking authorisation to supply a service or invest in each-other's markets. Provisions are designed to ensure that each side's licensing and qualification requirements and procedures are transparent, non-discriminatory and not unduly burdensome. The chapter applies to both services and non-services sectors.

Mobility – enhanced opportunities to travel

The agreement will provide more certainty and clarity for business people to travel between the UK and New Zealand. This will improve business travel for UK residents to New Zealand. In 2019, 5% (£61 million) of total services trade between the United Kingdom and New Zealand, was delivered by the presence of individuals to provide a service (known as mode 4).[32]

Employees of a UK firm with a contract to supply services in New Zealand will be able to travel to New Zealand to fulfil that contract. We have secured access for key sectors such as audit, legal services and management consultancy which presents a new commitment in New Zealand's FTAs. This will be facilitated through a new immigration route for UK service suppliers covered under this agreement.

UK businesses will also have certainty that they can transfer their managers and specialists to their locations in New Zealand. This applies to all sectors. Transferees will be able to stay an initial period of three years and bring their partner and children with them.

Highly skilled independent contractors can enter New Zealand to fulfil a contract, such as self-employed accountants or management consultants.

Business visitors are included and the agreement provides clarity on the business activities they are able to perform. The agreement also provides clearer requirements on documentation, fees, timeframes, and rules for visa applications, helping stakeholders to navigate the process and take advantage of new opportunities. Neither the UK nor New Zealand will apply economic needs tests for business visitors or intra company transferees. New Zealand also makes commitments on installers and servicers.

31 ONS, UK Trade in Services: Services type by partner country, non-seasonally adjusted, (October 2021).
32 ONS, Trade in services by mode of supply, UK: 2019 (November 2020).

Investment – encouraging investment between the UK and New Zealand

This agreement will help the important investment relationship between the UK and New Zealand, supporting jobs in our towns and cities. In 2020, the stock of foreign direct investment (FDI) from New Zealand in the UK was £806 million and the corresponding UK investment in New Zealand was worth £900 million.[33] The UK is the 4th largest destination for New Zealand investment and the 6th largest investor in New Zealand.[34]

The agreement makes it easier for businesses to invest across the economy, with provisions that go beyond those included in CPTPP. This will increase transparency and create greater legal certainty for businesses.

Higher screening thresholds for UK investments into New Zealand will see more transactions made by UK investors coming under the threshold, making it quicker, easier and less costly to invest in New Zealand.

The agreement also ensures that UK investors will not be discriminated against and will protect their assets from expropriation without compensation. These protections operate alongside the government's inherent right to regulate in the public interest.

Procurement – a high quality chapter with additional market access commitments

The agreement includes a chapter on government procurement that expands on the commitments both Parties share as members of the WTO's Government Procurement Agreement. These additions include provisions to facilitate the participation of small and medium sized enterprises in procurement processes and promotes the use of paperless procurement, ensuring suppliers have easy access to information about procurement opportunities. As well as these areas, the chapter includes provisions aimed at tackling corruption in procurement and continued cooperation on promoting international liberalisation of government procurement markets.

Both countries have also committed to opening up market access beyond the level set through the WTO's Government Procurement Agreement. This will give suppliers, from both the UK and New Zealand, greater guaranteed access to opportunities in each other's government procurement markets. The UK and New Zealand have also committed to returning to the table to negotiate greater market access opportunities in the future should New Zealand reform their procurement rules or offer other market access opportunities to another trading partner.

Digital – tackling barriers to digital and online trade

Digital provisions are cross-cutting, thereby supporting the whole of UK trade with New Zealand, worth £2.3 billion in 2020.[35] The ONS estimates that 40% of UK services exports to New Zealand were supplied remotely in 2019, whilst roughly one quarter of UK services imports from New Zealand were supplied remotely. In 2019, the UK already exported £321 million worth of services to New Zealand via digital delivery.[36] The global market for digitally delivered services was worth $3.7 trillion in 2017 and is growing. Between 2005 and 2017, digitally delivered services accounted for two thirds of global growth in cross-border trade in services.[37]

The UK and New Zealand deal will help to tackle barriers to digital trade across all sectors of the economy, including specific commitments on trade facilitation, safeguards for businesses and data flows.

The UK and New Zealand have agreed to maintain laws that support e-commerce. The agreement includes commitments that ensure businesses and consumers can conclude legally binding contracts electronically and authenticate themselves easily digitally. Other measures that build trust in the digital economy, include commitments to minimise the receipt of unsolicited commercial electronic messages (spam) and to support cooperation between the UK and New Zealand in developing their Digital Identities Frameworks.

33 ONS, Foreign direct investment involving UK companies: 2019.
34 StatsNZ, Balance of Payments and international investment positions: Year ended 31 March 2021.
35 ONS, UK total trade: all countries, non-seasonally adjusted, July to September 2021.
36 ONS, Trade in services by mode of supply, UK: 2019 (November 2020).
37 WTO (2019), Trade in Services data by mode of supply (TISMOS). This is for cross-border trade in services and excludes Mode 3.

The UK and New Zealand have agreed that neither will force companies to hand over their encryption keys before entering the market.

The countries have also agreed to facilitate the free flow of data, prohibit unjustifiable data localisation requirements, and protect personal information. This means that UK businesses operating in New Zealand can plan their business growth knowing that they can collect, process, and transfer data between the two countries, without facing unnecessary red tape. The commitments made in the UK-New Zealand FTA do not alter or undermine the UK's domestic legislation on personal data protection. Onward transfers to third parties are still governed by the UK's Data Protection Act 2018.

Consumer Protection – first of its kind in the UK's new FTAs

The Consumer Protection chapter is the first of its kind in the UK's new trade deals. It will recognise the importance of consumer trust and confidence in enabling consumers to access the benefits of trade in both countries. The chapter will include commitments to uphold consumer protection rights and ensure that consumers continue to benefit from trade in both online and offline settings.

The deal requires goods to be of satisfactory quality at the time of delivery and consistent with the supplier's claims regarding the quality of the goods. It also requires services to be performed with reasonable skill and care, in a reasonable time and consistent with the supplier's claims regarding quality.

The UK and New Zealand have also made firm commitments to protect consumers from fraudulent, deceptive, misleading, or unfair commercial practices. Commitments have also been made to work together to identify what the obstacles might be for consumers trying to access redress mechanisms for claims involving suppliers from the other country.

The agreement will give additional protections to a highly important element of UK-New Zealand trade: in 2019, total consumer goods trade (exports plus imports) between the UK and New Zealand was around £773 million.[38] This accounted for 46% of all goods trade between the UK and New Zealand.

Telecommunications – fairness, transparency, and non-discrimination

The agreement includes an ambitious Telecommunications chapter that ensures service suppliers have transparent, reasonable, and non-discriminatory access to the UK's and New Zealand's public telecommunications networks and services, to build on existing trade worth £8 million in 2020.[39] This includes access to essential facilities and interconnection commitments.

The UK and New Zealand have also agreed regulatory principles which set out the requirements relating to the independence of regulatory authorities responsible for any regulation of telecommunications. Where regulatory interventions, such as Universal Service Obligations or Authorisation, are sought these should be reasonable, transparent, and not more burdensome than necessary. These rules create a level-playing field for suppliers seeking to enter the market.

Commitments on the adoption and maintenance of competitive safeguards and approaches to regulation will prevent anti-competitive practices in the market, necessary to ensure suppliers of all sizes can enter the market and create further competition.

Both the UK and New Zealand have agreed to rules which will benefit consumers, such as on number portability and on international mobile roaming.

Greater cooperation will be forged by exchanging information on opportunities and challenges in the telecommunications sector and working together in international fora to promote a shared approach to international standards.

These commitments will all be reinforced by agreeing a mechanism which allows operators to refer their dispute to the telecommunications regulatory authority for consideration. This reinforces investor confidence in the market.

The agreement ensures the UK and New Zealand will protect the security and integrity of their telecommunications networks. Both countries will also work together in international forums to promote a shared approach to telecommunications regulatory frameworks, security and diversification.

38 WITS, United Kingdom product exports and imports 2019.
39 ONS, UK Trade in Services: Services type by partner country, non-seasonally adjusted (July 2021)

Intellectual property (IP) rights – comprehensive provisions

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. The agreement includes a provision on Artist's Resale Rights which New Zealand commits to adopting within two years of entry into force. Once in place, this reciprocal arrangement will provide new income streams for our visual artists. New Zealand has committed to extend the term of copyright and rights in performances. This will align with the UK term of protection and shall be implemented within 15 years of the agreement coming into force. Owners of rights in original works, performances, and sound recordings will then enjoy remuneration for a further 20 years when their works are exploited in New Zealand.

The agreement includes provisions relating to the registration and renewal of trade marks. New Zealand will make all reasonable efforts to accede to the Geneva Act of the Hague Agreement,[40] which would improve efficiency for users seeking to register their designs internationally.

The agreement will support enforcement against online intellectual property infringement, which includes enshrining the availability of injunctive relief to block infringing websites. The enforcement text also enshrines the availability of alternate dispute resolution mechanisms, supporting voluntary initiatives with industry and public awareness-raising to address intellectual property infringement.

In respect of Geographical Indications (GIs), the agreement provides that if New Zealand introduces a bespoke scheme for agricultural products or foodstuffs, or substantively amends its domestic GI system, New Zealand and the UK will review and amend the agreement to ensure this protection is afforded through the FTA to UK GIs in New Zealand and to New Zealand GIs in the UK. If these conditions have not been met after two years, the GI provisions will be reviewed by the UK and New Zealand. This will ensure UK GIs always have access to the highest standard of protection available in New Zealand and encourage greater mutual recognition and export of each country's unique local foods in the future.

The chapter also includes provisions covering co-operation on genetic resources, traditional knowledge and traditional cultural expressions with respect to discussions taking place at the World Intellectual Property Organisation (WIPO) Inter Governmental Committee (IGC). The chapter commits both countries to working together to promote multi-lateral outcomes on these issues at the WIPO IGC and to providing for review of these provisions in the agreement.

Environment – strengthening cooperation and promoting mutually supportive trade and environmental policies

The environment chapter promotes mutually supportive trade and environmental policies and supports the UK's and New Zealand's transition to net zero. This includes commitments to promote trade and investment in low carbon goods, services and technology, with the biggest list of environmental goods with tariffs liberalised on entry into force, in an FTA to date.

The agreement preserves the rights of both the UK and New Zealand to regulate to meet climate change and environmental protection objectives. Both Parties reaffirm their shared commitment to implement the Paris Agreement and other multilateral environmental agreements.

The chapter contains precedent-setting FTA commitments including to end unabated coal use for electricity generation, take steps to eliminate harmful fossil fuel subsidies where they exist, and pursue an ambitious phase down of hydrofluorocarbons.

It also contains commitments on key climate and environmental issues, such as tackling deforestation, biodiversity and sustainable agriculture.

The chapter creates commitments which may be enforced through dispute settlement, should any of the Parties fail to meet them.

40 Geneva Act of the Hague Agreement Concerning the International Registration of Industrial Designs, done at Geneva on July 2, 1999.

Development – cooperation, best practice and monitoring

This agreement includes one of the first ever dedicated development chapters within a bilateral FTA between two advanced economies, with new mechanisms in place to extend the benefits of increased trade to developing countries. For example, the UK and New Zealand may share best practice on technical assistance and capacity building, cooperate in international fora, and consider how changing trade flows can affect developing countries through monitoring the development impacts of the agreement.

There are also provisions relating to trade and development in other chapters of the agreement – including Rules of Origin, Technical Barriers to Trade, Digital Trade, Trade and Gender Equality, and Cross Border Trade in Services. These provisions will ensure the whole FTA supports mutual trade and development objectives.

Trade and Gender Equality – ensuring a gender perspective across the agreement

The agreement includes a dedicated chapter on Trade and Gender Equality alongside gender equality provisions across the agreement. The UK and New Zealand agree to cooperate to support women as workers, business owners and entrepreneurs to access the full benefits of this agreement.

This includes agreement to work together to address barriers for women in trade such as lack of access to markets, business and leadership networks, or finance. Future cooperation may focus on promoting equal opportunities for women in the workplace, financial inclusion, developing trade missions for women entrepreneurs, and promoting access to digital skills and online business tools. To ensure that future interventions are driven by evidence, the UK and New Zealand have agreed to develop a framework for analysing sex or gender-disaggregated data, and gender-focused analysis of trade policies.

The Trade and Gender Equality chapter complements several provisions across other chapters of this agreement which seek to advance gender equality or women's economic empowerment. This includes in areas such as services, small and medium sized enterprises, financial services, government procurement, labour and digital trade.

Small and Medium-sized Enterprises (SMEs) – promoting participation

The Small and Medium-sized Enterprises (SMEs) chapter commits both Parties to help SMEs to take advantage of the opportunities arising from the agreement and to encourage SME participation in international trade.

The chapter will require both New Zealand and the UK to publish information about the agreement that is considered useful for SMEs. Information will be provided in digital form that SMEs can draw on when trading, investing, or doing business in our respective markets.

Provisions within the chapter will facilitate cooperation between New Zealand and the UK to support SMEs' access to international markets and global supply chains. Cooperation may include exchanging best practice, working together to support SMEs to participate in digital trade and e-commerce, and running promotional activities targeted at SMEs such as joint roadshows to promote the agreement and the opportunities it creates for them. These and other cooperation activities should help SMEs take full advantage of the agreement.

New Zealand and the UK also commit to a range of additional outcomes across the agreement which are targeted at reducing the compliance barriers and costs SMEs face when exporting.

Reducing further non-tariff obstacles to businesses

An FTA can reduce uncertainty in the regulatory environment for firms when operating abroad. For example, the Good Regulatory Practice chapter provides for the Parties to maintain transparent, effective and predictable regulatory systems to help UK traders feel more confident exporting to New Zealand. UK firms should also have greater assurance that they will compete on an equal footing with domestic firms due to the Competition and State-owned Enterprises chapters.

4. Overall impacts of the UK-New Zealand agreement

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 department's Computable General Equilibrium (CGE) model which provides a comparative static analysis. The estimates are applied to economic projections of the global economy from DIT's Global Trade Outlook to generate the most representative value for the expected long run pound value of the agreement (expressed in today's money).[41] 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 of the agreement.

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

- **a long run boost to UK GDP.** In the central estimates, the agreement is estimated to increase UK GDP by the equivalent of around £800 million when applied to projections of UK GDP in 2035 levels, which is the equivalent of a 0.03% increase against the baseline. The estimates and the projections to which they are applied are both subject to uncertainty: therefore, the point estimates are not precise estimates and should be interpreted as indicative of the direction and broad scale of impacts
- **more opportunities for UK exporters, as UK exports are estimated to rise.** As UK goods and services become more competitive in the New Zealand market, UK exports to New Zealand are estimated to increase by £700 million, when compared to projected levels in 2035 in the absence of the FTA
- **businesses and consumers are set to benefit from greater access to New Zealand products.** Imports of New Zealand goods and services are estimated to increase by £1 billion when compared to projections of 2035 levels. While increased imports can enhance competition, a significant share of the estimated increase in imports from New Zealand are expected to replace imports to the UK from other countries as businesses switch to better value and easier to source inputs from New Zealand
- **better paid jobs.** The modelling estimates an increase in wages for UK households by around £200 million every year in the long run compared to 2019 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 21 out of 23 sectors contribute to increased output as they take advantage of the opportunities in the agreement. Some sectors, such as the agriculture and semi-processed foods sector, are expected to see an increase in competition and are estimated to contract in domestic output relative to a baseline without the agreement
- **opportunities across the UK.** In the central estimates, all of the UK's nations and regions are estimated to see an increase in output, with consumers across the UK expected to benefit from tariff reductions on imports from New Zealand

4.1 Economic gains from trade agreements

International evidence suggests that by reducing the costs of trade and investment, trade agreements can have a wide range of macroeconomic and social impacts while also having important distributional consequences across economic sectors, groups, and individuals.

Free trade agreements generate economic gains through a variety of channels, such as:[42]

- **gains through increased specialisation across sectors,** whereby enhanced access to international markets and imports reshapes the UK economy to specialise in producing goods, services, and sectors which it is relatively better at producing. Over the long run, greater specialisation increases the overall value of national output and income via the reallocation of resources towards expanding sectors of the economy

41 DIT, Global trade outlook – September 2021 report.
42 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'.

- **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, driving up the average productivity and wages within the sector, while at the same time, generating increased choice and lower prices for consumers
- **dynamic gains through trade-induced increases in productivity.** These result from businesses benefitting from greater economies of scale or scope, increases in investment and research and development stimulated by access to larger markets, reductions in inefficiencies due to increased competition, or from positive spillovers between firms

The distributional impacts of FTAs – that is, who is affected and by how much – depend upon the interaction of a range of complex factors. This includes the structure of each of the economies involved, what each country is relatively specialised in producing, sectoral patterns of trade in each country as well as the physical and institutional infrastructures in each country. In addition, the distributional impacts are impacted by the ability of individuals and firms to adjust to increased trade and short and long term domestic policies.

4.2 Approach to assessing macroeconomic impacts

The scale of the macroeconomic and sectoral impacts is estimated using Computable General Equilibrium (CGE) modelling undertaken by DIT. The modelling is based upon a comparative static approach, which 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 2020 Scoping Assessment

Technical changes to our economic modelling mean that the results in this impact assessment are not directly comparable to the modelling in the 2020 Scoping Assessment.

DIT'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. To inform the longer-term development of DIT's modelling approach and toolkit, DIT established an independent expert modelling review panel, to explore and inform ways to improve the department's modelling toolkit and approach to CGE modelling.

In response to a need to address a number of technical issues identified in the CGE model, DIT has implemented several technical changes to the CGE model applied in this assessment compared to the modelling undertaken in the 2020 Scoping Assessment for a UK-New Zealand FTA. These changes have been informed by suggestions of the Modelling Review Panel.

These include:

- updating the underlying data in the modelling to the latest data available in the GTAP 10 database to more closely reflect the pattern of global trade (section 4.3)
- undertaking the modelling at a more disaggregated sector level (the 61 sectors allowed by the GTAP 10 database) to reduce the potential for aggregation bias
- updating the UK tariff schedule to reflect the UK Global Tariff (UKGT) rather than the Common External Tariff (assumed in the previous modelling) to better reflect the tariff reductions agreed in the agreement (section 4.3)
- updating the inputs to better approximate the negotiated outcome (section 4.4)
- implementing changes to the modelling specification from a 'Melitz-style' model used in the previous modelling to an Armington specification in this modelling. The move towards the new model specification results in trade flows that are generally more responsive to reductions in trade costs and generates results that are less sensitive to technical parameter estimates in the model which have limited theoretical or empirical basis. These results from the new Armington model specification of the potential scale of impacts from the UK-New Zealand FTA are therefore more reliable and robust

The differences in model specification are explained further in Annex 1.

Limitations of CGE modelling

Despite these modelling developments, the comparative static CGE modelling is still subject to several limitations.

While CGE modelling is a globally-used standard approach to quantifying the impacts of FTAs, this an inherently uncertain exercise, and the analysis does not capture the full range of dynamic impacts of the trade agreement. The modelling does not fully capture the impact of:

- future changes to the sectoral composition of the UK and New Zealand economies by drivers separate to the agreement, as outlined below
- 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
- recent and future policy choices or international trade agreements which may influence the value of the agreement
- 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

Future changes to UK and New Zealand economies and global trends

The modelling uses 2014 data as a baseline and therefore does not account for several trends that could influence the impact of a UK-New Zealand FTA. The model does not take into account, for example:

- global trends such as the increased 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 the UK-New Zealand 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 DIT's Global Trade Outlook.

4.3 Data and baseline

The impacts of the agreement are assessed against a baseline where the UK and New Zealand do not have an FTA with each other. It has also been assumed in the baseline that the UK has completed a new FTA with Australia, but not with any other FTAs in progress (such as with the USA), nor that the UK has finalised its accession to the CPTPP.

The underlying data in the baseline is taken from the GTAP10 dataset relating to 2014. The dataset is widely used in trade policy analysis and is the most recently available data.

Both the UK and New Zealand's trading relationships with certain other countries have changed since 2014, which may influence the estimation of the impact of the UK-New Zealand FTA. This is partially addressed in our modelling by incorporating the following FTAs into the baseline:

- the UK's FTAs with Canada, Japan, and Singapore
- New Zealand's FTA with the Republic of Korea
- Australia's FTAs with China, Japan, Republic of Korea and Vietnam

The UK's trade relationship has changed with the EU since 2014. 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.[43]

Since 2014, there have also been changes to the UK and New Zealand's tariffs levied on countries with which they do not have an FTA. These are MFN rates. For the UK's MFN, the baseline uses the UKGT, while for New Zealand's MFN, the modelling updates New Zealand tariffs to 2020 levels, based on tariff information received from the New Zealand government.

43 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).

4.4 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 trade costs resulting from the agreement. The approach to generating inputs is set out in Annex 2 alongside a table of inputs.

Tariffs	To approximate the impact of the agreement, the modelling assumes that all tariffs and tariff-rate quotas are removed in the long run. An adjustment to the standard GTAP data inputs has been undertaken to reflect the usage of TRQs. New Zealand exporters already have existing WTO tariff rate quotas (TRQs) in some products e.g. lamb, for which imports face 0% in-quota tariffs, or tariff rates lower than the MFN tariff e.g. beef and some dairy products. This is not fully captured in the GTAP data where products are aggregated and represented by a single ad valorem equivalent (AVE) tariff. For further technical information on this change, please see Annex 2. The long run modelling does not account for the gradual staging of tariff reductions nor tariff rate quotas in the agreement.
Non-tariff measures (NTMs) affecting goods trade	The modelling assumes non-tariff trade cost reductions for industrial goods which are in line with estimated reductions observed in the set of deep and comprehensive agreements signed in the past, as identified in the publicly available DESTA database. This is because the depth of provisions affecting industrial goods trade in this agreement are assessed to be broadly consistent with those in the deepest agreements in the DESTA database. The estimated reductions associated with various levels of depth for each sector are derived from gravity modelling which estimates the increases in trade resulting from agreements of each depth. The modelling assumes non-tariff trade cost reductions for agri-food sectors which are in line with estimated reductions observed in a set of shallower agreements, as identified by the publicly available DESTA database. This is because there are limited provisions affecting trade in the agri-food sectors and no new permissions for New Zealand goods to enter the UK market, including maintaining bans on growth promotants. Therefore, the provisions affecting these sectors are assessed to be more consistent with shallower agreements.
Regulatory restrictions affecting services trade	This agreement represents a deep services agreement. Whilst this agreement goes beyond CPTPP in a number of areas, these were difficult to model in a consistent way. Therefore, for simplicity, the modelling assumes trade cost reductions affecting services sectors are broadly in line with the expected reductions in the CPTPP agreement. Adjustments were made where appropriate to ensure that the reductions better approximate the impact of the provisions in this agreement. The adjustments are explained in Annex 2. The estimated reductions were derived from previously published analysis which mapped the commitments between CPTPP members to the OECD's Services Trade Restrictiveness Index (STRI).

4.5 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. The point estimates do not represent precise estimates. Instead, they represent an indication of the direction of impacts and broad orders of magnitude.

Table 2: Summary of estimates of UK macroeconomic impacts, long run changes against baseline

	£bn estimate, applied to 2035 projections
Change in GDP	£0.8bn
Change in UK exports to New Zealand	£0.7bn
Change in UK imports from New Zealand	£1.0bn
Change in UK exports to World	£0.7bn
Change in UK imports from World	£0.6bn

Source: DIT CGE Modelling (2021). Note: Throughout this section, equivalent pound values are provided. These are calculated by multiplying the percentage changes from the model with the projections for 2035 where available. Full details, including numbers based on 2019 values are found in Annex 1.

The modelling estimates point to a 59% increase in trade (exports and imports) with New Zealand in the long run resulting from the agreement. This is equivalent to £1.7 billion when applied to projected levels of trade in 2035.[44] It is equivalent to £1.6 billion when applied to levels of trade in 2019.

DIT's projections suggest that, in the absence of the agreement, the future growth of the New Zealand import market could lead to an extra £0.2 billion in UK exports by 2035. This represents an 11% increase in UK exports to New Zealand in real terms (today's prices) compared to 2019.

The modelling estimates of the impact of the agreement point to an additional 40% increase in the long run level of UK exports to New Zealand compared to the level in the absence of the agreement. This represents an increase of £0.7 billion when applied to projected levels of exports in 2035 or £0.6 billion when applied to levels in 2019. The greatest export increases are in the manufacture of motor vehicles, machinery and equipment, and electronic equipment sectors.

Overall UK exports to the world are estimated to increase by £0.7 billion when compared to projected levels in 2035 without the agreement. This shows that a large share of the estimated increase in exports to New Zealand represent increased export opportunities, rather than UK producers diverting their existing exports to New Zealand from other markets.

Increased imports and competition also drive 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.

The estimates point to an increase in UK imports from New Zealand of 76%, equivalent to £1.0 billion when applied to projected levels of imports in 2035 or £0.9 billion when applied to 2019 levels. The greatest estimated import increases are in semi-processed foods and textiles sectors. Overall UK imports from the world are estimated to increase by £0.6 billion when compared to projected levels in 2035 without the agreement. This shows that a significant share of the estimated increase in imports from New Zealand are replacing UK imports from other countries.

Reduced trade costs and increased trade lead to higher productivity; this means that businesses can produce more with the same number of workers, afford to pay higher wages and that consumers can consume more and better products.

The estimates point to a long run increase in UK GDP of 0.03%, equivalent to £0.8 billion a year when applied to projected GDP in 2035 (around 10-15 years from the implementation of the agreement). This is equivalent to £0.6 billion when applied to GDP levels in 2019.[45] The largest contribution comes from increased consumer spending.

44 2035 projections for UK total exports and imports are calculated using the methodology described in DIT's Global Trade Outlook (September 2021). For bilateral trade between the UK and New Zealand in 2035, the projections are combined with a market share assumption where both UK and New Zealand's markets shares evolve in line with projections of their global market shares (as projected in the Global Trade Outlook).
45 Calculated using OBR, Economic and fiscal outlook – March 2021 long term economic determinants. The estimated increase is over and above underlying growth of the UK economy. Based upon the OBR's long term economic determinants, UK real GDP could increase to around £2.79 trillion by 2035 (measured in 2019 prices).

This is a central estimate. To account for uncertainty in the modelling, using a range of estimates of key parameters and inputs shows that the long run annual increase in UK GDP is likely to lie between 0.02% and 0.03%. Further details can be found in section 7.

Real wages (wages in today's prices) are estimated to rise by 0.03%, equivalent to around £200 million annually when applied to 2019 levels, as workers benefit from higher productivity in the economy.

The scale of increases is not directly comparable to those in the 2020 Scoping Assessment. The larger impact of this agreement (compared to the 2020 Scoping Assessment) primarily reflects the developments in the model specification (explained further in Annex 1).

4.6 Estimates of impacts by sector

A deal which generates opportunities across a wide range of sectors.

Overall output in the UK is estimated to increase. The increase is driven by expansions across a broad range of sectors; the modelling shows that 21 out of 23 sectors contribute to higher growth as they take advantage of the opportunities in the agreement. Some sectors see an increase in competition and are estimated to grow less rapidly following the agreement.

As a result of the agreement, services sectors are estimated to make the strongest contribution to the estimated growth in gross value added (GVA) in absolute terms. On the services side, the largest contributions in absolute terms come from wholesale and retail services (0.04% or £105 million), public services (0.03% or £82 million), and other services (transport, water, dwellings, 0.03% or £82 million). On the goods side, the largest contributions come from expansions in the manufacture of machinery (0.11% or £46 million) and motor vehicles (0.24% or £43 million).

These sectors are estimated to grow relative to other sectors of the economy. This is in part as a result of UK businesses taking advantage of the enhanced trading relationship with New Zealand and improved access to imported inputs, and of businesses' response to increased competition from international markets.

While services sectors are estimated to make the strongest contribution to the estimated growth in gross value added in absolute terms, this result is primarily a consequence of the liberalisation in goods sectors. In more detail, our additional analysis suggests that the source of the services sector contribution to GVA changes is goods sectors' liberalisation: direct services liberalisation plays a relatively small part. Goods liberalisation drives changes in the economy that lead to a higher gross value added in the service sectors by virtue of interlinkages across the economy (for example, services being the intermediate input into the output of other sectors).

The sectors estimated to expand the most in relative terms (i.e. in percentage changes) are manufacturing sectors, such as motor vehicles and the manufacture of machinery and equipment. The agriculture, forestry and fishing and semi-processed foods sectors are expected to experience a reduction of around 0.35% (£48 million) and 1.16% (£97 million) respectively. However, this does not mean that these sectors will not grow in the future. As the economy expands, these sectors account for a smaller proportion of the expanded output of the economy than would have otherwise been the case.

It is normal for trade agreements to lead to some degree of reallocation of resources across sectors. Some sectors expand to take advantage of new opportunities for higher returns resulting from lower barriers to trade and draw in resources from other sectors in the process. Indeed, it is principally this movement of workers and capital to sectors with falling trade barriers that allows better returns that leave workers and investors alike better off as a result of the agreement.

The scale of estimated changes in the modelling leaves the sectoral composition of the economy unaffected, with no changes in any sector's share of total UK GVA.

All the sectoral impacts are subject to uncertainty. Due to particular complexities in modelling agricultural liberalisation and the estimated impact on this sector from the agreement, the impacts on the agri-food sectors are discussed further in Box 2.

The quantitative estimates from the modelling are set out in Table 3. The point estimates do not represent precise estimates. Instead, they represent an indication of the direction of impacts and broad orders of magnitude.

Table 3: Results by sector and £ equivalents

Broad sector category	GTAP-23 Sector	A Change in GVA (%)	B Change in GVA (£ millions, 2019)	C Change in sector share of total UK GVA (percentage point)
Agri-Food	Agriculture, forestry, and fishing	-0.35%	-48	0.00
Agri-Food	Beverages and tobacco products	0.03%	3	0.00
Agri-Food	Other processed foods	0.06%	13	0.00
Agri-Food	Semi-processed foods	-1.16%	-97	0.00
Industry	Chemical, rubber, plastic products	0.03%	18	0.00
Industry	Energy	0.02%	13	0.00
Industry	Manufacture of electronic equipment	0.09%	20	0.00
Industry	Manufactures	0.05%	25	0.00
Industry	Manufacture of motor vehicles	0.24%	43	0.00
Industry	Manufacture of machinery and equipment	0.11%	46	0.00
Industry	Manufacture of other transport equipment	0.11%	14	0.00
Industry	Manufacturing n.e.c.	0.04%	7	0.00
Industry	Paper and printing products	0.03%	5	0.00
Industry	Textiles and wearing apparel	0.11%	15	0.00
Services	Business services	0.03%	77	0.00
Services	Communications	0.03%	32	0.00
Services	Construction	0.03%	48	0.00
Services	Financial services	0.03%	29	0.00
Services	Insurance	0.03%	8	0.00
Services	Other services (transport, water, dwellings)	0.03%	82	0.00
Services	Personal services	0.03%	23	0.00
Services	Public Services	0.03%	82	0.00
Services	Wholesale and Retail Trade	0.04%	105	0.00

Source: DIT CGE Modelling (2021).

Box 2: Agri-food impacts in the FTA

In DIT's CGE modelling the agriculture, forestry and fishing and semi-processed foods (which includes beef and sheepmeat) sectors are estimated to see a -0.35% and -1.16% reduction in GVA respectively, relative to the baseline over the long run as a result of the FTA. These results are primarily driven by increased import competition in beef.

There is no anticipated increase in sheepmeat imports from New Zealand as a result of the FTA, due to the large, underutilised access that New Zealand has on WTO terms, in the form of a TRQ. In 2020, the fill rate of this TRQ was only 46%.[46]

New Zealand is a globally competitive exporter of beef accounting for 5% of global beef exports.[47] The UK and New Zealand already have an agreement on the equivalence of sanitary measures in meat and other products of animal origin,[48] and New Zealand beef already meets the UK's stringent SPS conditions.[49] Historically, the UK has had high tariffs on beef. The potential increase in imports of these products could bring benefits to consumers, with more choice and lower prices, but would also compete with domestic producers. This is why beef has been afforded additional protections in the form of TRQs in years 1-10 and additional safeguards in years 11-15 of the agreement.

This modelling is comparative and static, and represents a stylised view of the world and various country economies. It is based upon a snapshot of historical trade and consumption patterns. There are therefore limitations to the CGE model's ability to accurately reflect changing trends, which increases the uncertainty over the extent to which the estimated sectoral impacts for all sectors in Table 3 are likely to occur in the long run.

The modelling does not capture several factors which add significant uncertainty to the estimates of the impact on the UK agri-food sectors, for example:

- it does not account for strong future growth in other markets that could mean that they become increasingly attractive for New Zealand's exporters. Around 55% of New Zealand's beef exports went to markets in Asia and the Pacific in 2020, with the UK making up just 0.1% of their exports (in kg terms), partly because of high existing tariffs. Combined with lower transport costs, and higher projected increases in demand for these markets (not directly captured in the model), this suggests markets in Asia and the Pacific may remain the focus for New Zealand's exporters
- by focussing on long run impacts, the comparative static CGE modelling does not capture the impact of safeguards included in the FTA, including how staging tariff reductions over several years affects the short term impact on agri-food sectors. For example, TRQs that will apply the UK's Global Tariff to beef imports above the quota will continue for 10 years. In addition, product-specific safeguards imposing 20% tariffs on beef above a volume threshold will apply for another 5 years thereafter. The CGE model does not evaluate how UK firms could adapt and improve their productivity when faced with additional competition from imports from New Zealand, nor other policies over the time period which could affect the competitiveness of UK producers e.g. domestic agricultural transition
- price is an important factor for consumer choice, but it is not just about price.[50] Historically, and more recently, there has been a push to 'Buy British' in order to support British farmers. The strength and persistence of this consumer preference, supermarket behaviour and linked advertising is not necessarily reflected in the parameters of the model. As a result, the comparative static modelling may not accurately reflect the extent to which consumption patterns shift towards imports from New Zealand

46 TARIC https://ec.europa.eu/taxation_customs/dds2/taric/quota_tariff_details.jsp?Lang=en&StartDate=2020-01-01&Code=092013
47 DIT calculations using UN Comtrade export data. Beef defined as HS0201-0202.
48 UK/New Zealand: Agreement on Sanitary Measures Applicable to Trade in Live Animals and Animal Products (2019) https://www.gov.uk/government/publications/cs-new-zealand-no12019-uknew-zealand-agreement-on-sanitary-measures-applicable-to-trade-in-live-animals-and-animal-product
49 Including the ban on the use of growth promotants. The use of growth promotants is limited in New Zealand.
50 AHDB/YouGov, How a more price conscious consumer affects product choices

Box 2: Agri-food impacts in the FTA *(continued)*

Additional agricultural analysis from alternative modelling approaches

Economic modelling is subject to uncertainty, and no modelling can completely capture all aspects of a trade deal, or all dynamic and efficiency gains which could take place after a trade agreement is agreed. There are several different modelling approaches that could be applied to analyse a specific policy, which can use different specifications and assumptions.

One alternative modelling approach employs partial equilibrium (PE) modelling of the UK agricultural market to estimate impacts on beef and sheepmeat. PE modelling has the advantages of greater disaggregation and model specifications more specific to the market under consideration than compared to a CGE model. As with the CGE modelling, these estimates do not account for changes to the industry as a result of changes to agricultural support policy which could affect the potential impacts.

Current imports from New Zealand of beef products are low due to the constraint of existing TRQs and prohibitive out of quota tariffs which makes estimating future UK demand for products from New Zealand inherently uncertain.[51] In that context, our estimates of the impact of the FTA with New Zealand (over and above the impact from the FTA with Australia) suggest:

- a reduction in gross output of around 1% for beef in the long run as a result of liberalisation, compared to what it otherwise would be by the end of the modelled projection period
- that due to the underfill of its existing WTO quota and the existing sanitary agreement, no reduction in gross output for sheepmeat is expected as a result of the agreement with New Zealand
- a small reduction in gross output for butter in the long run as a result of liberalisation. However, modelling is likely to overestimate the impact to the sector. This is because there are other reasons than high UK tariffs for why butter imports from New Zealand are low. Modelling does not capture that whilst New Zealand is a significant exporter of butter globally (including to the UK in the past), its main butter export (Anchor butter) has been made in the UK since 2012.[52] It also does not fully capture price convergence between UK and New Zealand butter since reforms to the UK dairy market in the mid-2000s. In reality, we do not expect significant changes to butter imports from New Zealand as a result of the trade agreement

4.7 Estimates of impacts by nation and region of the UK

Opportunities for businesses and consumers across the United Kingdom.

International evidence suggests that trade agreements have the potential to affect various regions within an economy differently. This is primarily because trade agreements affect sectors differently and the sectoral composition of output and employment vary systematically across regions.

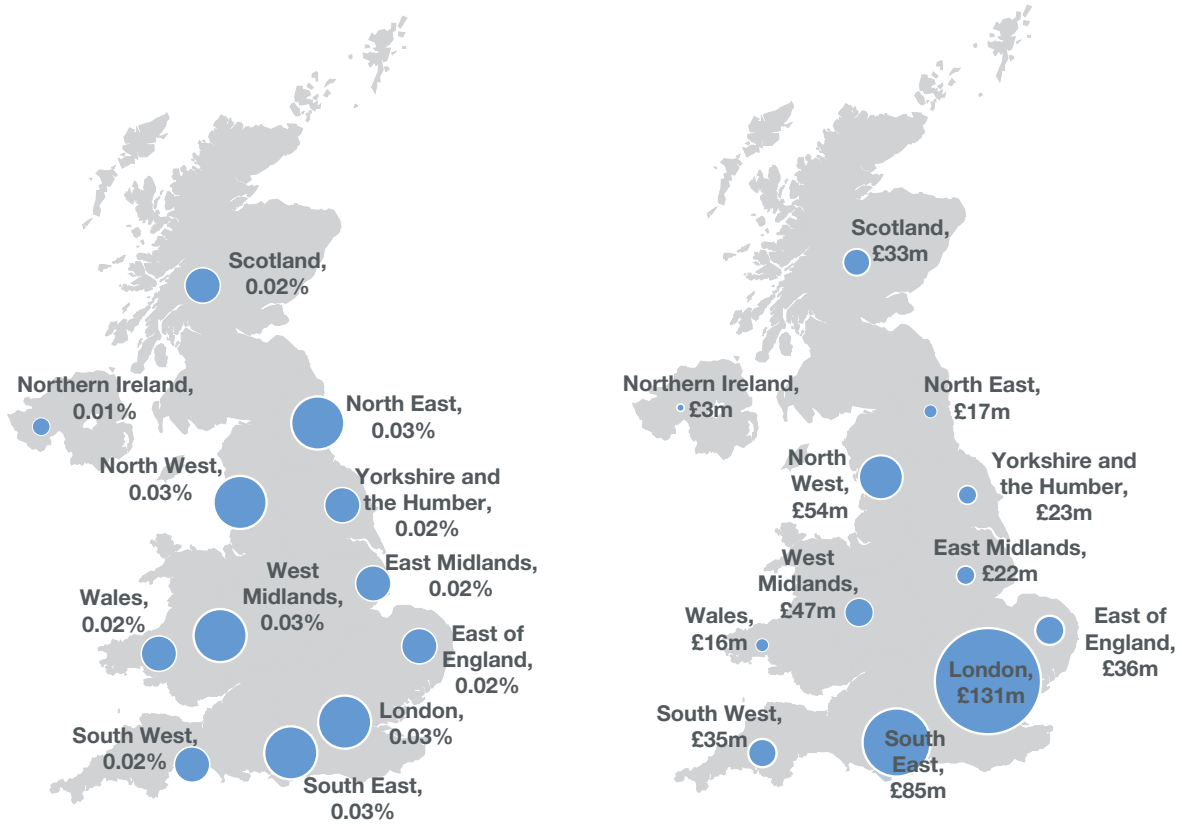
A simple apportionment of the sectoral impacts to the nations and regions of the UK suggests that all nations and regions are expected to see an increase in output. The output of the West Midlands and North East of England could be set to expand the most in relative terms as a result of the agreement (Table 4). This reflects a relative concentration of manufacturing of motor vehicles and machinery. Scotland, Wales and Northern Ireland could see a combined long run, annual increase in GVA of around £52 million.[53]

The sensitivity analysis in section 7 shows that the impacts on Northern Ireland and West Midlands are sensitive to assumptions regarding the presence and scale of local economic effects. Large local economic effects could more than double the GVA gain in West Midlands and result in a net GVA loss for Northern Ireland.

All of the sub-national impacts are subject to a high degree of uncertainty. They directly relate to the CGE estimates for sectors and so are subject to same limitations. As such, the results below should be interpreted as an indication of the order of magnitude of the results. In addition, the estimates do not account for future changes to the location of production for various sectors.

51 This modelling assumes an agreement with Australia in the baseline. Results presented here are therefore additional to those arising from an Australia FTA.
52 Arla Foods Press Release (2012), https://www.arlafoods.co.uk/overview/news--press/2012/pressrelease/arla-takes-its-uk-butter-offering-to-the-next-level-as-it-expands-production-at-its-bespoke-facility-at-westbury-791941/
53 Sectoral and regional estimates of output changes are presented in Gross Value Added (GVA) terms due to data availability. This means that they differ from the headline economy results which are presented in terms of Gross Domestic Product (GDP) which results in a discrepancy between whole economy, sectoral, and regional impacts on output.

Figure 3: Central estimates of changes in value-added in UK nations and regions, long run % and £ million changes



Source: DIT CGE Modelling (2021). Note: Based on 2019 data.

Table 4: UK nations and regions of England results, central estimates

Nations and regions	Main scenario	
	% Change in GVA	Change in GVA £ million, 2019
East of England	0.02%	36
East Midlands	0.02%	22
London	0.03%	131
North East	0.03%	17
North West	0.03%	54
South East	0.03%	85
South West	0.02%	35
West Midlands	0.03%	47
Yorkshire and the Humber	0.02%	23
Northern Ireland	0.01%	3
Scotland	0.02%	33
Wales	0.02%	16

4.8 Impacts on other countries

New Zealand

The agreement is estimated to increase New Zealand's GDP by the equivalent of around £1.1 billion when compared to projections of New Zealand GDP in 2035, and £0.8 billion when compared to its 2019 level.[54]

Developing countries

There is a possibility that an agreement between the UK and New Zealand could have consequences for other trading partners, including developing countries. 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 is of particular importance for developing countries.[55] As consumers and businesses shift their demand for imports towards cheaper imports from the UK and New Zealand, demand for similar exports from third countries, including developing countries, may be lowered. The resulting trade diversion away from developing countries may negatively impact their trade balances, foreign reserves, employment and overall economic growth potential. The UK Government supports free and fair trade recognising the overall positive contribution of trade to poverty alleviation.

Developing countries with a higher share of their trade with the UK or countries exporting products in which the UK or New Zealand are highly competitive, are more likely to be impacted from goods liberalisation in the agreement. The products identified as at risk of trade diversion away from developing country producers following the UK-New Zealand FTA are presented in Table 18 in Impact Assessment Annex 3.[56] Based on the analysis, the risks of trade diversion from preference erosion from the UK-New Zealand FTA are not substantial.

In monitoring the agreement, DIT will pay particular attention to changes in trade flows for the products identified as at potential risk of trade diversion from preference erosion, particularly where they originate in smaller and less diversified developing countries.

54 Projections of New Zealand GDP in 2035 from DIT's Global Trade Outlook (September 2021).
55 Developing countries in this case focuses on those trading under the Generalised Scheme of Preferences (GSP), those that have signed Economic Partnership Agreements (EPAs) or are African, Caribbean and Pacific Group of States (ACP).
56 The method for identifying products which may be at risk of trade diversion from preference erosion is detailed in Annex 10. These are products in which a) New Zealand 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.

5. Impacts by main groups

This section examines the impact of the agreement by main groups. 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 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 the New Zealand market.** UK exports to New Zealand will see £17 million of reduced tariff costs per annum. SMEs are proportionately represented in sectors that benefit most from the agreement
- **as trade barriers are reduced, consumers will benefit directly from increased choice, better product quality and lower prices for imported goods.** UK businesses and consumers may find it cheaper to import final and intermediate goods from New Zealand, with total annual tariff reductions on imports estimated to be £40 million annually in the long term. This is estimated to be predominantly on final, rather than intermediate, goods
- **workers of all skill types are expected to benefit from higher take home wages.** Overall, UK real wages are estimated to increase by around £200 million in the long run, when compared to 2019 levels

The modelling suggests some small reallocation of jobs across sectors in the long run. The overall employment level is unaffected by changes in trade costs. The representation of protected groups in sectors where employment is estimated to fall relative to the baseline as a result of the agreement is estimated to be broadly in line with the general population of the workforce in relation to disability. However, workers who are female, of an ethnic minority background or below 65 are less concentrated in sectors where employment is estimated to fall.

5.1 Impacts on UK businesses

The evidence suggests that the agreement could have positive impacts on businesses in the UK and New Zealand. 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 New Zealand are expected to benefit from a growth in exports by becoming more price competitive and having more efficient market access into the New Zealand economy. Provisions enhancing transparency and providing better information for SMEs could induce new businesses to enter the New Zealand market. Businesses importing goods from New Zealand will directly benefit from lower tariffs on and an expected increased variety of imported inputs to production and final goods from New Zealand. Greater access to global supply chains are an important source and driver of competitive advantage for businesses.

Some businesses may experience greater competition from imports from New Zealand exporters. The evidence shows that competition from trade promotes business innovation and growth.[57] Some businesses may expand, creating more jobs, but some businesses may be adversely affected by the increased competition.

In addition, our modelling estimates a £70 million long run increase in annual business investment in the UK. The increase in investment in the modelling is driven by the estimated increase in the return to capital.

Business growth and exports

New Zealand is an important trading partner for UK businesses. Over 6,700 businesses exported goods to New Zealand in 2020.[58] These existing exporters 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 £0.6 billion long run increase in UK exports to New Zealand,

57 CMA, Productivity and competition: A summary of the evidence (July 2015).
58 HMRC, UK trade in goods by business characteristics 2019. 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 New Zealand.

when compared to 2019 levels. 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.

The scale and distribution of estimated tariff reductions on UK exports

Section 3 describes the preferential tariffs negotiated under the agreement. The estimated annual tariff reductions increase over time due to the staged tariff reduction process that is set out under the agreement. The majority of tariffs are liberalised at entry into force of the agreement.

The reductions in tariffs 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.[59] However, UK businesses could benefit from maintaining or increasing competitiveness, particularly when compared to businesses exporting to New Zealand from countries without an FTA.

By sector

The largest tariff reductions on UK exports in the long term occur in the transport equipment, machinery, and prepared foodstuffs, beverages, and tobacco sectors.

By nation and region

Overall, businesses based in the West Midlands, South East, North West, and the East of England are expected to benefit the most from lower tariffs on UK exports to New Zealand. All regions are expected to benefit by a proportion of tariff reductions that are similar with their share of goods exports to New Zealand. In some instances, businesses are expected to benefit by a greater proportion than their region's share of overall UK goods exports. For example, though businesses in the North West and West Midlands account for 10% and 16% of UK goods exports to New Zealand respectively, their exports are estimated to benefit from 12% and 17% of the overall tariff savings on UK goods in the long term. A full breakdown of tariff reductions by nation and region are shown in Tables 9 and 10 in Annex 3.

The scale and distribution of tariff reductions on UK imports of intermediates and final products

The gains from the estimated reduction in annual duty paid on UK imports comparing the UKGT regime to the tariff schedule under this agreement are £40 million in the long term. The majority of the duty reductions come from final goods as can be seen in the table below.[60]

Table 5: Estimated tariff reductions on UK imports from New Zealand, by end use

Type of Good	Long term tariff savings, £m
Intermediate goods	1.9
Final goods	37.8
Total savings	39.7

Source: DIT calculations (2021), Eurostat (2020).

The majority of the estimated import duty reductions on intermediate goods occur in the plastics and rubber products (57%), machinery & mechanical appliances (9.5%) and textiles and textile appliances (9%) sectors. These tariff reductions provide benefits for businesses that make use of New Zealand imports in their production processes.[61] The breakdown of final goods can be found in the section on consumers.

The effects of liberalisation of goods imports can be apportioned to the various regions and nations of the UK. According to this, the largest shares of tariff reductions will affect London, the South East, and the North West (23%, 16% and 13% respectively).[62]

Increased imports and competition

Around 1,800 businesses imported goods from New Zealand in 2020. This agreement is expected to benefit businesses by increasing access to cheaper and increased varieties of imported inputs. Greater access to global supply chains is an important source of competitive advantage for businesses. The modelling results estimate a £0.9 billion increase in UK imports from New Zealand, when compared to 2019 levels.

Some businesses may experience greater competition from imports from New Zealand firms. The evidence shows that competition from trade promotes business innovation and growth.[63]

59 Note that tariff reductions apply to goods that meet Rules of Origin requirements.
60 Long term refers to the end of the liberalisation period for the UK and New Zealand schedules. 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
61 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.
62 The methodology for apportioning the gains from tariff reductions to each nation and region is explained further in Annex 4, which also sets out a number of important caveats.
63 CMA (2015) Productivity and competition: A summary of the evidence.

Some UK businesses may expand, creating more jobs, 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.[64] SMEs also play an integral role in engaging with the international economy. In 2020, over 5,900 SMEs exported goods to New Zealand, accounting for 40% of UK bilateral goods exports.[65] 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.

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, 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.

A large proportion of UK SMEs are based in sectors whose share of the economy will increase because of the agreement. For example, the wholesale and retail trade sector, which accounts for 15% of total SMEs, is expected to see an increase in GVA. Sectors which will make up a smaller share, such as agriculture, forestry and fishing and semi-processed foods, only have a small proportion of total SMEs (2.6% and 0.4% of the total numbers respectively). Overall SMEs are proportionately represented in sectors which gain the most.

There is a full breakdown of sectoral distribution of SMEs and SME turnover by sector provided in Table 20 in Annex 7. 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.

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 New Zealand 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.[66] The cost 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 treaty's provisions regarding proving goods are eligible for preferences. The central estimate of these costs is £3.5 million, with a range between £3.4 million and £3.6 million (2019 price base).[67] This figure could be an overestimate as it double counts firms which both export to, and import from, New Zealand. However, it does not consider the number of businesses that may start to trade with New Zealand because of the agreement, and this may mean that the figure is an underestimate. Annex 6 sets out further information on the methodology.

To trade under preferential tariffs, businesses must follow certain administrative procedures. These include customs declarations forms which will be an additional cost borne by firms that start trading with New Zealand because of the agreement. These 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%.[68] 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 New Zealand associated with rules of origin requirements are assumed to range from 2% to 4%. The potential cost to UK business is

64 BEIS, Business Population Estimates 2020.
65 HMRC, Trade in Goods by Business Characteristics.
66 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 New Zealand will be picked up by this analysis through the HMRC dataset, but they are not expected to by significant in number.
67 These differences reflect differences in estimated reading time
68 Ciuriak and Xiao (2014), Should Canada unilaterally adopt global free trade?

estimated to be between £6.5 million and £13.0 million per annum, with a central estimate of £9.8 million.[69] Annex 6 provides further detail on the methodology used to estimate the potential familiarisation and administration costs.

5.2 Impacts on UK consumers

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 around £400 million over the long run.

This section presents the estimated tariff reductions for consumers, the likely impact of the agreement on consumer choice and a summary of the provisions that would benefit consumers in the agreement.

Consumers can benefit both from:

- tariff reductions on final consumer goods (goods that are imported from New Zealand for sale in the UK without processing or modification for household use, e.g. wine)
- tariff reductions on the intermediate goods that are passed onto the consumer in the longer term (materials that are used to produced final consumer goods, e.g. electrical machinery)

However, tariff reductions will not always be passed through fully into consumer prices. The extent to which businesses or consumers in the UK will benefit from the reduction in tariffs in the agreement's tariff schedule will depend on the rate of "pass through" of lower import costs from the importing business to the end consumer.[70] Some businesses may absorb the benefit from the reduced tariff cost on intermediate goods.

Annual tariff duty reductions on imported final goods from New Zealand are estimated to be around £37.8 million annually in the long term.[71] Calculated in this way, consumer savings when importing final goods are equivalent to the reduction in tariff revenues accruing to the UK Exchequer. This is detailed in Table 12 in Annex 3.

The estimated tariff reductions do not account for tariff reductions on intermediate goods that may be passed on to the consumer in the longer term.

By sector and nation and region

Tariff reductions are estimated to be largest on alcoholic beverages including wine, worth around £27 million per year in the long run.[72] It is estimated that the average UK household spends 2% of their total weekly spend on these goods.[73] This is detailed in Table 13 in Annex 3.

Food (largely semi-processed foods) and non-alcoholic beverages are estimated to have the second highest tariff reductions of around £10 million annually in in the long term. The average UK household spends 7% of their total weekly spend on such goods, with Northern Irish households spending the highest proportion at 8.5%. Within England there will be further variation due to different consumer preferences across each region.

By Income

Tariff reductions will also have differential impacts on households based on their income. In general, imported goods account for a greater proportion of weekly spend for high income households, however goods such as food and non-alcoholic beverages make up a greater proportion of low-income households weekly spending from imports. This is detailed in Table 14 in Annex 3.

Product choice for consumers

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

Under the current UKGT schedule, the UK would have 801 types of final consumer products (as defined by 6-digit level tariff lines) that are tariff free. Under this agreement, this would increase to 1903 consumer products, increasing the choice of products that are free from import tariffs for the UK consumer.

69 Based upon 2017-2019 average UK exports to New Zealand.
70 It is generally accepted that importers bear the costs of tariffs. 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.
71 These results are based on average trade flows between the UK and New Zealand between 2017-2019. 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.
72 According to Eurostat Reference and Management Of Nomenclatures (RAMON) correspondence tables from Harmonised System (HS) to Classification of individual consumption by purpose (COICOP).
73 Data on household expenditure from ONS Living Costs and Food Survey (LCF).

5.3 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. This means that 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.

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. 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, 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 £200 million in the long run, when compared to 2019 levels. All occupation types (workers of all skill levels) benefit from trade liberalisation, see Table 15 in Annex 3 for a breakdown.

Impact on sectoral employment

The modelling shows a marginal shift in the distribution of employment across sectors over the long run.[74] It suggests that any reallocation of employment across sectors in the long run will be modest, with increases and declines in the sector shares of employment all below 0.02%. It would suggest a slight rebalancing away from semi-processed foods (and to a lesser degree, agriculture, forestry, and fishing) towards other sectors (primarily the manufacture of motor vehicles and machinery and equipment). These changes reflect the limited structural changes we expect to see 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.[75] 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 10–15-year period. This compares to an average movement of jobs across all sectors of around 18% over the last 15 years.[76] 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.

74 Employment is according to the ILO definition as specified by the relevant LFS indicator (ILODEFR). 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.
75 Industrial turbulence indices are calculated as: where ΔEi is the change in employment in each sector, and E is overall employment in the economy. (Layard, Nickell and Jackman (1991) "Unemployment" Chapter 6.
76 This average is based on the 15 years to March 2020.

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

Looking in more detail at those sectors which see a slight employment shift away, historic data shows that annual movements from those sectors are regularly of a much larger scale than the impacts we are likely to see from the agreement. Annual Survey of Hours and Earnings (ASHE) data shows at least 2% of employees moved from any given sector to a new sector each year. This compares to the less than 0.02% we would expect to see over a much longer period.[77] This gives some indication that any adjustments due to the agreement could be absorbed through labour market churn.

The sector that sees a slight shift away in employment, semi-processed foods, has lower outflows of workers than average. This suggests that the annual movement of people across the sector is substantially higher than the modelled changes in employment share due to the trade agreement. Semi-processed foods workers have historically been most likely to move to business service sectors (See Table 17 in Annex 3).

The long run movement of labour across sectors and regions within the UK contributes to the estimated output and wage gains from increased specialisation resulting from the UK-New Zealand FTA. Note that 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. The representation of protected groups in relation to disability is broadly in line with the general population. Sectoral representation in relation to sex, ethnicity and age is less in line with the general population, with female workers, those from ethnic minority backgrounds and workers under 65 less represented in sectors where employment is expected to fall relative to the baseline as a result of the agreement.[78]

Sex

- 47% of those in employment in the UK are female and 53% are male[79]
- 72% of the workforce in sectors estimated to account for lower long run employment relative to the baseline are male and 28% are female
- recently published experimental analysis by the DIT 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 women[80]

Ethnicity

- 12% of the overall workforce are from an ethnic minority background and 88% are white
- those from ethnic minority backgrounds represent only 4% of the employment share in sectors expected to see a long run reduction in employment relative to the baseline

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 10% and 15% respectively

Disability

- around 13% of those in employment in the UK report that they have a disability (as defined by the Equality Act 2010)[81]
- this is broadly in line with the employment share in sectors expected to see a fall in employment as a result of the deal

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 is not consistent with the CGE modelling results which reflect the global economy in the long run when the composition of the workforce may have changed.

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

77 This is based on average movement between GTAP sectors between 2011-2019.
78 Race is a protected characteristic under the Equality Act 2010. For the purposes of this analysis, we utilise data regarding ethnicity to consider this protected characteristic.
79 According to DIT Analysis of the ONS three-year pooled Annual Population Dataset (2016-2018).
80 FAI research on behalf of DIT 'Estimating the relationship between exports and the labour market in the UK (2021).
81 It is possible that non-response to this question in the Annual Population Survey affects the estimated proportion.

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 demographics in this section are available in Annex 8.

6. Impacts on the environment

The agreement could impact on the environment through a variety of channels. This section sets out these potential impacts.

- **The environment chapter of the agreement supports high environmental standards in both countries.** It does so by:
  - preserving the UK's right to regulate to meet our climate and environment commitments
  - preventing deviation from environmental laws to secure a trade advantage
  - affirming commitments to Multilateral Environmental Agreements
  - promoting commitments and cooperation across a wide range of environmental issues

Both the UK and New Zealand are already party to the United Nations Framework Convention on Climate Change (UNFCCC),[82] including the Paris Agreement. The agreement affirms both Parties' commitment to implement the Paris Agreement.

- **overall greenhouse gas emissions associated with UK-based production are not estimated to change from the agreement.** Projected increases in UK economic growth from the agreement are not expected to be associated with a change in emissions. There is also likely to be a small shift in UK production towards less emission-intensive sectors
- **there will be some increase in transport-related emissions associated with increased trade flows.** The increase is estimated to be around 0.1 $MtCO_2e$ each year. This increase in transport emissions is small when compared to 2018 UK production emissions of around 500 $MtCO_2e$. The UK is committed to being at the forefront of tackling maritime emissions
- **there are minimal risks of carbon leakage associated with the agreement.** Some degree of beef production is expected to shift to New Zealand. However, a range of sources suggest the greenhouse gas (GHG) intensity of UK and New Zealand meat production is not significantly different
- **the agreement provides opportunities to boost trade in environmental goods, which can speed the development and uptake of environmentally friendly production techniques.** The UK and New Zealand currently impose tariffs on 61 and 158 tariff lines respectively of products on the agreed UK-NZ environmental goods list in Annex A of the Environment Chapter. The UK-NZ environmental goods list is the most comprehensive list agreed in an FTA to date. The agreement means that at entry into force, all goods on this list will be tariff free
- **the economic growth and sectoral changes resulting from the agreement could affect air pollution, water quality, forests, biodiversity and waste management.** Whilst it is difficult to quantify the scale of these wider environmental impacts, the agreement is not expected to have a significant impact at the national level. Some sub-national or localised impacts are possible

Environmental challenges of climate change and nature loss are among the most complex global challenges of our time.

The UK and New Zealand are both party to a broad range of Multilateral Environmental Agreements, including the Paris Agreement, and have domestic legislation in place to protect the environment. Yale University's Environmental Protection Index (EPI) ranks both countries in the top 20 countries globally for environmental performance.

The Environment chapter of the agreement supports these high standards by:

- affirming commitments to Multilateral Environmental Agreements, including a climate change article that affirms both the UK's and New Zealand's commitment to the Paris Agreement and the importance of achieving its goals
- preventing both Parties from deviating from their environmental laws to secure a trade advantage
- preserving our right to regulate to meet our climate commitments
- promoting cooperation across a wide range of environmental issues

82 United Nations Framework Convention on Climate Change (UNFCCC) done at New York on 9 May 1992.

The potential impact of the agreement on the environment

FTAs can also affect the environment indirectly by expanding and redirecting economic activity. This may occur as trade liberalisation:

- boosts economic growth, raising economic activity and its associated environmental degradation (scale effect)
- changes the mix of a country's production and consumption (composition effect). If the sectors which expand are more environmentally harmful, other things equal, the composition effect could result in more environmental harm, and vice versa. If the sectors which expand the most are less environmentally harmful, the composition effect can offset some of the increase in environmental harm associated with increased economic activity overall
- changes the location of global production across countries, affecting the distance travelled by goods and the environmental impacts associated with transporting them from producers to consumers
- promotes the transfer and adoption of more efficient and environmentally friendly production techniques (technique effect)

Climate change affects the availability of resources and can decrease the productivity of factors of production, such as labour, capital and land. Environmental impacts will likely have greater magnitude in the future should resources be more scarce and less productive.

This section assesses the impact of the agreement on a range of environmental impacts, including greenhouse gas emissions, carbon leakage, air quality, and biodiversity.

Greenhouse gas emissions and climate change

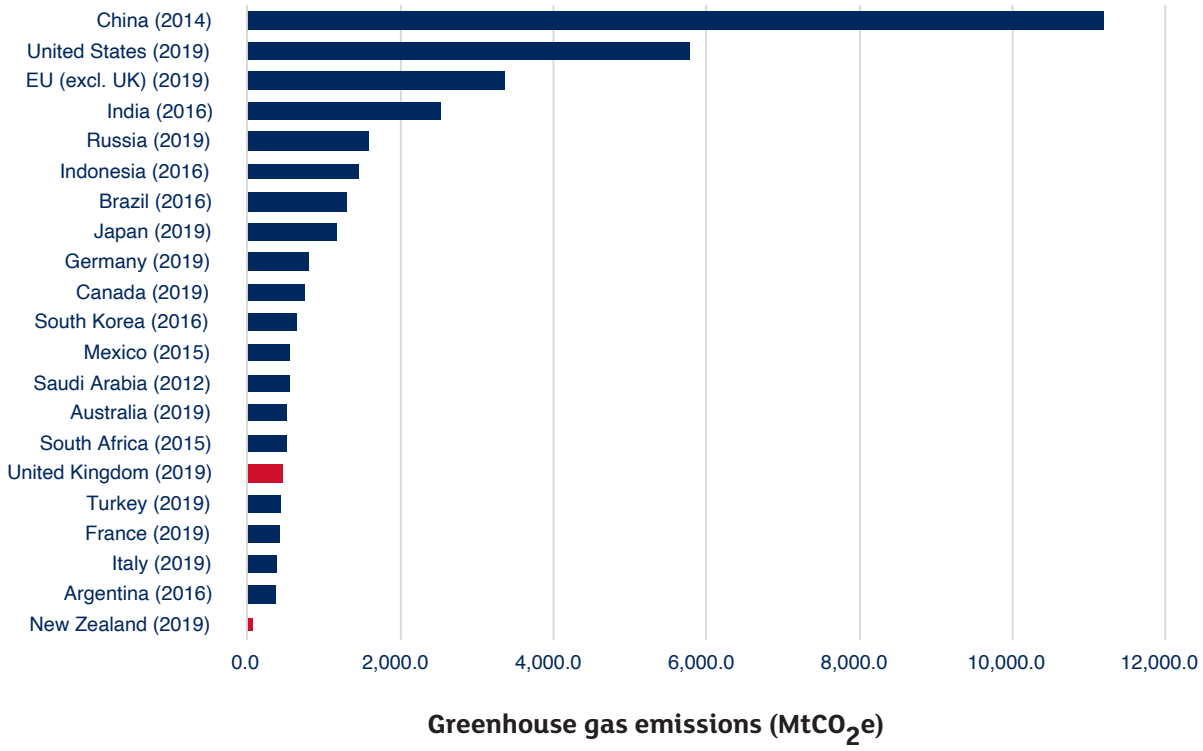
In 2019 the UK became the first G20 country to legislate binding commitments to bring all greenhouse gas emissions to net zero by 2050. The UK has also committed to protecting 30% of UK land by 2030 to support the recovery of nature. Since 1990, the UK has reduced its greenhouse gas emissions by 44%[83] – faster than any other G7 economy – and will seek to reduce emissions by 78% by 2035 compared to 1990 levels.[84]

The UK and New Zealand are the world's 5th and 50th largest economies respectively.[85] UK CO_2 emissions account for around 1% of global emissions. Together, the UK and New Zealand accounted for 1.12% of global CO_2 emissions in 2019.[86] Countries' emissions tend to reflect their size, with the highest emissions coming from countries with the largest populations and land areas.

In the UK, greenhouse gas emissions are dominated by carbon dioxide, estimated to have accounted for 80% in 2019. Weighted by global warming potential, methane accounted for about 12% of UK emissions and nitrous oxide for about 5% of emissions in 2019. Fluorinated gases accounted for the remainder, around 3%.[87]

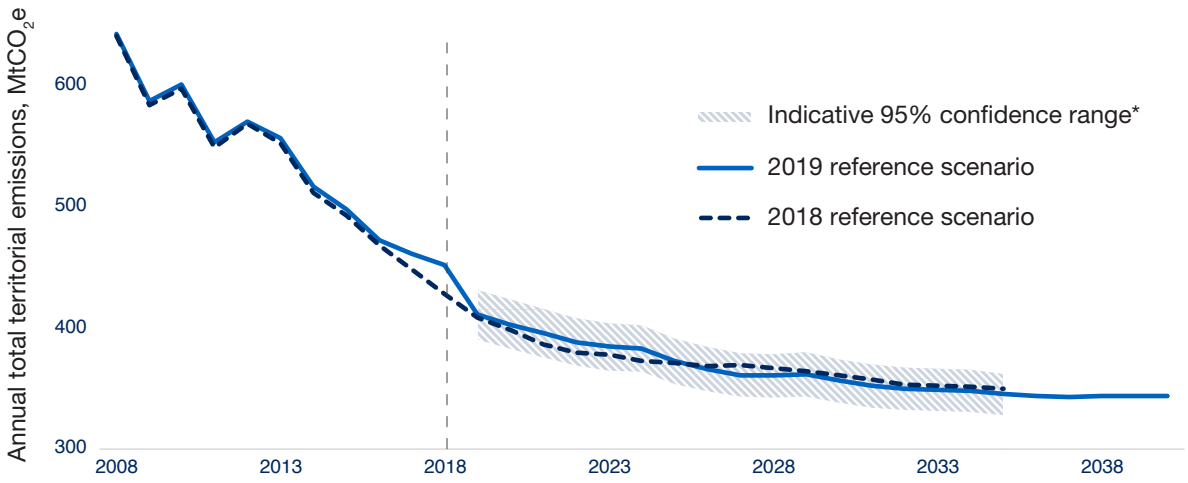
83 BEIS, Updated energy and emissions projections: 2019 (October 2020).
84 Press release, UK enshrines new target in law to slash emissions by 78% by 2035.
85 IMF, World Economic Outlook April 2021.
86 BEIS, UK Greenhouse Gas Emissions, Final Figures: 2019 (February 2021).
87 BEIS, UK Greenhouse Gas Emissions, Final Figures: 2019 (February 2021).

Figure 4: Territorial Greenhouse Emissions reported to the UNFCCC (2019): G20-countries ($MtCO_2e$)[88]



Source: UNFCCC.

Figure 5: UK projected emissions, $MtCO_2e$



Source: BEIS, Updated energy and emissions projections: 2019 (October 2020).
* The uncertainty ranges are indicative and are based on EEP 2018. The chart includes LULUCF.

The UK and New Zealand are already party to several international climate agreements. These include the UNFCCC, including the Paris Agreement as well as the Montreal protocol.[89]

Environment provisions within this FTA include commitments and cooperation between the UK and New Zealand on areas including emissions reduction, carbon pricing, fossil fuels, environmental goods and services, sustainable forest management, agriculture, and the phase down of hydrofluorocarbons. In addition, through this agreement the UK and New Zealand have affirmed their commitment to climate change objectives, the UNFCCC, the Paris Agreement and to enhance cooperation on a range of issues in support of these objectives.

88 Note that while territorial greenhouse emissions are partly driven by the location of production of goods and services, consumption of these goods and services may take place in other countries once traded.
89 Montreal Protocol on Substances that Deplete the Ozone Layer, done at Montreal on 15 September 1987.

Quantitative estimates of the impact on emissions as a result of the agreement

The impact on overall greenhouse gas emissions associated with UK-based production are estimated to be negligible as a result of a UK-New Zealand FTA.

Trade liberalisation boosts economic growth, raising economic activity and energy use. All else equal, the scale effect of economic activity and energy use will lead to higher levels of greenhouse gas emissions. Trade liberalisation also changes the mix of a country's production towards those products where it has a comparative advantage. The re-allocation of resources within a country is how trade improves economic efficiency and can also drive changes in emissions. The composition effect will also determine the extent to which economic growth brings about a change in greenhouse gas emissions, with a reduction in emissions expected if expanding sectors are less energy intensive than the contracting sectors, and vice versa.

Estimated output changes from CGE modelling and ONS environmental accounts data are used to estimate production change impacts from the agreement on greenhouse gas emissions, including CO_2 and Non-CO_2 emissions.[90] However, the quantitative assessment does not capture changes in consumption patterns or the emission intensity. Furthermore, the analysis does not reflect any improvements in emissions intensities over time in line with the UK's transition to Net Zero. The assessment also does not take into account deforestation or land use change.

The estimated increase in economic growth, measured by a change in gross output, resulting from a UK-New Zealand FTA, other things equal, is associated with a negligible estimated change in UK greenhouse gas emissions when compared to emissions levels in 2018 (the scale effect).[91]

There is a small shift in output towards sectors with relatively lower emissions-intensities. This is estimated to reduce greenhouse gas emissions by 0.1 $MtCO_2e$ relative to 2018 (composition effect).

The overall estimated net impact is that a UK-New Zealand FTA could reduce greenhouse gas emissions from UK production by around 0.1 $MtCO_2e$. Analysis on transport emissions is presented in the following section.

The quantitative analysis does not provide an estimate of the impact on partner or global emissions which result from changes to global patterns of trade across third countries.

The estimates are high-level estimates and subject to a number of important limitations. For example:

- the estimates are based upon a snapshot of data for emissions across sectors. Therefore, the size of the scale and composition effects (in % terms) do not account for the projected decline in greenhouse gas emissions in various sectors, for example due to policy measures to deliver the UK's net zero commitment. Therefore, the estimates potentially over-estimate the eventual long run changes in emissions resulting from the increased economic activity in both countries
- they do not include several of the potential benefits of the agreement such as enhancing trade in environmental goods, spurring innovation and increasing the uptake and adoption of environmentally friendly production techniques (typically referred to as the 'technique effect'). This also means that the estimates potentially over-estimate the increase in emissions from the agreement
- the estimates do not take account the impacts on transport emissions, which are assessed below
- the estimates do not take into account emissions due to deforestation or land use change
- the 'climate change' effect is also not accounted for. Climate change affects the availability of resources, especially food, water and energy[92]

Trade-related transport emissions

This agreement is expected to lead to an increase in transport emissions as a result of the expected increase in trade of goods with New Zealand. For context, the increase in trade of goods and services with New Zealand is estimated to be around 59%. The estimates suggest that the increase in emissions associated with maritime and aviation freight could be between around 0.13 and 0.14 $MtCO_2e$ each year, a 48% to 50% increase in associated transport emissions associated with trade with New Zealand. This is small when compared to UK production emissions in 2018 of around 500 $MtCO_2e$. The estimates do not account for the future decarbonisation of international shipping.

90 ONS, UK Environmental Accounts: 2021 (June 2021).
91 These estimates are based on 2018 data from the Department for Business, Energy, and Industrial Strategy (BEIS) and do not account for the projected long term reduction in emissions intensity across sectors.
92 CCC, Independent Assessment of UK Climate Risk, 2021. PWC, Climate change and resource scarcity, 2015.

Global international trade was linked with 8,800 $MtCO_2e$ or 27% of global CO_2 emissions from fuel combustion in 2015.[93] International transport is estimated to be responsible for 33% of world-wide trade-related emissions, with shipping freight alone accounting for 3% of global greenhouse gas emissions.[94,95]

The scale of emissions associated with international trade in goods reflects a complex combination of factors including distance, weight (rather than value) and mode of transport. Different modes of transport vary greatly in their carbon intensity. Maritime freight is associated with 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 Greenhouse Gas Strategy for the sector, agreeing a target of reducing emissions by at least 50% by 2050.[96] Both the IMO and the International Air Transport Association (IATA) recognise that transport emissions are a significant driver of global emissions and have made commitments to improve the climate impact of maritime and aviation transport: the IMO has adopted mandatory measures to reduce emissions of various pollutants under their pollution prevention treaty (MARPOL[97]), and the IATA has adopted a four-pillar strategy to address the global challenge of climate change.

In terms of weight, maritime freight accounted for approximately 97% of the volume of trade between the UK and New Zealand in 2019, whilst aviation freight only accounted for approximately 3% of goods traded.

By increasing bilateral trade, the agreement is estimated to lead to an average increase in annual greenhouse gas emissions of between 0.13 $MtCO_2e$ and 0.14 $MtCO_2e$ each year between 2020-2035. This results from an estimated increase in the emissions associated with maritime and aviation freight between the UK and New Zealand of between 48% and 50% compared to a scenario without the agreement. This increase in transport emissions is very small when compared to 2018 UK production emissions of around 500 $MtCO_2e$.

Table 6: Estimated impact of the agreement 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 ($MtCO_2e$)	0.01	0.01 – 0.01	0.02 – 0.03	0.07	0.03 – 0.04	0.10 – 0.11	0.13 – 0.14
Change relative to baseline (%)	35%	22%	28% – 28%	98%	36%	59% – 62%	48% – 50%

Note: The range for maritime emissions is based on a sensitivity analysis looking at the shortest and longest typical routes ships may take between the UK and New Zealand. Where ranges look identical, this is due to slight differences lost in the rounding.

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. Where trade shifts from partners geographically closer to the UK towards New Zealand the increased distance travelled would also increase emissions.[98]

A large proportion of services trade does not involve any transport at all (i.e. Mode 1 service supply, rather than Mode 4).[99] Insofar as it does increase the movement of people, it could increase transport emissions. While it has not been possible to quantify this impact, it is expected to be small.

The above analysis does not take account of any improvements we may expect to see in the emissions intensity of transport over time, for example due to the future decarbonisation of international shipping or resulting from this FTA. Additional information on the transport emission modelling is provided in the technical annexes.

93 OECD – CO2 Emissions embodied in international trade and domestic final demand.
94 A. Cristea, et al., Trade and the greenhouse gas emissions from international freight transport, Journal of Environmental Economics and Management (2012).
95 International Maritime Organization Fourth Greenhouse Gas Study 2020.
96 DfT's Clean Maritime Plan, July 2019.
97 International Convention for the Prevention of Pollution from Ships, done at London on 2 November 1973.
98 Different modes of transport vary greatly in their carbon intensity; one kilogram of cargo flown on a plane generates approximately 36 times the emissions of a kilogram of cargo transported by ship (over the same distance). The mode of transport used will be influenced by the type of good being exported, in particular whether it is perishable or part of a supply process that requires rapid delivery of intermediate products, and the proximity of the export destination to an airport, seaport or rail network.
99 According to experimental data, Mode 4 trade made up around 5% of cross-border services trade (excluding Investment) with New Zealand in 2019.

Carbon leakage risk

The displacement of GHG production emissions, because of differing climate rules and policies across jurisdictions, is known as 'carbon leakage'. Carbon leakage can be said to occur if all the following conditions are satisfied:

- climate mitigation policies differ across jurisdictions
- emissions shift to a region with lower climate mitigation obligations
- shifts in production to a firm in a different jurisdiction lead to a sustained increase in emissions intensity, higher than it would have been had production not moved

By enabling greater market access, the agreement could facilitate higher levels of trade in sectors where the GHG intensity of production differs between the UK and New Zealand. The above conditions for carbon leakage could therefore be met following liberalisation if production shifts from the UK to New Zealand due to an increase in more GHG intensive imports from New Zealand.

However, an initial analysis suggests that the risk of carbon leakage with New Zealand is limited. The only sectors where some degree of UK production is expected to be displaced by New Zealand imports is in cattle meat. However, data currently available suggests that the GHG intensity of production in these sectors is similar across both countries.[100]

Moreover, New Zealand has committed to operating an Emissions Trading Scheme since 2008 and both the UK and New Zealand have made 2050 net zero targets, meaning their relative climate mitigation policies are unlikely to diverge significantly over the coming decades. This reduces any future risk of carbon leakage occurring between the two countries as the GHG intensity of production is likely to fall in both countries at a similar rate.

Opportunities for increased trade in environmental goods

Environmental goods refer to products with an environmental end use or benefit. Reducing trade barriers and increasing trade in environmental goods and services can increase their application and speed the diffusion and take up of more environmentally friendly production techniques resulting in positive environmental and climate outcomes.

Trade in these goods and spread of technologies are one of the key ways in which FTAs partially mitigate the environmental impacts of higher growth and changes to the economy resulting from FTAs. There is no internationally agreed definition of environmental goods. For the purposes of this FTA, the UK and NZ have agreed to an environmental goods list in Annex A of the Environment Chapter. This impact assessment uses this list.

The UK and New Zealand currently impose tariffs on 61 and 158 tariff lines of products on this list respectively. New Zealand's average tariff applied on environmental goods is around 4.4%, with tariffs of 5% or above imposed on over 110 environmental goods.[101]

Upon entry into force, both the UK and New Zealand will remove tariffs on all environmental goods covering a range of uses. This is the most comprehensive list of environmental goods agreed in an FTA to date.

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 a wide range of environmental issues, beyond greenhouse gas emissions.

Air pollution

Air pollution is an important issue affecting human, animal and plant health in both the UK and New Zealand. Exposure to air pollution is one of the UK's biggest public health challenges, shortening lifespans and damaging quality of life for many people.[102] Air pollutants also contribute to climate change.

100 OECD TECO2 data finds similar CO2 intensity across all agricultural sectors in the UK and New Zealand. Poore, J. & Nemecek, T. (2018) find C02 intensity of sheep meat production to be roughly the same in the UK and New Zealand. GTAPe GHG intensity finds New Zealand to be slightly more intensive in the 'bovine cattle, sheep and goats, horses' sector.
101 Tariff data: Macmaps 2019 & DIT analysis.
102 PHE, Health matters: air pollution, 2018.

Many sources of air pollution are linked to economic activities, including burning fossil fuels, industrial processes, transport, agricultural food production, wood fires and solvent use.[103] Both the UK and New Zealand have domestic policies to improve air quality. The UK has implemented a mix of regulatory frameworks, encouraged investment by industry in cleaner processes and a shift in the fuel mix towards cleaner forms of energy. Air quality has improved significantly in recent decades, but there are some parts of the UK where air pollution still exceeds the national limits, especially large metropolitan areas. The Environmental Performance Index (EPI) ranks the UK 14th among 180 countries for air quality. The UK has substantially improved its score over time. In comparison, New Zealand ranks 6th on the EPI for air quality.

Table 7: Environmental Performance Index (EPI) for air quality

	New Zealand			UK		
Air Quality Indicators	**Rank**	**EPI Score**	**10-year change**	**Rank**	**EPI Score**	**10-year change**
Air quality *	6	97.4	+2.2	14	84.7	+5.5
PM2.5 exposure	1	100	+0.6	18	75.4	+9.7
Ozone exposure[104]	24	67.4	-8.3	29	64.5	+3.7
Household solid fuels exposure	26	97.6	+5.8	1	100	-

Source: Environmental Performance Index (EPI), 2021.

* Air quality is a composed indicator made of household solid fuel use; PM2.5 average exposure, and PM2.5 exceedance of WHO thresholds.

The UK exports environmental goods to New Zealand that improve air quality, such as air handling equipment for extracting polluted air, corrosive gases or dust. In 2019, the UK's highest exported product to New Zealand associated with air quality was air pumps and other gas compressors. Trade in these products was worth £807,000 and accounted for 0.1% of total UK exports to New Zealand. These products face a tariff of 2.5%, whilst tariffs on other environmental goods in this area range from 0% to 5%. The agreement will eliminate these tariffs when the agreement comes into force.

The agreement is expected to have a limited negative impact on UK air quality. However, regional impacts may vary. The agricultural and food sectors are expected to decrease in GVA terms, which could lead to a reduction in CO_2 and non-CO_2 air pollutants.

New Zealand is a highly competitive producer of beef and sheep meat. Emissions such as ammonia (NH3)[105] and methane (CH4), produced by cattle could contribute to increases in air pollution under the agreement.

Water quality

Increased production from trade could put pressure on water resources and quality through agricultural, industrial and urban pollution.

Water is relatively abundant in New Zealand due to the temperate climate and maritime weather patterns. However, in recent years water pollution has become an important environmental issue.[106] New Zealand has 425,000 kilometres of rivers and streams, almost 4,000 lakes larger than 1 hectare in surface area and about 200 groundwater aquifers. By international standards, freshwater in New Zealand is both clean and in good supply. However, some aspects of water quality and quantity are deteriorating in areas dominated by intensive land use. The UK benefits from high annual rainfall but is seeing localised water stress notably in Southern and Eastern England due to increased abstraction demands.

Yale University's Environmental Performance Index (EPI) for sanitation & drinking water ranks the UK joint 1st among 180 countries and ranks New Zealand 29th. The water resources index measures the extent the country is mitigating risks to aquatic ecosystems through treatment.[107] For this index, the UK and New Zealand rank 6th and 20th respectively.

103 Defra, Air quality: explaining air pollution – at a glance, 2019.
104 Exposure to ground-level ozone pollution.
105 RAND, The impact of ammonia emissions from agriculture on biodiversity, 2018.
106 NZ Ministry for the Environment, Our Freshwater 2020, 2020.
107 The wastewater index is based on a wastewater management index that measures the proportion of wastewater that undergoes at least primary treatment in each country, multiplied by the proportion of the population connected to a wastewater collection system.

Table 8: Environmental Performance Index (EPI) for water quality

	New Zealand			UK		
Water Quality and Use Indicators	**Rank**	**EPI Score**	**10-year change**	**Rank**	**EPI Score**	**10-year change**
Sanitation & Drinking Water *	29	80.4	2	1	100	+0.8
Water Resources **	20	79.9	-	6	98.5	-

Source: Environmental Performance Index (EPI), 2021.

* This indicator measures how well countries protect human health from environmental risks on two indicators: unsafe drinking water and unsafe sanitation.

** 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.

New Zealand currently imposes tariffs on 28 goods associated with improving water quality whilst the UK imposes tariffs on 9 of these goods. The UK-New Zealand FTA will eliminate all of these tariffs when the agreement comes into force.

For example, New Zealand applies a 2.5% tariff on UV lamps used for purifying water.

In 2019, the UK imported a variety of environmental goods from New Zealand associated with supporting wastewater management, including pipes and hoses used for purifying water, with a UK tariff of up to 6%. These goods can help to minimise or reduce water wastage and will be eligible for tariff free imports and exports between the UK and New Zealand when the agreement comes into force.

The impact of the agreement on UK water resources and quality is difficult to estimate, especially at a regional level. Increased production for trade could put pressure on water resources and quality, particularly in areas where there is localised water stress due to increased abstraction demands, such as the South and East of England.[108] In New Zealand, projected increases in agricultural and semi-processed foods sectors could lead to increased water pressures and affect water quality.

Marine habitats and fisheries

Trade in seafood has increased dramatically in recent decades and is amongst the most highly traded food commodities.[109] Both the UK and New Zealand share ambitions for improving marine habitats and supporting sustainable fishing practices.[110] Both countries:

- are party to international agreements that seek to protect the marine environment, such as the United Nations Convention on the Law of the Sea (UNCLOS)[111] and the MARPOL[112] convention
- implement domestic regulations which prevent illegal, unreported and unregulated fishing (IUU) and seek to ensure sustainable fishing[113]
- implement international IUU fishing agreements and both share ambitions to tackle IUU fishing internationally

Marine protected areas in the Exclusive Economic Zone (EEZ)[114] can help to address issues of overfishing, by conserving habitat and reducing the fishing pressure on stocks in specific locations. The UK has made a significant improvement in protecting marine areas within its EEZ. In 2020, marine protected areas accounted for around 41% of the UK's EEZ compared to only 4% in 2010.[115] New Zealand has the fourth largest EEZ in the world and a network of 34 marine protected areas, covering 12,790 km^2 within its coastal zone or just over 7% of New Zealand's territorial sea.[116] Yale University's Environmental Performance Index (EPI) ranks the UK 38th among 111 countries for Fish Stock Status and ranks New Zealand 71st. It also ranks the UK and New Zealand 52nd and 60th respectively among 77 countries for Fish Caught by Trawling.

108 WRAP, Freshwater availability and use in the United Kingdom, 2012, p. 17.
109 WTO, Trade and Fisheries: Key Issues for the World Trade Organization, 2021.
110 New Zealand Gov, Government adopts oceans vision, 2021.
111 United Nations Convention on the Law of the Sea, done at Montego Bay on 10 December 1982.
112 International Convention for the Prevention of Pollution from Ships, done at London on 2 November 1973.
113 New Zealand Gov, International Fisheries Management.
114 An exclusive economic zone (EEZ), as prescribed by UNCLOS, is an area of the sea in which a sovereign state has special rights regarding the exploration and use of marine resources, including energy production from water and wind.
115 OECD Data, Protected areas, 2017.
116 Convention on Biological Diversity, New Zealand profile.

Table 9: Environmental Performance Index (EPI) for marine habitats and fisheries

	New Zealand			UK		
Marine Habitats and Fisheries Indicators	Rank	EPI Score	10-year change	Rank	EPI Score	10 year-change
Overall ranking	128	5.4	+0.7	109	8.8	+3.5
Fish Stock Status *	71	7.3	+0.5	38	13.1	+4.7
Fish Caught by Trawling **	60	3	+0.7	52	3.7	+2

Source: Environmental Performance Index (EPI), 2020.

* This indicator measures the percentage of a country's total catch that comes from overexploited or collapsed stocks, considering all fish stock within a country's EEZ. A score of 100 indicates that none a country's fish catch come from stocks that are overexploited or collapsed, and a score of 0 indicates worst performance.

** This indicator measures the percentage of a country's fish catch (within its EEZ) caught by bottom or pelagic trawling. A score of 100 indicates no fish caught using trawling, and a score of 0 indicates worst performance (99th-percentile).

CGE modelling estimates a very small change in output of the fisheries sectors of the UK and New Zealand as a result of the agreement. However, the modelling suggests an increase in trade in goods, which could cause an increase in shipping traffic and have additional impacts on marine ecosystems.

Forests

Forests play a key role in supporting ecosystems and their degradation leads to biodiversity loss, air pollution and water and soil erosion. Forestry in the UK is the largest source of national carbon sequestration, removing 18 million tonnes of CO_2 in 2017.[117] Conversely, deforestation is the second largest source of CO_2 emissions internationally.[118]

In 2020, woodland areas in the UK covered 3.2 million hectares (m ha), 1.39 million ha (43%) of which is independently certified as sustainably managed.[119] Forests cover 13% of the total land area in the UK, 10% in England, 15% in Wales, 19% in Scotland and 9% in Northern Ireland. In 2019-20 over 10,000 ha of newly created woodland was established in the UK. In 2020, New Zealand's' forest area stood at 10 million ha, covering 37.6% of the total land area in New Zealand.[120]

In Yale University's EPI, the UK ranked 117th for tree cover loss, down on a decade earlier. However, the UK Government manifesto commits to planting 30,000 hectares of trees per year by 2025 across the UK.[121] The UK Government has also pledged £50 million to the Woodland Carbon Guarantee to encourage woodland planting and develop the domestic market.[122] This is part of the 25 Year Environmental Plan introduced in 2018. New Zealand ranks 112th for tree cover loss, and has developed the One Billion Trees Programme with the goal of planting one billion trees by 2028.[123]

Table 10: Environmental Performance Index (EPI) for forestry

	New Zealand			UK		
Forestry Indicators	Rank	EPI Score	10-year change	Rank	EPI Score	10-year change
Tree cover gross loss *	112	24.9	-2.9	117	24	-3.8

Source: Environmental Performance Index (EPI), 2020.

* This indicator measures the gross average annual loss in forest area over the past five years, divided by the total extent of forest area in the year 2000. Forested areas include parcels with ≥ 30% canopy cover. A score of 100 indicates virtually no tree cover loss, and a score of 0 indicates the worst levels of loss.

Beef and dairy production could increase in New Zealand as a result of the agreement. However, the New Zealand Government requires notification of any deforestation and payment to offset this under their emissions trading scheme. New Zealand are also a signatory to the Glasgow Leaders' Declaration on Forests and Land Use[124] which commits them to reversing land degradation and forest loss by 2030. There is not expected to be increased land use change and deforestation pressures in the UK as a result of the agreement.

117 ONS, UK natural capital accounts 2019.
118 IPCC, Sixth Assessment Report pages 5-6.
119 Forest Research, "Forestry Statistics and Forestry Facts & Figures" Data: 2020.
120 World Bank – World Development Indicators.
121 Tree planting on the up in England, "Defra in the Media", 2020.
122 UK Government, Woodland Carbon Guarantee, 2019.
123 New Zealand Gov, One Billion Trees Programme.
124 Glasgow Leaders' Declaration on Forests and Land Use done at Glasgow on 2 February 2021.

Biodiversity and ecosystems

Biodiversity is the variety of ecosystems and species and the genetic diversity within them. The main direct causes of biodiversity loss around the world are: land use change; climate change; the pollution of ecosystems; invasive non-native species; and the over-exploitation of natural resources.[125] Trade in goods can contribute to these causes. It is estimated that around 30% of all species' threats are due to international trade.[126]

The UK has a diverse mix of habitats and species with approximately 13% of the world's 'blanket bog'[127] and 20% of Europe's lowland heathland.[128] The main threats to habitats in the UK are habitat change (land use and condition) and pollution, as well as invasive species and climate change.[129] Due to New Zealand's isolation from continental land masses, the country has a high level of endemic biodiversity, with an estimated 80,000 species of native animals, plants and fungi. Endemic species include all frogs, 90% of insects, 80% of vascular plants and a quarter of bird species. Eighty percent of the country's indigenous species are thought to occur in the marine environment, where 44% are estimated to be endemic. The main threats to biodiversity in New Zealand involve the introduction of invasive alien species and predators.[130] According to the New Zealand Ministry of Environment,[131] almost two-thirds of rare ecosystems are threatened by collapse.

The EPI includes the Ecosystem Vitality index which is divided into Biodiversity[132] and Ecosystem Services.[133] The UK performs strongly (better than the Global West[134] regional average) in Biodiversity with a score of 88, ranking it 6th overall. New Zealand also performs comparatively well with a score of 84, ranking 24th. In contrast, both the UK and New Zealand perform less well for Ecosystem Services. New Zealand scores 28.2 while the UK has a marginally higher score of 28.3.[135] The UK's lowest score is on the Biodiversity Habitat Index (BHI), which estimates the effects of habitat loss, degradation, and fragmentation on the ability to retain terrestrial biodiversity. The UK scores 44.7 out of 100.[136]

Table 11: Environmental Performance Index (EPI) for biodiversity and ecosystems

	New Zealand			UK		
Biodiversity and Ecosystems Indicators	**Rank**	**EPI Score**	**10-year change**	**Rank**	**EPI Score**	**10-year change**
Biodiversity	24	84	+0.1	6	88	+19.3
Ecosystem Services	117	28.2	-3.8	115	28.3	-0.6

Source: Environmental Performance Index, 2020, New Zealand and UK EPI profile.

The UK has committed to tackling biodiversity threats as a party to the Convention on Biological Diversity (CBD), within the UK Government 25-Year Environment Plan, and through several multilateral agreements such as the Convention on International Trade in Endangered Species.[137] The agreement is not expected to have any major impact on biodiversity in the UK.

The increase in trade with New Zealand expected as a result of the agreement may facilitate the movement of species between the UK and New Zealand either accidentally or deliberately. Invasive non-native species (INNS) are one of the largest threats to species loss in New Zealand because of the high levels of species that only live in a particular location. However, New Zealand has a stringent approach to tackling invasive alien species with the Biosecurity 2025 programme, which aims to protect New Zealand from pests and diseases.

The increase in livestock production in New Zealand may also increase pressure on biodiversity, though the impacts are expected to be small. This is because of the high environmental and regulatory standards in New Zealand, and the scale of changes in output and trade as a result of the agreement.

125 IPBES.
126 Lenzen et al. (2012), International trade drives biodiversity threats in developing nations.
127 Blanket bog is an area of peatland with a variable depth of peat and is a natural carbon store- International Union for Conservation of Nature.
128 Convention on Biological Diversity, UK profile.
129 Convention on Biological Diversity, UK profile.
130 Convention on Biological Diversity, New Zealand profile.
131 Environment Aotearoa 2019, New Zealand Ministry of Environment, April 2019.
132 Assesses the actions taken in each country to protect biodiversity. Comprised of seven indicators- Terrestrial biomes (national), terrestrial biomes (global), marine protected areas, Protected Areas Representativeness Index, Species Habitat Index, Species Protection Index, Biodiversity Habitat Index.
133 This recognises the important service ecosystems provide to human and environmental well-being. It comprises three indicators – tree loss cover and two new pilot indicators for 2020 – grassland loss and wetland loss.
134 Global West region includes: EU (Austria, Belgium, Germany, Denmark, Spain, Finland, France, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Sweden), UK, EFTA (Norway, Iceland, Switzerland), Canada, USA, Australia and New Zealand.
135 A score of 100 indicates virtually no tree cover loss. This indicator is a sub-category of Ecosystem Services.
136 A score of 100 indicates that a country has experienced no habitat loss or degradation. This indicator is a sub-category of the Biodiversity index.
137 Convention on International Trade in Endangered Species of Wild Fauna and Flora, done at Washington D.C. on 3 March 1973

Waste management

As countries grow and industrialise, they produce more solid waste as a result of production and consumption.[138] The volume of solid waste and effective waste management processes – such as those determining the disposal and recycling of goods – are an important determinant of the impact of increased economic activity on the environment.

The UK generated 222.2 million tonnes of total waste in 2018, an increase of 1.8% from the 218.3 million tonnes generated in 2016.[139] In comparison, New Zealand generates 17.5 million tonnes of total waste a year.[140] Both the countries are parties to the 1989 Basel Convention which puts controls on transboundary movements of hazardous wastes and their disposal.[141]

According to Yale University's Environmental Performance Indicator, the UK and New Zealand collect and treat 93% and 68% of their household and commercial waste respectively. As of 2016, the UK also produced less solid waste per day per capita than New Zealand.

Table 12: Baseline indicators for waste management, New Zealand and UK

Waste Management Indicators	New Zealand	UK
Solid waste generated in 2016 (Kg per day per capita)	1.99	1.33
"Controlled solid waste" EPI Score (100 is the top score)	68	92.9

Source: World Bank, "What a Waste 2.0" database; Environmental Performance Index (EPI).

The UK exports environmental goods to New Zealand that support waste management, such as crushing or grinding machines for solid mineral substances. In 2019, the UK exported machines and parts used for, inter alia, preparing waste for recycling, at a value of £6.8 million to New Zealand, accounting for 0.8% of total UK exports to New Zealand.

New Zealand currently imposes tariffs on environmental goods associated with improving waste management, ranging from 0% to 5%. These will be eliminated upon entry into force of the agreement, opening the New Zealand market to tariff free access for UK exporters.

In the UK, an increase in imports from New Zealand could impact the volume and composition of waste streams in the UK. The CGE modelling indicates an increase in imports in a number of sectors from New Zealand, particularly in the agri-food sector. Once these goods or services reach their end of life they will need to be treated within the UK or exported as a waste product.

In New Zealand, food and organic waste accounts for around 4% of overall GHG emissions.[142] Increases in the GVA of the agricultural and semi-processed foods sectors in New Zealand could increase food waste in New Zealand. In addition, the New Zealand IT sector already has one of the largest volumes of e-waste per capita in the world (19kg/cap in 2019),[143] and could see an increase in GVA as a result of the agreement.

138 World Bank, What a Waste: A Global Review of Solid Waste Management, 2012, p. 8–13.
139 Defra, UK Statistics on Waste, 2021, p.13.
140 New Zealand Gov, Estimates of waste generated in new Zealand, 2021.
141 UN Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal done at Basel on 22 March 1989.
142 New Zealand MfE, Reducing food waste, 2021.
143 UN, The Global E-waste Monitor, 2020, p111.

7. Uncertainty and sensitivity analysis

Many of the results throughout this Impact Assessment are presented for clarity as central point estimates. However, the modelling results should not be interpreted as highly precise estimates of what will happen; rather, they represent an indication of the direction of impacts and broad orders of magnitude.

Uncertainty surrounding the scale of macroeconomic impacts

It is important to recognise that the scale of macroeconomic impacts, as well as the distribution across sectors and regions are subject to a high degree of uncertainty from various sources.

Uncertainty in the estimated impacts relating to the model and key parameters

The scale of estimates for the macroeconomic impacts depends on the model structure, underlying data, key structural parameters (such as elasticities) and input assumptions (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 behavioural response of businesses and consumers when faced with lower trade costs and a new set of relative prices in the economy. The model structure exerts the largest influence on the estimated impacts as this also determines the ways in which businesses and consumers are assumed to respond to the trade agreement.

A 'Monte Carlo' statistical exercise has been undertaken to capture the impact of uncertainty surrounding the key parameters (for example, elasticities) and the scale of non-tariff trade cost reductions resulting from the agreement. The Monte Carlo exercise generates thousands of estimates for the impact of the agreement based upon alternative, randomly sampled, values for these input assumptions. It generates 90% confidence intervals which represent the ranges within which 90% of the estimates fall. See Annex 1 for further technical details.

The results from this exercise show that at the lower end of the 90% confidence interval, the agreement is estimated to increase GDP by 0.02% (0.023% to 3 decimal places). This is the equivalent of £0.6 billion, when compared to projected levels of GDP in 2035. At the upper end of the 90% confidence interval, the agreement is estimated to increase GDP by 0.03% (0.034% to 3 decimal places), the equivalent of £0.9 billion, when compared to projected levels of GDP in 2035.

However, it is important to recognise that the ranges do 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 the exogenous factors (described further below) which are likely to 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 Monte Carlo exercise (which only captures the impact of uncertainty from modelling parameters).

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 for 2014 and, like many approaches to economic modelling, assumes 'all else remains equal'. That means that it assumes that factors outside of the modelling framework all remain the same. However, there are many geopolitical trends and changes to the UK and global economy which may continue over the long run (c.15 years and beyond). These may 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, but are not limited to, those discussed in DIT's Global Trade Outlook, such as:

- global trends such as the increased importance of Asia and Africa to the global economy
- changing demographics and the rising global middle class
- geo-political developments and their impact on global value chains and UK-New Zealand trade in general
- the recovery of the global economy and international trade following Covid-19 related turbulence

It is not possible to quantify the impacts of these trends, but they may exert a large effect on the eventual impacts of the agreement. These and other sources of uncertainty mean that the impacts of the agreement are likely to differ from the central estimates and fall outside of the ranges estimated as part of the Monte Carlo statistical exercise.

Uncertainty and sensitivities surrounding the impact on nations and regions of the UK

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 current output for each sector within each nation and region of the UK.

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 also be subject to aggregation bias affecting the sub-national results.

In previous DIT analyses, the apportioned estimates have been adjusted using 'location quotients' in an attempt to account for local spending multipliers. The method is described further in Annex 4.[144]

There is some evidence to support the presence of regional multipliers resulting from changes in trade. These effects occur where tradable sectors and exporters pay higher wages and the expansion of exports leads to creation of jobs in other non-tradeable sectors, through a 'local employment multiplier effect'.[145]

However, the estimates based upon this approach are now presented as a sensitivity analysis.
The sensitivity analysis provides a broad indication of the direction of impacts if local economic effects were to persist in the long run. They are presented as a sensitivity analysis, rather than a central estimate because the scale and persistence of these multiplier effects is highly uncertain. On a conceptual level, they are particularly uncertain over the long term horizon, where in the CGE modelling framework markets are assumed to adjust fully in the long term and that labour is mobile across regions, dissipating any local multipliers effects. On a practical level, there are limited examples in the literature where the local multiplier effects of trade policies have been estimated. As such, attempting to adjust the estimates for these potential impacts introduces additional uncertainty to the estimates.

In this case, the distribution of impacts is highly sensitive to the adjustments made to account for local spending multipliers. After including these adjustments, the estimated impacts are shown in Table 13.

The adjustment increases the variation in sub-national impacts. The North East of England and West Midlands are still estimated to grow the most in relative terms, compared to baseline. Following the adjustment, net GVA in Northern Ireland is estimated to see a small reduction overall. This reflects the relative concentration of the semi-processed foods sector in Northern Ireland. Even in this case, Northern Ireland would still be expected to benefit from an increase in opportunities, and consumers in Northern Ireland would still benefit from tariff reductions in the agreement. The net reduction in GVA estimated under this method would not mean that the output of Northern Ireland would be expected to contract relative to today. The Northern Ireland economy would still be expected to grow over the next 15 years and several industries which are concentrated in Northern Ireland, such as the manufacture of electronic equipment, are expected to grow because of the agreement regardless.

144 Location quotients are used to reflect how concentrated or specialised a sector is within a given nation or region.
145 See, for example, Moretti (2010) "Local Multipliers" in American Economic Review: Papers & Proceedings 100 (May 2010): 1–7.

Table 13: Results for sensitivity analysis: Estimated changes in UK nations and regions of England after adjusting for the potential for local multipliers (value added, long run % and £ million change)

Nations and regions	Sensitivity results	
	% Change in GVA	Change in GVA £ million, 2019
East of England	0.02%	32
East Midlands	0.02%	19
London	0.03%	152
North East	0.04%	21
North West	0.03%	52
South East	0.03%	81
South West	0.02%	34
West Midlands	0.05%	77
Yorkshire and the Humber	0.01%	14
Northern Ireland	-0.06%	-26
Scotland	0.02%	26
Wales	0.02%	16

Source: DIT CGE Modelling (2021). Note: Based on 2019 data.

8. 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:

- DIT will include the results of monitoring in a biennial FTA monitoring report
- DIT will publish a comprehensive ex-post evaluation for the agreement within 5 years of its entry into force. The evaluation report will synthesise findings from monitoring, evaluation, and stakeholder engagement activities to assess the impact of the agreement and answer DIT's core evaluation questions. Following the report's publication, DIT 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 New Zealand and measuring 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 DIT'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 agreement 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 as well as future FTAs
- combine findings from monitoring, evaluation and stakeholder engagement activities to assess the impact and effectiveness of the agreement 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:

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, DIT 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 DIT'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 DIT may conduct.

For this evaluation, DIT 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 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.

Annex 1: Description of Computable General Equilibrium model

The macroeconomic analysis in this assessment uses the UK government Computable General Equilibrium (CGE) model, GETRADE. The following section highlights key features and assumptions underpinning the model. For a full technical description of the model and dataset please see the original model documentation.[146]

Dataset

The model used in this assessment is based on the standard GTAP model and the latest available GTAP 10A dataset. Both are widely used for international trade analysis. The elasticities used are Armington substitution elasticities, as provided in the GTAP 10A 2014 database.

GTAP 10A is the latest available GTAP dataset and draws on trade data from 2014. Where necessary, the baseline data are updated to reflect changes to tariffs and significant developments in trade policy since 2014. However, changes in the pattern of trade between 2014 and today are not fully reflected in the estimates.

The GTAP 10A database's sectoral coverage is 65 sectors. These sectors have been aggregated to 23 sectors,[147] for reporting purposes, to ensure consistency with the previous published Government analysis of long term impacts of trade agreements. Table 1 shows how the sectors provided in the source data are grouped together for the purposes of this Impact Assessment analysis.

146 Lanz and Rutherford (2016), 'GTAP in GAMS: Multiregional and Small Open Economy Models'.
147 The modelling however has been undertaken at 61 sectors aggregated from the 65 GTAP sectors – this is to avoid computational feasibility problems caused by small or zero trade flows (merging pdr and pcr, coa, gas and p_c and dwe and wtr).

Table 1 – Sector aggregation

23 Sector name	GTAP 10 code (65 Sectors)	GTAP Sector description
Agriculture, forestry, and fishing	pdr	Paddy rice
	pcr	Processed 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
	sgr	Sugar
Other processed foods	ofd	Food products nec
Beverages and tobacco products	b_t	Beverages and tobacco products
Energy	coa	Coal
	oil	Oil
	gas	Gas
	oxt	Other Extraction (formerly omn Minerals nec)
	p_c	Petroleum, coal products
	ely	Electricity
	gdt	Gas manufacture, distribution
Textiles and wearing apparel	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

23 Sector name	GTAP 10 code (65 Sectors)	GTAP Sector description
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
Manufacture of other transport equipment	otn	Transport equipment nec
Manufacture of electronic equipment	ele	Computer, electronic and optical products
Manufacture of machinery and equipment	eeq	Electrical 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
	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 describing the interactions between agents 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, 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) but does not capture the full range of channels through which a trade agreement may generate economic gains.

Key features of the model include:

- full employment of labour and capital: The model assumes that in the long run the economy would have time to adjust to new trade policy and displaced workers would be reallocated to jobs in other sectors.[148] The model assumes a fixed labour supply. This full employment closure rule is a common assumption employed in CGE modelling. It implies that the overall level of equilibrium employment in the long run is not affected by the Free Trade Agreement (FTA) but workers gain from increased wages due to higher productivity and a more efficient allocation of labour
- perfect labour mobility between sectors in the same country but not across skill types or between different countries
- countries are linked only via trade in goods and services, there are no migration or international capital flows. The primary trade policy levers impacting these links are tariffs, non-tariff measures and regulatory restrictions on services

Developments in model specification compared to previous DIT analysis

DIT's modelling is subject to an ongoing development programme. As part of this, DIT established an independent expert Modelling Review Panel, to explore ways to improve the department's modelling toolkit and approach to CGE modelling.

Consistent with the outcome of this review and suggestions from the expert panel, DIT has implemented several technical changes to the CGE model applied in this assessment compared to the modelling undertaken in the 2020 Scoping Assessment for a UK-New Zealand FTA.

These include:

- updating the underlying data in the modelling to the latest data available in the GTAP 10A database to better reflect the pattern of global trade (section 4.3 in the main document)
- undertaking the modelling at a more disaggregated sector level (the 61 out of 65 sectors allowed by the GTAP 10A database) to reduce the potential for aggregation bias and to better and more accurately reflect the changes in trade policy accounted for in the baseline
- updating the UK tariff schedule to reflect the UK Global Tariff (UKGT) rather than the Common External Tariff (assumed in the previous modelling) to better reflect the tariff reductions agreed in the agreement (section 4.3)
- updating the inputs to better approximate the negotiated outcome (section 4.4), and
- implementing changes to the modelling specification from a 'Melitz-style' model used in the previous modelling to a simpler and more stable, Armington specification applied in this modelling. The move towards the new model specification means that trade flows are generally more responsive to reductions in trade costs and generates results which are less sensitive to technical parameter estimates in the model which have limited theoretical or empirical basis

The specification of the CGE model used in this assessment is based on the standard GTAP model (the Armington specification). The Armington specification is used as a base for most CGE models around the world. Some examples of FTA publications which are modelled using the Armington trade specification include the USITC's TPP CGE assessment (2016), the EU Commission's Impact Assessments for Australia and New Zealand (2017) and the Canadian Government's CPTPP CGE assessment (2018). The Armington specification is also used in the external model used in the department's Japan scoping and impact assessments for the UK-Japan agreement, as well as the scoping assessment for UK's accession

148 As argued by Petri and Plummer (2017:10), the assumption is used in most applied models of trade agreements.

to CPTPP. It does, however, differ from the department's previously published scoping assessments for the US, Australia, and New Zealand, which use a 'new trade theory' specification resembling a Melitz-style model.[149]

The model specification has been updated because, under the Melitz-style model specification used for previous scoping assessments, the size of FTA impacts have been found to be highly sensitive to the choice of a key scaling factor which determines the size of the supply response for firms who export.[150] The scarcity of peer reviewed articles and research using this scaling factor means there is limited empirical or theoretical basis to select a particular value. The choice to use the Armington specification of the model ensures it relies on parameters more routinely used by trade modellers and academics.

This use of the Armington model specification rather than the Melitz-style model specification affects the estimated scale of impacts. Specifically, it generates larger supply responses and therefore larger estimated GDP impacts for a given FTA.

The use of this Armington model specification, along with updates to the databases and estimations of trade barrier reductions, means that the scale of impacts across DIT analyses are not directly comparable. This includes comparisons of the New Zealand Impact Assessment to the Japan Impact assessment, where although an Armington Specification was used for Japan, Professor Joe Francois' modelling differed in other ways, for example it included projected economic growth and allowed for international capital flows. There has also been a change to the estimation of the elasticity of substitution compared to the CPTPP scoping assessment, making direct comparisons impossible.

Monte Carlo analysis

Where possible, DIT's CGE modelling presents ranges around central point estimates of GDP and welfare which are generated by a Monte Carlo statistical process.

These ranges are based on 90% confidence intervals meaning that, after accounting for the variation in these parameters, there is a 90% probability that the true value is within the range. The process is similar to that used in previously published Scoping Assessments and Impact Assessments but omits model parameters not relevant to the model specification used in this publication and does not account for uncertainty arising from the baseline, which is typically found to be small.

A summary of the parameters varied is provided below.[151]

Table 2: Summary of parameters

Parameter	Definition	Distribution used	Range of values
UK-FTA partner NTMs	Estimated NTM levels on UK-FTA partner trade (AVE)	Normal	Standard deviations of 0.5 times the central estimate
Technical and rent generating NTM ratio	Ratio of NTMs assumed to be efficiency-reducing or rent-generating	Uniform	55:45 – 85:15 (midpoint 70:30)

Source: DIT (2021).

Method for calculating pound figures

The results presented throughout the impact assessment have been expressed in pound 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 % changes which represent long run changes relative to a baseline in 2014. The conversion to £ values allows the contextualisation of results in terms relatable to today's economy.

For GDP, £ values (expressed in 2019 prices) are calculated by applying the percentage change from the modelling to a level of real GDP in 2035. Based upon the OBR's long term economic determinants, UK real GDP could increase to around £2.79 trillion by 2035 in 2019 prices. This provides the best summary estimate of the value of the long run increase in GDP in £ values, expressed in today's prices.

149 See HMG (2018) 'EU Exit: Long term Economic Analysis Technical Reference' paper for detailed description of previously used model.
150 The scaling factor ETA is the export supply elasticity in the GETRADE model and is one of the two key parameters required to estimate ETAv. ETAv is the elasticity of substitution between sector specific capital and all other inputs and is required to solve the model.
151 For further detail on the parameters common to both this analysis and EU exit, see HMG's publication on EU Exit: Long term Economic Analysis (HMG, 2018).

This is because the 'long run' in this context is typically assumed to be around 10-15 years following the implementation of the agreement. For further context, and in light of the considerable uncertainty surrounding projections of future growth, £ values compared to 2019 levels of GDP are also presented.

For trade and impacts on New Zealand GDP, £ values (also expressed in 2019 prices) are calculated by applying the percentage changes to the DIT's projections set out in DIT's Global Trade Outlook.[152] The GTO projections are supplemented by additional assumptions regarding the evolution of the UK and New Zealand's market shares where necessary.

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 on the UK and global economy remains highly uncertain. In addition, while the CGE model is based on 2014 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 2035. These calculations do not take such variations into account and instead rest on the simplifying assumption that the structure of UK and New Zealand trade remains broadly the same in 2035 as it was in 2014.

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

Key Metric	Data Used
GDP	CGE model % impacts ONS GDP estimate[153] Bank of England Exchange rate[154] OBR forecast (for 2035 estimates)[155]
Total Trade and trade with New Zealand (Exports and Imports)	CGE model % impacts ONS UK total trade: all countries, non-seasonally adjusted, 2019 Global Trade Outlook projections of UK total exports and imports (for 2035 estimates)[156] For bilateral trade between the UK and New Zealand in 2035, it is further assumed that both countries lose market shares of partner import demand in line with their relative loss of global market shares (as projected in the Global Trade Outlook)
Wages	CGE model % impacts ONS, UK sector (S.1): Wages and salaries (D.11): Resources: Current price: £ million: Not seasonally adjusted
GVA by sector	CGE model $ impacts Bank of England exchange rate OECD, GDP in current prices $ (to inflate to 2019)[157]
GVA by region	See annex with regional methodology
Household spending and business investment	% CGE impacts Quarterly National Accounts[158]

Regional % and £ impacts are calculated by combining the CGE % sector impacts with 2019 ONS sectoral GVA data and for the sensitivity a location quotient using the methodology described in annex 4.

Sectoral £ impacts are calculated by converting the $ GVA impacts from the CGE model into £ at the 2014 USD-GBP exchange rate. These are then inflated to 2019 levels in line with the growth rate of UK GDP between 2014-2019.

152 DIT, Global trade outlook – September 2021 report.
153 ONS, GDP – data tables (August 2021).
154 Bank of England Data, average annual spot exchange rates.
155 Calculated using OBR, Economic and fiscal outlook – March 2021 long term economic determinants.
156 DIT, Global trade outlook – September 2021 report.
157 OECD Data, Gross domestic product (May 2021).
158 ONS, GDP – data tables (August 2021).

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

NTMs and regulatory restrictions to services can be hard to observe directly. As a result, for this assessment we estimate these using a gravity model. The estimates are expressed in ad valorem equivalent terms, that is in terms of the tariff that would create a similar cost and therefore have the same impact on trade flows as the NTM.

The gravity models use data on the trade flows between 121 countries for 30 sectors for the years 2004, 2007, 2011, and 2014.

NTM reduction inputs for goods sectors

To determine the NTM reduction inputs for the goods sectors a gravity model is used to estimate the scale of non-tariff measure reductions resulting from previous agreements which vary according to their 'depth' (as categorised by the DESTA database[159]). This generates an estimate of the impact of the various categories of FTA (defined according to depth) for each sector of the model. The econometric specification is set out in box 1.

A cross-check based on expert judgement is then applied to determine whether the provisions in the negotiated outcome broadly compare to those included in the previous agreements. This process determines which estimates are applied for each sector in the modelling to approximate the impact of the agreement.

For industrial goods sectors, the provisions are assessed to be broadly in line with estimated reductions estimated from the set of deep and comprehensive agreements in the database (corresponding to DESTA 7 agreements in the DESTA database). This means that the depth of provisions affecting industrial goods trade in this agreement are assumed to be broadly consistent with those in the deepest agreements in the DESTA database.

For agri-food sectors, the provisions are assessed to be broadly in line with the reductions estimated from the set of shallower agreements, as identified by the publicly available DESTA database (DESTA 1). This is because there are limited provisions affecting trade in the agri-food sectors and no new permissions for New Zealand goods to enter UK market, including maintaining bans on hormone beef. Therefore, the provisions affecting these sectors are assessed to be more consistent with shallower agreements. The NTM reductions in the modelling exercise reflect this.

159 Design of International Trade Agreements.

Box 1: Gravity model specification for goods sectors

To estimate the impact of the agreement on NTMs a gravity model for goods sectors is augmented to estimate the impact that previous FTAs of varying depth have had on NTM levels. Scores in the DESTA database are used as a proxy for the depth of an agreement. The DESTA database sorts historic FTAs into seven categories of ambition based on the chapters covered in the relevant agreement. The depth according to DESTA is captured in the variable $DESTA_{ijt}$ in Equation (1).

To account for asymmetric impacts between trading partners, we interact the *DESTA* variable with an estimate of the MFN NTM levels of country j in year t, denoted as AVE_{jt}. The coefficient β_3 can be interpreted as the impact of FTA depth between country i and country j for a given level of MFN NTMs in country j. MFN NTM estimates are obtained using the methodology of Fontagne et al (2011), which estimates NTMs from importer-time fixed effects that capture the relative restrictiveness of importing countries that cannot be attributed to other barriers.[160] For more details on the methodology please see the original paper.

$$(1)\ y_{ijt} = \exp\left(\beta_1 EU_{ijt} + \beta_2 EEA_{ijt} + \beta_3 DESTA_{ijt} AVE_{jt} + \beta_4 \ln\left(Tariff_{ijt}\right) + GDP_{jt} + \delta_{ijt} + \pi_{it} + \omega_{jt} + \varepsilon_{ijt}\right)$$

In the specification for the model above y_{ijt} denotes 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 gravity resistance 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 tariffs, to avoid tariff reductions being captured in β_3.

Inputs for reductions in regulatory restrictions to services trade

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).[161] 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.[162] 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 agreement.

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

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

The specification for the model used is shown above where π_{it} and ω_{jt} are sets of exporter-time and importer-time time trends respectively, and δ_{ijt} is a vector of standard gravity resistance variables. GDP_{jt} is importer GDP which is included with a coefficient constrained to unity in line with standard results of the literature. Also included are dummy variables for EU and EEA membership, and a dummy variable indicating the presence of an FTA between trading partners.

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 AVE NTMs that would create observed trade distortions, controlling for standard gravity variables and using a ranking of estimated fixed effects. Once NTMs have been estimated for each country in the dataset, we assume that 1/3 of NTMs are "actionable" and can be impacted by the agreement.[163] These actionable NTMs are reduced in proportion to reductions in water, or increased legal certainty, arising from the agreement as well as any applied liberalisation (Methodology is outlined below). A change in water is assumed to have a 42% impact on NTMs compared to a change in the applied rate.[164]

NTM input assumptions

The section below summarises the NTM reduction assumptions under the baseline and modelled scenario.

160 Where Fontagne et al (2011) use a constraint of 0.8 to reflect a perspective that the income elasticity of imports is less than unity, we change this to unity to reflect the perspective of the wider gravity modelling literature.
161 Ciuriak, D., Dadkhah, A. Lysenko, D. (2020). *The Effect of Binding Commitments on Services Trade,* World Trade Review , Volume 19 , Issue 3, pp. 365 – 378.
162 "Water" is the difference between legally bound liberalisation and the applied regime.
163 That is the maximum level of barriers that could be removed by the agreement is assumed to be 1/3 of their MFN levels. This is based on a literature for actionability.
164 Ciuriak, D., Dadkhah, A. Lysenko, D. (2020) 'The Impact of Binding Commitments on Services Trade', World Trade Review, Volume 19, Issue 3, July 2020, pp. 365 – 378.

Table 4: Applied reduction in tariffs and NTMs

	UK imports from New Zealand		UK exports to New Zealand	
Sectors	**Reductions in tariffs**	**Reductions in NTMs**	**Reductions in tariffs**	**Reductions in NTMs**
Agri-food	12.25%	2.58%	2.17%	0.98%
Industrial goods	1.63%	7.28%	1.74%	5.83%
Services	0.00%	3.34%	0.00%	1.80%

Services NTMs:

We score each services sector using the OECD's STRI methodology. 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 17 sectors.[165] Each sector score is determined by several individual policy measures.

As a baseline, analysts used work from the LSE that was commissioned by DIT. The research aimed to inform UK accession of CPTPP and mapped CPTPP members commitments in CPTPP and GATS, General Agreement on Trade in Services, to the STRI.[166] DIT policy judgement was that CPTPP provided a precedent of New Zealand for the level of services commitments we would expect to see in the UK-NZ FTA. We therefore assumed the services NTM reductions for the agreement are mostly consistent with those made by New Zealand in CPTPP. Since both New Zealand and the UK have open-service economies, and expert policy judgement indicated most of the final agreement text would apply symmetrically, DIT analysts assumed that this FTA score would apply for both UK exports to New Zealand, and New Zealand exports to the UK.

We made several adjustments to this FTA score where we expected the UK-NZ FTA could diverge from CPTPP in the following areas:

- liberalisation on residency requirements (measure that one board member must be a resident was removed)
- maritime transport services (several measures that relate to the UK's IMTS ask were removed)
- audio-visual services where we assumed no liberalisation from the agreement (there were no STRI measures bound in for the three AV sectors, broadcasting, sound recording and motion pictures)
- liberalisation to reflect measures pertaining to the recognition of qualification for legal services

The specific measures where we assumed the UK-NZ FTA would be more liberal that CPTPP are listed in the table below.

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.

To produce a UK GATS score DIT analysts used an average GATS score from the following high-income CPTPP countries: Australia, Canada, Japan, New Zealand, and Singapore. DIT analysts sense-checked the GATS score assumption against several alternative approaches and found the results to be broadly consistent.

It should be noted that the final UK-NZ FTA differs from the adjusted CPTPP FTA score that was modelled. Significant differences include:

165 Services sectors included are broadcasting, motion pictures, sound recording, construction, courier, computer services, commercial banking, insurance, accounting, architecture, engineering, legal, telecommunications, air transport, maritime transport, rail freight transport, and road freight transport. Distribution, logistics cargo-handling, logistics customs-brokerage, logistics freight-forwarding, and logistics storage and warehouse are out of the scope of this assessment.
166 The General Agreement on Trade in Services (GATS) is among the World Trade Organization's most important agreements. The accord, which came into force in January 1995, is the first and only set of multilateral rules covering international trade in services. It has been negotiated by the Governments themselves, and it sets the framework within which firms and individuals can operate (OECD definition).

Table 5: Targeted Services Measures Liberalised under Modelling Scenarios

Measure Code	Measure	Sector(s)
1.4.4	Board of directors: at least one must be resident	Insurance (non-life)
1.11.22	Bilateral/plurilateral cargo sharing agreements	Maritime Transport
1.25.13	Statutory monopoly on port services	Maritime Transport
1.13.31	Restrictions on the number of licences/concessions	Maritime Transport
1.13.32	Restrictions in the awarding of port licences/concessions	Maritime Transport
1.16.1	Commercial presence is required in order to provide cross-border services	Maritime Transport
3.7.21	Discriminatory port tariffs and other port-related fees	Maritime Transport
3.7.22	Discriminatory environmental and/or security standards	Maritime Transport
3.50.1	Other restrictions in other discriminatory measures	Maritime Transport
4.7.131	Shipping agreements are fully exempt from national competition laws	Maritime Transport
4.7.132	Shipping agreements are partially exempt from national competition laws upon approval	Maritime Transport
4.7.133	Certain types of shipping agreements are partially exempt from national competition laws	Maritime Transport
4.7.134	Obligation to use a local maritime port agent	Maritime Transport
2.6.1	Laws or regulations establish a process for recognising qualifications gained abroad	Legal
2.8.1	Foreign providers have to completely re-do the university degree, practice and exam in the domestic country	Legal (international law)

Note that these measures reflect those targeted measures bound in beyond the CPTPP baseline.

Adjustments to UK baseline tariffs

As described in section 4, the modelling uses tariffs from the 2014 GTAP 10A dataset and assumes that all tariffs and non-tariff quotas (TRQs) are removed in the long run. The following adjustments have been made to the CMT sector (a subset of semi-processed foods which includes beef and sheepmeat) tariff applicable to UK imports from New Zealand to reflect the trading relationship more accurately.

1. **Tariffs applicable to tariff lines under a TRQ**

   New Zealand has access to a large and underfilled sheepmeat quota. This quota has an in-quota rate (the tariff applied to imports within the quota volume) of 0%, meaning that New Zealand already has tariff free access. The ad valorem equivalent (AVE) tariff estimate applied to sheepmeat has been adjusted to reflect this in-quota rate.[167] An average of the in and out of quota (the tariff applied to imports above the quota volume) rates has been used for beef.[168]

2. **Trade weighting**

   The calculation of AVEs in the GTAP database is further complicated by the aggregation of tariff lines into broader sectors via trade weighting. This means that these estimates can sometimes be subject to endogeneity and aggregation problems i.e. that there is low trade in some tariff lines due to high tariffs, which then have a low contribution to the overall trade weighted tariff. In this instance, sheepmeat accounts for the majority of the UK's CMT imports from New Zealand due to its effectively tariff free access, in contrast to beef access which is under a much smaller TRQ with a 20% in quota rate. As a result, sheepmeat drives the trade weighted CMT tariff which results in a very low tariff which does not accurately reflect the barriers to beef. To adjust for problems arising from endogeneity/aggregation bias created by the difference in market access for each product, tariffs have been trade weighted according to gravity modelled estimates of beef and sheepmeat imports in a scenario with no tariff barriers.

167 GTAP data does make adjustment for CMT TRQs but using the Erga Omnes (EO) TRQ rather than the bilateral TRQ. In this case, the bilateral sheepmeat quota is much larger than the EO TRQ and better reflects the access available to New Zealand. Using just the EO quota results in the out of quota rate being applied to sheepmeat, and a trade weighted CMT tariff of 44%.
168 These adjustments have been made applying 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 yields a tariff AVE of 19% which is applied in our modelled liberalisation scenario rather than the tariff in the GTAP database of 44%. This adjustment should better capture the effective tariff barrier on the CMT imports. Note that in the modelling for New Zealand Scoping assessment, the AVE for the whole of CMT sector was adjusted to 0%, reflecting that the vast majority of CMT imports from New Zealand (i.e. sheepmeat) enter the UK duty free.

Though less significant to the overall results, a similar adjustment in accordance with TRQ fill rates has also been made to the MIL (dairy products) sector. The adjustment reduces the tariff from 45% in GTAP database to 18% applied in our modelling.

Annex 3: Supplementary results

This annex provides additional detail to the analysis set out in the main Impact Assessment.

3.1 Additional macroeconomic results

Table 6: Macroeconomic results

	Percentage change on baseline	2035 £ change on baseline (in 2019 prices)	£ change on baseline (compared to 2019 in 2019 prices)
Change in UK GDP	0.03%	£0.8bn	£0.6bn
Change in UK exports to New Zealand	39.7%	£0.7bn	£0.6bn
Change in UK imports from New Zealand	76.4%	£1.0bn	£0.9bn
Change in UK exports to World	0.10%	£0.7bn	£0.7bn
Change in UK imports from World	0.08%	£0.6bn	£0.5bn
Change in real wages	0.03%	Not Available	£0.2bn

Source: DIT CGE Modelling (2021).

Table 7: Results by component of GDP

Component of GDP	% Change
Consumption	0.02%
Investment	0.01%
Government	0.00%
Imports	0.08%
Exports	0.10%

Source: DIT CGE Modelling (2021).

3.2 Additional results on tariff saving and SMEs

Table 8: Top 10 HS sections, ranked by scale of estimated tariff reductions on UK exports to New Zealand[169]

Product Section (HS)	Long term duty reductions, (£ million)	Average annual exports value, 2017-19, (£ million)
17: Transport equipment	5.5	288.0
16: Machinery	4.4	256.9
04: Prepared food, beverage and tobacco	1.5	58.4
06: Chemical products	1.4	89.8
07: Plastics and rubber	1.2	31.8
15: Base metals and articles	1.0	28.3
20: Miscellaneous articles	0.6	14.2
11: Textiles and textile articles	0.6	12.6
13: Stone, cement	0.5	12.7
18: Optical and other apparatus	0.2	36.2

Source: DIT Calculations (2021).

Table 9: Share of estimated tariff reductions on UK exports to New Zealand, by nations and regions of the UK

Region	Proportion of goods exports to New Zealand, %	Proportion of tariff reduction affecting each nation and region in the long term, %
West Midlands	16%	17%
South East	13%	12%
North West	10%	12%
East	11%	11%
East Midlands	11%	10%
London	8%	8%
Yorkshire and the Humber	8%	8%
South West	6%	6%
North East	5%	5%
Scotland	6%	4%
Northern Ireland	3%	3%
Wales	3%	3%

Source: DIT Calculations (2021). Columns may not sum to 100% due to rounding.

169 Short term refers to entry into force of the agreement. Long term refers to the end of the tariff liberalisation period.

Table 10: Shares of estimated tariff reductions on UK imports of goods from New Zealand, by nations and regions of the UK

Region	Proportion of goods imports from New Zealand, %	Proportion of tariff reductions affecting each nation and region in the long term, %
London	28%	23%
South East	18%	16%
East	14%	10%
North West	7%	13%
East Midlands	7%	9%
West Midlands	6%	3%
South West	6%	9%
Yorkshire and the Humber	6%	4%
Scotland	4%	5%
North East	2%	4%
Wales	1%	2%
Northern Ireland	1%	2%

Source: DIT calculations (2020). Columns may not sum to 100% due to rounding.

Table 11: Distribution of SMEs in each sector and total change in GVA in each sector relative to no FTA

Sector	Distribution of SMEs	Change in sector share of total UK GVA (percentage point)	GVA £m change
Agriculture, forestry, and fishing	2.60%	0.00%	-48
Beverages and tobacco products	0.24%	0.00%	3
Other processed foods	0.72%	0.00%	13
Semi-processed foods	0.36%	0.00%	-97
Chemical, rubber, plastic products	0.36%	0.00%	18
Energy	0.52%	0.00%	13
Manufacture of electronic equipment	0.12%	0.00%	20
Manufactures	0.48%	0.00%	25
Manufacture of motor vehicles	0.12%	0.00%	43
Manufacture of machinery and equipment	0.84%	0.00%	46
Manufacture of other transport equipment	0.60%	0.00%	14
Manufacturing n.e.c	0.24%	0.00%	7
Paper and printing products	1.30%	0.00%	5
Textiles and wearing apparel	0.36%	0.00%	15
Business services	22.69%	0.00%	77
Communications	1.06%	0.00%	32
Construction	16.61%	0.00%	48
Financial services	1.02%	0.00%	29
Insurance	0.51%	0.00%	8
Other services (transport, water, dwellings)	8.74%	0.00%	82
Personal services	9.39%	0.00%	23
Public Services	16.11%	0.00%	82
Wholesale and Retail Trade	15.00%	0.00%	105

Source: BEIS BPE and DIT CGE Modelling (2021).

3.3 Additional results on consumer impacts

Table 12: Top estimated annual tariff reductions on consumer goods imported from New Zealand[170]

Type of Consumer Good	Proportion of household spending on imports, %	Annual tariff savings in the long term, £ million
Alcoholic beverages, tobacco and narcotics	71%	26.8
Food and non-alcoholic beverages	57%	9.9
Recreation and culture	23%	0.3
Clothing and footwear	59%	0.3
Furnishings, household equipment and routine household maintenance	50%	0.3
Total final consumer goods tariff savings	24%	37.9

Source: DIT analysis (2020), UK input-output analytical tables, ONS (2019) and Living Costs and Food Survey (LCF), ONS (2019).

Table 13: Comparison of estimated tariff reductions from a UK-New Zealand agreement to average UK household weekly expenditure by nation

Type of Consumer Good	Estimated long run national annual tariff reductions, £ million	Estimated proportion of total weekly household spend owing to imports, %				
		UK	England	Wales	Scotland	Northern Ireland
All expenditure groups	37.9	31.5%	31.3%	32.1%	32.8%	33.9%
Alcoholic beverages, tobacco and narcotics	26.8	1.8%	1.7%	1.9%	2.4%	2.4%
Food and non-alcoholic beverages	9.9	7.0%	6.9%	7.2%	7.3%	8.5%
Recreation and culture	0.3	3.5%	3.5%	3.9%	3.5%	2.8%
Clothing and footwear	0.3	2.8%	2.7%	2.7%	3.2%	4.1%

Source: DIT analysis (2021), UK input-output analytical tables, ONS (2019) and Living Costs and Food Survey (LCF), ONS (2019).[171]

170 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).
171 Note: 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 tariff reductions from a UK-New Zealand agreement to average UK household weekly expenditure by income level

Type of Consumer Good	Estimated national annual tariff reductions in long run, £ millions	Estimated proportion of total weekly household spend owing to imports (%)		
		All households	Lowest 20%	Highest 20%
All consumer goods	37.9	31.2%	28.5%	31.5%
Alcoholic beverages, tobacco and narcotics	26.8	1.6%	0.8%	1.5%
Food and non-alcoholic beverages	9.9	6.6%	6.7%	6.0%
Recreation and culture	0.3	3.2%	3.4%	3.5%
Clothing and footwear	0.3	3.0%	1.8%	3.1%

Source: DIT analysis (2021), UK input-output analytical tables, ONS (2019) and Living Costs and Food Survey (LCF), ONS (2019).

3.4 Additional results on labour market outcomes

Table 15: Gains in wages across labour market groups

Occupation	Gains in wages %
Managers	0.03
Technicians	0.03
Service workers	0.03
Clerks	0.03
Labourers	0.02

Source: DIT CGE Modelling (2021).

Table 16: Change in shares of employment and GVA by sector

Sector name	Change in share of employment	Change in sector share of total UK GVA (percentage point)
Agriculture, forestry, and fishing	0.00%	0.00%
Beverages and tobacco products	0.00%	0.00%
Other processed foods	0.00%	0.00%
Semi-processed foods	-0.01%	0.00%
Chemical, rubber, plastic products	0.00%	0.00%
Energy	0.00%	0.00%
Manufacture of electronic equipment	0.00%	0.00%
Manufactures	0.00%	0.00%
Manufacture of motor vehicles	0.00%	0.00%
Manufacture of machinery and equipment	0.00%	0.00%
Manufacture of other transport equipment	0.00%	0.00%
Manufacturing n.e.c	0.00%	0.00%
Paper and printing products	0.00%	0.00%
Textiles and wearing apparel	0.00%	0.00%
Business services	0.00%	0.00%
Communications	0.00%	0.00%
Construction	0.00%	0.00%
Financial services	0.00%	0.00%
Insurance	0.00%	0.00%
Other services (transport, water, dwellings)	0.00%	0.00%
Personal services	0.00%	0.00%
Public Services	0.00%	0.00%
Wholesale and Retail Trade	0.00%	0.00%

Source: DIT CGE Modelling 2021.

Table 17: Proportion of people who move to a new sector in any given year.

Sector	Move to a new sector
Semi – Processed foods	5%

Source: DIT Analysis of Longitudinal ASHE data, 1% sample (2011-2019 averages).

Table 18: Developing country exports identified as being at potential risk of trade diversion from the UK-New Zealand FTA, 2017-19 average

HS6 code and product description	UK imports from developing countries	New Zealand exports to World	Developing countries' reliance on the UK market (UK exports as % of total exports)
020130: Fresh or chilled bovine meat, boneless	£16.5m	£202.4m	Namibia $12.1m (26.4%) Botswana $9.3m (27.9%)
020230: Frozen, boneless meat of bovine animals	£5.1m	£1.3bn	Botswana $4.9m (16.3%)
030289: Fresh or chilled fish (nes)	£4.8m	£14.4m	India $2.3m (14.0%) Sri Lanka $3.2m (21.1%)
030389: Frozen fish (nes)	£21.2m	£80.0m	Bangladesh $7.0m (40.6%) Myanmar $15.0m (22.6%)
030619: Frozen crustaceans	£3.3m	£9.1m	Bangladesh $4.0m (85.4%)
060319: Fresh cut flowers and buds	£4.1m	£4.7m	Tanzania $1.3m (18.8%)
070310: Fresh or chilled onions and shallots	£7.7m	£66.3m	Senegal $6.7m (81.9%)
070610: Fresh or chilled carrots and turnips	£2.0m	£4.3m	South Africa $2.7m (27.2%)
070960: Fresh or chilled fruits of the genus Capsicum or Pimenta	£10.6m	£11.5m	Kenya $2.7m (61.0%) Mozambique $1.3m172 (74.2%) Pakistan $1.8m (56.7%) Senegal $1.4m (65.1%) Uganda $2.4m (40.3%)
070993: Fresh or chilled pumpkins, squash and gourds "Cucurbita spp."	£8.0m	£31.1m	South Africa $6.7m (38.5%)
071080: Vegetables, uncooked or cooked by steaming or by boiling in water, frozen	£2.8m	£7.1m	Bangladesh $1.7m (80.8%) India $1.4m (11.0%)
080440: Fresh or dried avocados	£29.3m	£58.5m	Tanzania $1.8m (12.3%) South Africa $27.9m (17.3%) Zimbabwe $1.0m (10.8%)
080810: Fresh apples	£66.3m	£406.7m	South Africa $86.4m (29.5%)
080910: Fresh apricots	£1.8m	£1.8m	South Africa $2.4m (37.0%)
081040: Fresh cranberries, bilberries and other fruits of the genus Vaccinium	£34.7m	£18.7m	South Africa $43.8m (55.4%) Zimbabwe $1.0m (37.7%)
081070: Fresh persimmons	£1.3m	£4.8m	South Africa $1.2m (28.8%)
081190: Frozen fruit and nuts, uncooked or cooked by steaming or boiling in water	£7.9m	£5.3m	Cote d'Ivoire $1.8m (65.6%) South Africa $4.6m (32.4%)
151590: Fixed vegetable fats and oils and their fractions, whether or not refined, but not chemically modified	£5.4m	£4.9m	Kenya $1.7m (15.2%)
160420: Prepared or preserved fish (excl. whole or in pieces)	£5.2m	£12.1m	Mauritius $3.9m (37.2%)

172 Differentiation between trade reported in TradeMap and HMRC for Mozambique in this product.

HS6 code and product description	UK imports from developing countries	New Zealand exports to World	Developing countries' reliance on the UK market (UK exports as % of total exports)
170490: Sugar confectionery not containing cocoa, incl. white chocolate	£5.8m	£38.2m	Pakistan $1.6m (17.4%) Philippines $3.2m (17.3%)
190120: Mixes and doughs of flour, groats, meal, starch or malt extract, not containing cocoa or containing < 40%	£3.0m	£16.1m	Bangladesh $1.6m (49.8%), Pakistan $1.1m (55.9%)
190190: Malt extract: food preparations of flour, groats, meal, starch or malt extract, not containing cocoa or containing < 40% by weight	£4.4m	£143.9m	Pakistan $1.8m (71.5%)
190230: Pasta, cooked or otherwise prepared	£4.2m	£11.1m	Ghana $1.0m (83.1%) India $1.1m (13.0%),
190590: Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa	£16.7m	£58.3m	Bangladesh $2.7m (22.3%) Jamaica $2.8m (15.5%)
200599: Vegetables and mixtures of vegetables, prepared or preserved otherwise than by vinegar, non-frozen	£14.8m	£14.3m	India $15.1m (24.0%) Jamaica $2.9m (37.5%)
210390: Preparations for sauces and prepared sauces; mixed condiments and seasonings	£17.7m	£55.9m	India $9.1m (16.5%) Jamaica $2.7m (16.5%) Pakistan $4.0m (28.0%) Trinidad and Tobago $1.8m (19.5%)
220210: Waters, incl. mineral and aerated, with added sugar, sweetener or flavour	£3.8m	£60.9m	Philippines $1.5m (13.9%)
220421: Wine of fresh grapes, incl. fortified wines	£67.1m	£711.6m	South Africa $86.1m (17.1%)
220429: Wine of fresh grapes, incl. fortified wines	£39.7m	£202.3m	South Africa $51.6m (26.8%)
220600: Cider, perry, mead and other fermented beverages	£4.8m	£4.6m	Jamaica $5.0m (85.1%)
230910: Dog or cat food, put up for retail sale	£1.8m	£85.8m	India $1.9m (20.0%)
291819: Carboxylic acids	£6.1m	£35.6m	South Africa $3.6m (33.5%)
392329: Sacks and bags, incl. cones, of plastics	£27.2m	£7.4m	India $34.2m (38.4%)
392390: Articles for the conveyance or packaging of goods, of plastics	£7.7m	£21.2m	Bangladesh $1.2m (10.7%) India $8.5m (13.8%)
392410: Tableware and kitchenware, of plastics	£11.8m	£55.2m	India $12.8m (16.0%),
441239: Plywood consisting solely of sheets of wood <= 6 mm thick	£7.8m	£14.8m	Indonesia $6.0m (15.3%), South Africa $4.1m (48.8%)
510610: Carded wool yarn containing >= 85% wool by weight	£4.5m	£6.9m	Mauritius $5.8m (39.1%)

HS6 code and product description	UK imports from developing countries	New Zealand exports to World	Developing countries' reliance on the UK market (UK exports as % of total exports)
520911: Plain woven fabrics of cotton, containing >= 85% cotton by weight and weighing > 200 g/m², unbleached	£7.8m	£0.3m	Pakistan $8.5m (22.6%)
630630: Sails for boats, sailboards or landcraft of textile materials	£8.7m	£8.9m	Sri Lanka $9.4m (21.6%) Philippines $1.8m (56.6%)
761290: Casks, drums, cans, boxes and similar containers	£16.8m	£15.3m	South Africa $21.3m (43.6%)

Source: HMG analysis using HMRC and WITS data

Annex 4: 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.

Trade agreements affect places differently depending on a host of factors including the composition of economic activity in areas, the relative competitiveness of those activities compared to the rest of the country, and the degree to which those regions and nations are integrated into international trade.

This method uses the differing composition of economic activity across UK regions and nations to estimate the long run impact of a trade agreement on their economic output.

Data and method

Central 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 current output (GVA) and, where necessary, employment shares for each sector within each nation and region (NUTS-1) of the UK.[173] The regional impact is calculated by weighting the UK wide change to each sector's output from the CGE modelling (denoted as UK Impacts 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 NUTS 1 region and s stands for sector.

$$Regional\ Impact_r = \sum_{s}^{S} Share\ of\ GVA_{rs}\ x\ UK\ Impact_s$$

This means that the estimated impact on a particular sector in a particular region is the change in GVA for the UK sector multiplied by the share of the sector that is located in that region. Changes in sectors are then summed to give the total regional impact.

The apportionment approach means that the uncertainties affecting the sectoral impacts also affect the sub-national impacts. In addition, due to data availability, the sub-national impacts may be subject to additional uncertainty.

Local Multiplier Effects

In previous DIT analyses, the apportioned estimates have been adjusted using 'location quotients'.

There is some evidence to support the presence of regional multipliers resulting from changes in trade. These occur where tradable sectors and exporters pay higher wages and the expansion of exports leads to the creation of jobs in other non-tradeable sectors, through a 'local employment multiplier effect'.[174]

However, the estimates based upon this approach are now presented as a sensitivity analysis.

They are presented as a sensitivity analysis, rather than central estimate, because the scale and persistence of these multiplier effects is highly uncertain. On a conceptual level, they are particularly uncertain over the long term horizon where the CGE modelling approach assumes that markets fully adjust and that labour is mobile across regions: in this long run framework any local multiplier effects would be expected to dissipate. On a practical level, there are limited examples in the literature where the local multiplier effects of trade policies have been estimated. As such, attempting to adjust the estimates for these potential impacts introduces additional uncertainty to the estimates. There is limited evidence to guide the scale of adjustment which should be applied to capture these potential effects.

173 NUTS-1 regions of the UK are used. These include Northern Ireland, Scotland, Wales and nine English regions. Further information on the NUTS-1 classification can be found at "The establishment of a common classification of territorial units for statistics (NUTS), Eurostat 2018.
174 For example, Moretti (2010) "Local Multipliers" in American Economic Review: Papers & Proceedings 100 (May 2010): 1–7.

The sensitivity approach multiplies the regional impact by each sector's location quotient in each region to account for the rank and direction of potential second order effects in each region. The sectoral changes are then constrained to ensure the overall change in a sector matches the sectoral change from the CGE results.

where r stands for NUTS 1 region and s stands for sector.

$$Regional\ Impact_r = \sum_{s}^{S} Share\ of\ GVA_{rs}\ x\ UK\ Impact_s\ x\ Location\ Quotient_{rs}\ x\ Constraint_s$$

The average is then taken between this, and the simple apportionment methodology, to provide for a sensitivity analysis. However, there is limited evidence to guide this choice. Therefore, the sensitivity analysis should be interpreted as providing a broad indication of the direction of impacts if local economic effects were to persist in the long run.

Box 2: Location quotient

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 1 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 1 means that the industry makes up a larger share of employee jobs in the region than at the national level (that is, the nation or region is particularly specialised in a sector). For example, Northern Ireland has a location quotient of 4.61 for semi-processed foods, meaning the share of jobs in the semi-processed foods sector in Northern Ireland is over four times the share of jobs in the sector in the UK as a whole.

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.

Limitations

The aim of the regional analysis is to provide a high-level overview of potential UK regional impacts, using an intuitive analytical approach rather than precise estimates or forecasts. The analysis is subject to the same limitations as CGE modelling in general, as set out in the main report and the CGE modelling annex. In addition, the sub-national analysis requires several additional simplifying assumptions and is subject to limitations, for example:

- it is based on sector results and location quotients at a highly aggregate level. It therefore does not fully reflect differences in patterns of production across nations and regions of the UK
- it does not explicitly consider the varying trade patterns of individual sectors across each part of the UK
- it assumes the long term structures of regional economies are consistent with GVA and employment data from 2019
- it assumes that the sector GVA shock is the same for all nations and regions of the UK i.e., the CGE model provides only a UK-wide sectoral shock
- it does not give any insight into how nations and regions adjust to a new long term equilibrium
- it does not explicitly take account of any impacts arising from the Protocol on Ireland/Northern Ireland (to the Withdrawal Agreement)

Annex 5: Method for assessment of impacts on tariffs

This annex sets out the method for estimating the value of tariff reductions UK businesses and consumers would face on the imports of intermediate and final goods.

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 tariff reductions.

Once tariff reductions have been estimated, it is possible to apportion these reductions across UK nations and regions, based upon historic trade flows.

Method for estimating tariff reductions

UK exports to Partner Country

The total value of UK trade that will become eligible for tariff-free or preferential access under the agreement is calculated using average trade flow data (2017 to 2019) from official statistics of the partner country at the 8-digit product classification (HS2017).

To calculate annual tariff reductions on partner country imports from the UK, the difference between the partner country's MFN tariff rates (applied 2020) and the preferential schedule is multiplied by the average of partner country imports from the UK (2017 to 2019) at the 8-digit product classification level. Using the preferential tariff schedule, it is then possible to identify and aggregate immediate tariff reductions (where tariffs are removed at entry into force) and long term tariff reductions (immediate tariff reductions plus tariff reductions on goods that are subject to staged tariff removal).

The data is grouped into intermediate or final consumption goods using the UN's 'Broad Economic Categories' (BEC).[175]

UK imports from Partner Country

The total value of partner country trade that will become eligible for tariff-free or preferential access under the agreement is calculated using average trade flow data (2017 to 2019) from HMRC at the 8-digit product classification (HS2017).

To calculate annual tariff reductions on UK imports from the partner country, the difference between UKGT tariff rates (applied 2020) and the preferential schedule are multiplied by the average UK imports from the partner country (2017 to 2019) at the 8-digit product classification level. Import data is from Eurostat which provides a more detailed breakdown of the tariff regime by which a product enters the UK. For these calculations, imports entering the UK as non-MFN 0 are used.[176] Using the preferential tariff schedule, it is then possible to identify and aggregate immediate tariff reductions (where tariffs are removed at entry into force) and long term tariff reductions (immediate tariff reductions plus tariff reductions on goods that are subject to staged tariff removal).

The data is grouped into intermediate or final consumption goods using the UN's 'Broad Economic Categories' (BEC).

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.

175 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.
176 An adjustment was made to tariff reduction calculations for apples, where a seasonal tariff is applied. To more accurately estimate tariff reductions, monthly HMRC import data is multiplied by the seasonal tariff.

Apportioning tariff reductions by UK nations and regions: data and methodology

The approach takes the following steps:

- data is collated from various sources:
  - DIT calculations of estimated tariff reductions on a HS/CN basis
  - HMRC Regional Trade in goods estimates for all UK regions and nations (NUTS1) by country and commodity (SITC 2-digit)
  - Mappings of CN8-SITC (2018)/HS6-SITC (2017)
- tariff reductions are mapped from CN8/HS6 to SITC
- 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 between UK nations and regions and the partner country
- trade not assigned to a UK nation or region was removed from calculations
- tariff reductions are apportioned across nations and regions according to the pattern of trade then aggregated to estimate the total tariff reduction in each nation and region

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.[177] 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 average of 2017-2019) is in line with the future trade patterns
- the proportion of the tariff reductions passed through to consumers is not known, some businesses may consume final goods or 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 classifications of individual consumption by purpose (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 tariff reductions 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

177 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 6: 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[178]
- 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.[179] 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 £286.[180] 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 £286
- 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[181]
- 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 average weekly working hours is 33 and the average weekly total earnings is £572.[182] Average earnings per hour is therefore estimated at £17.27. Non-wage costs are assumed to be around 18%.[183] The estimated total cost to businesses is therefore around £20 per hour
- 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 (£20)
- therefore, the total one-off familiarisation costs are: (total number of businesses trading with the partner country) x ((60% x £286) + (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.

178 HMRC, UK trade in goods by business characteristics 2019 – data tables (November 2020).
179 ONS, UK total trade: all countries, non-seasonally adjusted, April to June 2021.
180 HMRC, Understanding tax administration for businesses, HM Revenue and Customs Research Report 375, (July 2015). Note: this has been rebased to 2019 prices in line with consumer price inflation from the 2015 cited price of £265.
181 Trauzettel-Klosinski and Dietz (2012), 'Standardized Assessment of Reading Performance: The New International Reading Speed Texts IReST', IOVS Volume 53 I ssue 9.
182 ONS, Earnings and hours worked, all employees: ASHE Table 1 (November 2020).
183 RPC guidance note on 'implementation costs'. Data source: Eurostat.

Academic studies estimate the tariff equivalent trade costs associated with rules of origin administration and compliance requirements ranges between 2% to 6%.[184] 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
- this estimated impact could be up to double if counting firms who both export and import goods
- 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

184 Ciuriak & Xiao (2014) 'Should Canada unilaterally adopt global free trade?'

Annex 7: 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.

SMEs can be defined as:

- firms employing fewer than 50, and fewer than 250 employees respectively; and
- firms not exceeding either (a) £44.0 million in annual turnover or (b) an annual balance-sheet total of £38.0 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 2020 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.[185]

Data and method

Information on the characteristics of UK businesses come from the BEIS Business Population Estimates (BPE) dataset. 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 10A sector definitions used in the CGE modelling.

Table 19: SMEs in the Profile of UK Businesses

Business size (number of employees)	Number of Businesses	% of Total Businesses	Number of employees	% of Employee Proportion	Turnover Proportion	% Turnover Proportion
None	4,567,775	76.4	4,966,000	17.9	315,627	7.3
1-49	1,368,770	22.9	8,336,000	30.1	1,260,914	29.0
50-249	36,140	0.6	3,535,000	12.7	693,689	16.0
>249	7,835	0.1	10,896,000	39.3	2,076,739	47.8
All Businesses	5,980,520	100.0	27,733,000	100.0	4,346,969	100.0

Source: BEIS Business Population Estimates (2020).

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 dataset. SMEs are present in all sectors of the economy, but four sectors – 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.

185 BEIS, Business Population Estimates 2020, (October 2020).

Table 20: SMEs across sectors by Number and Turnover

GTAP Sector	Sectoral Distribution of SMEs	SMEs Turnover by Sector, £ million	Estimated Contribution to Turnover		
			Micro/ Small	Medium	Large
Agriculture, forestry, and fishing	2.60%	42,650	80.97%	9.29%	9.74%
Energy	0.52%	34,442	14.89%	8.77%	76.34%
Semi-processed foods	0.36%	15,274	14.71%	18.06%	67.23%
Other processed foods	0.72%	30,549	14.71%	18.06%	67.23%
Beverages and tobacco products	0.24%	10,183	14.71%	18.06%	67.23%
Textiles, apparel, and leather	0.36%	15,274	14.71%	18.06%	67.23%
Manufactures	0.48%	20,366	14.71%	18.06%	67.23%
Paper and printing products	1.30%	32,872	23.82%	17.67%	58.52%
Chemical, rubber, plastic products	0.36%	15,274	14.71%	18.06%	67.23%
Manufacture of electronic equipment	0.12%	5,091	14.71%	18.06%	67.23%
Manufacture of machinery and equipment n.e.c	0.84%	35,640	14.71%	18.06%	67.23%
Manufacture of motor vehicles	0.12%	5,091	14.71%	18.06%	67.23%
Manufacture of other transport equipment	0.60%	25,457	14.71%	18.06%	67.23%
Manufacturing n.e.c	0.24%	10,183	14.71%	18.06%	67.23%
Other services (transport, water, dwellings)	8.74%	166,922	36.43%	14.48%	49.08%
Public services	16.11%	141,778	44.07%	14.41%	41.52%
Construction	16.61%	259,231	60.36%	12.84%	26.81%
Wholesale and retail trade	15.00%	867,912	35.89%	16.97%	47.14%
Personal services	9.39%	91,085	31.29%	12.92%	55.79%
Communications	1.06%	22,689	29.69%	17.41%	52.89%
Business services	22.69%	422,268	44.89%	17.24%	37.86%
Financial services	1.02%	-	-	-	-
Insurance	0.51%	-	-	-	-

Source: DIT Internal Analysis of BEIS Business Population Estimates (2020). Note: No turnover data available for Financial or Insurance sectors.

The data on sectors where SMEs are located (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 8: Method for assessment of impacts on groups in the labour market

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.[186]

The international evidence suggest that trade agreements and trade liberalisation have the potential to affect various sectors of the economy and groups differently.[187] 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 agreement.

Data and method

Sectors in the CGE model are defined by the GTAP 10A dataset 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.

186 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.

187 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.

Table 21: Proportion of employment by sector and protected characteristics[188]

GTAP Sector (23 Disaggregation)	Females	Males	Disabled	Ethnic Minorities	Age (16-24)	Age (65+)
Agriculture, forestry, and fishing	27.4%	72.6%	14.5%	1.4%	10.0%	18.3%
Semi-processed foods	31.3%	68.7%	7.9%	12.1%	10.2%	2.6%
Other processed foods	37.9%	62.1%	11.4%	15.0%	9.0%	2.1%
Beverages and tobacco products	26.5%	73.5%	6.8%	5.8%	9.0%	1.2%
Energy	21.2%	78.8%	10.1%	6.7%	8.5%	2.0%
Textiles, apparel, and leather	49.6%	50.4%	11.6%	16.6%	9.7%	4.8%
Manufactures	16.4%	83.6%	10.5%	5.0%	10.8%	4.0%
Paper and printing products	36.9%	63.1%	12.1%	8.8%	7.1%	4.6%
Chemical, rubber, plastic products	32.4%	67.6%	9.5%	8.0%	8.7%	2.4%
Manufacture of motor vehicles	13.0%	87.0%	10.4%	9.1%	9.1%	2.4%
Manufacture of other transport equipment	13.2%	86.8%	10.4%	4.7%	9.6%	2.6%
Manufacture of electronic equipment	30.4%	69.6%	8.2%	10.9%	7.6%	2.8%
Manufacture of machinery and equipment n.e.c	18.7%	81.3%	11.3%	6.1%	8.3%	3.3%
Manufacturing n.e.c	31.3%	68.7%	12.1%	8.5%	8.0%	3.9%
Other services (transport, water, dwellings)	25.6%	74.4%	12.2%	16.6%	7.7%	4.5%
Construction	12.4%	87.6%	11.0%	5.5%	9.8%	3.7%
Wholesale and retail trade	48.4%	51.6%	13.6%	14.2%	24.6%	3.5%
Communications	26.4%	73.6%	11.4%	14.0%	9.5%	0.9%
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%
Business services	40.2%	59.8%	11.4%	13.6%	8.7%	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%
Total	46.9%	53.1%	12.6%	11.9%	11.9%	3.8%

Source: ONS Annual Population Survey.

The CGE modelling provides estimates of the changes in 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.

188 Employment is defined as set out in ILODEFR. For further information see Labour Force Survey User Guide: Details of LFS variables 2019.

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 following limitations:

- 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 infer how groups or employers will respond to sectoral shocks, which in turn may mitigate the impact on different labour market groups. It also does not assess the welfare impacts of the trade agreements
- the need to map the sector aggregation of the APS to the sector aggregations used in the GTAP modelling could affect how accurately the distribution of employment is captured
- the analysis is based on the structure of the UK workforce based on the Annual Population Survey from 2016-18, which is subject to limitations associated with survey data such as sampling bias. While the CGE modelling results reflect the global economy in the long run when the composition of the workforce may have changed

Annex 9: Method for assessment of environmental impacts

This annex sets out the methodology for estimating the impact of the agreement on Green House Gas (GHG) and transport emissions.

Greenhouse gas emissions from UK production

Method

Estimated output changes from CGE modelling and ONS environmental accounts data[189] are used to estimate production change impacts from the agreement on greenhouse gas emissions (CO2 and Non-CO2).

Each indicator is decomposed into the scale and composition effect:

1) ***Scale effect:*** Reflects environmental changes resulting from an expansion in economic activities holding the existing economic structure constant; directly linked to the new trade policy.

2) ***Composition effect:*** Reflects environmental changes arising from changes in economic structure; directly linked to the new trade policy. The net effect of structural change on the levels of emissions and energy uses depends on whether emission-intensive and energy-intensive activities expand or contract.

The CGE estimated changes in production output are converted to emissions output using ONS sector-level emissions intensity. This gives the scale and composition effects.

The impact of a new trade policy on the environment is determined by the scale effect (negative impact) and the composition effect (ambiguous impact), each with its own unique value. The net impact of trade will depend on the magnitude of each of these effects.

Limitations of the Greenhouse gas emissions from UK production method

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 same limitations of economic modelling.

With respect to the environmental modelling, there are caveats concerning the interpretation of the results:

- the results do not factor in known policy measures to deliver net zero emissions
- the assumption is that the trend of the last twenty years will be an indicator of the ongoing progress of emissions intensity trends at the time of the implementation of the agreement. The past does not provide a guarantee for the future and due to the lack of available data on projections of environment indicators, this proxy approach was chosen
- environmental modelling results reflect impacts based on the indicators used in the analysis and does not capture the breadth of environmental issues that could occur due to the new trade policy. The analysis does not capture direct emissions in UK households resulting from consumption pattern changes as the analysis models production pattern changes only
- this approach does not consider the change in emission intensity (emission per unit of output) that could result from the implementation of the agreement. The pre and post agreement emission intensity may not be the same. The removal of barriers could affect firms' choices of production inputs (domestic vs. foreign or less fuel efficient vs. more fuel-efficient), resulting in a different emission intensity

189 ONS, UK Environmental Accounts: 2021 (June 2021).

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.

Limitations of the Transport emissions method

As with production emissions, the impact of the agreement on transport emissions is based on the CGE results and therefore inherits the same limitations of economic modelling.

The methodology uses several assumptions:

- services are negligible (i.e. ignores the agreement's impact on the movement of people and examines goods only)
- significant technological change has a negligible impact in the medium-term (i.e. long-haul electric aircraft and hydrogen-powered cargo ships do not become available)
- emissions savings come from more modest improvements from cleaner fuels, energy efficiency savings, and engine upgrades
- emissions intensity does not change over time. In reality, emissions intensity (CO_2e emissions per tonne per km) is expected to improve over time under business-as-usual conditions reflecting technological change and global climate ambitions. 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

Annex 10: 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) regions, which are trading under the UK's Generalised Scheme of Preferences (GSP) or have signed Economic Partnership Agreements (EPAs) with the UK.

On average from 2017-19, the UK imported goods worth £28.8 billion[190] from developing countries and £4.7 billion from Least Developed Countries (LDCs). Exports to the UK as a share of annual global exports reported by developing countries is 3.4%. For some individual countries or products, the importance of the UK as a market is considerably higher. For instance, the UK imported 22% of Belize's exports, 12.3% of the Seychelles' exports, 10.3% of St. Lucia's exports, 8.9% of Kenya's and 8.6% of Bangladesh's exports.[191]

When an FTA is signed, these countries may experience preference erosion, a reduction in their relative competitive advantage due to the greater market access agreed between the UK and partner country. This can lead to demand for imports shifting away from these developing countries and towards the FTA partner. Reduced demand for developing country exports could impact negatively on their economy's trade balance, foreign reserves and GDP. It may also reduce demand for goods and industries that are likely to drive future development and growth.

Data and method

This analysis provides an indication of whether the market access agreed as part of the agreement is likely to impact negatively on the trade flows of developing countries receiving preferential market access to the UK. It does so by identifying goods 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 partner country, we analyse trade data from the FTA partner to determine the competitiveness of their exports, and from developing countries to determine the value of exports and the 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[192] are defined as competitive if any of the following indicators are met:

- partner's global exports exceed UK total imports
- more than 5% of UK imports of the good are imported from the partner
- global exports from the partner are greater than 5% of total global imports
- revealed comparative advantage[193] is greater than 1, indicating that the partner exports a higher proportion of the good than the global average

Criteria for goods at risk of preference erosion for developing countries

Developing countries' exports[194] 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

190 HMRC trade data (accessed July 2021).
191 WITS trade data using average values for 2017-2019.
192 FTA partner's trade data sourced from TradeMap, averaged from 2017-2019.
193 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.
194 Developing country global exports sourced from UN Comtrade, averaged from 2017-19, using mirror data (world imports from developing countries).

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 which 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. 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.

Limitations

There are however limitations with this analysis. We consider only 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 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.

Annex 11: Partial equilibrium (PE) modelling

The results of the additional agricultural analysis outlined in section 4 (box 2) have been generated by running the Armington version of the UK government's Partial Equilibrium Trade (PETRA) model with additional features to capture the characteristics of agricultural markets.

Partial Equilibrium (PE) models simulate the direct economic impact that changes in barriers to trade, such as tariff rates and non-tariff measures, for example regulations, can have on equilibrium prices, domestic production and trade. PE models provide a means of testing how much impacts might vary depending on the nature of the policy changes and on which changes might be more significant than others.

The model does not produce a forecast, but rather a guide to the direction of movement and order of magnitude of possible changes, as well as how sensitive these might be to variations in the policy changes.

PETRA model

PETRA is a static model which allows for a simulation of a range from an initial equilibrium period, based on historical data, to a new equilibrium once all the impacts of the policy change that are being modelled have worked their way through the model. It does not predict the path of how the economy will move to its new equilibrium. Nor does it consider how other factors which might affect output such as demographics or productivity may change over time.

The outputs from PETRA are intended to complement the results from other HMG[195] models, especially the CGE (Computational General Equilibrium) model, by being able to simulate potential impacts at a more disaggregated product level. Because it requires less data than CGE models, it can be run for more detailed sectors. However, its sectors still contain a wide variety of products with different characteristics so care should be taken before assuming that the results for a sector apply to all the products produced within that sector.

Like all PE models, PETRA focuses on the direct impact of a policy change on a particular sector. It does not incorporate general equilibrium effects that might result from policy changes, for example from a reallocation of resources or changes in capital allocation.

PETRA was developed for HMG by InterAnalysis.[196] There are several versions of the model. These results have been generated by running the Armington version of the model, in which the equilibrium is estimated by equating supply with demand in each market, with some additional features to better simulate certain characteristics of agri-food markets.

Basic features of the Armington Model

Goods are differentiated by the country in which they are produced. Markets in each country are competitive, with the number of varieties of each product equal to the number of countries included in the simulation. Firms are price takers and price equals marginal cost. The elasticity of demand is derived from a two stage CES (constant elasticity of substitution) process. In the first stage overall demand for a product is determined by the elasticity of demand, whilst in the second stage demand is split between different varieties of the product according to the Armington elasticity of substitution.

The supply curve in each market is assumed to be upward sloping but relatively flat (ie relatively elastic).

The equilibrium level of prices and output in each market are solved independently, so changes in one market do not directly affect other markets.

195 Her Majesty's Government.
196 See https://tradesift.com/. InterAnalysis is a group that draws on trade experts based at Sussex University. It includes academics who have extensive experience in the fields of trade and trade modelling.

Additional features

Some characteristics of agricultural markets can make modelling the sector difficult e.g. low existing trade flows as a result of high tariff barriers and relatively inelastic supply. Additional features have been built into the model which attempt to improve the accuracy of this modelling. These are:

1. the small shares adjustment (SSA). A limitation with some models is that they can struggle to simulate potential impacts when there is no or minimal historical trade because of prohibitive barriers. The SSA tackles this issue by replacing historical trade levels in such cases with proxied levels of trade that are estimated to represent what trade might have been if the prohibitive barriers were not in place
2. the supply redirection adjustment (SRA). This links markets, so that supply to one market can be influenced by changes in supply to other markets. It means that producers can redirect some output to other markets if a policy change leads to a significant change in their market share

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