



Department for
International Trade



**Impact assessment of
the Free Trade Agreement
between the United
Kingdom of Great Britain
and Northern Ireland and
Australia**

Contents

Executive summary	4
1. Background	10
2. Rationale	11
3. The agreement	15
4. Overall impacts of the UK-Australia agreement	24
4.1 Economic gains from trade agreements	24
4.2 Approach to assessing macroeconomic impacts	25
4.3 Data and baseline	26
4.4 Inputs	27
4.5 Macroeconomic impacts	28
4.6 Estimates of impacts by sector	29
4.7 Estimates of impacts by nation and region of the UK	32
4.8 Impacts on other countries	34
5. Impacts by main groups	35
5.1 Impacts on UK businesses	35
5.2 Impacts on UK consumers	38
5.3 Impacts on the labour market and UK workers	39
6. Impacts on the environment	42
7. Uncertainty and sensitivity analysis	53
8. Plans to monitor and evaluate the agreement	56
Annex 1: Description of the computable general equilibrium model	58
Annex 2: Modelling inputs	62
Annex 3: Supplementary results	66
Annex 4: Method for assessment of impacts on nations and regions	73
Annex 5: Method for assessment of impacts on tariffs	75
Annex 6: Method for assessment of the impacts on businesses	77
Annex 7: Method for assessment of the impacts on small and medium-sized enterprises (SMEs)	79
Annex 8: Method for assessment of impacts on groups in the labour market	82
Annex 9: Method for assessment of environmental impacts	85
Annex 10: Method for assessment of impacts on developing countries	87
Annex 11: Note on corrections	89

Executive summary

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

It is a deep and comprehensive agreement which aims to enhance the historic trading and investment relationship between the 2 nations. It aims to build upon long-lasting economic and cultural links. It is expected to bring long-term economic benefits for both nations, support UK jobs and provide opportunities for growth in sectors all around the UK.

The agreement aims to support the reorientation of the UK's trading relationships towards the emerging markets in the Indo-Pacific region. It represents a major step in our accession to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), one of the world's largest FTAs.

The agreement aims to forge stronger ties between the UK and Australia. It could help to increase collaboration in areas including services trade, intellectual property, animal welfare, trade for development, women's economic empowerment and the environment.

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

The agreement

The UK-Australia FTA is the UK's first trade deal negotiated from scratch since leaving the EU. It fulfils the government's manifesto commitment to secure a free trade agreement with Australia, which is an important and like-minded trading partner for the UK.

UK public support for a UK-Australia free trade agreement continues to be high. DIT's Public Attitudes to Trade Tracker shows that 65% of people support one.¹ Only 5% of people are opposed to a deal.

This is a deep and comprehensive agreement, going further than any UK or Australian FTA has before in several areas, such as innovation and procurement.

The agreement:

- includes the first ever dedicated innovation chapter of any FTA in the world. This ensures that the agreement will continue to support emerging trade opportunities and innovative technologies throughout its lifetime
- secures more legally-guaranteed access to Australian procurement opportunities than Australia has ever previously offered in a trade deal. This is expected to provide around £10 billion of new legally-guaranteed procurement opportunities each year
- removes tariffs on all UK exports to Australia, as well as removing and reducing regulatory barriers
- includes an ambitious agreement on business mobility which will make it easier for UK professionals to travel for work

The agreement maintains high standards on issues that DIT's Public Attitudes Tracker shows matter to UK consumers, such as food standards and animal welfare.

For example:

- on food standards, the agreement does not create any new permissions for imports from Australia and hormone-treated beef will continue to be banned. All food and drink products imported into the UK will have to comply with our import requirements. 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, the agreement includes non-regression and non-derogation clauses on animal welfare standards. This means, both countries are committed to not lowering their animal welfare standards

As well as removing barriers to trade, the agreement aims to support closer cooperation between the UK and Australia to raise global standards. This will be possible through bilateral cooperation in fora including the World Trade Organization and the G20.

¹ DIT, Public attitudes to trade tracker (September 2021).

The impact of the agreement

Trade between the UK and Australia was worth £13.9 billion in 2020, having grown steadily between 2010 and 2019.² The top UK goods exports to Australia are chemicals and manufacturing, while the top services exports include insurance, pensions, and finance. UK exports to Australia already support over 100,000 jobs in the UK. Import demand from Australia is expected to grow by 30% in real terms over the next decade.³

Greater access to Australian 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



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

Macroeconomic impacts

Our analysis shows that bilateral trade between the UK and Australia could increase by the equivalent of around **£10.4 billion** in the long run. This increase is compared to projected levels of trade in 2035 (in today's prices) without the agreement.⁴ This is based on a central estimate of a 53% increase in trade resulting from the FTA. The increase is driven by reductions in regulatory restrictions to goods and services trade, tariff reductions, income and supply chain effects as the UK economy grows.

This assessment also shows that UK gross domestic product (GDP) could increase by around **£2.3 billion** in the long run. This is when compared to projected levels of GDP in 2035 (in today's prices) without the agreement.⁵ The estimate indicates the value of a 0.08% increase in GDP (as a central estimate) as a result of the FTA in 2035. The estimate is subject to a high degree of uncertainty.⁶

In the central estimates, take-home pay for UK workers is estimated to increase by **£900 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 0.1% increase in wages resulting from the FTA in 2019.

² ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2021.

³ DIT, Global trade outlook – September 2021 report.

⁴ 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 Australia 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).

⁵ As with all modelling exercises, both the point estimates and the projections which they are applied to are subject to uncertainty

⁶ For context, this amounts to £1.8 billion when compared to 2019 GDP.

These estimates are based on a set of important assumptions about the global economy and the UK-Australia 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 0.06% and 0.10%. 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.

Consumers and businesses – including small and medium-sized enterprises (SMEs) – could benefit from the immediate removal of 95% of existing tariffs on UK imports of Australian goods. Most of the remaining tariffs gradually reduce to zero over time. This boosts access and increases choice for businesses seeking to source inputs from Australia. However, this will also open up some UK businesses to increased competition from Australian exporters. Annual duties on UK goods exports to Australia could fall by around £116 million annually.⁷ SMEs are well-represented in sectors that benefit most from the FTA.

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. Our analysis shows that:

- on services, the largest contributions in absolute terms come from wholesale and retail services (around +£340 million in the central estimates). This is followed by public services (around +£265 million) and business services (around +£210 million). This is driven by reductions in regulatory restrictions to services trade. Income and supply-chain effects as other parts of the UK economy grow as a result of the agreement are also important driving factors.
- on goods, the largest contributions come from the UK's advanced manufacturers, with expansions in the manufacture of machinery (around +£230 million). Followed by motor vehicles (around +£200 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 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 -£94 million) and semi-processed foods (around -£225 million). This is in favour of growth in manufacturing sectors, in particular manufacture of motor vehicles and manufacture of machinery and equipment.
- just as the UK is competitive in the business and financial services sectors, Australia is a large, competitive producer of agricultural products. The modelling shows potential for the deal to result in lower output for some agricultural sectors as a result of increased competition. The potential and scale of any long-run increase in imports are uncertain (box 2). Increased imports of these products could bring significant benefits 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 import-competing producers and in localities where production is concentrated.
- the agreement therefore includes mitigations which seek to limit the potential for increases in imports in the near-term. The agreement also supports affected producers to enhance productivity and competitiveness over the longer-term. For example, beef and lamb producers will be protected through measures including tariff rate quotas that last 10 years. These automatically apply the UK Global Tariff to imports above a certain volume threshold. From years 11 to 15 a product-specific safeguard will have a similar effect, imposing tariffs – of 20% for beef and sheepmeat – above a volume threshold. A general bilateral safeguard mechanism will provide a safety net for industry if they face serious injury from increased imports as a direct consequence of the FTA. This applies to all products. There are also tariff rate quotas for a range of other products, such as UK imports of sugar, butter, cheese and long-grain milled rice.



Tariff reductions for UK manufacturers

The deal will help support UK manufacturing exporters by removing tariffs on industrial goods. Based on historic trade, this amounts to around £100 million per year.⁸

⁷ Once tariff staging is complete, in year 6 of the agreement.

⁸ Industrial goods defined as non-agricultural goods, broadly defined as HS chapters 25-97.

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** of England, equivalent to around £195 million and £65 million each year. The **North West** and **South East** of England are expected to benefit by around £190 million and £295 million respectively.
- **Wales, Scotland** and **Northern Ireland** combined could see an increase in GVA of around £200 million from the agreement.

In the central estimates for sub-national impacts, all nations and regions of the UK are expected to increase output because of the agreement. The sub-national impacts are subject to a high degree of uncertainty. Sensitivity analysis shows that the impacts on Northern Ireland and West Midlands 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 West Midlands and 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 environmental implications for greenhouse gas emissions and other environmental outcomes such as air pollution, water quality and biodiversity.

The analysis suggests that overall greenhouse gas emissions associated with UK-based production are estimated to be largely unchanged from the agreement. However, the agreement is expected to lead to an increase in transport related emissions as a result of the increase in trade with Australia. The estimates suggest that the increase in emissions associated with transport of goods could be between around 0.1^r and 0.3 MtCO₂e each year. This is a 31-40% increase in transport emissions associated with trade with Australia. The estimates do not account for the future decarbonisation of international shipping. This is the form of transport used to carry 99% of goods trade (by volume) between the UK and Australia.

Reflecting this risk, the agreement preserves the UK's right to regulate to meet its climate commitments. Therefore, nothing in the agreement prevents the UK government taking the domestic action necessary to achieve its commitment to net zero by 2050.

In addition, the agreement includes provisions on the environment. The main vehicle for addressing climate change internationally is via multilateral processes. However, the agreement does include a substantive article on climate change. This article reaffirms both parties' commitments to the Paris Agreement and the importance of achieving its goals.

Next steps

The predicted impact of the agreement on the UK economy has been assessed using 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 FTAs 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.

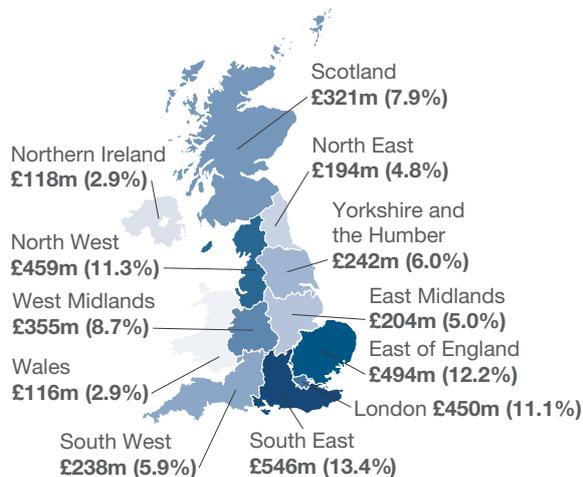
Ongoing monitoring and evaluation (M&E) of the implementation and impacts of the agreement is an important part of ensuring that the predicted impacts materialise. They are also an important part of ensuring that the benefits are maximised for businesses, workers, and consumers. M&E activities help to 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 1: Existing trade in numbers (based on 2020 data)

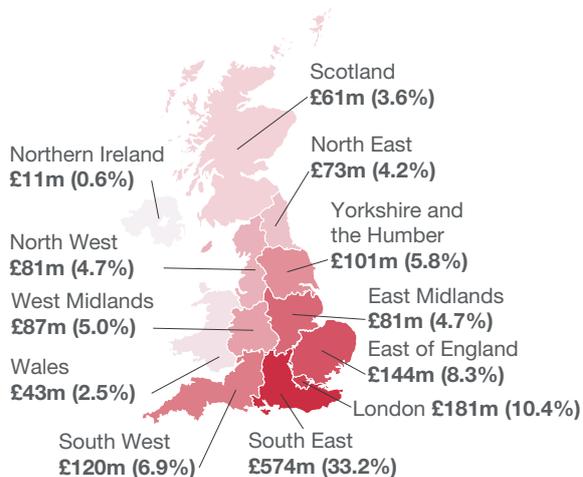


Regional trade with Australia

Goods exports in 2020 to Australia



Goods Imports in 2020 from Australia



Business

15,400 UK Business exported goods to Australia in 2019

Business

5,600 UK Business imported goods from Australia

Jobs Supported

56,000 direct jobs supported by UK exports to Australia

50,000 indirect jobs supported by UK exports to Australia

1. Background

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

In July 2018, the government launched a public consultation to inform the negotiations.⁹ In June 2020, the government published negotiation objectives, a response to the public consultation and a scoping assessment.¹⁰

The government launched negotiations with Australia in June 2020, resulting in signature of the final agreement in December 2021.

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 and Disputes). When this legislation is laid in Parliament, an assessment of its impacts will be published.

⁹ DIT, Consultation outcome: Trade with Australia (June 2020).

¹⁰ DIT, UK's approach to negotiating a free trade agreement with Australia (June 2020).

2. Rationale

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

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

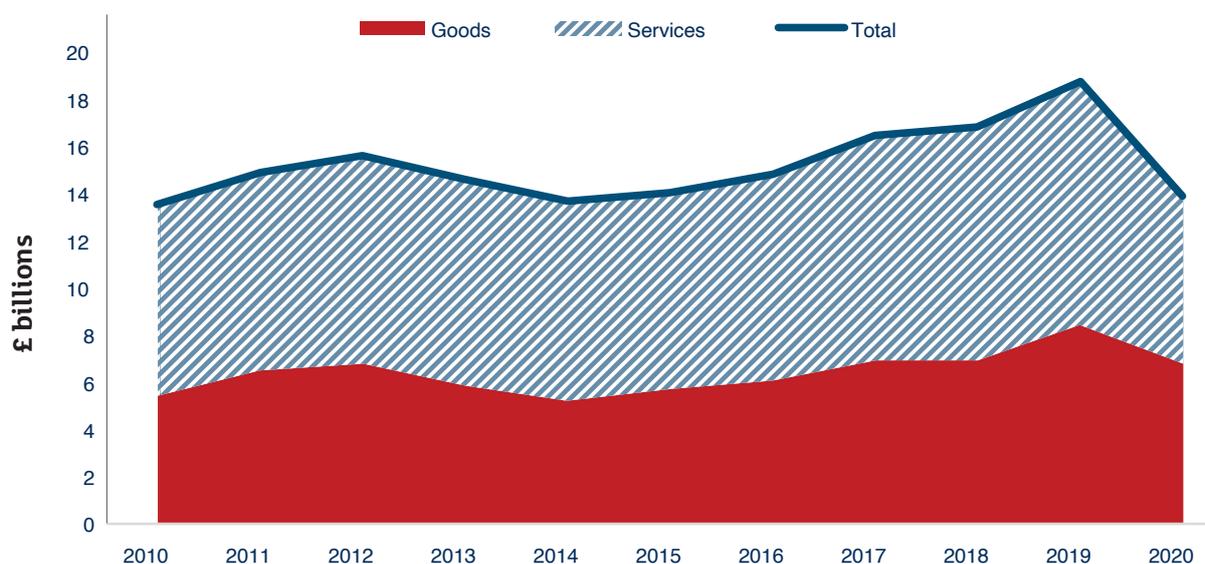
- **the agreement will enhance an already strong trade and investment relationship**, building on long-lasting economic and cultural links.
- **it is expected to support UK jobs and boost economic growth, providing opportunities for businesses across the UK.** It will reduce barriers to trade such as tariffs and non-tariff barriers, increasing market access.
- **it is a key stepping stone to our accession to CPTPP**, one of the world's largest trade agreements. It supports the reorientation of our trading relationships towards the emerging markets in the Indo-Pacific region.
- **it supports wider objectives**, cementing trading and cultural relationships with a like-minded partner.

Enhancing a strong trade and investment relationship

In recent years trade between Australia and the UK has grown strongly, driven by the growth in both goods and services trade prior to the coronavirus pandemic. In 2020, Australia was the UK's 20th largest trading partner.¹¹ Between 2014 and 2019 trade in goods and services with Australia had grown by 37% – reaching £18.8 billion. This compares to the growth of 30% for goods and services to the world over the same period. While trade fell by 26% in 2020 to £13.9 billion, it is expected to recover strongly as coronavirus restrictions are lifted. DIT's projections suggest that the Australian import market could grow by around £100 billion between 2019 and 2035.¹² This represents a 44% increase in the size of the import market in real terms (today's prices) compared to 2019.

Services trade was worth £7.1 billion in 2020, with sectors such as insurance services and Other Business Services, such as legal, accounting, and architectural services, making up a high proportion of the UK's trade with Australia.

Figure 2: UK-Australia trade (exports and imports) in goods and services with Australia 2010 to 2020



Source: UK total trade: all countries, non-seasonally adjusted, January – March 2021

¹¹ ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2021.

¹² 2035 projections for UK total exports and imports are calculated using the methodology described in the Global Trade Outlook, (September 2021)

The UK trades a broad range of goods with Australia and has a comparative advantage in complementary sectors, including financial and business services. Both the UK and Australia already trade along the lines of their comparative advantage. For example, financial services are one of the UK's key exports. The UK exported £777 million of financial services to Australia in 2020 – around 14% of the UK's total service exports to the country.¹³ Material manufactures are one of the UK's largest imports, where Australia has a comparative advantage. Chemicals and Miscellaneous manufactures are also among the UK's highest exports to Australia.

Table 1: Relative export specialisation by sector¹⁴

		UK Export Specialism	Aus Export Specialism
Agri-foods	Agriculture	-0.60	0.57
	Beverages and tobacco products	0.26	0.01
	Semi-processed foods	-0.38	0.41
	Processed foods	-0.19	-0.12
Industry	Chemical, rubber, plastic products	0.19	-1.25
	Electronic equipment	-1.78	-1.37
	Energy	-3.34	5.20
	Manufactures of materials	0.75	0.31
	Motor vehicles and parts	0.69	-0.84
	Other machinery and equipment	-0.99	-1.25
	Other manufacturing	-0.22	-0.28
	Other transport equipment	0.60	-0.28
	Paper and printing products	0.00	-0.12
	Textiles, apparel, and leather	-0.96	-0.65
Services	Business services	2.53	-0.34
	Communications	0.66	-0.07
	Construction	-0.08	-0.08
	Financial services	2.07	-0.12
	Insurance	0.44	-0.04
	Other services (transport, water, dwellings)	0.11	0.04
	Personal services	0.22	0.08
	Public services	0.02	0.17
	Wholesale and retail trade	-0.01	-0.02

Source: GTAP10 and DIT calculations (2021)

Australia is also an important market for the UK's inward and outward foreign direct investment (FDI). In 2019 the UK invested £37.3 billion in Australia – accounting for 2.5% of its outward FDI. Similarly, Australia invested £14.4 billion in the UK – representing 0.9% of the UK's inward FDI stock over the same period.

Trade with Australia supports emerging UK industries. In 2019 Australia was the largest producer of lithium – a key component in electric cars. In addition, it is also the third largest producer of cobalt, which is also used in electric vehicle batteries and battery storage production.¹⁵

¹³ UK trade in services: service type by partner country, non-seasonally adjusted (July 2021).

¹⁴ 23 Sectors are an aggregation of the 65 GTAP Sectors.

¹⁵ 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 IEA (2021), The Role of Critical World Energy Outlook Special Report Minerals in Clean Energy Transitions.

Supporting UK jobs and economic growth

An FTA with Australia is expected to support jobs across the UK. UK exports to Australia were estimated to support (directly and indirectly) around 106,000 UK FTE jobs in 2016.¹⁶ Australian-owned businesses also employ UK workers across the UK. In 2019, there were over 2,000 Australian owned local business units, employing more than 71,000 people, with the most people employed in London (22,200 people), followed by the South East (10,400) and the North West (6,600) of England.¹⁷

It is expected to generate opportunities for businesses in all UK nations and regions. In 2020 the South East, East and North West of England exported the greatest share of goods to Australia, while the South East, London and East of England imported the most goods.¹⁸ Businesses across these areas will have access to the preferences negotiated through the agreement.

An FTA with Australia could help to support the economic recovery from coronavirus. The IMF forecasts that Australia's economy will grow by 5.3% in 2021 and 3.0% in 2022, while the UK economy will grow by 7.0% in 2021 and 4.8% in 2022.¹⁹ A strong economic rebound will boost demand for exports and imports in both countries. An FTA can provide benefits additional to that forecast growth.

Opportunity for a deep and comprehensive FTA

The UK-Australia FTA is a deep and comprehensive trade agreement. It removes tariffs on the majority of goods trade, including on all UK exports to Australia, and removes or reduces regulatory barriers. It aims to open up services and goods market access and drive investment. It covers a wide range of chapters from mobility to innovation making this a deep and comprehensive FTA.

A free trade agreement is expected to help ensure UK firms are not disadvantaged relative to firms in other countries when trading with Australia. In the absence of the FTA, UK firms trade with Australia on Most Favoured Nation (MFN) tariffs.²⁰ This reduces market access opportunities relative to business in countries that have an FTA with Australia. For example:

- tariffs – in the absence of the FTA, UK exporters face tariffs when trading with Australia. For example, car exports currently face a 5% tariff, clothes exports face tariffs of up to 5%, and tariffs on cheese are up to around 20%. The FTA could support jobs and increase growth by cutting these tariffs to 0%, reducing costs and enhancing the competitiveness of British products in the Australian market.
- tariff reductions can also support the levelling up agenda. In the long term 24% of tariff reductions on exports will apply to products originating from the West Midlands, and 11% each from the North West and South East of England.

Reorientation towards the Indo-Pacific region

An FTA with Australia provides a major step towards UK accession to the CPTPP, expected to generate additional economic benefits and more involvement in Indo-Pacific region. The UK is negotiating to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), a free trade area of 11 Indo-Pacific nations, including Australia, covering £8.4 trillion in GDP.²¹ It would increase the UK's access to a growing market which includes some of the world's fast growing economies. An FTA with Australia strengthens the UK's case to join.

Analysis by DIT suggests that joining CPTPP could increase UK trade by around £3.3 billion in the long run. 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.

¹⁶ Estimates are experimental and relate to 2016 (that is, they do not reflect the impact of economic shocks such as Covid-19 and EU exit). 'Direct' export-supported jobs are jobs in industries that export goods or services. 'Indirect' jobs are jobs in industries that are in the UK supply chain of exporting industries. These jobs are existing UK-based jobs (that is, 'supported') rather than newly created jobs ('created'). See FAI (2021) report for full list of caveats.

¹⁷ ONS's Business Structural Database, accessed using the Secure Research Service.

¹⁸ HMRC Regional Trade Statistics (data extracted from the interactive tables in July 2021).

¹⁹ IMF World Economic Outlook, July 2021.

²⁰ Tariffs are normally applied on a Most Favoured Nation (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.

²¹ IMF World Economic Outlook, April 2021, 2020 data

²² DIT, UK approach to joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (June 2021).

An FTA with Australia and accession to CPTPP would increase market access opportunities in the Indo-Pacific region. The Indo-Pacific is the world's growth engine; home to half the world's people; 40% of global GDP; and some of its fastest-growing economies. It is at the forefront of new global trade arrangements. CPTPP accession provides opportunities to export goods such as whisky and cars that are sought by the growing middle classes in member states.

Strengthening economic links and policy cooperation

The UK and Australia already have long-lasting, close economic and cultural links. Like the UK, Australia is committed to free trade and an even playing field. Like the UK, it has high product standards and remains committed to improving environmental outcomes. Australia and the UK work together successfully in international organisations, such as the G20, World Trade Organization and the Commonwealth.

Links between the UK and Australia are further strengthened by the high proportion of UK-born people living in Australia. In 2020 4.6% of Australia's population were born in the UK – or around 1.2 million people. This makes those born in the UK the largest group of overseas born residents in the country.²³

Personal travel has historically been a particularly important component of our trade with Australia. In 2019 around 1.1 million visits were made to the UK by Australian residents in total – the tenth highest number of any country.²⁴

The UK and Australia have other areas of policy cooperation, which can be strengthened through an FTA. These include:

- **the environment** – this agreement maintains our high levels of environmental protection and right to regulate to meet our climate commitments. We have also set out areas for continued and new cooperation, including emissions reduction, circular economy, biodiversity, sustainable forest management, and environmentally friendly alternatives to ozone-depleting substances and hydrofluorocarbons
- **labour markets** – this agreement locks in high domestic protections for our workers, encourages good business practice and corporate responsibility, and advances our mutual ambition to tackle forced labour and modern slavery
- **animal welfare** – this FTA is the first Australian FTA that has agreed a non-regression clause on animal welfare. Securing a commitment to non-regression on animal welfare standards means both countries must strive to uphold their current animal welfare standards and that neither country should lower their animal welfare standards to undercut the other

²³ Australian Bureau of Statistics, Migration, Australia – Latest release, (April 2021).

²⁴ ONS, Travel trends estimates: overseas residents in the UK (May 2020).

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. The full text of the agreement is available online.

The agreement is an ambitious trade agreement. It aims to increase trade in goods and services and enhance investment and productivity, for the benefit of businesses, workers, and consumers.

It secures tariff-free trade for all UK exports to Australia. 98% of estimated tariff reductions will be available as soon as the agreement enters into force. It will also substantially reduce tariffs imposed on imports from Australia to the UK, while retaining safeguards for certain products.

While removing UK tariffs on most Australian imports in the long run, it will retain protections for UK sensitive sectors for a number of years. This includes applying transitional Tariff Rate Quotas (TRQs) for 10 years to beef and sheepmeat entering the UK. From years 11 to 15, a further product specific safeguard with an annual volume trigger will also apply to beef and sheepmeat. Certain other products will see protections including staged reductions of tariffs over time and transitional TRQs – including dairy products. There will be a permanent duty-free quota of 1,000 tonnes per year for long-grain milled rice. Additionally, a general bilateral safeguard mechanism will 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 FTA.

It will minimise red tape for UK businesses, including modern rules of origin, commitments to transparent and efficient customs procedures and commitments relating to technical barriers to trade (TBT) and sanitary and phytosanitary (SPS) measures.

It is a globally leading FTA for services and mobility, providing unprecedented commitments to provide clarity and certainty for businesses and professionals providing services in Australia. Both the UK and Australia will also separately expand their Youth Mobility Schemes including removing requirements to do specified work such as working on a farm.

It guarantees UK investors fair and equal treatment when investing in Australia, while preserving the UK's right to regulate in the public interest.

It will tackle barriers to digital and online trade across the board, including specific commitments on electronic contracts, e-authentication and trust services. In 2019, the UK exported £4.3 billion worth of services to Australia via digital delivery.²⁵

It includes significant commitments on procurement, securing increased legally guaranteed access for UK firms to an Australian procurement market worth billions of pounds each year. The agreement goes significantly beyond the current World Trade Organization's Government Procurement Agreement baselines, including an article requiring covered procurement notices to be available electronically.

It contains ambitious intellectual property (IP) provisions that support our vibrant economies through adequate, effective and balanced protection and enforcement of IP rights, and that encourage innovation and creativity. This includes provisions on copyright, trademarks, enforcement, patents and geographical indications.

The agreement also includes dedicated chapters on the environment, development, and trade and gender equality.

Throughout the FTA, the UK has secured exceptions and exclusions for the NHS – our National Health Service and the services it provides will never be on the table.

²⁵ ONS, Exports of services by country, by modes of supply (November 2020). Mode 1 is used as a proxy for digital delivery.

Goods trade – cutting tariffs and red tape

The agreement liberalises tariffs and makes it easier for businesses to trade goods. This will help to boost goods trade, which accounts for a significant share of total UK-Australia trade. In 2020, 44% of total UK exports to Australia and 60% of total UK imports from Australia were goods.²⁶

Tariff free trade for UK exports

The agreement includes immediate tariff free access on £2.3 billion worth of UK exports.²⁷ 98% of estimated tariff reductions will come into immediate effect, on UK exports such as cars, Scotch whisky and ceramics. Once staging is complete, in year 6 of the agreement, 100% of UK exports will be eligible for tariff-free access.

Duties of up to 5% will be eliminated on UK exports to Australia such as cars, whisky, some pharmaceutical products, motors, clothing and even Christmas decorations. Tariffs of up to around 20% on UK agri-food products such as cheese will also be eliminated.²⁸

Based on historic trade flows, the total annual tariff reductions on UK exports to Australia are estimated to be £115 million at entry into force and £116 million in year 6. This is without considering potential increases in UK exports to Australia resulting from this agreement.

Tariff reductions on imports

The agreement also liberalises tariffs on UK imports. 89.3% of UK imports from Australia can already enter tariff free under the UK Global Tariff regime (for example, pharmaceutical products, aircraft components, and various medical instruments). The agreement will allow a further 9.2% of UK imports from Australia to enter tariff free immediately.²⁹ The agreement also establishes the phased elimination of tariffs on 1.5% of UK imports from Australia.

As a result of the agreement on tariffs, UK businesses importing intermediate products could benefit from cheaper inputs. Consumers could also benefit from lower prices of final goods due to tariff liberalisation on imports into the UK (see section 5.1 and 5.2 for impacts on UK business and consumers).

Based on historic trade flows, the total annual tariff reductions on UK imports from Australia are estimated to be £41 million in the short term and £43 million in the long term.

The agreement also includes a chapter on trade remedies that affirms both countries' rights and obligations under the WTO framework. This ensures that Australian and UK businesses can seek protection from unfair trading practices or unforeseen surges in imports. The chapter also includes a general bilateral safeguard mechanism.

²⁶ ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2021.

²⁷ Upon entry into force.

²⁸ MacMap (2019). Ad valorem equivalent rates calculated for specific duties.

²⁹ Note that tariff reductions only apply to goods that meet Rules of Origin requirements.

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 sectors. These apply to exports of goods from Australia to the UK.

- **Beef and sheepmeat:** Transitional Tariff Rate Quotas (TRQs) will allow for a phased increase in the volume of tariff free goods that can be imported to the UK in a number of areas including:
 - increasing TRQ volumes on beef over 10 years, rising in equal instalments from 35,000 tonnes in year 1 to 110,000 tonnes in year 10. Out of quota tariffs will remain at MFN until year 10 and then be eliminated.
 - increasing TRQ volumes on sheepmeat over 10 years, rising in equal instalments from 25,000 tonnes in year 1 to 75,000 tonnes in year 10. Out of quota tariffs will remain at MFN until year 10 and then be eliminated.
 - In addition, product specific safeguards will be implemented from year 11-15, imposing tariffs of 20% on beef and sheepmeat above a volume of rising instalments to 170,000 tonnes beef and 125,000 tonnes sheepmeat by year 15. A general bilateral safeguard mechanism will provide further protections should industry face serious injury as a result of the FTA.
- **Dairy:** Tariffs on dairy will be gradually eliminated in equal instalments over 5 years. There will be a duty-free transitional quota for cheese rising in equal instalments from 24,000 tonnes in year 1 to 48,000 tonnes in year 5. There will be a duty-free transitional quota for non-cheese dairy of 20,000 tonnes during the 5 years of staging. There will be a further duty-free transitional quota for butter rising from 5,500 tonnes in year 1 to 11,500 tonnes in year five.
- **Sugar:** Tariffs on sugar will be eliminated in equal instalments over 8 years with a duty-free quota of 80,000 tonnes from year 1 rising in equal instalments to 220,000 at year 8.
- **Other goods:** Certain other products will see protections including staged reductions of tariffs over time. There will be a permanent duty-free quota of 1,000 tonnes per year for long-grain milled rice.

In addition, a general bilateral safeguard mechanism will 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 FTA.

Modern rules of origin

Modern rules of origin will see UK products qualify for the agreement's tariff liberalisation even if they are comprised of imported ingredients and parts. This reflects modern production processes and the existing and future global value chains of UK businesses. The commitments ensure that administrative procedures will be efficient, minimising costs and red tape by making it simple for traders and customs authorities 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 Australia. Businesses will also be able to use simple 'build-up' or 'build-down' value calculations to determine whether their good is originating in the UK/Australia.

The agreement does not include restrictive requirements for ingredients to be wholly obtained when used in processed foods – instead a change in tariff classification rule tailored to each product has been agreed. Firms will not need to additionally consider 'insufficient transformation' requirements when determining whether goods qualify for reduced tariffs. This means that if firms meet the product specific requirement, they will qualify for the reduced tariff. Insufficient transformation requirements can unfairly deny reduced tariffs to firms who create their products by performing simple operations such as cutting, mixing or painting to a very high standard.

Transparent and efficient customs procedures

The agreement will help boost trade by ensuring that Australian and UK customs procedures are efficient, consistent, and transparent, while also allowing the UK and Australia to maintain effective customs control.

If all requirements have been met, all goods must be released within 48 hours, or 6 hours for perishable goods and certain shipments, including fast-tracked parcels. There will be a fixed 90-day period for issuing advance rulings on tariff classification and origin. Paperwork needed to release goods will be minimised, 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.

Sanitary and Phytosanitary measures

The agreement will establish a Sanitary and Phytosanitary (SPS) Committee, supported by Technical Working Groups and Technical Consultations which will be established where necessary. This will help resolve issues effectively and provide a route to collaboratively ease SPS related market access issues. It will also enhance the transparency and timeliness of processes related to market access procedures and trade conditions. Imports will still have to meet the same respective UK and Australian food safety and biosecurity standards.

Animal welfare and anti-microbial resistance

On animal welfare, the agreement includes non-regression and non-derogation clauses, which contain commitments for both countries to not lower their welfare standards.

It commits the UK and Australia to work in close partnership on a range of animal welfare matters. This includes an agreement to work together internationally to promote increased recognition of animal welfare in trade, a strong statement recognising animals as sentient beings, and sharing information and expertise between our agricultural sectors.

The agreement also includes a commitment for both countries to cooperate on areas of mutual interest, including development of best practices in animal welfare and combatting antimicrobial resistance.

On antimicrobial resistance, the UK and Australia have reaffirmed their recognition of, and commitment to fight, the threat of antimicrobial resistance. We have agreed to continue to work on initiatives to ensure the prudent and responsible use of antimicrobial agents in both animal and group production. We have agreed to strengthen our cooperation on international standards concerning the use of antibiotics and support their implementation.

Technical barriers to trade

The agreement aims to address technical barriers to trade (TBTs) by ensuring that product laws are based on relevant shared international standards and limit discrimination against overseas products. The agreement will also make it easier to establish when UK and Australian product laws are equivalent to each other, streamlining our regulatory relationship and paving 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. This will make it easier for businesses in both countries to export to each other in the future. In particular, the UK and Australia will increase cooperation on medicines, medical devices, and cosmetic products.

Services trade – liberalising further than before

The agreement includes more ambitious provisions for services trade than either the UK or Australia have agreed before. This will help to boost services trade, which accounts for the majority of UK-Australia trade. Australia is currently the UK's 7th largest services export market, and the UK is Australia's 4th largest service export market.³⁰ UK services exports to Australia were worth £5.4 billion (56% of total UK exports to Australia) and increased by 62% from 2009 to 2019. The agreement creates significant opportunities for services trade through guaranteed access in areas such as transport, professional services, and commitments on domestic regulation, providing for full market access for service suppliers except where specific reservations are made. This agreement goes beyond best precedent for both Australia and the UK in terms of increased certainty and guaranteed opportunities for businesses and enhanced mobility opportunities.

Increased certainty for services trade

The agreement provides market access liberalisation that goes beyond the UK and Australia's respective best precedents. This includes 'most favoured nation' provisions which ensure that, if Australia provides more liberal access to their services markets for other countries, this will also extend to the UK.

The agreement includes services provisions that will ensure unnecessary bureaucracy does not get in the way of firms operating in Australia, with transparency commitments for all services sectors, as well as sector-specific rules and domestic regulation commitments. This will ensure it is easier for UK services exporters to understand and access the Australian market.

³⁰ ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2021. ITC Trade Map (July 2021).

A key aspect of providing enhanced transparency and certainty for businesses through this agreement is the way that the UK and Australia have outlined where Australia and UK reserve against commitments made in the agreement. This agreement uses a negative listing approach, which means that areas that do not follow commitments in the services and investment chapters are explicitly stated through schedules of reservations. Australia have provided this information at the federal and sub-federal for the first time in an FTA, providing clarity for UK businesses beyond what they have provided for in any other FTA.

This deal is the first time either the UK or Australia have agreed commitments as a chapter across all professional services, reflecting the importance of the sector to both parties. In 2020, the UK exported £1.3 billion worth of other business services (which includes professional business services) to Australia and imported £792 million from Australia.

The chapter will help facilitate the recognition of UK professional qualifications across many sectors, creating opportunities for our professionals while allowing British companies to attract and retain global talent. This will primarily be driven by collaboration between regulatory and accreditation bodies, with commitments between Government to support regulators and facilitate work towards Mutual Recognition Agreements.

This chapter also includes a ground-breaking set of provisions on legal services, which reduce barriers to legal services trade. This includes establishing structured engagement between the UK and Australia's legal sector, and reciprocal commitments that guarantee UK lawyers can practise foreign and international law in Australia, using their "home" title and qualification, without having to requalify as an Australian lawyer.

The agreement also includes specific annexes on international maritime transport services (IMTS) and express delivery services (EDS). For IMTS, the annex ensures non-discriminatory treatment of UK shipping companies and UK-flagged vessels – for example in accessing ports and related services. This will support already high levels of transport services exports that in 2020 totalled £571 million, accounting for 10% of total UK services exports to Australia.³¹ 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 Australian market. For example, the annex prevents Australia's postal monopoly subsidising its competitive express delivery services.

Dedicated provisions on financial services

The agreement includes provisions tailored to the UK financial services industry, which was the UK's 3rd largest services export sector to Australia worth £777 million in 2020.³² It will create a strong framework to facilitate closer regulatory cooperation between the UK and Australia. This aims to improve our financial services relationship over time, with commitments on working towards and developing dialogues on mutual compatibility and regulatory deference, as well as emerging issues.

Financial service suppliers will be able to offshore their back-office functions, with parties able to avoid the imposition of arbitrary requirements on the performance of those functions.

The agreement recognises the importance of transparency in facilitating the ability of financial service suppliers to gain access to and operate in each other's markets. The core non-discrimination rules ensure that both UK and Australian firms cannot be treated unfairly when providing services in the other parties' markets.

The agreement also supports innovation in financial services with commitments on the provision of new financial services. On insurance, for the first time, the UK and Australia have committed to allow both parties' firms to provide insurance of additional categories of large risks (e.g. fire and natural resources, property) and insurance of large risks relating to multinational corporations in each others' country.

The deal enables the free and trusted flow of data cross-border to ensure UK banks, financial institutions and other service suppliers can operate cross-border with Australia without unjustifiable barriers to data flows and the prohibition of data localisation requirements.

Mobility – enhanced opportunities to travel

The agreement will provide more certainty and clarity for business people to travel between the UK and Australia to deliver services. This will improve business travel for UK residents who undertook 52,000 business visits to Australia in 2019. Around 10% (£727 million) of total services trade between the United Kingdom and Australia, was delivered by the movement of natural persons to provide a service (known as mode 4) in 2019.

³¹ ONS, UK Trade in Services: Services type by partner country, non-seasonally adjusted, (July 2021).

³² ONS, UK trade in services: service type by partner country, non-seasonally adjusted, (July 2021).

Australia has given unprecedented FTA commitments to provide guarantees on visa pathways for service suppliers for a substantial number of sectors. This will provide important certainty and clarity for service suppliers as travelling to Australia to deliver these services will no longer be dependent on a changing list of eligible occupations.

Executives and managers of UK businesses will also have certainty that they can transfer their senior employees to their location in Australia, removing concerns that their sector may or may not qualify for a visa. Transferees will be able to bring their spouses and dependents with them, who will have the right to work in Australia during the transfer. This is now for up to four years, whereas the previous visa limit was two years.

For companies who wish to take advantage of new opportunities to trade in Australia, the agreement includes commitments for prospective UK investors in Australia to set up a location of their business in Australia. While there, they can also bring their partner and children. This is no longer subject to whether the sector qualifies for a visa. This is now for up to four years, whereas the previous visa limit was two years.

Cross-border trade is also supported. Employees of a UK firm with a contract to supply services in Australia can travel to Australia to fulfil that contract. We have secured bound, unchanging access for key sectors such as legal services, architecture, science, and manufacturing which is unprecedented in Australian FTAs. This also applies for ongoing servicing of goods, such as aeroplane engines and machinery made in the UK.

Highly skilled contractors can share their skills by travelling to Australia to fulfil a contract, such as self-employed accountants or management consultants.

Shorter-term business visits are included, and the agreement provides for clearer transparency commitments on what documentation, reasonable fees, timeframes, and rules there are around visas, helping stakeholders to navigate the process and take advantage of new opportunities. The UK and Australia have also jointly removed economic needs tests including labour market tests, so that companies will no longer be required to prove that they cannot hire someone from their domestic work force before offering temporary visa to highly skilled professionals.

A wider range of side initiatives alongside the agreement will see changes to the existing Youth Mobility Scheme and Working Holiday Maker programme to allow 18 to 35 year olds to travel to the UK or Australia for a total stay of up to 3 years. This also includes removing the requirement in Australia for UK citizens using the Working Holiday Maker programme to undertake specified work, for example on a farm. UK citizens will also be able to take advantage of a dedicated Australian visa pilot to facilitate mobility for early career professionals and those involved in innovation and both countries will provide enhanced clarity on mobility for those involved in agricultural work through the Joint Declaration on Agriculture and Agribusiness Workers.

Investment – encouraging investment between the UK and Australia

This agreement will help boost the important investment relationship between the UK and Australia, supporting jobs in our towns and cities. The stock of foreign direct investment (FDI) from Australia in the UK was £14.4 billion in 2019, with the UK being the second largest destination for Australian investment.³³

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

Higher Screening Thresholds for UK investors from Australia's Foreign Investment Review Board (FIRB) will see more transactions made by UK investors bypassing the board, making it quicker, easier and less costly to invest in Australia.

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

³³ ABS, International Investment Position, Australia: Supplementary Statistics, (May 2021).

Procurement – a multi-billion pound market

The agreement will give businesses guaranteed opportunities to participate in each other's government procurement markets. Commitments will go significantly beyond current World Trade Organization (WTO) Government Procurement Agreement (GPA) baselines.

Australia has offered the UK more legally guaranteed procurement market access than it has offered in any other FTA, amounting to approximately £10 billion of new legally guaranteed market access for UK businesses per year.³⁴ In return, the UK has offered to build on the legally guaranteed market access offered to Australia in the GPA by offering additional sub-central entities and coverage of additional services.

The agreement also requires procurement to be conducted electronically, which ensures suppliers have easy access to the same information about procurement opportunities as their Australian competitors.

Commitments in the government procurement chapter include provisions aimed at tackling corruption in procurement, strengthened rules of non-discrimination in procurement, and continued cooperation on promoting international liberalisation of government procurement markets. These rules apply to the procurement of all goods covered by the FTA, and goes significantly beyond the existing WTO GPA baseline.

Digital – tackling barriers to digital and online trade

Digital provisions are cross cutting, thereby supporting the whole of UK trade with Australia, which was worth £13.9 billion in 2020.³⁵ Roughly one quarter of total UK trade in goods and services was remotely delivered in 2019.^{36,37} The ONS estimates that 59% of the UK service exports to Australia were supplied remotely in 2019, and 52% of UK imports from Australia.³⁸ In total in 2019 the UK exported £4.3 billion worth of services to Australia via digital delivery.³⁹

The UK and Australia FTA will help to tackle barriers to digital and online trade across the board, including specific commitments on trade facilitation, consumer protection, safeguards for businesses, and data flows.

The UK and Australia have agreed to maintain laws that support e-commerce. The FTA includes commitments that ensures businesses and consumers can conclude legally-binding contracts electronically; identify themselves easily online; and other measures that build trust in the online marketplace.

This deal includes firm commitments to protect consumers from misleading, deceptive, and fraudulent commercial practices when transacting online. Additionally, consumers will benefit from measures that minimise the receipt of unsolicited commercial electronic messages, and to ensure that they are clearly identifiable.

The UK and Australia have agreed not to force companies to hand over their software or encryption keys before entering the market. These commitments are subject to exceptions that ensure government can ensure software is safe and complies with domestic laws. The agreement's source code provisions do not infringe the ability of authorities to ensure compliance with legislation, and to enforce remedies.

The two sides have agreed to facilitate the free flow of data and prohibit unjustifiable data localisation requirements. This means that UK businesses operating in Australia can plan their business growth knowing they need that they can collect, process, and transfer data between the two countries, without facing unnecessary red tape. The commitments made in the UK-Australia 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.

³⁴ This estimate has been derived using a combination of publicly available contract award notices (AusTender, 2018-2019). Where data is missing or unavailable, individual expenditure reports for relevant entities have been sourced. Certain assumptions have then been applied using published OECD statistics (OECD Government at a Glance, 2019). Australia provided estimates for the value of their services offer. Detailed UNSPSC-CPC matching was undertaken, with the help of Australia, to determine which exact services would come into scope of their offer. This estimate was then verified by DIT analysts.

³⁵ ONS, UK Economic Accounts: balance of payments – current account: Total Trade (July 2021).

³⁶ ONS, Modes of Supply data is experimental, and methodology used to compile the data are subject to future improvements. Caution is therefore advised when using the ONS Modes of supply data. These estimates exclude supply Mode 3 (commercial presence), which is estimated to make up the largest proportion of UK trade in services but is not typically included in estimates of total trade.

³⁷ ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2021.

³⁸ ONS, Modes of Supply data, (November 2020).

³⁹ ONS, Exports of services by country, by modes of supply (November 2021). Mode 1 is used as a proxy for digital delivery.

Intellectual property rights – ambitious provisions

The agreement includes ambitious intellectual property (IP) provisions that support our vibrant economies through adequate, effective and balanced protection and enforcement of IP rights that encourage innovation and creativity. The agreement includes a provision on reciprocal arrangements for artist resale royalties. These reciprocal arrangements, once in place, will provide new income streams for our visual artists. The agreement also includes provisions relating to the registration and renewal of trademarks, which will enable business to register and renew their trademarks more efficiently and keep pace with technological advances.

Design right protections in the agreement ensure that two or more designs for a product can be registered in one application, as opposed to separate applications – which is more time-consuming and costly. Australia will also make reasonable efforts to accede to the Geneva Act of the Hague Agreement Concerning the International Registration of Industrial Designs, strengthening international harmonisation and therefore making processes the same in different countries, making the registration of designs more efficient for businesses.

The agreement will look to support enforcement against online intellectual property infringement for both trademarks and copyright, which includes the authority to order internet service providers to block infringing websites. This may also include the authority to order internet service providers to disclose information about who is responsible for such websites. The enforcement text also includes provisions which facilitate voluntary initiatives and awareness-raising to address Intellectual Property infringement.

The agreement also ensures that if Australia establishes bespoke geographical indication (GI) protection schemes for spirits and agri-foods, protecting third country GIs, the UK can put forward our GIs for protection subject to Australia's legal procedures. If these conditions have not been met after two years, the GI provisions will be reviewed by the UK and Australia.

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

The environment chapter will promote mutually supportive trade and environmental policies.

It will encourage the UK and Australia to work together on climate change and affirms both parties' commitments to upholding all of their obligations under the Paris Agreement and the importance of achieving its goals.

Both the UK and Australia preserve their right to regulate, including to combat climate change. This means both parties can establish their own levels of environmental protection, including for the UK to pursue net zero.

Neither party will be allowed to waive or fail to domestically enforce environmental laws to create an unfair competitive advantage and both parties will have recourse to dispute settlement.

The agreement will also strengthen cooperation on areas like sustainable forest management, the circular economy and environmentally friendly alternatives to ozone depleting substances and hydrofluorocarbons.

Innovation – first ever chapter in an FTA

The UK and Australia have committed to the world's first ever innovation chapter in a free trade agreement. This will help to ensure that the agreement reflects the realities of international trade in the future by ensuring that future developments in innovation are taken into account when reviewing the agreement. The chapter establishes a Strategic Innovation Dialogue to support and stimulate innovation in the UK and Australian economies, as well as providing for specific co-operation between the UK and Australia on artificial intelligence and emerging technologies. The Strategic Innovation Dialogue will have a wide remit to consider how trading arrangements can best keep pace with major technological developments, to share and develop best practice in innovation policy, and to identify further areas of cooperation to promote and facilitate innovation in the UK and Australia.

Development – cooperation, best practice and monitoring

The agreement includes the first ever dedicated development chapter within a bilateral FTA between two advanced economies, recognising the importance of trade as a tool for economic growth and poverty reduction. The chapter aims to provide the opportunity to deliver joint development activities and includes provisions which facilitate cooperation and sharing of best practice on technical assistance and capacity building in support of developing country needs and trade.

The chapter also provides that the UK and Australia may monitor the impacts of the agreement on developing countries.

Trade and gender equality – a dedicated chapter reflecting our mutual ambition

The agreement includes a dedicated chapter on trade and gender equality. The UK and Australia commit to cooperate to support women as workers, business owners and entrepreneurs to access the full benefits of this agreement.

This may include exchanging experiences and evidence relating to the promotion of equal opportunities in the workplace; improving women's access to markets, technology and financing; trade missions for women entrepreneurs; and strengthening women's business networks or access to digital skills. In order to ensure that future interventions are driven by evidence, this chapter also facilitates cooperation to promote the integration of gender in approaches to data collection, analysis and monitoring.

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, including in areas such as services, small and medium sized enterprises, financial services, government procurement, labour and digital trade. This chapter establishes an ongoing dialogue between the UK and Australia to support implementation. The Dialogue on Trade and Gender Equality will be able to work with other bodies across this agreement on our shared objective of advancing gender equality across the UK-Australia trading relationship.

4. Overall impacts of the UK-Australia 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)⁴⁰. 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 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 £2.3 billion when applied to projections of UK GDP in 2035 levels, which is the equivalent of a 0.08% increase against the baseline. The estimates and 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 Australian market, UK exports to Australia are estimated to increase by £6.2 billion, when compared to projected levels in 2035 in the absence of the FTA
- **businesses and consumers are set to benefit from greater access to Australian products.** Imports of Australian goods and services are estimated to increase by £4.2 billion when compared to projections of 2035 levels. While increased imports can enhance competition, a significant share of the estimated increase in imports from Australia are expected to replace imports to the UK from other countries as businesses switch to better value and easier-to-source inputs from Australia
- **better-paid jobs.** The modelling estimates an increase in wages for UK households by around £900 million every year in the long run, when compared to 2019 levels
- **opportunities across a wide range of sectors.** Increased growth is driven by expansions across a broad range of services and manufacturing sectors; the modelling shows that 20 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 in the modelling to contract domestic output relative to the baseline without the agreement
- **opportunities across the UK.** In the central estimates, all of the UK's nations and English regions are estimated to see an increase in output, with consumers across the UK expected to benefit from tariff reductions on Australian imports

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:⁴¹

- **gains through increased specialisation across sectors,** whereby enhanced access to international markets and imports reshapes the economy to specialise in producing goods, services, and sectors which they are 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

⁴⁰ DIT, Global trade outlook – September 2021 report.

⁴¹ 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 and 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 the Department for International Trade (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 impacts are 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-Australia FTA. These changes have been informed by the discussions of the Modelling Review Expert 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 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 elasticities used in the new model specification are more representative of how different sectors react to trade liberalisation in the real world.

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 Australian 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
- the impacts of 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 Australian 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-Australia 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 impact on global value chains and UK-Australia 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 Australia do not have an FTA with each other.

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

- the UK's FTAs with Canada, Japan, and Singapore
- 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.⁴²

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

For the baseline, it has been assumed that the UK has not completed any of its new FTAs (for example, New Zealand and the United States of America) nor that the UK has finalised accession to CPTPP.

⁴² 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 FTA using a CGE model, inputs are required for the following:

- changes in tariffs
- changes to the trade costs associated with changes to non-tariff barriers in goods sectors and regulatory restrictions to 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	<p>To approximate the impact of the agreement, the modelling assumes that all tariffs and tariff-rate quotas are removed in the long-run.</p> <p>In the negotiated outcome, there are four products (pork, poultry, eggs and long grained rice), where UK tariffs on Australian products remain in the long run. These products cover only a small proportion of trade.</p> <p>The long run modelling does not account for the gradual staging of tariff reductions nor tariff rate quotas in the agreement.</p>
Non-tariff measures (NTMs) affecting goods trade	<p>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.</p> <p>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.</p> <p>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 Australian 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.</p>
Regulatory restrictions affecting services trade	<p>This agreement represents a deep services agreement. Whilst this agreement goes far 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 which 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.</p> <p>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).</p>

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	£2.3bn
Change in UK exports to Australia	£6.2bn
Change in UK imports from Australia	£4.2bn
Change in UK exports to World	£3.1bn
Change in UK imports from World	£3.0bn

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 3.

The modelling estimates point to an increase of around 53% in trade (exports and imports) with Australia in the long run resulting from the agreement. This is equivalent to £10.4 billion when applied to projected levels of trade in 2035.⁴³ It is equivalent to £9.7 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 Australian import market could lead to an extra £1.7 billion in UK exports by 2035. This represents a 14% increase in UK exports to Australia in real terms (today's prices) compared to 2019.

The modelling estimates of the impact of the agreement point to an additional 44% increase in the long run level of UK exports to Australia compared to the level in the absence of the agreement. This represents an increase of £6.2 billion when applied to projected levels of exports in 2035 or £5.4 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 £3.1 billion when compared to projected levels in 2035 without the agreement. This shows that a large share of the estimated increase in exports to Australia represent increased export opportunities, rather than UK producers diverting their existing exports to Australia 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 Australia of 66%, equivalent to £4.2 billion when applied to projected levels of imports in 2035 or £4.3 billion when applied to 2019 levels. The greatest estimated import increases are in semi-processed foods and energy sectors. Overall UK imports from the world are estimated to increase by £2.6 billion when compared to 2019 levels. This shows that a significant share of the estimated increase in imports from Australia 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 0.08%, equivalent to £2.3 billion a year when applied to the applied to projected GDP in 2035 (around 10-15 years from the implementation of the agreement). It is equivalent to £1.8 billion when applied to GDP levels in 2019.⁴⁴ The largest contribution comes from increased consumer spending.

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 fall between 0.06% and 0.10%. Further details can be found in section 7.

Real wages (wages in today's prices) are estimated to rise by 0.1%, equivalent to £900 million annually when applied to 2019 levels, as workers benefit from higher productivity in the economy.

⁴³ 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 Australia in 2035, the projections are combined with a market share assumption where both UK and Australia's markets shares evolve in line with projections of their global market shares (as projected in the Global Trade Outlook).

⁴⁴ 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).

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 20 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). On the services side, the largest contributions (in absolute terms) come from wholesale and retail services, public services, and business services. On the goods side, the largest contributions come from expansions in the manufacture of machinery and motor vehicles.

These sectors are estimated to grow relative to other sectors of the economy as UK businesses take advantage of the enhanced trading relationship with Australia, improved access to imported inputs and as they respond to increased competition from international markets. This raises the share of UK output that is accounted for by those faster-expanding sectors. This is reflected in the modelling as more resources and investment, such as capital and labour, move into these sectors with higher returns thereby expanding output overall.

The sectors estimated to expand the most in relative terms (that is, in percentage changes) are manufacturing sectors, such as motor vehicles and the manufacture of machinery and equipment. The primary agriculture and semi-processed foods sectors are expected to experience a reduction of around 0.7% (£94m) and 2.65% (£225m) respectively relative to baseline growth in the sectors. 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 parts of the economy where falling trade barriers allow better returns that leaves people better off as workers and investors are able to earn more as a result of the FTA.

The scale of estimated changes in the modelling leaves the sectoral composition of the economy relatively unaffected, albeit with a marginal (0.01 ppt) percentage point reduction in the share of output accounted for by the agriculture and semi-processed foods sectors. This reflects an increase in imports, raising competition in these sectors; and resources moving over time to sectors in which returns are likely to be higher.

While all the sectoral impacts are subject to uncertainty, due to complexities in modelling agricultural liberalisation and the high degree of uncertainty in the estimates, 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	-0.70%	-94	-0.01
Agri-Food	Beverages and tobacco products	0.10%	12	0.00
Agri-Food	Other processed foods	0.14%	29	0.00
Agri-Food	Semi-processed foods	-2.65%	-225	-0.01
Industry	Chemical, rubber, plastic products	0.16%	88	0.00
Industry	Energy	0.04%	24	0.00
Industry	Manufacture of electronic equipment	0.40%	89	0.00
Industry	Manufactures	0.23%	108	0.00
Industry	Manufacture of motor vehicles	1.16%	202	0.01
Industry	Manufacture of machinery and equipment	0.59%	231	0.01
Industry	Manufacture of other transport equipment	-0.03%	-4	0.00
Industry	Manufacturing n.e.c.	0.20%	37	0.00
Industry	Paper and printing products	0.20%	36	0.00
Industry	Textiles and wearing apparel	0.19%	24	0.00
Services	Business services	0.07%	212	0.00
Services	Communications	0.07%	87	0.00
Services	Construction	0.12%	173	0.00
Services	Financial services	0.06%	69	0.00
Services	Insurance	0.07%	21	0.00
Services	Other services (transport, water, dwellings)	0.08%	229	0.00
Services	Personal services	0.09%	69	0.00
Services	Public Services	0.08%	264	0.00
Services	Wholesale and Retail Trade	0.12%	341	0.00

Source: DIT CGE Modelling (2021).

Box 2: Agri-food impacts in the FTA

In DIT's comparative static modelling the agriculture and semi-processed foods sectors are estimated to see a reduction in GVA relative to the baseline and decrease in their share of UK GVA (by around 0.01ppt for both sectors) over the long-run as a result of the FTA. These results are driven by increased import competition in the beef and sheepmeat sub-sectors.

Australia is a large and globally competitive exporter of beef and sheepmeat (accounting for around a tenth of global exports of beef and a third of sheepmeat). The estimated impacts for the agriculture and semi-processed foods sectors reflect Australia's relative specialisation in these products. DEFRA assess that the majority of Australian beef production is able to meet the UK's stringent SPS conditions (including the ban on the use of growth promotants). The UK has historically had high tariffs on these goods. 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 in these sectors. This is why these products in particular have been afforded additional protections in the form of Tariff Rate Quotas (TRQs) in years 1-10 and additional safeguards in years 11-15 of the agreement. Additional protections have been secured in other sectors (dairy, rice, sugar).

This modelling 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 of the 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 Australian exporters. Over 75% of Australia's beef exports go to markets in Asia and the Pacific, with the UK currently making up just 0.1% of their exports (in kg terms). 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 Australian 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 sheepmeat imports above the quota will continue for 10 years. In addition, product-specific safeguards imposing 20% tariffs on beef and lamb 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 Australian imports, 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, with buying local also a significant determinant (AHDB/YouGov). Currently, there are strong 'Buy British' trends in the UK and strong support for British farmers. 81% of retail sales of beef in the UK is under the British logo, with Aldi, Budgens, the Co-Op, Lidl, M&S, Morrisons, and Waitrose all using 100% British beef (National Beef Association). The strength of this preference 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 Australian imports.

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 sectors. PE modelling has the advantages of greater disaggregation and model specifications more specific to the market under consideration than compared to a CGE model. However, while it accounts for linkages between agricultural sectors, it does not incorporate linkages between agriculture and the rest of the economy, unlike the 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 Australia of beef and sheepmeat products are low due to the constraint of existing TRQs and prohibitive out of quota tariffs which makes estimating future UK demand for Australian products inherently uncertain.

- Our best estimates suggest a reduction in gross output of around 3% for beef and 5% for sheepmeat as a result of liberalisation.
- These estimated impacts would be felt gradually over the staging period. It is likely that the increase in imports will primarily displace beef imports from the EU and sheepmeat imports from New Zealand.
- Our best estimates suggest that around three quarters of the estimated impacts to gross output reflect reductions in producer price, which could also benefit consumers. The remaining quarter of impact is driven by reductions in the quantity of production. This is driven by historic domestic supply responses which are relatively low in the beef and sheepmeat sectors. If supply was more responsive in the future than suggested by the historic data, production volumes could decrease by more.

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 £200 million.⁴⁵

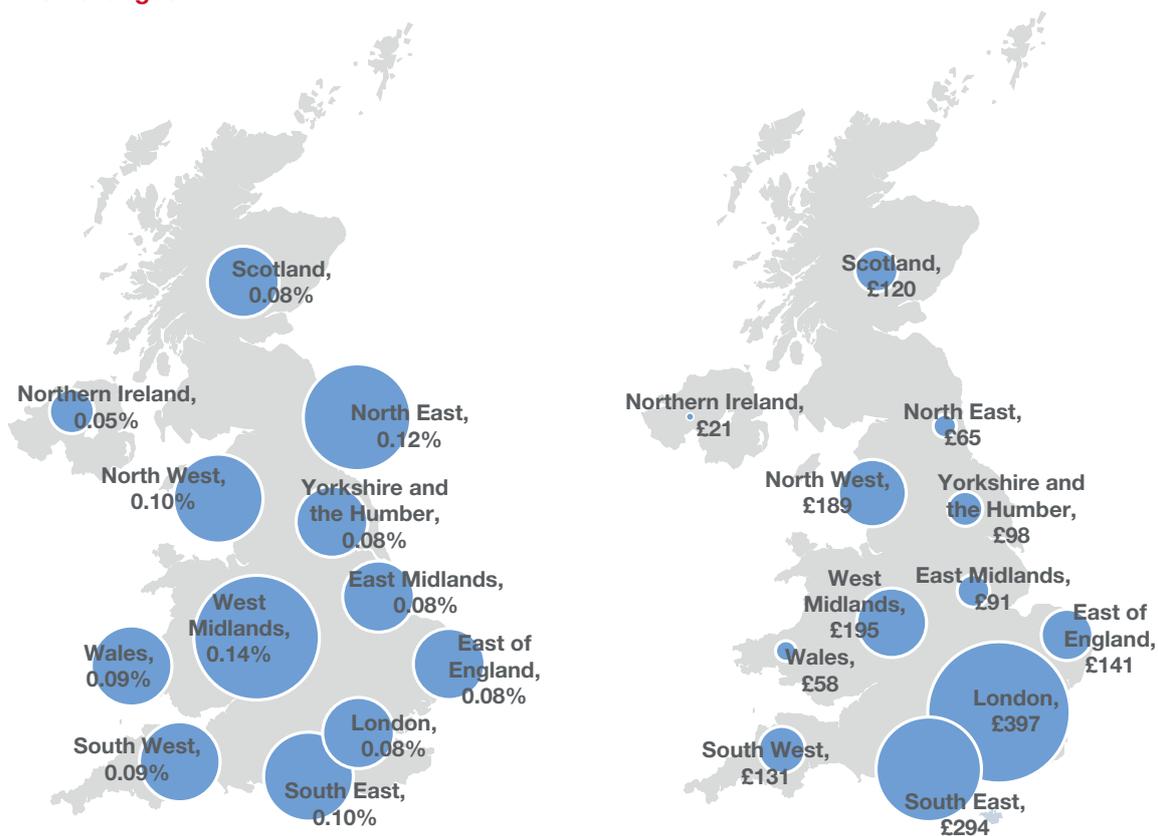
The sensitivity analysis in section 7 shows that the impacts on Northern Ireland and West Midlands are sensitive to assumptions regarding the presence and scale of local economic effects. Large local economic effects could increase the GVA gain in West Midlands and result in a net GVA loss for Northern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

The expert modelling review panel are exploring ways to help improve DIT's modelling toolkit, including improving the estimation of sub-national impacts.

⁴⁵ 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	0.08%	141
East Midlands	0.08%	91
London	0.08%	397
North East	0.12%	65
North West	0.10%	189
South East	0.10%	294
South West	0.09%	131
West Midlands	0.14%	195
Yorkshire and the Humber	0.08%	98
Northern Ireland	0.05%	21
Scotland	0.08%	120
Wales	0.09%	58

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

4.8 Impacts on other countries

Australia

The agreement is estimated to increase Australia's GDP by the equivalent of around £1.6 billion when compared to its 2019 level, and £2.3 billion when compared to projections of Australian GDP in 2035.⁴⁶

Developing countries

The agreement includes the first ever dedicated development chapter within a bilateral FTA between two advanced economies, recognising the importance of trade as a tool for economic growth and poverty reduction. The chapter includes provisions which facilitate cooperation, sharing of best practice on technical assistance and capacity building, and provides that the UK and Australia may monitor the impacts of the agreement on developing countries.

Nonetheless, FTAs have the potential to contribute to preference erosion. 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.⁴⁷ As consumers and businesses shift their demand for imports towards cheaper imports from the UK and Australia, 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 Australia are highly competitive, are more likely to be impacted from goods liberalisation in this agreement. The products identified as at risk of trade diversion away from developing country producers following this agreement are presented in Table 17 in Impact Assessment Annex 3.⁴⁸ Based on the analysis, the risks of trade diversion from preference erosion from this agreement are not substantial.

The risk of trade diversion is greatest for raw cane sugar. Australia is a significant producer and exporter of raw cane sugar for refining.⁴⁹ From 2017 to 2020, Australia exported on average 3.6 million metric tonnes of raw cane sugar globally.⁵⁰ Several African, Caribbean and Pacific (ACP) countries rely on the preferential access they receive to the UK market for their exports. Belize, Fiji, and Guyana exported £24.3 million (93,000 tonnes), £14.2 million (46,000 tonnes) and £21.3 million (67,000 tonnes) to the UK, on average from 2017 to 2019, which accounted for 60%, 30% and 71% respectively of their global exports of raw cane sugar for refining.⁵¹ Other ACP exporters that meet the criteria set include Mozambique (£5.8 million or 32,000 tonnes, 12% to the UK) and Jamaica (£4.9 million or 16,000 tonnes, 51% to the UK). Greater access to the UK market for a more competitive sugar producer such as Australia could lead to a reduction in demand for raw cane sugar exports from ACP producers, although the extent of this will depend on supply from other sources of sugar both domestically and from the EU, as well as domestic demand.

In monitoring the agreement, we will pay particular attention to changes in trade flows of raw cane sugar, as well as the goods flagged in Annex 3, particularly where they originate in smaller and less diversified developing countries.

46 Projections of Australia GDP in 2035 from DIT's Global Trade Outlook (September 2021).

47 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 ACP.

48 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) Australia 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.

49 HS codes 17011310 and 17011410.

50 Data from US Department of Agriculture. Precise data on Australian exports of raw cane sugar is not available in UN Comtrade.

51 Reliance on the UK market is calculated at HS6. 170114 includes both raw cane sugar for refining and not for refining. Belize exported £7.7 million of 17011490 to the UK, which contributes to the 60% share of total exports to the UK.

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 Australian market.** UK exports to Australia will see £115 million of reduced tariff costs per annum in the short term and £116 million per annum after 5 years. SMEs are proportionately represented in sectors that benefit most from the FTA.
- **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 Australia, with total annual tariff reductions on imports estimated to be £41 million annually in the short term and £43 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 £900 million.

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 Australia. 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 Australia are expected to benefit from a growth in exports by becoming more price competitive and having more efficient market access into the Australian economy. Provisions enhancing transparency and providing better information for SMEs could induce new businesses to enter the Australian market. Businesses importing goods from Australia will directly benefit from lower tariffs on and an expected increased variety of imported inputs to production and final goods from Australia. 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 Australian exporters. The evidence shows that competition from trade promotes business innovation and growth.⁵² Some businesses may expand, creating more jobs, but some businesses may be adversely affected by the increased competition.

In addition, our modelling estimates a £241 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

Australia is an important trading partner for UK businesses. Around 15,400 businesses exported goods to Australia in 2019.⁵³ 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 £5.4 billion increase in UK exports to Australia, 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 from £115 million in Year 1 to £116 million in Year 6 due to the staged tariff reduction process that is set out under the agreement. The estimates show that the majority of tariffs are liberalised at entry into force of the agreement.⁵⁴

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.⁵⁵ However, UK businesses could benefit from maintaining or increasing competitiveness, particularly when compared to businesses exporting to Australia 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, North West, the South East of England, and Scotland are expected to benefit the most from lower tariffs on UK exports to Australia. For example, though businesses in the West Midlands account for 16% of UK goods exports to Australia, they are estimated to benefit from 24% of the overall tariff savings to the UK in the long term. A full breakdown of tariff reductions by nation and region are shown 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 £43.5 million in the long term. The majority of the duty reductions come from final goods as can be seen in the table below.⁵⁶

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

Type of Good	Long-term tariff savings, £m
Intermediate goods	4.0
Final goods	39.5
Total savings	43.5

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

The majority of the estimated import duty reductions on intermediate goods occur in the vegetable products (23%), plastic and rubber products (22%) and machinery & mechanical appliances (19%) sectors. These tariff reductions provide benefits for businesses that make use of Australian imports in their production processes. This could provide competitiveness gains for those UK businesses but could also result in increased competition between Australian producers, domestic producers, and imports from third countries on intermediate products with liberalised tariffs.⁵⁷ 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 West, and the East of England (32%, 20% and 13% respectively).⁵⁸

⁵³ 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 Australia.

⁵⁴ 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 Australia.

⁵⁵ Note that tariff reductions apply to goods that meet Rules of Origin requirements.

⁵⁶ Long term refers to the end of the liberalisation period for the UK and Australia 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>

⁵⁷ 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.

⁵⁸ 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.

Increased imports and competition

Around 5,600 businesses imported goods from Australia in 2019. 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 £4.3 billion increase in UK imports from Australia, when compared to 2019 levels.

Some businesses may experience greater competition from imports from Australian firms. The evidence shows that competition from trade promotes business innovation and growth.⁵⁹ Some UK businesses may expand, creating more jobs, but others may be adversely affected by the increased competition.

Small and medium-sized enterprises (SMEs)

SMEs play an integral role in engaging with the international economy. In 2019, around 13,400 SMEs exported goods to Australia, accounting for 33% of UK bilateral goods exports.⁶⁰ 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 FTA. 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 manufacturers of other transport equipment, agriculture, forestry and fishing and semi-processed foods, only have a small proportion of total SMEs (0.6%, 2.4% and 0.4% of the total numbers respectively). Overall SMEs are proportionately represented in sectors which gain the most.

Detailed results breakdowns on business impacts are available in Annex 3

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 Australia 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. 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 £11.8 million, with a range between £11.4 million and £12.2 million (2019 price base).⁶¹ This figure could be an overestimate as it double counts firms which both export to, and import from, Australia. However, it does not consider the number of businesses that may start to trade with Australia 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 Australia 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.

⁵⁹ CMA (2015) Productivity and competition: A summary of the evidence.

⁶⁰ HMRC 'Trade in Goods by Business Characteristics, country tables' (viewed August 2021).

⁶¹ These differences reflect differences in estimated reading time.

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%.⁶² 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 Australia associated with rules of origin requirements are assumed to range from 2% to 4%. The potential cost to UK business is estimated to be between £46.4 million and £91.7 million per annum, with a central estimate of £69.1 million.⁶³ 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 £1.1 billion 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.

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.⁶⁴

Consumers can benefit both from:

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

However, tariff reductions will not always be passed through fully into consumer prices. Some businesses may absorb the benefit from the reduced tariff cost on intermediate goods. Calculated in this way, consumer savings when importing final goods are equivalent to the reduction in tariff revenues accruing to the UK Exchequer.

Annual tariff duty reductions on imported final goods from Australia are estimated to be around £38.3 million in the short term and could increase marginally to around £39.5 million annually in the long term.⁶⁵ This is detailed 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 £34.2 million per year at entry into force.⁶⁶ It is estimated that the average UK household spends 1.8% of their total weekly spend on these goods, while the average Scottish (2.4%) and Northern Irish (2.4%) household spend the highest proportion of income on these goods of all UK nations.

Food (largely semi-processed foods) and non-alcoholic beverages are estimated to have the second highest tariff reductions of £2.4 million annually 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.

⁶² Should Canada unilaterally adopt global free trade? <http://www.ceocouncil.ca/wp-content/uploads/2014/05/Should-Canada-unilaterally-adopt-free-trade-Ciuriak-and-Xiao-May-20141.pdf>

⁶³ Based upon 2017 to 2019 average UK exports to Australia.

⁶⁴ 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.

⁶⁵ These results are based on trade flows between the UK and Australia between 2017 and 2019. The analysis therefore does not account for any changes in consumer behaviour which may change the value or composition of goods imported once the agreement is implemented. They are calculated by mapping the negotiated tariff schedule to consumer expenditure categories.

⁶⁶ According to Eurostat Reference and Management Of Nomenclatures (RAMON) correspondence tables from Harmonised System (HS) to Classification of individual consumption by purpose (COICOP).

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 the 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. The full breakdown of results is available in Annex 3.

Product choice for consumers

Liberalising trade with Australia 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 1893 consumer products, increasing the choice of products that are free from import tariffs for the UK consumer.

The full breakdown of results in this section is available in Annex 3.

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 FTA. 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 (that is, they are assumed to be unaffected by the FTA). 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 £900 million in the long run. All occupation types (and therefore workers of all skill levels) benefit from trade liberalisation, see 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.⁶⁷ It suggests that any reallocation of employment across sectors in the long run will be modest, with increases and declines all below 0.03%. It would suggest a slight rebalancing away from semi-processed food (and to a lesser degree, business services, 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.⁶⁸ 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

⁶⁷ Employment is according to the ILO definition as specified by the relevant LFS indicator (ILODEFRR). 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.

⁶⁸ Industrial turbulence indices are calculated as: where ΔE_i is the change in employment in each sector, and E is overall employment in the economy. (Layard, Nickell and Jackman (1991) "Unemployment" Chapter 6.

in the labour market. The agreement is estimated to lead to a movement of less than 1% of jobs across all sectors, manifesting over a 10-15 year period. This compares to an average turbulence of around 18% in existing employment over the last 15 years.⁶⁹

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.

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 <0.03% we would expect to see over a much longer period.⁷⁰ This gives some indication that any adjustments due to the agreement could be absorbed through labour market churn.

None of the three sectors which see a slight shift away in employment (semi-processed foods, business services and agriculture, forestry and fishing) have lower outflows of workers than average. This suggests that the annual movement of people across sectors is substantially higher than the modelled changes in employment share due to the trade agreement. Agriculture, forestry and fishing and semi-processed food workers have historically been most likely to move to business service sectors, while business service workers are most likely to move to public services (See Annex 3).

Different UK regions have different clusters of economic sectors. It is difficult to accurately assess how changes in the composition of sectoral employment affect employment in UK regions. These are the evolution of the regional comparative advantage in response to global trends, and the potential for the location of production and employment to evolve over the 15-year time horizon for the economic modelling.

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- Australia FTA.

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.⁷¹

Sex

- 47% of those in employment in the UK are female and 53% are male.⁷²
- 77%^r of the workforce in sectors estimated to account for lower long run employment relative to the baseline are male and 23%^r 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 males, with the remaining 36% filled by females.⁷³

Ethnicity

- 12% of the overall workforce are from an ethnic minority background and 88% are white.
- Those from ethnic minority backgrounds represent only 4%^r 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%^r and 11%^r respectively.

69 This average is based on the 15 years to March 2020.

70 This is based on average movement between GTAP sectors between 2011 to 2019.

71 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.

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

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

Disability

- Around 13% of those in employment in the UK report that they have a disability (as defined by the Equality Act 2010).⁷⁴
- 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 the share of employment is estimated to be lower than in the absence of the FTA may not necessarily be adversely affected by the agreement. For example, workers who remain in the sector could benefit from increases in wages, owing to higher productivity. In addition, some of the adjustment may take place as workers leaving the labour market are not replaced, with new entrants more likely to find employment in sectors where employment is higher. Any workers who do transition across sectors may incur short-term adjustment costs. However, they could ultimately benefit from higher wage jobs in other sectors of the economy.

A more detailed breakdown of the demographics in this section are available in Annex 8.

⁷⁴ It is possible that non-response to this question in the Annual Population Survey affects the estimated proportion.

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 promoting cooperation across a wide range of environmental issues, affirming commitments to Multilateral Environmental Agreements, preventing deviation from environmental laws to secure a trade advantage, and preserving the UK's right to regulate to meet the UK's climate commitments. Both the UK and Australia are already party to the UNFCCC, including the Paris agreement. The FTA affirms all the aims of the Paris Agreement.
- **Overall greenhouse gas emissions associated with UK-based production are largely unchanged from the agreement.** This is because an expected increase in emissions associated with higher economic activity is offset by an overall shift in UK production towards less emissions-intensive sectors. There will be some emissions associated with Australian production of goods imported to the UK as a result of the agreement. Overall, our experimental analysis suggests that the economic changes resulting from the agreement could increase Australia's production emissions by around 0.1%.
- **There will be some increase in transport-related emissions associated with increased trade flows.** The increase is estimated to be around 0.1-0.3 MtCO₂e each year. The increase in transport emissions is small when compared to 2018 UK production emissions of around 500 MtCO₂e.⁷⁵ The UK is committed to being at the forefront of tackling maritime emissions.
- **The impact on carbon leakage is more uncertain.** Increased market access could facilitate higher levels of trade in sectors where climate mitigation policies differ between the UK and Australia. These effects will depend heavily upon how the UK and Australia's environmental policies develop over the coming decades, as well as external factors such as technological change.
- **The agreement provides opportunities to boost in trade in environmental goods, which can speed the development and uptake of environmentally friendly production techniques.** The UK and Australia currently impose tariffs on 165 and 204 tariff lines of products classified as environmental goods by the OECD's combined list of environmental goods respectively. The agreement means that, after 5 years, all goods on the OECD's combined list of environmental goods will be tariff free in UK-Australia trade.
- **The agreement could also affect air pollution, water quality, forests, biodiversity and waste management** as a result of increased growth and sectoral changes within the UK and Australian economies and shifts in global trade patterns. Whilst it is difficult to quantify the scale of these wider environmental impacts, the agreement is not expected to have a significant impact on these areas.

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

The UK and Australia are both party to a broad range of multilateral environmental agreements (MEAs), 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 15 countries globally for environmental performance.

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

- promoting cooperation across a wide range of environmental issues;
- affirming commitments to MEAs, including a climate change article that affirms both the UK's and Australia'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.

⁷⁵ Internal DIT analysis based on ONS 2018 data.

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).

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% – faster than any other G7 economy – and will seek to reduce emissions by 78% by 2035 compared to 1990 levels.⁷⁶

The UK and Australia are the world's 5th and 12th largest economies respectively.⁷⁷ UK CO₂ emissions account for around 1% of global emissions. Together, the UK and Australia accounted for 2.2% of global CO₂ emissions in 2018.⁷⁸ 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%.⁷⁹

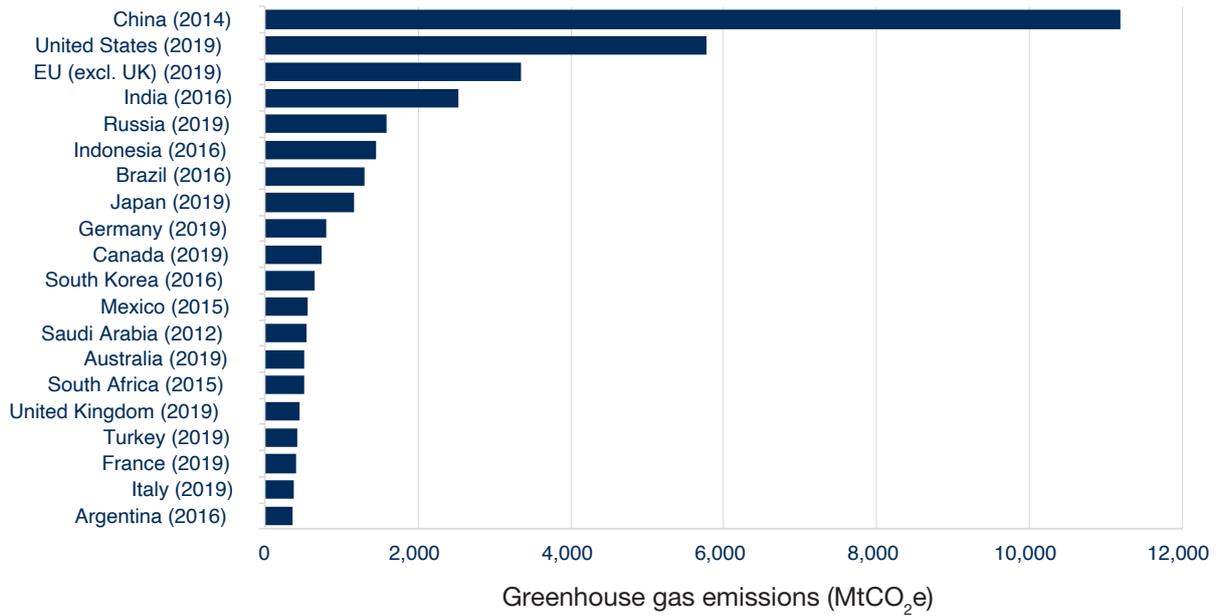
⁷⁶ BEIS, Updated energy and emissions projections: 2019 (October 2020).

⁷⁷ IMF World Economic Outlook April 2021.

⁷⁸ OECD Data: Air and GHG Emissions: CO₂, Million tonnes, (February 2020).

⁷⁹ BEIS, UK Greenhouse Gas Emissions, Final Figures: 2019 (February 2021).

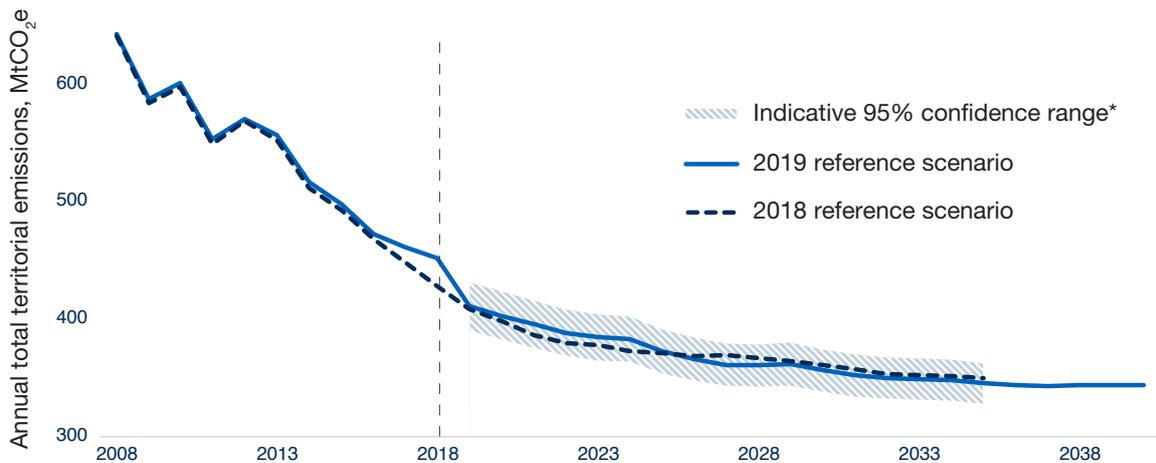
Figure 4: Territorial Greenhouse Emissions reported to the UNFCCC (2019): G20- countries (MtCO₂e)



Source: United Nations Framework Convention on Climate Change (UNFCCC).

The UK will seek to reduce emissions by 78% by 2035 compared to 1990 levels.⁸⁰

Figure 5: UK projected emissions, MtCO₂e



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 Australia are already party to several international climate agreements. These include the UNFCCC, including the Paris Agreement and Kyoto protocol, as well as the Montreal protocol. In 2021, the UK and Australia entered into the Clean Technology Partnership which strengthens the partnership between the two countries and provides the opportunity to collaborate on innovative, low-carbon technologies.

Environment commitments within this FTA strengthen recognition and cooperation between the UK and Australia on areas including emissions reduction, sustainable forest management, environmentally friendly alternatives to ozone depleting substances and hydrofluorocarbons, marine environments, biodiversity, sustainable fishing and the circular economy. In addition, through this agreement the UK and Australia 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. These shared commitments demonstrate each party’s resolve to address climate change as both a domestic and global issue while supporting their respective policy agendas.

⁸⁰ Press release, UK enshrines new target in law to slash emissions by 78% by 2035 <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>.

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

Overall greenhouse gas emissions associated with UK-based production are largely unchanged from the FTA. Excluding emissions associated with greater transport activity, higher emissions from increased economic activity are offset by a shift in output away from sectors with relatively high emissions.

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 reallocation of resources within a country is how trade improves economic efficiency and can also drive changes in emissions. The composition effect will result in less (more) greenhouse gas emissions if the expanding sectors are less (more) energy intensive than the contracting sectors.

Estimated output changes from CGE modelling and ONS environmental accounts data are used to estimate production change impacts from the FTA on greenhouse gas emissions, including CO₂ and Non-CO₂ emissions.⁸¹

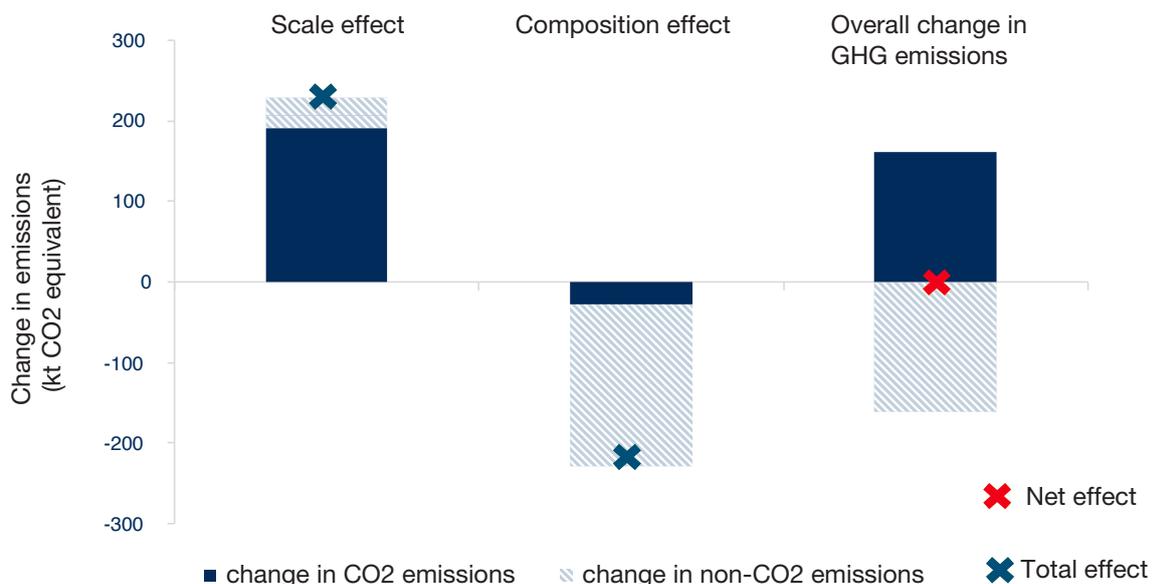
However, the quantitative assessment does not capture changes in consumption patterns, the emission intensity, or emissions associated with greater transport activity that could result from the implementation of the agreement. Furthermore, the analysis does not reflect any improvements in emissions intensities over time in line with the UK's transition to net zero.

The estimated increase in economic growth resulting from the agreement is, other things equal, associated with an estimated 0.05% increase in UK greenhouse gas emissions compared to levels of emissions in 2018 (the scale effect). This is equivalent to an increase of 0.2 MtCO₂e. 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.

The estimated increase is offset by the estimated shift in output towards sectors with relatively lower emissions-intensity, which is estimated to reduce greenhouse gas emissions by around 0.05% relative to 2018 (composition effect).

The analysis in the chart below shows that a net increase in CO₂ emissions is offset by a reduction in non-CO₂ greenhouse gas emissions, leaving the overall greenhouse gas emissions associated with UK-based production largely unchanged.

Figure 6: The impact on UK emissions, by changes in scale and composition effect, and changes in CO₂ emissions and non-CO₂ emissions, compared to emissions in 2018



Source: DIT calculations.

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

Experimental analysis, based on an alternative dataset which allows for analysis of other country's emissions and pertains to the emissions intensities of sectors in 2014, shows that Australia's production emissions are estimated to increase overall because of increased economic activity (the scale effect) and a net shift towards more emission-intensive sectors in Australia (composition effect).⁸² Australia's production emissions are estimated to increase by around 0.1%, equivalent to around 0.9MtCO₂e when compared to 2014 levels.

The quantitative analysis accounts only for changes in domestic production and does not consider transfer of emissions between the UK and Australia. It also does not provide an estimate of the impact on global emissions which result from changes to global patterns of trade across 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 FTA 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 energy⁸³

Trade-related transport emissions

This agreement is expected to lead to an increase in transport emissions as a result of the increase in trade with Australia. The estimates suggest that the increase in emissions associated with transport of goods could be between around 0.1 and 0.3 MtCO₂e each year, a 31 to 40% increase in transport emissions associated with trade with Australia. The estimates do not account for the future decarbonisation of international shipping.

Global international trade was linked with 8,800 MtCO₂e or 27% of global CO₂ emissions from fuel combustion in 2015.⁸⁴ 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.^{85, 86}

The scale of emissions associated with international trade in goods reflect 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 less 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 in 2018, resulting in the first ever Greenhouse Gas Strategy for the sector, agreeing a target of reducing emissions by at least 50% by 2050.⁸⁷ Both the International Maritime Organisation (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 have adopted mandatory measures to reduce emissions of various pollutants under their pollution prevention treaty (MARPOL), and the IATA have adopted a four-pillar strategy to address the global challenge of climate change.

In terms of weight, maritime freight accounted for approximately 99% of the volume of trade between the UK and Australia in 2019, whilst aviation freight only accounted for approximately 1% of goods traded.

By increasing bilateral trade, the agreement is estimated to lead to an average increase in annual greenhouse gas emissions of between 0.1 MtCO₂e and 0.3 MtCO₂e each year between 2020-2035. This results from an estimated increase in the emissions associated with maritime and aviation freight between the UK and Australia of between 31% and 40%, compared to a scenario without the agreement. The increase in transport emissions is small when compared to 2018 UK production emissions of around 500 MtCO₂e.

⁸² This analysis is produced using the GTAP-E database from Purdue University.

⁸³ CCC, Independent Assessment of UK Climate Risk, 2021. PWC, Climate change and resource scarcity, 2015.

⁸⁴ OECD – CO₂ Emissions embodied in international trade and domestic final demand

⁸⁵ A. Cristea, et al., Trade and the greenhouse gas emissions from international freight transport, Journal of Environmental Economics and Management (2012).

⁸⁶ International Maritime Organization Fourth Greenhouse Gas Study 2020

⁸⁷ DfT's Clean Maritime Plan, July 2019

CGE modelling has limitations in how it models the future energy sector. It does not fully capture expected changes in future trade flows as the UK moves towards net zero nor does it account of any improvements we may expect to see in the emissions intensity of transport over time.⁸⁸ Table 6 sets out a range of results to capture the impact of the agreement on transport emissions including and excluding energy trade. The true estimated transport emissions will depend upon the extent to which energy trade flows adapt to the UK's net zero transition.

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 ₂ e)	0.1 – 0.1	0.0 – 0.0	0.1 – 0.1	0.0 – 0.0	0.0 – 0.1	0.0 – 0.2	0.1 – 0.3
Change relative to baseline (%)	37% – 37%	24% – 25%	33% – 34%	56% – 56%	13% – 45%	26% – 46%	31% – 40%

The ranges are based on scenarios including and excluding energy sectors which have limitations in the CGE modelling. Part of the range on maritime emissions is also based on a sensitivity analysis looking at the shortest and longest typical routes ships may take between the UK and Australia. Where ranges look identical, this is due to slight differences lost in the rounding.

The main drivers for this increase in transport emissions are the increased volume of bilateral trade, increased distance travelled by transported goods as trade shifts from partners that are more geographically close to the UK towards Australia, and the estimated changes in the composition of goods traded and associated modes of transport used.⁸⁹

Increased services trade from the FTA is not expected to have a significant impact on transport emissions. The impact has not been quantified as a large proportion of services trade does not involve any transport.⁹⁰

The above analysis does not take account of any improvements we may expect to see in the emissions intensity of transport over time either in the baseline or resulting from this FTA. Further information can be found in Annex 9.

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; and
- 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, an FTA could facilitate higher levels of trade in sectors where climate mitigation policies differ between the UK and Australia. Therefore, the above conditions for carbon leakage could be met following liberalisation if production shifts from the UK to Australia due to an increase in more GHG intensive imports from Australia. However, the extent to which rising emissions may be attributable to carbon leakage relative to increased economic output (scale effect) is uncertain.

The modelling suggests that one area which might see increasing Australian imports and some shift in relative production levels is cattle meat. Differences may also exist in the GHG mitigation policies in force in this sector. However, data on emissions intensity in cattle meat production tend to vary according to the source⁹¹ and depending on whether only emissions from within the boundaries of the farm are considered (such as methane from cattle and electric usage) or if additional emissions from factors such as land use change are also included.

Furthermore, relative climate mitigation policies between the UK and Australia are unlikely to remain constant over the period in which the FTA is implemented and beyond. For example, if the gap in carbon pricing between both countries were to materially increase this could increase the risks of carbon leakage over time as the relative GHG intensity of production would be altered and products can be traded barrier free.

⁸⁸ Further information on the Transport emissions methodology can be found in Annex 9.

⁸⁹ 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.

⁹⁰ According to experimental data, Mode 4 trade made up around 10% of cross-border services trade (excluding Investment) with Australia in 2019.

⁹¹ The Food and Agriculture Organization of the United Nations (FAO STAT database and the Global Livestock Environmental Assessment Model database) finds very high emission intensities in Australia, whilst Poore and Nemecek (2018) estimate lower differences.

It should be noted, however, that the pathway for emissions remains highly uncertain and will depend on how the UK and Australia's policy positions develop over the coming decades, as well as external factors such as technological change.

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. This impact assessment follows the OECD approach, using the Combined List of Environmental Goods (CLEG).⁹²

The UK and Australia currently impose tariffs on 165 and 204 tariff lines of products classified as environmental goods by the OECD's combined list of environmental goods respectively. Australia's average tariff applied on environmental goods is around 4.5% with the highest tariff at 5.0% on a range of environmental goods.⁹³

The UK-Australia FTA will eliminate tariffs on environmental goods with a range of uses. Upon entry into force, the UK will remove tariffs on all environmental goods. Australia will remove 202 tariff lines on environmental goods and remove tariff lines on 2 further goods over 5 years. This means after 5 years all goods on the OECD's combined list of environmental goods will be tariff free in UK-Australia trade.

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 Australia. Exposure to air pollution is one of the UK's biggest public health challenges, shortening lifespans and damaging quality of life for many people.⁹⁴

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.⁹⁵ Both the UK and Australia 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, Australia ranks 2nd on the EPI for air quality.

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

Air Quality Indicators	Australia			UK		
	Rank	EPI Score	10-year change	Rank	EPI Score	10-year change
Air quality *	2	98.2	+2.9	14	84.7	+5.5
PM2.5 exposure	1	100	+1.7	18	75.4	+9.7
Ozone exposure ⁹⁶	19	73.8	-12.6	29	64.5	+3.7
Household solid fuels exposure	22	98.8	+6.5	1	100	-

Source: Environmental Performance Index (EPI), 2020.

*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 and Australia trade environmental goods that improve air quality, such as air handling equipment for extracting polluted air, corrosive gases or dust. Australia currently imposes tariffs on 16 environmental goods associated with improving air quality whilst the UK imposes tariffs on 19 of these goods. The UK-Australia FTA will eliminate these tariffs, promoting increased movement of these environmentally beneficial products.

92 OECD (2019), 'Report on a set of policy indicators on trade and environment', Joint Working Party on Trade and Environment.

93 Tariff data: Macmaps 2019 & DIT analysis

94 PHE, Health matters: air pollution, 2018.

95 Defra, Air quality: explaining air pollution – at a glance, 2019.

96 Exposure to ground-level ozone pollution

As well as benefitting those businesses and workers in those sectors, the estimated increase in manufacturing and construction output in the UK could result in an increase in associated air pollutants. In Australia, GVA increases in agriculture, construction and wholesale trade sectors could cause an increase in air pollutants, including anthropogenic sources of methane associated with the livestock industry. The impact on air quality could be partially mitigated by a GVA reduction in the Australian energy sector.

Water quality

Increased production from trade could put pressure on water resources and quality through agricultural, industrial and urban pollution. Australia is the driest continent on earth, receiving just over 1% of the world's available freshwater resources. Agriculture is the largest consumer of water in Australia, accounting for 59% to 65% of annual water use (~9400 to 12,800 gigalitre/year).⁹⁷ 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 Australia 25th. The water resources index measures the extent the country is mitigating risks to aquatic ecosystems through treatment.⁹⁸ For this index, the UK and Australia rank 6th and 11th respectively.

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

Water Quality and Use Indicators	Australia			UK		
	Rank	EPI Score	10-year change	Rank	EPI Score	10-year change
Sanitation & Drinking Water *	25	87	+1.5	1	100	+0.8
Water Resources **	11	92.7	-	6	98.5	-

Source: Environmental Performance Index (EPI), 2020.

* 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.

Australia currently imposes tariffs on 28 environmental goods associated with improving water quality whilst the UK imposes tariffs on 9 of these goods. The UK-Australia FTA will eliminate the majority of these tariffs, reducing the cost of trade for environmental goods supporting wastewater management.

In 2019, the UK's top three exports to Australia in goods that improve water quality include electrical machines and apparatus worth £25.2m, appliances for pipes and tanks worth £24.6m, machinery for filtering or purifying liquids worth £21.0m.⁹⁹ Australia's average tariffs on these three goods range from 0% to 2.5%. Australia also applies a 5% tariff on some goods that improve water quality, such as articles of iron or steel and centrifugal pumps.¹⁰⁰ The UK's exports to Australia in these products were £8.7m and £4.6m respectively in 2019.

In 2019, the UK's top import with a tariff from Australia associated with supporting wastewater management was electrical machines and apparatus, worth £14.7 million.¹⁰¹ This product faces an average 0.7% tariff under the UKGT, whilst tariffs on other environmental goods in this area range up to 6.0%. These goods can help to minimise or reduce water wastage and their tariffs will be removed under the UK-Australia FTA.

CGE modelling shows GVA increases in UK manufacturing goods. For businesses that demand more water for production, this could increase abstraction of water from rivers. Despite this potential impact, the government is still committed to the 25-year environment plan to maintain sustainable water usage.¹⁰² The small estimated reduction in GVA in the agriculture and semi-processed food sectors could lead to a modest reduction of water pollutants discharged from these sectors, and a mild reduction in water stress in the agricultural areas of the UK.

For Australia, increased output in the agriculture sector could place strain on Australian water resources and water quality in regions where red meat and livestock sectors are concentrated, such as Queensland, New South Wales, Victoria, and Western Australia.¹⁰³ In addition, the construction sector is estimated to increase. Since construction materials such as cement and steel have a high-water footprint, this may increase the risk of pressure on Australian water resources.¹⁰⁴

⁹⁷ AU Gov, Australia state of the environment: Inland water, 2016, p.6

⁹⁸ 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.

⁹⁹ HS: 848180, 842129 & 848190

¹⁰⁰ HS: 732690 & 841370

¹⁰¹ HS: 848180

¹⁰² UK Gov, At a glance: summary of targets in our 25-year environment plan, 2019.

¹⁰³ ABS, Livestock Products, Australia, 2021

¹⁰⁴ P.W. Gerbens-Leenes, A.Y. Hoekstra, R. Bosman, The blue and grey water footprint of construction materials: Steel, cement and glass, 2018

Marine habitats and fisheries

Trade in seafood has increased dramatically in recent decades and is amongst the most highly traded food commodities.¹⁰⁵ Both the UK and Australia share ambitions for improving marine habitats and supporting sustainable fishing practices.¹⁰⁶ Both countries are party to international agreements that seek to protect the marine environment, such as the 1982 UN Convention on the Law of the Sea and the MARPOL convention. Both nations also implement domestic regulations which prevent illegal, unreported and unregulated fishing (IUU) and seek to ensure sustainable fishing.¹⁰⁷ The UK and Australia implement international IUU fishing agreements and both share ambitions to tackle IUU fishing internationally.

Marine protected areas in the Exclusive Economic Zone (EEZ) can help to address issues of overfishing, by conserving habitat and reducing the fishing pressure on stocks in specific locations.¹⁰⁸ The UK has made a significant improvement in protecting marine areas within its EEZ. In 2020, marine protected areas accounted for around 41.46% of the UK's EEZ, compared to only 4% in 2010, and accounted for 40.97% of Australia's EEZ.¹⁰⁹ Yale University's Environmental Performance Index (EPI) ranks the UK 38th among 111 countries for Fish Stock Status and ranks Australia joint 105th. It also ranks the UK and Australia 52nd and 39th respectively among 77 countries for Fish Caught by Trawling.

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

Marine Habitats and Fisheries Indicators	Australia			UK		
	Rank	EPI Score	10-year change	Rank	EPI Score	10 year-change
Fish Stock Status*	105	0.7	-7.6	38	13.1	+4.7
Fish Caught by Trawling**	39	6.5	+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).

The agreement is expected to have a limited impact on bilateral trade in fishing or food products (products containing fish). For example, only 0.3% of UK seafood export value is to Australia, (£6m, 2017 to 2019 average.) despite already having tariff free access.¹¹⁰

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 CO₂e in 2017.¹¹¹ Conversely, deforestation is the second largest source of CO₂ emissions internationally.¹¹²

In 2020, woodland area in the UK covered 3.2 million hectares (m ha), 1.39m ha (43%) of which is independently certified as sustainably managed.¹¹³ 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 2018, Australia's forest area stood at 134m ha, covering 17.4% of the total land area in Australia.¹¹⁴

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 ha of trees per year by 2025 across the UK.¹¹⁵ The UK government has also pledged £50 million to the Woodland Carbon Guarantee to encourage woodland planting and develop the domestic market.¹¹⁶ This is part of the 25 Year Environmental Plan introduced in 2018. Australia ranks 115th for tree cover loss and has 10 Regional Forest Agreements which set out long-term plans for sustainable management and conservation in different regions. Australia have also committed to a National Forest Policy Statement to preserve the essential services that forests provide.

105 WTO, Trade and Fisheries: Key Issues for the World Trade Organization, 2021.

106 National Law School of Australia University, Coastal Regulation Zone: A Journey From 1991 Till 2019, 2020.

107 AU Gov, Plans of Action for Illegal, Unreported and Unregulated Fishing, 2019.

108 An exclusive economic zone (EEZ), as prescribed by the 1982 United Nations Convention on the Law of the Sea, 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.

109 <https://data.oecd.org/biodiver/protected-areas.htm>

110 HMRC trade data, aligned to EUMOFA definitions of seafood

111 Office for National Statistics, UK natural capital accounts 2019, 2019

112 IPCC Sixth Assessment Report pages 5-6

113 Forest Research, "Forestry Statistics and Forestry Facts & Figures" Data: 2020

114 World Bank – World Development Indicators

115 Tree planting on the up in England, "Defra in the Media", 2020

116 UK Government, Woodland Carbon Guarantee, 2019

Table 10: Environmental Performance Index (EPI) for forestry

Forestry Indicators	Australia			UK		
	Rank	EPI Score	10-year change	Rank	EPI Score	10-year change
Tree cover gross loss*	115	24.5	-4	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 $\geq 30\%$ canopy cover. A score of 100 indicates virtually no tree cover loss, and a score of 0 indicates the worst levels of loss.

There is evidence that agricultural activities (especially beef and dairy production) contribute to deforestation in Australia.¹¹⁷ It is also possible that an estimated increase in trade of wood, paper and rubber products in both directions could also place pressure on forested land.

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.¹¹⁸ Trade in goods can contribute to these causes. While it is estimated that around 30% of all species' threats are due to international trade, there are some potential benefits to biodiversity from trade liberalisation, such as access to environment-friendly technologies needed for biodiversity conservation.¹¹⁹

The UK has a diverse mix of habitats and species with approximately 13% of the world's blanket bog and 20% of Europe's lowland heathland.^{120, 121} 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.¹²² Australia is one of the most biodiverse countries in the world and its geographical isolation has led to the evolution of unique and vulnerable ecosystems. Between 7% and 10% of all species on Earth occur in Australia. The main threats to biodiversity in Australia include climate change and enhanced climate variability.¹²³

The EPI includes the Ecosystem Vitality Index which is divided into biodiversity and ecosystem services.^{124, 125} The UK performs strongly (better than the Global West regional average) in biodiversity with a score of 88, ranking it 6th overall.¹²⁶ Australia also performs comparatively well with a score of 83.7, ranking 25th. In contrast, both the UK and Australia perform less well for ecosystem services. Australia scores 27.9 while the UK has a marginally higher score of 28.3. Australia's lowest score is in the grassland loss indicator, with a score of 24.5 out of 100.¹²⁷ 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 100.¹²⁸

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

Biodiversity and Ecosystems Indicators	Australia			UK		
	Rank	EPI Score	10-year change	Rank	EPI Score	10-year change
Biodiversity	25	83.7	+21.3	6	88	+19.3
Ecosystem Services	120	27.9	-2.6	115	28.3	-0.6

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

The agricultural and semi-processed food (especially meat products) sectors are the main source of land-use change. Changes to land use can contribute to habitat and biodiversity loss through land clearing and land degradation.¹²⁹ CGE modelling suggests that UK imports of Australian agriculture and semi-processed food could increase in response to an FTA. Changes to agricultural production in both countries could affect the associated stress on habitats and biodiversity.

The UK has committed to tackling biodiversity threats as a member of the Convention on Biological Diversity (CBD) and within the UK Government 25-Year Environment Plan, in addition to several multilateral environmental agreements, such as the Convention on International Trade in Endangered Species.

117 Wilderness Society, Australian Beef and Deforestation Corporate Scorecard 2019. Wilderness Society, Drivers of Deforestation and land clearing in Queensland, 2019. World Wide Fund (WWF), Deforestation fronts: Drivers and responses in a changing world, 2020

118 IPBES

119 Lenzen et al. (2012), International trade drives biodiversity threats in developing nations

120 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

121 Convention on Biological Diversity, UK profile

122 Convention on Biological Diversity, UK profile

123 Convention on Biological Diversity, Australia profile

124 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

125 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.

126 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.

127 A score of 100 indicates virtually no grassland loss.

128 A score of 100 indicates that a country has experienced no habitat loss or degradation.

129 WWF, Deforestation Fronts Drivers and Responses in a Changing World, 2021

Waste management

As countries grow and industrialise, they produce more solid waste as a result of production and consumption.¹³⁰ 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 2016.¹³¹ In comparison, Australia generated 75.8 million tonnes of total waste in 2018 to 2019, an increase of 10% over the previous two years (since 2016 to 2017).¹³² Both the UK and Australia are parties to the 1989 Basel Convention, which puts controls on transboundary movements of hazardous wastes and their disposal.¹³³

According to Yale University's Environmental Performance Indicator, the UK and Australia collect and treat 93% and 77% of their household and commercial waste respectively. As of 2016, the UK also produced less solid waste per day per capita than Australia.

Table 12: Baseline indicators for waste management, Australia and UK

Waste management Indicator	Australia	UK
Solid waste generated in 2016 (Kg per day per capita)	1.54	1.33
"Controlled solid waste" EPI Score (100 is the top score)	77.3	92.9

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

The UK exports environmental goods to Australia that are categorised as supporting management of waste, such as machines and mechanical appliances to support in-vessel composting systems and trash compactors. Australia currently imposes tariffs on 21 environmental goods associated with improving waste management whilst the UK imposes tariffs on 4 of these goods. The agreement will eliminate these tariffs, promoting increased movement of these environmentally beneficial products.

The impact of the agreement on the waste and recycling sector will be influenced by the agreement's impact on various economic sectors, as different sectors produce different volumes, and types, of waste. For example, trade in many recyclable goods may increase overall. CGE modelling suggests the UK GVA for paper products could potentially increase whilst the GVA in Australia could potentially decrease following the agreement. This overall increase may have relatively small effects on the environment as the UK and Australia have recycling rates for paper of 66% and 60% respectively.^{134, 135} The agreement could also increase construction activity, which could result in an increase of waste generated in the UK.

130 World Bank, What a Waste: A Global Review of Solid Waste Management, 2012, p. 8–13

131 Defra, UK Statistics on Waste, 2021, p.13

132 Waste Account, Australia, Experimental Estimates, Australian Bureau of Statistics 2020

133 UN Basel Convention.

134 Defra, UK Statistics on Waste, 2021, p.18

135 Department of Agriculture, Water and the Environment, National Waste Report 2020

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 in various sectors 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 0.06%, the equivalent of £1.7 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 0.10%, the equivalent of £2.9 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 capture 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-Australia trade in general; and
- 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

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 and, where necessary, employment shares 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 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 4.¹³⁶

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 the creation of jobs in other non-tradeable sectors, through a 'local employment multiplier effect'.¹³⁷

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 multiplier 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, relative 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 "manufacture of electronic equipment", are expected to grow because of the agreement regardless.

¹³⁶ Location quotients are used to reflect how concentrated or specialised a sector is within a given nation or region.

¹³⁷ 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	0.08%	133
East Midlands	0.07%	79
London	0.09%	415
North East	0.13%	74
North West	0.10%	179
South East	0.10%	284
South West	0.09%	124
West Midlands	0.19%	272
Yorkshire and the Humber	0.07%	87
Northern Ireland	-0.04%	-16
Scotland	0.08%	111
Wales	0.09%	60

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 publish a monitoring report approximately two years after its entry into force and every two years thereafter.
- 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 monitoring report will:

- take a focussed approach, outlining the evolution of trade flows between the UK and Australia and measuring the utilisation of the agreement
- where possible, discuss the extent to which short-term changes in trade flows can be attributed to an 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 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 ones
- 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 the 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 and
- 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 and
- 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 the 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.¹³⁸

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.

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.¹³⁹ 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.

¹³⁸ Lanz and Rutherford (2016), 'GTAP in GAMS: Multiregional and Small Open Economy Models'.

¹³⁹ As argued by Petri and Plummer (2017:10), the assumption is used in most applied models of trade agreements.

Developments in model specification compared to previous DIT analysis

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-Australia FTA. These changes have been informed by the discussions 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 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 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), 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. The new model specification also 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 an 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 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.¹⁴⁰ For a detailed discussion of the key differences between the two models see 'Technical annexes for the scoping assessment for UK accession to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership'.

The Melitz style model specification that was used for the previous scoping assessments has been updated for this assessment. Under the Melitz-style model specification, the size of FTA impacts were 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.¹⁴¹ 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 Australia Impact Assessment to the Japan Impact assessment. 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.

¹⁴⁰ See HMG (2018) 'EU Exit: Long-term Economic Analysis Technical Reference' paper for detailed description of previously used model.

¹⁴¹ 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.

Monte Carlo analysis

Where possible, DIT's CGE modelling presents ranges around central point estimates of GDP 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 but omits model parameters not relevant to the model specification used in this publication. It also 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.¹⁴²

Table 1: Summary of parameters

Parameter	Definition	Approach
UK-FTA partner NTMs	Estimated NTM levels on UK-FTA partner trade (AVE)	Guided by above econometric analysis; the majority of implied NTM distribution mirror a normal distribution
Technical and rent generating NTM ratio	Ratio of NTMs assumed to be efficiency-reducing or rent-generating	Uniform between 20% and 40%
Trade elasticities	Elasticity of substitution between imports from different regions	Followed Hertel (2003) for goods sectors and for services sectors assumed std is 25% of the central estimate

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 conversion to pound sterling values allows the contextualisation of results in terms relatable to today's economy. The method and data used to convert the percentage figures to pound values are detailed in Table 2.

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 available summary estimate of the value of the long-run increase in GDP in £ values, expressed in today's prices. 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 Australia's 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.¹⁴³ The Global Trade Outlook projections are supplemented by additional assumptions regarding the evolution of the UK and Australia'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 Australia trade remains broadly the same in 2035 as it was in 2014.

¹⁴² 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).

¹⁴³ DIT, Global trade outlook – September 2021 report.

Table 2: Data sources used to convert CGE modelling impacts into pound values

Key Metric	Data Used
GDP	CGE model % impacts ONS GDP estimate ¹⁴⁴ Bank of England Exchange rate ¹⁴⁵ OBR forecast (for 2035 estimates) ¹⁴⁶
Total Trade and trade with Australia (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) ¹⁴⁷ For bilateral trade between the UK and Australia 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) ¹⁴⁸
GVA by region	See annex with regional methodology
Household spending and business investment	% CGE impacts Quarterly National Accounts ¹⁴⁹

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 and 2019.

144 ONS, GDP – data tables (August 2021).

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

146 Calculated using OBR, Economic and fiscal outlook – March 2021 long term economic determinants.

147 DIT, Global trade outlook – September 2021 report.

148 OECD Data, Gross domestic product (May 2021).

149 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 from the GTAP database 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 database¹⁵⁰). 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 Australian 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.

Box 1: Gravity model specification for goods sectors

To estimate the impact of the FTA on NTMs a gravity model for goods sectors is augmented to assess 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.¹⁵¹ For more details on the methodology please see the original paper.

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

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).¹⁵² 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.¹⁵³ In other words, FTAs aim to ‘lock-in’ countries applied regimes and reduce future policy space which in turn provides greater legal certainty to businesses. The NTM estimates aim to account for the reduction in this ‘water’ or increased legal certainty secured from the FTA.

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

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

The specification for the model used is shown above where π_{it} and ω_{jt} are sets of exporter-time and importer-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 FTA.¹⁵⁴ These actionable NTMs are reduced in proportion to reductions in water, or increased legal certainty, arising from the FTA as well as any applied liberalisation (Methodology is outlined below). A change in water is assumed to have a 42% impact on NTMs compared to a change in the applied rate.¹⁵⁵

151 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

152 Ciuriak, D., Dadkhah, A. Lysenko, D. *The Effect of Binding Commitments on Services Trade*, World Trade Review, Volume 19, Issue 3, July 2020, pp. 365 - 378

153 ‘Water’ is the difference between legally bound liberalisation and the applied regime.

154 That is the maximum level of barriers that could be removed by the FTA is assumed to be 1/3 of their MFN levels. This is based on a literature for actionability.

155 Ciuriak, D., Dadkhah, A. Lysenko, D. *The Effect of Binding Commitments on Services Trade*, World Trade Review, Volume 19, Issue 3, July 2020, pp. 365 - 378.

NTM input assumptions

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

Table 3: Applied reduction in tariffs and NTMs

Sectors	UK imports from Australia		UK exports to Australia	
	Reductions in tariffs	Reductions in NTMs	Reductions in tariffs	Reductions in NTMs
Agri-food	17.4%	2.1%	3.0%	1.4%
Industrial goods	0.3%	5.1%	2.6%	5.8%
Services		4.4%		3.6%

Services NTMs:

We score each services sector using the OECD's Services Trade Restrictiveness Index (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.¹⁵⁶ 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 Services¹⁵⁷, to the STRI. DIT policy judgement was that CPTPP provided a precedent of Australia's for the level of services commitments we would expect to see in the UK-Australia FTA. We therefore assumed the services NTM reductions for the FTA are mostly consistent with those made by Australia in CPTPP. DIT analysts assumed that this FTA score would apply for both UK exports to Australia, and Australia exports to the UK. This was considered reasonable to assume, since both Australia and the UK have open-service economies, and expert policy judgement indicated most of the final agreement text would apply symmetrically.

We made several adjustments to this FTA score where we expected the UK-Australia 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 FTA (there were no STRI measures bound in for the three AV sectors, broadcasting, sound recording and motion pictures)

The specific measures where we assumed the UK-Australia FTA would be more liberal than 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-Australia FTA differs from the adjusted CPTPP FTA score that was modelled. Significant differences include:

¹⁵⁶ 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.

¹⁵⁷ 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 4: Targeted services measures liberalised under modelling scenarios

Measure Code	Measure	Sector(s)
1.4.4	Board of directors: at least one must be resident.	Commercial Banking, Insurance, Air Transport, Maritime Transport
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
1.15.2	Restrictions on the chartering of vessels	Maritime Transport
1.16.1	Commercial presence is required in order to provide cross-border services	Maritime Transport
3.5.2	Discrimination in the use of port terminal 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

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

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 5: Macroeconomic results

	Percentage change on baseline	£ change on baseline (compared to 2035 in 2019 prices)	£ change on baseline (compared to 2019 in 2019 prices)
Change in UK GDP	0.08%	£2.3bn	£1.8bn
Change in UK exports to Australia	44.2%	£6.2bn	£5.4bn
Change in UK imports from Australia	66.1%	£4.2bn	£4.3bn
Change in UK exports to World	0.43%	£3.1bn	£3.0bn
Change in UK imports from World	0.36%	£3.0bn	£2.6bn
Change in real wages	0.10%	Not available	£0.9bn

Source: DIT CGE Modelling (2021).

Table 6: Results by component of GDP

Component of GDP	% Change
Consumption	0.08%
Investment	0.11%
Government	0.05%
Imports	0.36%
Exports	0.43%

Source: DIT CGE Modelling (2021).

3.2 Additional results on tariff saving and SMEs

Table 7: Top 10 HS sections, ranked by scale of estimated tariff reductions on UK exports to Australia¹⁵⁸

Product Section (HS)	Long term duty reductions, (£ million)	Value of exports, 2017 - 19 average (£ million)
17 – Transport equipment	40.3	903.8
16 – Machinery, Mechanical and Electrical Equipment	29.4	959.4
4 – Prepared Foodstuffs, Beverages, and Tobacco	14.5	382.2
6 – Chemical Products	9.5	712.5
7 – Plastics and Rubber Products	5.9	120.4
15 – Base Metals and Articles	5.8	147.7
20 – Miscellaneous Articles	2.6	66.9
11 – Textiles and Textile Articles	2.2	49.6
13 – Articles of Stone, Plaster, Cement or similar Materials, Ceramic and Glass Products	1.9	39.4
10 – Paper, Printed Products	1.5	161.8

Source: DIT Calculations (2021).

Table 8: Share of estimated tariff reductions on UK exports to Australia, by nations and regions of the UK

Nations and regions	Proportion of goods exports to Australia, %	Proportion of tariff reduction affecting each nation and region in the long-term, %
West Midlands	16%	24%
North West	10%	11%
South East	13%	11%
Scotland	9%	9%
North East	6%	9%
East	10%	7%
London	9%	6%
South West	7%	6%
Yorkshire and the Humber	6%	5%
East Midlands	6%	5%
Northern Ireland	4%	4%
Wales	3%	3%

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

¹⁵⁸ Short term refers to entry into force of the agreement. Long term refers to the end of the tariff liberalisation period.

Table 9: Shares of estimated tariff reductions on UK imports of goods from Australia, by nations and regions of the UK

Nations and regions	Proportion of goods imports from Australia, %	Proportion of tariff reductions affecting each nation and region in the long-term, %
London	20%	32%
South West	8%	20%
East	8%	13%
South East	32%	11%
North West	5%	9%
Scotland	4%	4%
West Midlands	6%	4%
Yorkshire and the Humber	5%	3%
East Midlands	4%	2%
Northern Ireland	1%	1%
North East	4%	1%
Wales	5%	1%

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

Table 10: 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
Wholesale and retail trade	15.0%	0.00	341
Public services	16.1%	0.00	264
Manufacture of machinery and equipment n.e.c	0.8%	0.01	231
Other services (transport, water, dwellings)	8.7%	0.00	229
Business services	22.7%	0.00	212
Manufacture of motor vehicles	0.1%	0.01	202
Construction	16.6%	0.00	173
Manufactures	0.5%	0.00	108
Manufacture of electronic equipment	0.1%	0.00	89
Chemical, rubber, plastic products	0.4%	0.00	88
Communications	1.1%	0.00	87
Personal services	9.4%	0.00	69
Financial services	1.0%	0.00	69
Manufacturing n.e.c	0.2%	0.00	37
Paper and printing products	1.3%	0.00	36
Other processed foods	0.7%	0.00	29
Energy	0.5%	0.00	24
Textiles, apparel, and leather	0.4%	0.00	24
Insurance	0.5%	0.00	21
Beverages and tobacco products	0.2%	0.00	12
Manufacture of other transport equipment	0.6%	0.00	-4
Agriculture, forestry, and fishing	2.6%	-0.01	-94
Semi-processed foods	0.4%	-0.01	-225

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

3.3 Additional results on consumer impacts

Table 11: Top estimated annual tariff reductions on consumer goods imported from Australia¹⁵⁹

Type of Consumer Good	Proportion of household spending on imports, %	Annual tariff savings in the long-term, £ million
Alcoholic beverages, tobacco, and narcotics	71%	34.2
Food and non-alcoholic beverages	57%	2.4
Clothing and footwear	59%	1.3
Recreation and culture	23%	0.5
Total final consumer goods tariff reductions	24%	39.5

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

Table 12: Comparison of estimated tariff reductions from a UK-Australia agreement to average UK household weekly expenditure by nation

Type of consumer good	Estimated national annual tariff reductions, £ million		Estimated proportion of total weekly household spending on imports, %				
	Short term	Long term	UK	England	Wales	Scotland	Northern Ireland
All expenditure groups	38.3	39.5	31.5%	31.3%	32.1%	32.8%	33.9%
Alcoholic beverages, tobacco, and narcotics	34.2	34.2	1.8%	1.7%	1.9%	2.4%	2.4%
Food and non-alcoholic beverages	1.2	2.4	7.0%	6.9%	7.2%	7.3%	8.5%
Clothing and footwear	1.3	1.3	2.8%	2.7%	2.7%	3.2%	4.1%
Recreation and culture	0.5	0.5	3.5%	3.5%	3.9%	3.5%	2.8%

Source: DIT analysis (2021), UK input-output analytical tables, ONS (2019) and Living Costs and Food Survey (LCF), ONS (2019).¹⁶⁰

¹⁵⁹ 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).

¹⁶⁰ 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 13: Comparison of estimated tariff reductions from a UK-Australia agreement to average UK household weekly expenditure by income level

Type of consumer good	Estimated national annual tariff reductions, £ millions		Estimated proportion of total weekly household spend owing to imports (%)		
	Short term	Long term	All households	Lowest 20%	Highest 20%
All consumer goods	38.3	39.5	31.2%	28.5%	31.5%
Alcoholic beverages, tobacco and narcotics	34.2	34.2	1.6%	0.8%	1.5%
Food and non-alcoholic beverages	1.2	2.4	6.6%	6.7%	6.0%
Clothing and footwear	1.3	1.3	3.0%	1.8%	3.1%
Recreation and culture	0.5	0.5	3.2%	3.4%	3.5%
Transport	0.3	0.3	8.1%	5.5%	8.5%

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

Table 14: Gains in wages across labour market groups

Occupation	Gains in wages %
Managers	0.10
Technicians	0.10
Service workers	0.10
Clerks	0.10
Labourers	0.11

Source: DIT CGE Modelling (2021).

Table 15: 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	-0.01%	-0.01%
Beverages and tobacco products	0.00%	0.00%
Other processed foods	0.00%	0.00%
Semi-processed foods	-0.02%	-0.01%
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	0.01%	0.01%
Manufacture of machinery and equipment	0.01%	0.01%
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	-0.01%	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 16: Proportion of people who move to a new sector in any given year.

Sector	Move to a new sector
Agriculture, forestry, and fishing	5%
Semi – Processed foods	5%
Business services	7%

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

Table 17: Developing country exports identified as being at potential risk of trade diversion from the UK-Australia FTA 2017 to 2019 average

HS6 code and product description	UK imports from developing countries	Australia exports to World	Developing countries' reliance on the UK market (UK exports as % of total exports)
020130: Fresh/ chilled bovine meat, boneless	£16.5m	£1.9bn	Namibia \$12.1m (26.4%), Botswana \$9.3m (27.9%),
020230: Frozen, boneless bovine meat	£5.1m	£2.9bn	Botswana \$4.9m (16.3%)
030890: Aquatic invertebrates	£0.7m	£2,667	Tonga \$41,414 (21.0%)
070610: Fresh/ chilled carrots and turnips	£2.0m	£54.3m	South Africa \$2.7m (27.2%)
080510: Fresh/ dried oranges	£47.0m	£174.5m	eSwatini \$1.1m (30.3%)
080521: Fresh/ dried mandarins (ex. clementines)	£42.7m	£89.1m	South Africa \$55.4m (30.7%)
080610: Fresh grapes	£170.9m	£257.4m	Namibia \$21.5m (29.8%), South Africa \$167.5m (19.6%)
080930: Fresh peaches, incl. nectarines	£18.4m	£29.6m	South Africa \$23.0m (51.3%)
080940: Fresh plums and sloes	£16.4m	£12.4m	South Africa \$21.4m (21.8%)
170310: Cane molasses	£24.3m	£28.1m	South Africa \$1.1m (37.7%), Sudan \$1.3m (26.0%), Algeria \$1.5m (57.8%), Ethiopia (ex. Eritrea) \$2.3m (34.8%), Pakistan \$5.6m (36.2%), India \$17.1m (26.1%)
190190: Malt extract containing < 40% cocoa	£4.4m	£247.8m	Pakistan \$1.8m (71.5%)
220421: Containers of wine <= 2 l (excl. sparkling wine)	£66.0m	£1.3bn	South Africa \$86.1m (17.1%)
220429: Containers of wine > 10 l (excl. sparkling wine)	£39.5m	£271.6m	South Africa \$51.6m (26.8%)
420340: Leather clothing accessories	£1.3m	£3.4m	Pakistan \$1.1m (23.4%)
640192: Waterproof footwear covering ankle	£2.3m	£11.3m	Indonesia \$2.7m (28.3%)
690410: Building bricks	£5.4m	£6.8m	India \$3.7m (95.7%), Pakistan \$3.3m (98.4%)

Source: FCDO analysis using HMRC trade data.

Annex 4: Method for assessment of impacts on nations and regions

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. Examples of these factors are: 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.¹⁶¹

This 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:

$$Regional\ Impact_r = \sum_s^S Share\ of\ GVA_{rs} \times UK\ Impact_s$$

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

The regional impacts are 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 national and regional impacts may be subject to aggregation bias affecting the sub-national results.

Local Multiplier Effects

In previous DIT analyses, the apportioned estimates have been adjusted using 'location quotients' in an attempt to account for local spending multipliers.

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'.¹⁶²

¹⁶¹ 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.

¹⁶² For example, Moretti (2010) "Local Multipliers" in *American Economic Review: Papers & Proceedings* 100 (May 2010): 1–7.

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.

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.

$$Regional\ Impact_r = \sum_s^S Share\ of\ GVA_{rs} \times UK\ Impact_s \times Location\ Quotient_{rs} \times Constraint_s$$

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

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 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).

The data is grouped into intermediate or final consumption goods in two steps. First the trade data is aggregated into the UN's 'Broad Economic Categories' (BEC) via the conversion table developed by the UN. The BEC classification of goods is then assigned to the two basic kinds of domestic end-use categories as laid out in the System of National Accounts (SNA) (intermediate or final consumption goods). Before aggregation, the trade data is matched to corresponding data for applied tariffs in 2020 in the partner country.

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

UK imports from partner country

The estimated value of tariff reductions for businesses and consumers importing goods from the partner country are calculated using average trade flow data (2017 to 2019) at the 8-digit product classification (HS2017) sourced from Eurostat.

The data is aggregated into the UN's 'Broad Economic Categories' (BEC) via the conversion table developed by the UN. The BEC classification of goods is then assigned to the two basic kinds of domestic end-use categories as laid out in the System of National Accounts (SNA), namely – intermediate or final goods.¹⁶³

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

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.

¹⁶³ 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.

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

The approach takes the following steps:

- data are 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.¹⁶⁴ 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.

¹⁶⁴ 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.¹⁶⁵
- 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.¹⁶⁶ 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 £286.¹⁶⁷ 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.¹⁶⁸
- 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 £572.¹⁶⁹ Average earnings per hour is therefore estimated at £17.27. Non-wage costs are assumed to be around 18%.¹⁷⁰ The estimated total cost to businesses is therefore around £20 per hour.
- the cost of reading the FTA 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 FTA text))

¹⁶⁵ HMRC, UK trade in goods by business characteristics 2019 – data tables (November 2020).

¹⁶⁶ ONS, UK total trade: all countries, non-seasonally adjusted, January to March 2021.

¹⁶⁷ 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.

¹⁶⁸ Trauzettel-Klosinski and Dietz (2012), 'Standardized Assessment of Reading Performance: The New International Reading Speed Texts IReST', IOVS Volume 53 Issue 9.

¹⁶⁹ ONS, Earnings and hours worked, all employees: ASHE Table 1 (November 2020).

¹⁷⁰ RPC guidance note on 'implementation costs'. Data source: Eurostat.

On-going costs associated with Rules of Origin Compliance

There is a wide range of academic literature on the impact of rules of origin compliance on trade flows and a range of estimates on the potential associated trade cost to businesses.

Academic studies estimate the tariff equivalent trade costs associated with rules of origin administration and compliance requirements ranges between 2% to 6%.¹⁷¹ 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.

¹⁷¹ 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.¹⁷²

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 18: 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.

¹⁷² BEIS, Business Population Estimates 2020, (October 2020).

Table 19: 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 which sectors SMEs belong to (as above), are paired with the sectors where output is expected to increase or decrease relative to the baseline as a result of an FTA. This provides a preliminary assessment of whether SMEs are concentrated in industries where GVA decreases relative to the baseline. For the purpose of identifying which sectors have a higher concentration of SMEs, the analysis focuses on sectors in which employment changes by more than +/- 0.05% relative to the baseline.

Limitations

The preliminary analysis is in line with best practice in this area but requires several simplifying assumptions and is subject to several limitations:

- this approach does not take into account whether SMEs may be more or less affected by changes in trade barriers than other businesses.
- mapping the Standard Industrial Classifications to the sector aggregations used in the GTAP modelling requires several simplifying assumptions which could result in biases in the estimated distribution of SMEs across GTAP sectors.
- BEIS BPE data captures data on unregistered and sole traders, however it does not allow for disaggregation between small and micro businesses and there is no available turnover data for the Finance or Insurance sectors.

Annex 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.¹⁷³

The international evidence suggest that trade agreements and trade liberalisation have the potential to affect various sectors of the economy and groups differently.¹⁷⁴ This is because consumption patterns and employment patterns can differ systematically across groups.

The method analyses the characteristics of the workforce within sectors where employment is predicted to decline relative to the baseline over the long run due to the FTA.

Data and Method

Sectors in the CGE model are defined by the GTAP 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.

¹⁷³ 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.

¹⁷⁴ 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 20: Proportion of employment by sector and protected characteristics¹⁷⁵

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 share of overall employment accounted for by each sector of the UK economy resulting from a free trade agreement. For the purposes of estimating potential impacts on different groups in the labour market, the analysis focuses on sectors in which employment changes by more than +/- 0.05%^r relative to the baseline.

¹⁷⁵ 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 FTA 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 data¹⁷⁶ are used to estimate production change impacts from the FTA 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

¹⁷⁶ 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 FTA 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 (that is, ignores the FTA's impact on the movement of people and examines goods only)
- significant technological change has a negligible impact in the medium-term (that is, 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 (CO₂e 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 impacts 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 to 2019, the UK imported goods worth £28.8 billion¹⁷⁷ 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 exports¹⁷⁸.

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 FTA 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 are defined as competitive if any of the following indicators are met:¹⁷⁹

- 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 is greater than 1, indicating that the partner exports a higher proportion of the good than the global average.¹⁸⁰

Criteria for goods at risk of preference erosion for developing countries

Developing countries' exports of a good at HS6 are defined as at risk of preference erosion if:¹⁸¹

- exports to the UK account for more than 10% of global exports of that product, indicating reliance on the UK market.

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

¹⁷⁷ HMRC trade data (accessed July 2021).

¹⁷⁸ WITS trade data using average values for 2017-2019.

¹⁷⁹ FTA partner's trade data sourced from TradeMap, averaged from 2017-2019.

¹⁸⁰ 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.

¹⁸¹ Developing country global exports sourced from UN Comtrade, averaged from 2017-19, using mirror data (world imports from developing countries).

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. In addition, as this analysis is performed at HS6 level only there may be issues of aggregation, particularly when another HS6 code is a very close substitute. These are not considered in this static analysis.

Annex 11: Note on corrections

The following corrections were made on the 10th of May 2022 following the first publication of the Impact Assessment on the 16th December 2021:

Executive summary

- Page 7: The lower estimate for the increase in emissions associated with transport of goods has been corrected from 0.2 to 0.1 MtCO₂e a year. The correct figure was stated in section 6 of the document published in December 2021.
- Page 8: An error has been corrected in Figure 1, whereby export values of chemicals and machinery and transport equipment were mislabelled.

Employment impacts for protected groups

A correction has been made to the calculation of the impact of the agreement on protected groups of the population.

- Page 83: The analysis now corrects to calculate on sectors in which employment changes by more than +/- 0.05% instead of +/- 0.01%. This methodology correction leads to sentence revisions in section 5 of the document.
- Page 35: It has been clarified that workers who are female, of an ethnic minority background or aged 25-64 are estimated to be less concentrated in sectors where employment is estimated to fall.
- Page 40: The percentage of male and female workers in sectors estimated to account for lower long run employment relative to the baseline has changed from 51% and 49% to 77% and 23% respectively.
- Page 40: The percentage of workers from ethnic minority backgrounds in sectors estimated to account for lower long run employment relative to the baseline has changed from 12% to 4%.
- Page 40: The percentage of workers aged 16-24 and over 65 in sectors estimated to account for lower long run employment relative to the baseline has changed from 9% and 4% to 10% and 11% respectively.
- Page 41: It has been clarified that the percentage of workers in the workforce who report they have a disability is in line with the percentage in sectors where employment is estimated to fall relative to the baseline.

Method for assessment of impacts on tariffs

- Page 75: It has been clarified that the data on Australian trade was received directly from the partner. The applied tariff data used has been corrected to 2020, from 2019. The data source for import calculations has been corrected to Eurostat, from HMRC.

The Department for International Trade (DIT) helps businesses export, drives inward and outward investment, negotiates market access and trade deals, and champions free trade.

We are an international economic department, responsible for:

- supporting and encouraging UK businesses to drive sustainable international growth
- ensuring the UK remains a leading destination for international investment and maintains its number one position for international investment stock in Europe
- opening markets, building a trade framework with new and existing partners which is free and fair
- using trade and investment to underpin the government's agenda for a Global Britain and its ambitions for prosperity, stability and security worldwide.

Legal disclaimer

Whereas every effort has been made to ensure that the information in this document is accurate, the Department for International Trade does not accept liability for any errors, omissions or misleading statements, and no warranty is given or responsibility accepted as to the standing of any individual, firm, company or other organisation mentioned.

Copyright

© Crown Copyright 2022

You may re-use this publication (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence.

To view this licence visit:

www.nationalarchives.gov.uk/doc/open-government-licence

or email:

psi@nationalarchives.gov.uk.

Where we have identified any third party copyright information in the material that you wish to use, you will need to obtain permission from the copyright holder(s) concerned.

All enquiries regarding this material should be sent to us at

enquiries@trade.gov.uk