Erasmus University Rotterdam

MSc in Maritime Economics and Logistics

2018/2019

An Impact Analysis of the Australian Iron Ore Industry under the European Union and Australia Free Trade Agreement

by

Thomas Röwekamp

Acknowledgements

I would like to thank all the people that supported me during the writing of this thesis, especially those people who directly contributed to it. Particularly, I would like to thank Dr. Koen Berden, who guided me through this interesting topic, and allowed me to support him in a unique project through an internship at Trade Impact BV. The internship provided me the ability to write about this exciting and fascinating subject. I would also like to express my appreciation for Dr. Tatiana Berden for supporting me during the internship and the thesis period with her accurate and honest opinion, and solid experience and expertise in policy consulting. Additionally, I would like to thank all the other people that worked on the EU-Australia and EU-New Zealand FTA trade sustainability impact assessments under BKP Economic Advisors, who were willing to support me at all times.

Furthermore, I would like to thank the MEL team for their support, assistance and guidance throughout the entire year and especially during the thesis period. Through your exceptional planning and organisational capabilities, this year has passed smoothly without any problems or issues. I greatly appreciate that and wish you all the best of luck and happiness in your future work and life. I am sure we will see each other many more times here in Rotterdam.

Finally, I would like to thank my family and all of my friends for always being there for me. Your wise words, encouragements and humor has motivated me throughout this challenging year – I could not have done it without you all. Last but not least, I would like to say my deepest gratitude to my main motivator, RR.

Thomas Röwekamp
August, 2019

Abstract

Over the course of the past decades, the number of FTAs has grown rapidly in light of various micro- and macro-economic benefits for the signing parties. One of the largest contributors to this large growth in FTAs is the EU, who has deeply aligned the principles of free and open trade into its foreign trade policy. One of the FTAs currently under negotiation is the EU-Australia FTA aimed at strengthening the trade relationship between both parties. However, literature on the potential impact of the FTA is scarcely available, especially for specific sectors, and thus this study aims to contribute and add to the information available related to the ongoing negotiations between the EU and Australia.

The impact assessments on the EU-Australia FTA that can be found employ complex econometric modelling approaches, which tend to lack sector specificity, transparency and simplicity. This study analyses the impacts of the EU-Australia FTA on the iron ore industry, one of Australia's largest export sectors and contributors to the country's GDP. In order to identify the economic, social, human rights, environmental, and ports and logistics impacts of the potential trade agreement, we employ a multi-pronged analysis approach, comprising of a combination of a quantitative assessment, based on a CGE and GSIM model, and an additional qualitative analysis.

The findings of the CGE and GSIM model suggest that the EU-Australia FTA will entail various small but positive effects for both the EU and Australia. With regards to the economic impact, bilateral EU-Australian iron ore trade will increase by 7.0% causing positive effects for both parties overall and the iron ore producers in particular in Australia and the iron ore consumers for the EU. The social impacts indicate that the FTA will entail mixed but limited effects on employment, the employment structure and consumers and producers for both parties. The findings support the results of the economic impact analysis, indicating that Australian producers and the EU's iron ore consumers will benefit primarily under the potential FTA. With regards to the human rights impacts relevant for the iron ore industry, the EU and Australia will face positive but limited effects on the right to an adequate standard of living and labour standards, while marginal but negative effects on the right to work and on the right to a clean environment can be expected as a consequence of the FTA's effects on trade and output. In light of an increase in trade flows between both parties, the iron ore carrying vessel emissions into the air in the EU and Australia are expected to increase marginally but negligibly as well. As a result of increased iron ore trade and output, the primary iron ore export port in Australia, the Port of Dampier, will face a 1.3 million tonnes increase in iron ore tonnage exports and a 462,000 tonnes capacity increase going through the port. Based on the current infrastructure of the port, Dampier is required to expand in light of an increase of seven to eight vessels port calls per year. Through its expansion the port is able to secure and improve its already crucially important position as the largest exporter to the EU, resulting in higher regional port competitiveness. The results imply that the EU-Australia FTA will have a marginally positive impact on both parties and their respective iron ore industries, and lower prices for iron ore, indicating various potential benefits, not only for the iron ore industry, but also for downstream ones, and thus the EU-Australia FTA serves its objective of contributing to sustainable and inclusive growth.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AHS	Applied Tariffs
ASEAN	Association of Southeast Asian Nations
AUS	Australia
ANZCERTA	Australia New Zealand Closer Economic Relations Trade Agreement
APEC	Asia-Pacific Economic Cooperation
BND	Bound Tariffs
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CERD	Convention on the Elimination of All Forms of Racial Discrimination
CFR	Charter of Fundamental Rights
CGE	Computable General Equilibrium
ChAFTA	China-Australia Free Trade Agreement
CPI	Consumer Price Index
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
CRC	Convention on the Rights of the Child
CRPD	Convention on the Rights of Persons with Disabilities
CSR	Corporate Social Responsibility
DG	Directorate-General
EC	European Commission
EESS	Electrical Equipment Safety System
EFTA	European Free Trade Association
EPA	Economic Partnership Agreement
EU	European Union
FDI	Foreign Direct Investment
FMG	Fortescue Metals Group
FTA	Free Trade Agreement
FTAAP	Free Trade Area of the Asia Pacific
GATT	General Agreement on Trade and Tariffs
GDP	Gross Domestic Product
GE	General Equilibrium
GHG	Greenhouse Gas
GSIM	Global Simulation Model
GVC	Global Value Chain
ICESCR	International Covenant on Economic, Social and Cultural Rights
ILO	International Labour Organisation
IMO	International Maritime Organisation
LDC	Least Developed Country
LNG	Liquefied Natural Gas
LSE	London School of Economics
MFN	Most Favored Nation Tariff
MRA	Mutual Recognition Agreement
NTB	Non-Technical Barrier
NTM	Non-Tariff Measure
OECD	Organisation for Economic Co-operation and Development
PA	Port Authority
PACER	Pacific Agreement on Closer Economic Relations

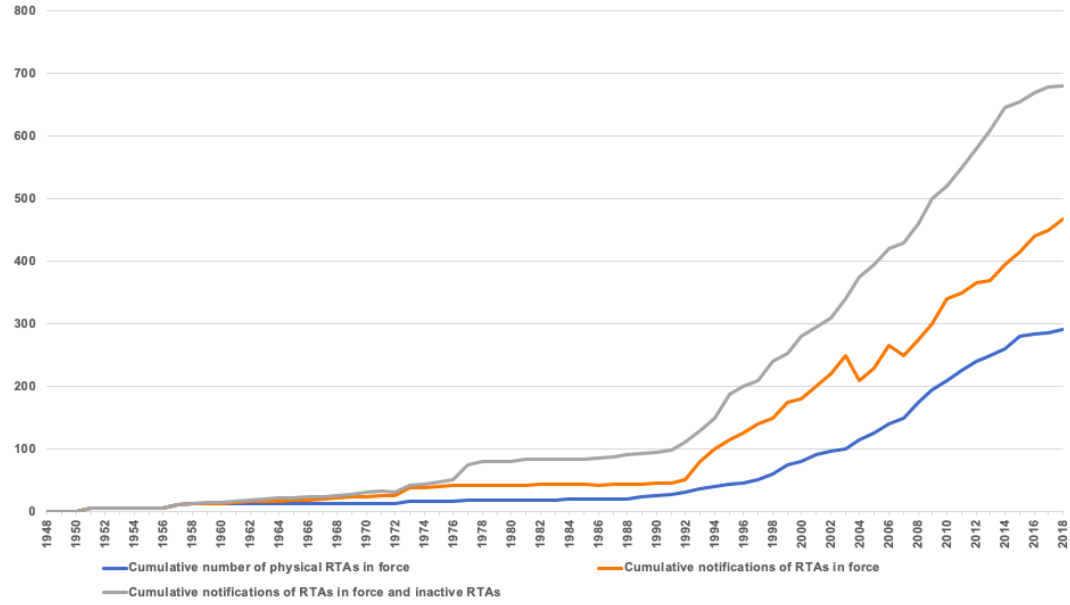
PE	Partial Equilibrium
RBC	Reasonable Business Conduct
RoO	Rules of Origin
RoW	Rest of World
RTA	Regional Trade Agreement
SDG	Sustainable Development Goal
SIA	Sustainability Impact Assessment
SME	Small and Medium Sized Enterprise
TCE	Trade Cost Equivalent
TiVA	Trade in Value-Added
TPP	Trans-Pacific Partnership
TPRM	Trade Policy Review Mechanism
TSIA	Trade Sustainability Impact Assessment
TTIP	Transatlantic Trade and Investment Partnership
UDHR	Universal Declaration of Human Rights
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
US	United States
WIOD	World Input-Output Database
WITS	World Integrated Trade Solution
WTO	World Trade Organisation

1. Introduction

1.1 General context

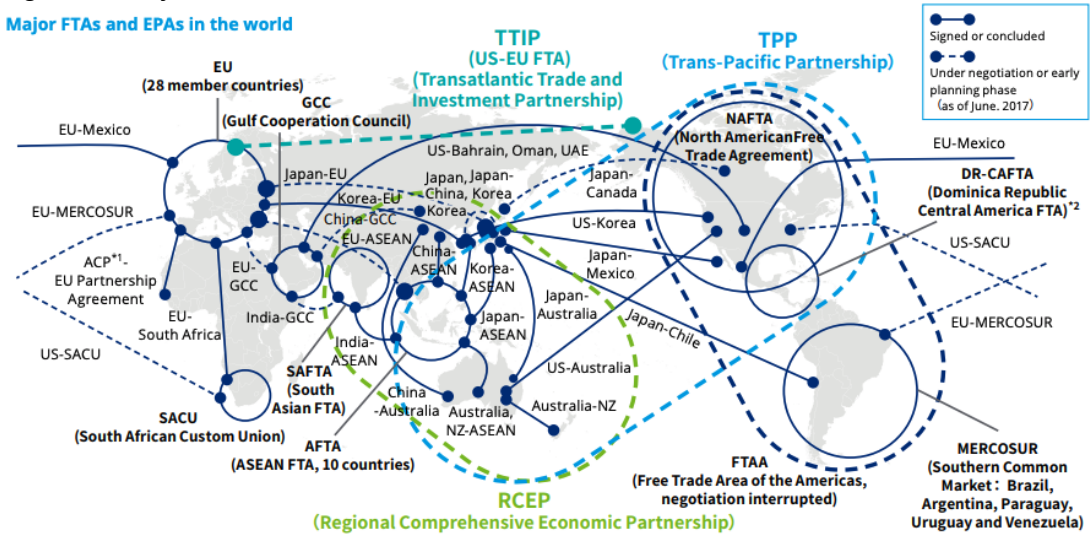
With the establishment of the General Agreement on Tariffs and Trade (GATT) in 1947, the predecessor of the World Trade Organisation (WTO), the push for further liberalisation of international trade and the reduction of – mainly tariff – barriers began. The WTO, since 1995, has taken over (and expanded) the role of the GATT. Its primary objective of the WTO is to set non-discriminatory rules for trade between countries, while aiming to reduce tariffs in trade and promote an open multilateral trading system (WTO, 2019). In addition to the trade reforms implemented by the WTO, there has been a large increase in bilateral and multilateral trade agreements, also known as regional trade agreements (RTAs), in the past decades (see Figure 1). The introduction of RTAs, free trade agreements (FTAs), economic partnership agreements (EPAs) and other trade agreements entailed various micro- and macro-economic advantages and benefits for the signing parties. From the consumer and producer perspectives product and service prices, quality and variety will change, whilst from a more macro-economic perspective overall welfare, employment and trade flows will be impacted causing attractive spill-over effects (European Commission, 2018). As such, the international trade landscape has become quite complex and interwoven (see Figure 2), with the European Union (EU) having the most RTAs in place (see Figure 3). Figure 2 includes the Trans-Pacific Partnership (TTP) which did not come into force as the United States (US) withdrew its signature from the agreement. As a result, the remaining countries under the TTP introduced the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). As the EU represents the largest trading block in the world and thus holds a crucially important position in global trade, open, fair, free and non-restricted trade is of high importance to the European economy (Clingendael, 2017). Thus, the EU deeply aligns its trade strategy with the aforementioned values and is in constant pursuit of expanding its network of trade agreements. Currently, the EU is in negotiations for numerous EPAs, investment agreements and 15 FTAs, one of which is the EU-Australia FTA.

Figure 1: Evolution of Regional Trade Agreements in the world, 1948-2019



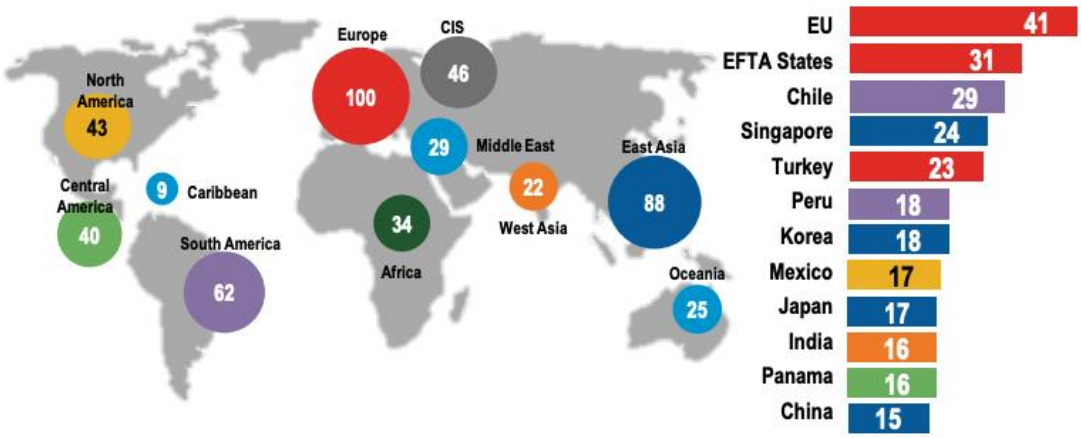
Source: WTO Secretariat (2019), author's own calculations

Figure 2: Major FTAs and EPAs in the World



Source: Deloitte (2017)

Figure 3: Number of RTAs notified and currently in force



Source: WTO Secretariat (2019)

Over the course of the past years Australia has transformed its economy to one of the fastest growing developed economies compared to the G7 countries (Australian Government, The Treasury, 2016). Contributing to this impressive growth are various trade agreements, and the resulting preferential access for Australian exporters to third markets for companies in those third markets to Australia's markets. The EU's and Australia's economic and trade relationship however is primarily based on a generic framework agreement, more specifically the EU-Australia Partnership Framework. The EU-Australia Partnership Framework was introduced in 2008 and is mainly aimed at promoting trade in industrial products. In 2017, the EU and Australia signed an additional EU-Australia Framework Agreement with the purpose of supporting and strengthening the economic and trade cooperation between both countries. Under the EU-Australia Partnership Framework, the trade between both countries has grown to become of more substantial importance. The trade volume between both countries amounted to €47.6 billion in 2018, out of which EU imports accounted for €11.6 billion and EU exports totalled €35.9 billion (European Commission, Directorate General (DG) Trade, 2019). As of 2018, Australia represents the 19th largest trade partner for the EU and exports approximately €2.4 billion in commodities to the EU. This large share in commodity exports is not surprising as Australia is the largest bulk minerals producer and exporter in the world – especially in iron ore, accounting for 57% of global seaborne iron ore exports in 2017 (Government of Australia, Department of Jobs, Tourism, Science and Innovation, 2018). The value of iron ore in the total Australian exports to the EU however represent only a marginal share of approximately 0.01%. The EU, vice versa, is the second-largest trading partner for Australia and mainly exports manufactured primary goods and services to the country (BKP Economic Advisors, 2019 forthcoming).

In light of the potential improvement in trade regulations and against the backdrop of already further evolving agreements between the two countries and to provide even less restricted access to both of the country's markets, the Council of the EU approved the negotiations for an FTA with Australia on the 22nd May 2018, which were then initiated on the 18th June 2018. The general objective of an FTA between the EU and Australia is to reduce overall trade and investment barriers and to provide a new detailed framework that will ensure smart, sustainable and inclusive growth, in order to create benefits for both parties (European Commission, 2018).

1.2 Research objectives

As raw materials and minerals, including iron ore, represent a large share of Australia's exports to the world and to the EU, it is a requirement to analyse and interpret the implications and effects the FTA between the EU and Australia would have on the country's iron ore exports and industry. This research thus aims to measure the potential impact of an EU-Australia FTA on iron ore trade. More specifically the impact of the FTA on the global iron ore industry, the society, the human rights, the environment and the Australian iron ore port infrastructure and logistics will be analysed. Possible impacts are to be expected in these respective dimensions under the implementation of the FTA. This research will analyse the specific dimensions across sustainability pillars, by combining both a quantitative and qualitative analysis. The micro- and macro-economic, part of the social and then environmental aspects will be analysed with the help of the Computable General Equilibrium (CGE) model and Global Simulation Model (GSIM), whereas the human rights and port infrastructure and logistics part will follow a more qualitative analysis.

To analyse these issues the following main research question needs to be answered in this study: **How will the EU-Australia FTA impact the EU and Australia economically and from a social human rights, environmental and port infrastructure and logistics perspective, via its impact on Australia's iron ore industry?**

The logic behind this research question is that under the EU-Australia FTA the currently existing trade barriers, customs procedures, certification processes and many other trade obstacles will reduce, causing an increase in bilateral iron ore trade between the EU and Australia. This might occur most likely under the diversion of Australian iron ore exports from other destinations to the EU. In the occurrence of increases in bilateral trade, further impacts on the society, the human rights, the environment, and the Australian iron ore port logistics and infrastructure can be expected.

To sufficiently satisfy and answer the main research question, several sub-research questions have been created. The following additional questions will be addressed as well:

- What is the best methodological approach to cover both the iron ore industry in particular and global and intersectoral linkages?
- How will the FTA between the EU and Australia affect the global supply and demand for iron ore, production and trade?
- What will the FTA mean for the employment and producers active in the iron ore industry as well as for iron ore consumers?
- How will the FTA impact the most important human rights Australia and the EU are responsible for?
- To what extent will there be an increase in vessel-related and iron ore-related emissions, affecting the environment?
- What will be the impact of changes in iron ore exports for ports in Australia and how should/could they cope?

1.3 Relevance

Australia is the world's largest producer and exporter of iron ore and under the FTA the bilateral exports to the EU are expected to be impacted. With the implementation of an EU-Australia FTA, potential impacts will affect the future of global iron ore trade. These changes might be of vital importance to both the EU, Australia and the rest of the world. This research aims to identify and analyse these important changes profoundly by applying a holistic approach in analysing the impact on five main dimensions:

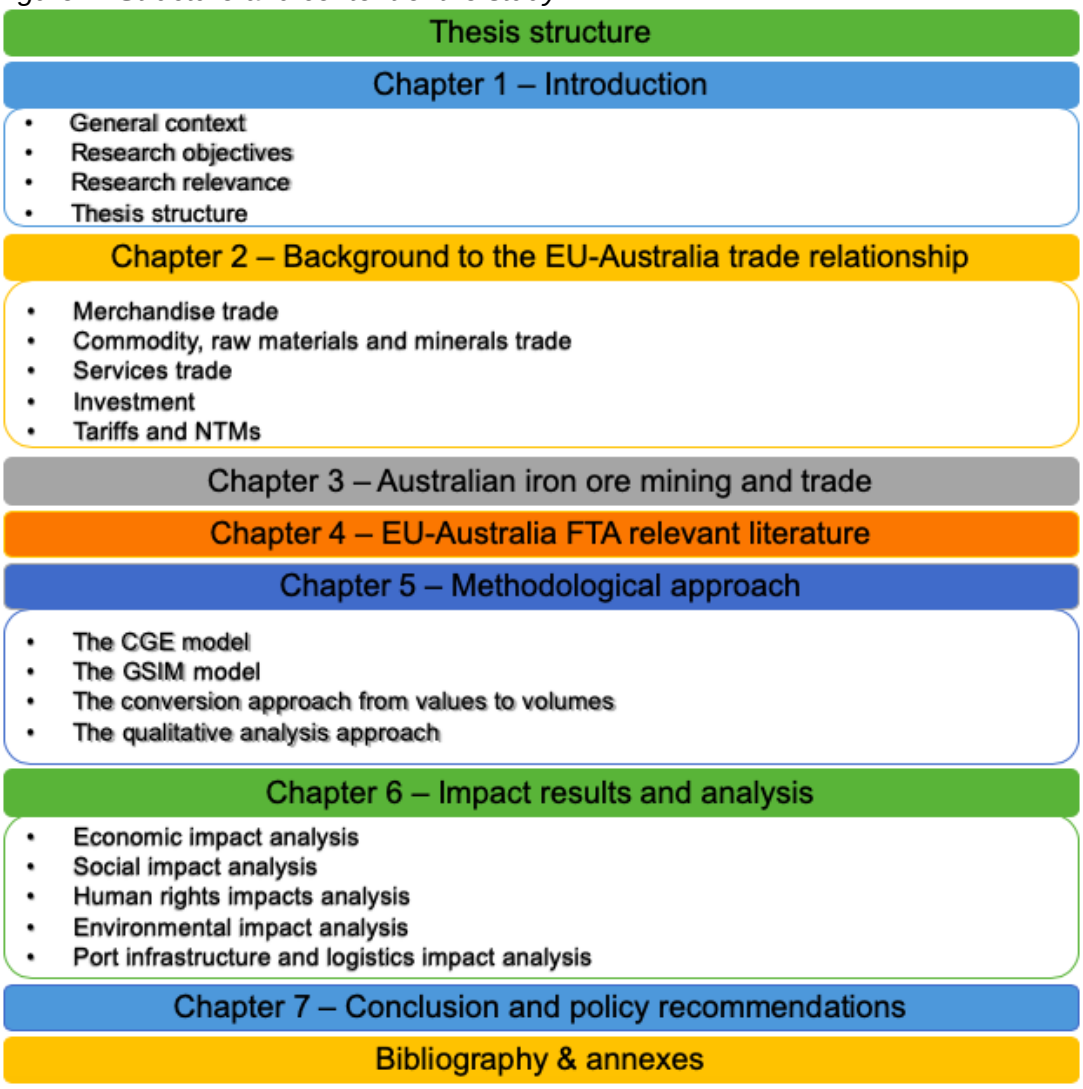
- Micro- and macroeconomic impacts with regard to iron ore: international trade values and destinations, prices, output (production), etc.
- Social impacts that reveal effects in employment and welfare within the iron ore industry.
- Human rights impact of the EU-Australia FTA related to iron ore.
- Environmental and sustainability impacts that indicate changes in expected greenhouse gas (GHG) and non-GHG emissions relating to iron ore trade.
- Infrastructure and logistics impact on the major iron ore export port in Australia.

The results of this thesis will provide a comprehensive and extensive analysis of the impacts of the EU-Australia FTA, focussed on iron ore trade. This thesis will add value as currently the literature for the impact of the EU-Australia FTA in general and the iron ore sector is very thin as the FTA negotiations are currently still in process. This study will also provide useful macro- and microeconomic insights into the EU-Australia FTA. In addition, this study links the trade-based analysis to transport and logistics by translating trade values to dry-bulk tonnage, port infrastructure and port competitiveness, adding value by linking two relevant economic disciplines. The results will include policy, strategy and management recommendations for the EU, Australia as well as the major iron ore export port in Australia. Additionally, this thesis will also include a discussion of the main findings in order to stimulate further debate and advice on more elaborated research.

1.4 Thesis structure

This study follows the structure depicted in Figure 4. In Chapter 2, we will provide background information on the EU-Australian trade relationship. Chapter 3 covers the Australian iron ore mining industry and trade. Chapter 4 presents a literature review on the most relevant and previous impact assessment literature with regard to a potential EU-Australia FTA. Chapter 5 provides an overview of the chosen methodological approach for this study. Chapter 6 covers the overall results and analysis, which will focus on the impact of the EU-Australia FTA in the following order: economic impact, social impact, human rights impact, environmental impact, and port infrastructure and logistics impact. Finally, Chapter 7 will provide the conclusions in terms of the main findings, policy recommendations and areas for further research. The Annexes are comprised of the bibliography, quantitative work and results under the model applied in this study, the methodology of the CGE economic model, the quantitative results of the CGE model, and the current tariffs in place between the EU and Australia.

Figure 4: Structure and content of the study



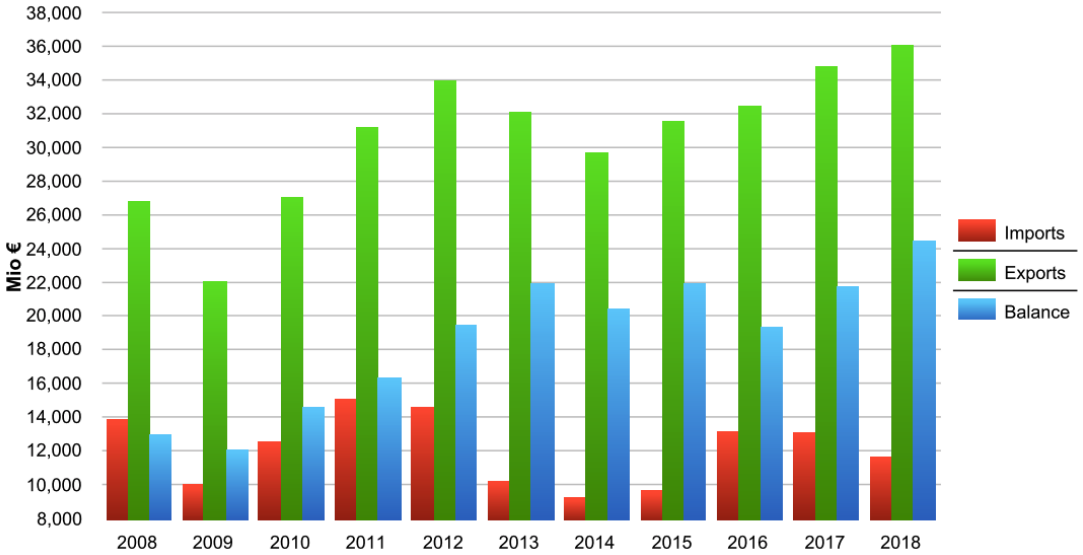
2. Background to the EU-Australia trade relationship

This chapter provides an in-depth overview of the trade and investment relationship between the EU and Australia. As mentioned above, both countries have already become important trading nations under the current trade policy frameworks and arrangements. The EU-Australia Partnership Framework was first launched in 2008 and aimed at promoting "[…] trade in industrial products between the EU and Australia by reducing technical barriers and improve trade in services and investment" (European Commission, 2019). According to the Delegation of the European Commission to Australia and the Australian Government of Foreign Affairs and Trade (2009) the EU-Australia Partnership Framework has five main objectives:

- "to strengthen bilateral and multilateral dialogue and cooperation in support of shared foreign policy and security interests,
- to promote and support the multilateral rules-based trading system, and consolidate and expand the bilateral trade and investment relationship,
- to enhance bilateral and regional cooperation and coordination between Australia and the EU in relation to the Asia and Pacific regions,
- to seek opportunities to cooperate on climate change, environment, energy security, fisheries and forestry,
- and to strengthen cooperation between the EU and Australia in science, research, technology and innovation, education and culture and to facilitate the movement of people (According to the Delegation of the European Commission to Australia and the Australian Government of Foreign Affairs and Trade, 2009)".

In 2017 both parties agreed to sign a strengthened version of the EU-Australia Partnership Framework in order to further improve economic and trade cooperation, which as the EU External Action Service (2017) describes as the foundation and "[…] work towards launching negotiations for a comprehensive and high quality free trade agreement". Figure 5 and Table 1 depict the steady increase in total trade flows and balance between the EU and Australia since the implementation of the EU-Australia Partnership Framework in 2008.

Figure 5: EU trade flows and balance, annual data 2008 – 2018



Source: European Commission, DG Trade (2019)

Table 1: Total goods: EU trade flows and balance

Period	Imports			Exports			Balance	Total trade value (mln €)
	Value (mln €)	Growth in %	Extra-EU %	Value (mln €)	Growth in %	Extra-EU %	Value (mln €)	
2008	13,791	0.0	0.9	26,700	0.0	2.0	12,909	40,491
2009	9,928	-28.0	0.8	21,948	-17.8	2.0	12,019	31,879
2010	12,461	25.5	0.8	26,972	22.9	2.0	14,511	39,433
2011	14,958	20.0	0.9	31,174	15.6	2.0	16,216	46,131
2012	14,533	-2.8	0.8	33,933	8.9	2.0	19,400	48,466
2013	10,172	-30.0	0.6	32,051	-5.5	1.8	21,879	42,223
2014	9,185	-9.7	0.5	29,577	-7.7	1.7	20,392	38,761
2015	9,575	4.3	0.6	31,504	6.5	1.8	21,930	41,079
2016	13,093	36.7	0.8	32,421	2.9	1.9	19,328	45,514
2017	13,013	-0.6	0.7	34,695	7.0	1.8	21,682	47,708
2018	11,594	-10.9	0.6	35,978	3.7	1.8	24,384	47,572

Source: European Commission, DG Trade (2019)

2.1 Merchandise trade

Under the current trade framework, Australia became the 19th – largest trade in goods partner of the EU, while the EU was the second-largest trading partner in goods in 2018 for Australia. In 2018, the total trade in goods between both parties amounted to approximately €47.6 billion, out of which EU imports and exports were valued at €11.6 billion and €35.9 billion respectively (European Commission, DG for Trade, 2019). Table 2 depicts the EU's and Australia's trade composition in the major industry sectors. The European Commission, DG for Trade (2019) show that primary products comprise the largest share of Australian exports to the EU with 61.8%, manufactures account for approximately 22.9%, other products being valued at 13.8%, and other at 1.6%. For Australia, on the other hand, imports from the EU consist primarily of manufactures with 85.4% (mainly machinery), primary products

(12.6%), other products at 0.7%, and others at 1.3%. The top five EU import sectors from Australia include mineral products (35.4%), pearls, precious metals and articles thereof (15.3%), base metals and articles thereof (8.6%), vegetable products (7.7%), and machinery and appliances (6.1%). For Australia, on the other hand, the top five import sectors from the EU include machinery and appliances (26.8%), transport equipment (20.3%), products of the chemical or allied industries (16.5%), foodstuffs, beverages and tobacco (6.7%), and optical and photographic instruments (5.5%) (European Commission, DG for Trade, 2019 and BKP Economic Advisors, 2019 forthcoming).

Table 2: Trade flows by sector (2015 – 2018)

Sector	Imports (million €)				Exports (million €)			
	2015	**2016**	**2017**	**2018**	**2015**	**2016**	**2017**	**2018**
Total trade	9,575	13,093	13,013	11,594	31,504	32,421	34,695	35,978
Food & live animals	723	646	609	545	1,941	2,086	2,270	2,336
Beverages & tobacco	487	464	470	470	720	732	781	840
Crude materials, inedible, except fuels	2,060	1,601	2,269	1,969	283	278	333	454
Mineral fuels, lubricants & related materials	1,969	2,129	3,452	3,291	54	54	54	545
Animal and vegetable oils, fats & waxes	20	11	14	19	94	132	119	139
Chemicals & related prod	647	630	630	609	6,047	6,577	6,432	6,435
Manufactured goods (by material)	1,190	915	1,290	1,326	2,955	2,940	3,206	3,196
Machinery & transport equipment	866	810	865	837	14,652	15,006	16,616	17,025
Msc Manufactured articles	758	703	718	756	4,043	3,990	4,194	4,339
Commodities & transactions	802	5,001	2,438	1,590	288	254	284	199
Other	55	191	259	183	428	371	405	470

Source: European Commission, DG for Trade (2019)

2.2 Commodity, raw materials and minerals trade

The EU's commodity and minerals imports from Australia include fuel exports, primarily coal, which represent roughly 16.4% of total Australian exports to the EU and are valued at €2.0 billion. Gold exports to the EU in 2016 amounted to €4.3 billion, out of which 98.8% was delivered to the United Kingdom (UK), who serves as a global intermediary gold trader. Primary EU industrial metal ore imports include lead and

lead ore, valued at €344.4 million (Australian Government Department of Foreign Affairs and Trade, 2017). With regard to trade in total ores, slag and ash, Australia exported a total of €648.7 million to the EU in 2018, out of which €88.6 million was iron ore (UN Comtrade, 2018). As Australian iron ore exports to the EU represent approximately 13.7% of the EU's total ores, slag and ash import structure the total volume of EU iron ore imports from Australia was around 1.3 million tonnes in 2018. As Brazil's also is a leading iron ore supplier and as the country's geographical position is more attractive to the EU, the union imports iron ore and concentrates primarily from Brazil. Out of the 144 million tonnes of iron ore imported by the EU more than 30% originates from Brazil (Schüler et al., 2017). Table 2 shows that commodities and transactions represent a large share of the EU's imports from Australia. According to the Australian Government's Department of Foreign Affairs and Trade (2017), Australian mineral exports to the EU in 2016 amounted to approximately €477.8 million. These mineral exports include precious metal ores, excluding gold (BKP Economic Advisors, 2019 forthcoming).

2.3 Services trade

In terms of trade in services, the EU is Australia's largest trading partner. In 2017, the total trade in services amounted to approximately €33 billion, EU imports from Australia accounted for €9.5 billion and EU exports to Australia totalled €23.5 billion (European Commission, 2019). According to BKP Economic Advisors (2019 forthcoming), the EU primarily imported travel services (36%), business services (25.8%) and transport services (17.9%) from Australia. Australian imports from the EU primarily consisted of travel services (25.2%) and transport, telecommunication and other business services. Table 3 shows a more detailed overview of the trade in services between both parties (BKP Economic Advisors, 2019 forthcoming).

Table 3: The EU's services trade with Australia (2017)

Services	Value (million €)		Share of total trade (%)		Share of total EU trade (%)	
	Exports	**Imports**	**Exports**	**Imports**	**Exports**	**Imports**
Manufacturing services on physical inputs owned by others	39.3	30.8	0.2	0.3	0.1	0.1
Maintenance and repair services	369.9	157.9	1.6	1.7	1.2	0.6
Transport	5,334.6	1,703.1	22.8	17.9	1.5	0.5
Travel	5,910.7	3,420.5	25.2	36.0	1.5	1.0
Construction	148.4	96.5	0.6	1.0	0.5	0.5
Insurance and pension services	334.9	89.6	1.4	0.9	0.6	0.2
Financial services	1,390.6	678.4	5.9	7.1	0.7	0.6
Charges for the use of intellectual property	1,141.0	234.5	4.9	2.5	0.8	0.1
Telecommunications, computer, information services	4,567.7	543.9	19.5	5.7	1.8	0.4
Other business services	3,229.8	2,446.2	13.8	25.8	0.6	0.5
Personal, cultural, recreational services	146.0	45.3	0.6	0.5	0.6	0.2
Government goods and services	39.9	46.2	0.2	0.5	0.2	0.2
Total services	**23,443**	**9,499**	**100**	**100**	**1.1**	**0.5**

Source: Organisation of Economic Cooperation and Development (OECD) Stats in BKP Economic Advisors (2019 forthcoming)

2.4 Investment

Bilateral investments also play a crucial part in the trade relationship between both parties. In 2017, EU-Australia foreign direct investment (FDI) in terms of inward stocks were valued at €25.8 billion while outward stocks amounted to €162.4 billion, creating an overall balance of €136.5 billion in FDI (European Commission, 2019). According to BKP Economic Advisors (2019 forthcoming) these numbers represent approximately 25% of the total Australian inward FDI flows and 22.2% of the total Australian FDI stocks. Table 4 provides a more detailed overview. Under the Australian Foreign Acquisitions and Takeovers Act of 1975, the Australian Foreign Investment Review Board reviews and regulates certain foreign acquisitions. Main barriers for foreign investors in Australia include an investment screening threshold, a monetary threshold, while certain industries, e.g. banking, transportation and telecommunications, are governed by additional acts and regulations (BKP Economic Advisors, 2019 forthcoming).

Table 4: The EU's FDI flows and stocks in and from Australia (2017)

	Values (€ mln)				Shares of total FDI (%)			
	Flows		Stocks		Flows		Stocks	
	Inward	Outward	Inward	Outward	Inward	Outward	Inward	Outward
AUS	10,255.7	2,307.9	130,279.6	81307.9	25	53.4	22.2	19.9

Source: OECD Stats in BKP Economic Advisors (2019 forthcoming)

2.5 Tariffs and NTMs

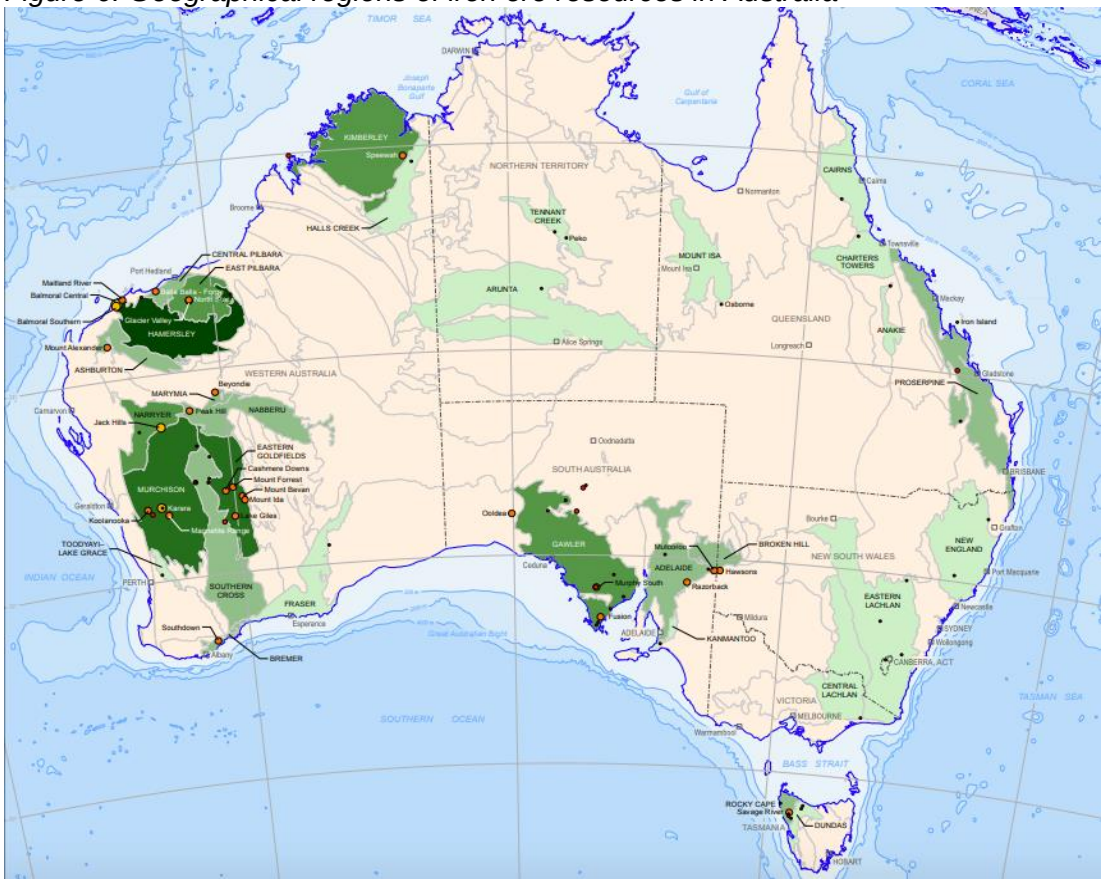
Despite the EU-Australia Partnership Framework being in place, several tariffs and NTMs undermine the bilateral trade between the two parties. Table IV.1 in the Annex IV provides an in-depth overview of the current barriers categorised based on product types (HS2 Chapters) – these include applied (AHS), bound (BND) and most favoured nation (MFN) tariffs, and simple averages. The EU has relatively high tariffs on Australian agricultural products (e.g. tobacco and manufactured tobacco substitutes, vegetables, meat, fish and crustaceans, sugar and dairy), and textiles and clothing. Australia, on the other hand, has comparably lower AHS tariffs than the EU, however there are several high BND tariffs on textiles and clothing, chemicals and agricultural products. Under the EU-Australia Partnership Framework a mutual recognition agreement (MRA) was implemented with the objective of creating lower trade barriers (e.g. the reduction of technical barriers) and higher conformity in the most important trading sectors: automotive products, pressure equipment, telecommunications terminal equipment, machinery, electromagnetic compatibility, good manufacturing practice inspections of medicinal products, low voltage equipment and medical devices (BKP Economic Advisors, 2019 forthcoming).

With regards to iron ore, the EU and Australia currently do not have any tariffs on imports in place. Generally, the EU's and Australian ore, slag and ash imports are not subject to AHS, BND or MFN tariffs. However, the trade and non-tariff measures (NTMs) liberalisation effects under an FTA are usually subject to the general equilibrium (GE) theory, which suggests that impacts and changes within one sector affect other sectors through their interlinkages. As such, as iron ore is a main input material for iron and steel, any tariff changes would affect the trade and demand for iron ore. Table IV.1 in the Annex IV also shows that iron and steel imports are subject to tariffs. Australia currently has a 4.35% AHS tariff, a 5.76% BND tariff and a 4.09 MFN tariff on EU iron and steel imports. Australian iron and steel imports into the EU are subject to a 0.05% AHS, BND and MFN tariff. Further articles of iron and steel are also subject to various tariffs in the EU and Australia, which are in the similar range as the aforementioned tariffs (see Table IV.1 in the Annex IV for more detail). Although the ore, slag and ash imports for both parties are not subject to any tariffs, the imports face a range of NTMs and non-technical barriers (NTBs). For both the EU and Australia, iron ore imports still face testing, inspecting, labelling and content requirements. As these NTMs are time-consuming and capital-intensive, the trade barriers for iron ore are not entirely eliminated.

3. Australian iron ore mining and trade

This chapter provides background information on iron ore mining and iron ore trade in Australia. The country currently has the largest iron ore reserves in the world, which are estimated to be at approximately 52 billion tonnes. This represents 30% of the global 170 billion tonnes of iron ore reserve. At current iron ore price levels this reserve represents a potential value of €3.1 trillion. Figure 6 shows Australia's primary geographical locations for its iron ore resources. 91% of the country's iron ore deposits can be found in Western Australia (in the Kimberly, Pilbara and Yilgarn regions), 8% in South Australia (in the Middleback Ranges and the Peculiar Knob), and the remaining 1% can be found in Tasmania, the Northern Territory and New South Wales (Government of Western, Department of Mines, Industry Regulation and Safety, 2017, Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019 and BKP Economic Advisors, 2019 forthcoming).

Figure 6: Geographical regions of iron ore resources in Australia

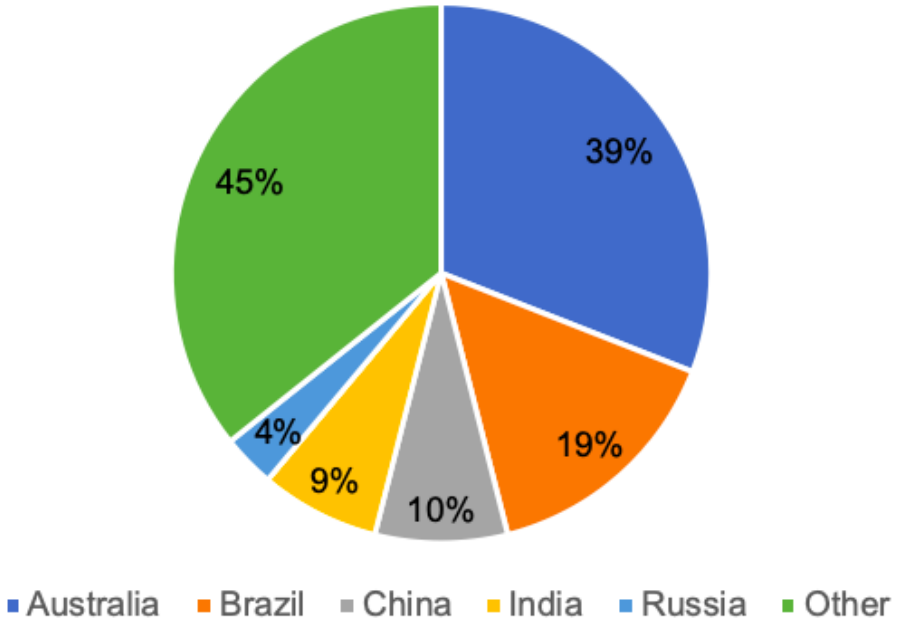


Source: Australian Government Geoscience Australia (2012)

Australia currently has 29 active mines in the aforementioned regions, which in the year 2017-2018 were able to sell 826 million tonnes of iron ore, resulting in sales revenues of approximately €55.2 billion (Government of Western Australia, Department of Mines, Industry Regulation and Safety, 2018). This makes Australia the largest supplier of iron ore in the world, followed by Brazil and China (see Figure 7). The majority of these mines are operated by three main producers: Rio Tinto, BHP Billiton and Fortescue Metals Group (FMG). Out of these three iron ore miners, Rio Tinto is the largest with a total of 360 million tonnes of iron ore sales as of 2018. BHP

Billiton and FMG sold approximately 290 million tonnes and 160 million tonnes of iron ore respectively. Atlas Iron, Cliffs Natural Resources, Citic Pacific Mining and Hancock Prospecting operate smaller and mid-sized iron ore mines in the country. In order to maximise the economies of scale in their operations these mines are closely connected to railways and export ports. The largest iron ore export port in Australia is Port Hedland, which exported approximately 470.8 million tonnes (57%) of Western Australia's iron ore exports in 2017-2018. The second largest port is Cape Lambert (22%), followed by Dampier (16%) and other smaller ports (5%). Port Hedland is utilised by three miners – FMG, BHP Billiton and Atlas Iron – while Cape Lambert and Dampier are primarily and exclusively operated by Rio Tinto. Figure 8 shows the geographical locations of the three aforementioned ports in the Pilbara region in Western Australia (Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019).

Figure 7: Major global iron ore suppliers (2018)



Source: Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2019), author's own calculations

Figure 8: Geographical location of Port Hedland, Cape Lambert and Dampier

Source: Author's own research

Based on the high availability and abundance of iron ore in the country, especially in Western Australia, the raw material represents one of the country's major exports. Overall, the iron ore industry accounts for 17% of Western Australia's gross state product, approximately 47% of Western Australia's merchandise exports and roughly 54% of Western Australia's minerals and petroleum sales (Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019 and BKP Economic Advisors, 2019 forthcoming).

The country's iron ore exports are primarily driven by demand across Asia due to its geographical proximity. In 2017, 83% of the total iron ore exports went to China amounting to 674 million tonnes. Japan, South Korea and Taiwan accounted for 8%, 6% and 2% respectively of the total iron ore exports. The remaining 1% was exported to the rest of the world. The 1.3 million tonnes of iron ore exports to the EU account for less than 1%, valued at €88.6 million (Australian Government, Department of Industry, Innovation and Science, 2018, UN Comtrade, 2018 and BKP Economic Advisors, 2019 forthcoming).

Overall, the iron ore industry accounts for 57% of the mining industry value added in Western Australia. In terms of direct employment, the industry employs 48% of the people working in the minerals and mining industry. In 2014, the total number of employees was 62,244 with forecasted growth rates of 11% per year. This large growth within the industry can be explained with the large-scale investments into iron ore projects. By the end of the year 2018, Western Australia had invested a total of €11.1 billion into iron ore projects and had an additional €38.6 billion under consideration. Typical investments include infrastructure improvements for capacity

increases, port upgrades and the development of new iron ore deposits to replace older ones. One of the most prominent investments currently under construction is Rio Tinto's €3.1 billion investment into the development of the Koodaideri deposit in order to ensure an iron ore production of 360 million tonnes per annum for the following years (Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019 and BKP Economic Advisors, 2019 forthcoming). Table 5 shows further iron ore investment projects in Western Australia in the next years.

Table 5: Major iron ore investment projects in Western Australia

Operator	Mine/ deposit	Capex (€ mln)	Mtpa	Start-up
Recently completed projects				
CITIC Pacific	Sino Iron	10,694	24	2013
BHP Billiton	Jimblebar	3,384	35-55	2013
Rio Tinto	Nammuldi	1,959	10	2014
Hancock Prospecting	Roy Hill	12,201	55-60	2015
Rio Tinto	Silvergrass	301	10-20	2017
Under construction or committed				
Rio Tinto	Billiard South	105	n.a.	2019
Mt Gibson	Koolan Island (Restart)	86	5	2019
BHP Billiton	Port Hedland Tug Haven	249	n.a.	2019
FMG	Eliwana	1,494	30	2020
Rio Tinto	Dampier Port Upgrade	62	n.a.	2020
BHP Billiton	South Flank	4,185	80	2021
Rio Tinto	Robe Valley Mesa B, C & H	1,157	n.a.	2021
Rio Tinto	West Angelas Deposits C & D	712	n.a.	2021
Rio Tinto	Koodaideri	3,116	42-70	2021
Under consideration				
Brockman	Marillana Mine, Rail and Port	1,780	20-30	2020
BBI Group	Balla Balla Port and Rail	4,986	50	2020
Todd Corp	Balla Balla Mine	1,780	6	2020
Atlas	Corunna Downs	44	4	2020
FMG	Iron Bridge (Stage 2)	1,576	15	2021
FMG	Nyidinghu	n.a.	30-45	2021
BC Iron	Buckland	838	8-15	2021
Rio Tinto	Western Turner Syncline 2	267	7	2022

Source: Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2019), author's own calculation

4. EU-Australia FTA relevant literature

In this chapter, we provide an overview of previous and current FTA impact assessment literature, which are important to consider in light of an EU-Australia FTA. Overall, one is able to find only a limited amount of previous impact assessment studies in the context of the EU-Australia FTA. The identified studies specifically focused on the FTA cover the impacts and implications for all industries within the economy of the EU and Australia. Thus, there is a general lack of sector- and industry specificity – especially the iron ore industry – within the available literature.

First, this literature review assesses previous studies that specifically analyse a potential EU-Australia FTA and its impacts. Secondly, as both the EU and Australia are active in negotiating FTAs with other countries, this section also covers additional studies that assess the impact of the most relevant EU and Australian FTAs. Table 6 summarises the main findings of the identified literature.

4.1 Previous EU-Australia FTA impact assessment studies

Currently, there are only three relevant studies that have conducted an impact assessment of a potential EU-Australia FTA: Ecorys (2009), LSE Enterprise Ltd. (2017) and BKP Economic Advisors (2019 forthcoming). In 2009, Ecorys (2009) published a study covering the impacts of an EU-Australia and EU-New Zealand FTA, an EU-US FTA, and an EU-Japan FTA within the OECD. Ecorys (2009) estimates promising positive effects for both the EU and Australia under an FTA. Total exports are expected to increase by 4.6% for Australia and by 0.2% for the EU. The welfare effects for Australia and the EU are also estimated to be positive with increases of €1.6 billion and €3.5 billion respectively. LSE Enterprise Ltd. (2017) focused specifically on an EU-Australia and EU-New Zealand FTA. According to their assessment, both parties would also benefit under an FTA. Total exports of the EU and Australia are projected to increase by 0.1% and 0.7% respectively. The welfare effects are also positive for both under the different scenarios utilised within their economic modelling. Overall, the gross domestic product (GDP) of Australia will grow by 0.2% while the EU's GDP will grow by 0.1%. The most recent impact assessment was conducted by BKP Economic Advisors (2019 forthcoming) and also focuses on an EU-Australia and EU-New Zealand FTA. According to BKP Economic Advisors (2019 forthcoming), the EU's GDP will only face modest positive increases of 0.0% under both scenarios, while the Australian GDP is expected to grow by 0.1% under the conservative scenario and by 0.2% under the ambitious scenario. The welfare effects show similar results as in LSE Enterprise's study of 2017 – the EU can expect positive welfare effects from €2.2 billion to €4.1 billion while Australia will potentially face positive effects of €900 million to €1.4 billion under the respective scenarios. Under both the conservative and ambitious scenario, the EU's exports will slightly increase by 0.0% and 0.1% respectively. For Australia the exports will increase by 0.4% and 0.8% respectively.

4.2 Previous and relevant Australian FTA impact assessment studies

As Australia is active in negotiating FTAs with a variety of countries, particularly in the Association of Southeast Asian Nations (ASEAN) area, it is important to analyse and review the implications and impacts of an FTA between Australia and other countries on the signing parties. Australia currently has eleven FTAs in force and as such one

is able to find several previous impact assessments on current and potential Australian FTAs. One of the first and most comprehensive FTAs for Australia was implemented in 1983 under the Australia New Zealand Closer Economic Relations Trade Agreement (ANZCERTA). In 2006, the Parliament of the Commonwealth of Australia (2006) published a qualitative impact assessment report of the ANZCERTA which states that since its introduction both Australia and New Zealand were able to achieve year-on-year GDP growth rates of 3.8% and 3.1% respectively. Bilateral trade also grew 9% on a yearly basis (BKP Economic Advisors, 2019 forthcoming).

As Australia's primary trading partners are located in Asia, the Asia-Pacific Economic Cooperation (APEC) conducted a study in 2009 to analyse the impacts of a potential FTA among the APEC members. APEC (2009) states that with the introduction of a Free Trade Area of the Asia Pacific (FTAAP), which will have large-scale economic implications for both the EU and Australia, the EU's and Australia's GDP would grow by 0.2% and 3.3% respectively. APEC (2009) also forecasts that under a FTAAP Australia's exports would increase by 10.6% whilst the EU's total exports would fall by 0.3%. Another study by Kim et al. (2013), on the other hand, also assesses the impact of a potential FTAAP and states that the EU's GDP would decrease by 0.04% to 0.1%, whereas Australia's GDP would face growth rates of 0.1% to 1.2%. With regard to total exports similar projections were made – the EU's exports will decrease by 0.7% to 0.8% and Australia's exports will grow by 4.5% to 7.1% (BKP Economic Advisors, 2019 forthcoming).

Further crucial trade negotiations for Australia outside the Asian region included the TTP, which was implemented under a CPTPP. Petri and Plummer (2016) conducted an impact assessment of the TTP and estimate GDP increases of 0.6% and 0.2% for both Australia and the EU respectively. According to their findings, total exports will also increase by 4.9% and 0.5% respectively. Lee and Itakura (2014) and Kawasaki (2014) all assess the TTP and estimate positive gains for the EU and Australia in terms of GDP and overall trade. With regard to the CPTPP, Walmsley et al. (2018) predict an average increase in GDP of 0.4% for the majority of CPTPP member countries (BKP Economic Advisors, 2019 forthcoming).

In addition to the regional FTAs, Australia has introduced several bilateral FTAs. The most relevant bilateral is the China-Australia FTA (ChAFTA). Qi and Zhang (2017) explicitly analyse the ChAFTA and its effects in their study and predict GDP increases of 0.6% for Australia and 0.1% for China under the agreement. Overall welfare and total trade flows are expected to increase as well. Their study also includes the potential impacts for the EU and according to their findings the EU's GDP would decrease by approximately 0.02% under the ChAFTA (BKP Economic Advisors, 2019 forthcoming).

4.3 Previous and relevant EU FTA impact assessment studies

Similar as Australia, the EU has implemented 15 FTAs and is currently negotiating several more and as such one is able to find various studies covering impact assessments of these agreements. As the EU has entered into several FTA agreements in Asia, this section will primarily focus on EU FTAs in that region. The most prominent and strategically important EU FTA in the region is the EU-Japan FTA. Under the impact assessment of Ecorys (2009), the EU-Japan FTA is expected to decrease the EU's GDP and increase Japan's GDP by 0.1% and 2.4% respectively.

Under the study of LSE Enterprise (2015), on the other hand, the EU-Japan FTA is expected to increase the EU's and Japan's GDP by 0.8% and 0.3% respectively. The study also predicts bilateral trade flow increases of 34% for the EU and 29% for Japan. As the EU is promoting its trade relationships within Asia, bilateral and regional FTA with the ASEAN area are of high interest. As such, the literature review yielded in a large variety of bilateral FTA impact assessments between the EU and an ASEAN member state. The European Parliament's DG for External Policies (2018) for instance conducted a study on the EU-Singapore FTA and predict GDP increases of 0.1% and 0.4% for the EU and Singapore respectively. The total bilateral trade volume is also expected to grow by 10% according to the study. Grumiller et al. (2018) research the EU-Vietnam FTA and also estimate low GDP increases for the EU and an increase of 0.5% for Vietnam. With regards to a potential regional FTA, the ASEAN Prosperity Initiative (API) conducted an impact assessment of a potential EU-ASEAN FTA in 2018. API (2018) predicts GDP growth for the majority of signing countries. The EU's GDP is expected to grow by a modest 0.2% whereas Vietnam, Singapore and Indonesia are forecasted to face GDP increases of 14%, 12.3% and 3.4% respectively (BKP Economic Advisors, 2019 forthcoming).

Further crucial trade negotiations for the EU outside the Asian region included a potential EU-United States (US) Transatlantic Trade and Investment Partnership (TTIP). Ecorys (2017) conducted an impact assessment study on TTIP and states that both the EU's and US' GDP will increase under the agreement. The EU can expect GDP growth of 0.3% to 0.5% while the US will face increases of 0.2% to 0.4%. Total exports of both parties will also increase by 4.6% and 7.2% respectively (BKP Economic Advisors, 2019 forthcoming).

Table 6: Summary of the most relevant impact assessment studies on FTAs

Study	Model	Time frame	Affected countries	Results				
				GDP	**Welfare (€ mln)**	**Trade (Export)**	**Wages/ Employment**	**EU sectors most impacted under the FTA**
Ecorys (2009)	GTAP 7	2020	EU, AUS	n.a.	EU: +3.454 AUS: +1.557	EU: +0.2% AUS: 4.6%	EU wages: no changes AUS wages: +0.2% (skilled) & +0.4% (unskilled)	Agriculture – Machinery +
LSE Enterprise Ltd. (2017)	GTAP 9	2030	EU, AUS	EU: +0.1% AUS: +0.2%	EU: +2.600 to +4.800 AUS: +900 to +1,800	EU: +0.1% AUS: +0.7%	EU wages: +0.1% (skilled and unskilled) AUS wages: +0.2% (skilled & +0.3% (unskilled)	Machinery, motor equipment, dairy + Animal/ livestock –
BKP (2019 forthcoming)	GTAP 9	2030	EU, AUS	EU: +0.0% AUS: +0.1 to +0.2%	EU: +2,200 to +4,100 AUS: +900 to +1,400	EU: +0.0 to +0.1 AUS: +0.4 to +0.8	EU wages: +0.0 AUS wages: +0.2 to +0.3 (skilled), +0.2 to +0.3 (unskilled)	Machinery, motor vehicles and equipment + Electricity, coal –
Petri and Plummer (2016)	GTAP 9	2030	TPP, WTO+, (EU and AUS)	EU: +0.2% AUS: +0.6%	n.a.	EU: +0.5% AUS: +4.9%	n.a.	n.a.
Walmsley, Strutt, Minor and Rae (2018)	GTAP 9.2	2040	CPTPP (AUS)	Other CPTPP members (AUS): 0.1% (1); +0.2% (2) +0.4% (3) +0.2% (4)	n.a.	Other CPTPP members (AUS): +0.7% (1) +1.3% (2) +2.0% (3) +1.3% (4)	CPTPP wages: rise for all signatories (especially low skilled); CPTPP employment: workers shift to agricultural and low-skilled workers occupation	AUS: beef and sheep meat + Manufactures –

Study	Model	Time frame	Affected countries	Results				
				GDP	Welfare (€ mln)	Trade (Export)	Wages/ Employment	EU sectors most impacted under the FTA
LSE Enterprise Ltd. (2015)	GTAP 8	2030	EU, Japan	EU: +0.8% Japan: +0.3%	n.a.	EU: +34% Japan: +29%	EU wages: +0.7% (skilled and unskilled); Japan wages: +0.5% (skilled and unskilled); Employment: electrical machinery: +6.7% (skilled and unskilled)	Food and feed + Manufactures +
Ecorys (2017)	GTAP 8	2030	EU, US (TTIP)	EU: +0.3% to 0.5% US: +0.2% to +0.4%	Increased welfare in TTIP countries	EU: +4.6% US: +7.2%	EU wages: +0.5% (skilled and unskilled); US wages: +0.3% (skilled), +0.4% (unskilled)	EU: Motor vehicles + Electrical Machinery – US: Non-ferrous metals + Motor vehicles -

Source: Author's own research, BKP Economic Advisors (2019 forthcoming)

5. Methodological approach

In this chapter we summarise the methodological approach. Overall, the methodology of this study follows a casual-chain analysis. We use a multi-pronged approach in order to take into account as many relevant factors as possible. The approach consists of replicating the EU-Australia FTA impact analysis of DG Trade of the European Commission (EC), which is a CGE analysis, followed by a much more detailed partial equilibrium (PE) approach using the Global Simulation (GSIM) model to allow for iron ore specific tariffs and NTMs. In addition to the two econometric models, the multi-pronged approach for this study includes a conversion methodology from iron ore values to volumes and a qualitative analysis.

Each of the aforementioned econometric models has its strengths and limitations and by applying the chosen methodological approach, we can combine and complement the strengths of both models, making the total impact analysis stronger than the sum of the respective parts. The CGE model applied by DG Trade of the EC under the EU-Australia FTA Trade Sustainability Impact Assessment (TSIA) is part of the GE theory. The econometric model is highly complex as it takes the interaction of supply and demand in several markets into account and thus provides the ability to model the economic equilibrium of a global market (Walras, 1874). As Bacchetta et al. (2012) state, a CGE model simulates the effect of a shock by approaching an economic equilibrium through an analysis of the effects of a shock on the interaction of different markets that build into one global marketplace. The model's highly complex and interwoven nature makes a CGE simulation prone to a lack of sector specificity, transparency and simplicity. The GSIM model on the other hand is a PE model that analyses the impact of a specific amount of country- or industry-related factors in a multi-country global market space. As such, the GSIM model is able to simulate the effects of a shock or policy change within a specified industry or country (Francois and Hall, 2002). As the GSIM is a PE model and focuses solely on one sector, the simulation faces drawbacks in terms of capturing downstream effects. The combination of both the CGE and GSIM model will provide the ability to accurately analyse the impacts of the FTA on the iron ore industry by eliminating the drawbacks of each model. By using the GSIM model and focusing specifically on the iron ore sector the general nature of the CGE model can be eliminated, whilst the CGE model can cover the limitations of the GSIM by modelling the intermediates and downstream global value chain effects, which are especially important for the iron ore industry.

5.1 The CGE model

During the author's internship at Trade Impact B.V. he supported in the preparation of the EU-Australia FTA TSIA. Throughout this period, the author primarily worked with the results of the CGE model to conduct various impact analyses under the FTA. As such, the author of this study did not develop the CGE model on his own but as part of his tasks the author was required to carefully re-check the results of the model by diving into the methodology and data. This helped the author to familiarize himself with its complex workings. This section provides a concise overview of the methodology behind the CGE model.

The CGE model has become a commonly used tool for empirical economic and policy analysis (Lofgren et al., 2002). The model requires realistic economic data to numerically solve simulations with regards to the supply and demand structure, prices

and aggregate welfare across a specified set of multiple interconnected markets and countries (Wing, 2004). The basis of the CGE model is the circular flow of commodities in a closed economy, which creates a linkage between income and spending among the main economic actors: households, firms and the government (Wing, 2004). As a GE theory, the CGE model combines and simulates the changes and effects in all economic activities within the specified countries and markets, and thus focuses on a variety of economic variables, e.g. trade, employment, production, consumption, wages, taxes and savings (Burfisher, 2011). Generally, a CGE model simulates based on a complex system of equations and variables and as the model has been used for several decades, the algebraic structure of the model has changed throughout the years. The model's algebraic structure varies also according to the skills, research question and objective of the modeler. However, the main rationale behind the model has always remained the same.

With the use of social accounting matrices (SAM), the CGE model is able to assume a closed free-market economy comprised of a number of industries. According to Lofgren et al. (2002), a SAM is "[…] a comprehensive, economywide data framework, typically representing the economy of a nation" (Lofgren et al., 2002). In order for the CGE model to solve the SAMs for equilibrium, the model requires a comprehensive amount of economic data for the respective industries, which produce their own type of commodity under an unspecified amount households and factor endowments (Wing, 2004). The CGE model used for this study simulates the global equilibrium under the EU-Australia FTA based on 32 industries or sectors: rice, cereals, vegetables and fruits, oil seeds, sugar, fibre and crops, bovine meat, other animal meat, other meat, dairy, wood and paper, fishing, coal, oil, gas, minerals, other food products, beverages and tobacco, textile, chemicals, oil products, metal products, non-metal products, motor equipment, machinery, other electrical products, electricity, utility, transport, communication, financial products and other services. The effects on these sectors is modelled under the following country specification: the EU27, the UK, Australia, New Zealand, Turkey, the US, Canada, Japan, South Korea, the European Free Trade Association (EFTA), EU FTA countries, ASEAN, ASEAN-TPP region, Vietnam, the Pacific region, LDCs, China, Hong Kong and the rest of world (RoW). Based on these inputs, the CGE model generates various variables under the potential FTA, e.g. GDP, welfare, exports and imports, prices, wages, sector output, sector employment, sector prices, sector exports and CO_2 emissions. These variables are necessary for the multi-pronged analysis of the impacts of the EU-Australia FTA on each of the sustainability pillars in this study.

Due to the general nature of the CGE model, the econometric model summarizes one of the major export sectors of Australia and one of the major import sectors of the EU as the minerals sector, of which the iron ore industry is part of. The underlying modelling framework of the CGE thus includes the overall EU-Australia FTA effects on the minerals sector, while taking into account the effects in all the remaining sectors and the intermediates.

5.2 The GSIM model

The main issue of the CGE model is its general nature and lack of sector specificity, making it unsuitable for a detailed sector analysis, especially when focussing on sector-specific effects on welfare, supply and demand structure, trade flows, output and price. In order to analyse these issues comprehensively, we employ the GSIM

model. Francois and Hall created the GSIM in 2002 in order to analyse global trade policy changes and their effect on trade flows, world prices and welfare (Francois and Hall, 2002). The GSIM model belongs to the PE theories and analyses the impact of a specific amount of country or industry-related factors in a multi-country global market space. By following this approach, Francois and Hall (2002) state that the GSIM model can run effectively with only a limited amount of data. To define the market space in the model several countries have to be chosen based on their level of market involvement and importance, and the general nature of the shock, while the outstanding countries are categorised as the RoW. Francois and Hall (2002) explain that the GSIM model's accuracy increases with the inclusion of the RoW as the model expands into a global market context. In addition to the country specification, the GSIM requires further data inputs: initial trade values between the specified countries, NTMs, the elasticities of demand, supply and substitution. The initial trade values represent the import and export values between the specified countries before the shock or policy change. As trade barriers exist around the world and effect the trade flows between those countries, they have to be included in the GSIM. These trade barriers can take the form of tariffs, subsidies, NTMs or NTBs. Through quantifying the relevant NTMs for the study, the goal is to quantify the trade cost equivalents (TCEs) of the NTMs (Berden and Francois, 2015). An initial baseline set of tariffs and NTBs is included in the model, followed by the new tariffs and NTBs. Based on these required inputs, the GSIM model will calculate new estimated trade values, welfare, price and employment changes (Francois and Hall, 2002). The indexes and variables required for the mathematical equations for the GSIM model are shown in the Table 7.

Table 7: Overview of the major variables utilised in the GSIM model

Indexes	
r, s	Exporting regions
v, w	Importing regions
i	Industry designation
Variables	
M	Import quantity
X	Export quantity
$M_{(i, v)}$	Aggregate imports
$P_{(i, v)}$	Composite price
E_s	Elasticity of substitution
$E_{m, (i, v)}$	Aggregate import demand elasticity (1)
$E_{x, (i, r)}$	Elasticity of export supply (2)
$N_{(i, v), (r, r)}$	Own price demand elasticity
$N_{(i, v), (r, s)}$	Cross-price elasticity
$T_{(i, v), r}$	The power of the tariff, T=(1+t)
$\theta_{(i, v), r}$	Demand expenditure share (3)
$\emptyset_{(i, v), r}$	Export quantity share
$t_{(i, v), r}$	Tariff equivalent

Source: Francois and Hall (2002)

Elasticities

According to Francois and Hall (2002) the elasticities represent a crucial part in the GSIM model and the main assumption behind the elasticities is that "[…] within each importing country *v*, import demand within product category *i* of goods from country *r*

is a function of industry prices and total expenditure category (Francois and Hall, 2002). As such, the following equation is formulated:

(1) $$M_{(i,v),r} = f(P_{(i,v),r},\ P_{(i,v),s\neq r}, y_{(i,v)})$$

Where,

$M_{(i,v),r}$ = Import demand of country *v* for product *i* from country *r*
$y_{(i,v)}$ = Total expenditure of imports of *i* in country *v*
$P_{(i,v),r}$ = Internal price for goods from region *r* within country *v*
$P_{(i,v),s\neq r}$ = Price of other varieties

Through a differentiation of equation (1), and the application of the Slutsky decomposition of partial demand and the zero-homogeneity property of Hicksian demand, the following equations can be derived (Francois and Hall, 2002):

(2) $$N_{(i,v),(r,s)} = \theta_{(i,v),s}(E_m + E_s)$$
(3) $$N_{(i,v),(r,r)} = \theta_{(i,v),r}E_m - \sum_{s\neq r}\theta_{(i,v),s}\,E_s = \theta_{(i,v),r}E_m - (1-\theta_{(i,v),r})E_s$$

Where,

$N_{(i,v),(r,s)}$ = Cross-price elasticity
$N_{(i,v),(r,r)}$ = Own price demand elasticity
$\theta_{(i,v),s}$ = Expenditure share of good *i* in country *v* from exporting country *s*
$\theta_{(i,v),r}$ = Demand expenditure share (at internal prices)
E_s = Elasticity of substitution
E_m = Elasticity of aggregate import demand in country *v*

National supply and demand equations

In order for the GSIM model to run effectively, the introduction of supply and demand relationships are necessary. This is done by linking the export price of exporters on the world market with the internal and domestic price of the same good (Francois and Hall, 2002). The following equation allows for the linkage between the prices:

(4) $$P_{(i,v),r} = \left(1 + t_{(i,v),r}\right)P^*_{i,r} = T_{(i,v),r}P^*_{i,r}$$

Where,

$P_{(i,v),r}$ = Internal and domestic price of the good
$T = 1 + t$ = Power of the tariff (the proportional price markup achieved by tariff *t*)
$P^*_{i,r}$ = Export price received by exporter *r* on world markets

According to Francois and Hall (2002), the export supply to world markets can be defined as a function of the world price (*P**):

(5) $$X_{i,r} = f(P^*_{i,r})$$

With the use of differentiation, the equations (1), (4) and (5) can be reformulated and simplified, resulting in the following equations, in which "^" represents a proportional change, that $\hat{x} = \frac{dx}{x}$ (Francois and Hall, 2002):

(6) $$\hat{P}_{(i,v),r} = \hat{P}^*_{i,r} + \hat{T}_{(i,v),r}$$

(7) $\hat{X}_{i,r} = E_{x(i,r)}\hat{P}^*_{i,r}$

(8) $\widehat{M}_{(i,v),r} = N_{(i,v),(r,r)}\hat{P}_{(i,v),r} + \sum_{s\neq r} N_{(i,v),(r,s)}\hat{P}_{(i,v),s}$

Global equilibrium conditions

To simplify the formulated equations and define the equations for a workable GSIM model with regards to world prices, several substitutions can be executed. The substituted equations include equation (2), (3), (6) and are substituted into equation (8) with the addition of the sum over import markets. These substitution efforts result in the following equation (Francois and Hall, 2002):

(9) $$\widehat{M_{\iota,r}} = \sum_v \widehat{M_{(\iota,v),r}} = \sum_v N_{(i,v),(r,r)}\widehat{P_{(\iota,v),r}} + \sum_v \sum_{s\neq r} N_{(i,v),(r,s)}\,\widehat{P_{(\iota,v),s}}$$
$$= \sum_v N_{(i,v),(r,r)}\left[P^*_r + \widehat{T_{(\iota,v),r}}\right] + \sum_v \sum_v N_{(i,v),(r,s)}\left[\widehat{P^*_s} + \widehat{T_{(\iota,v),s}}\right]$$

The core formula for the GSIM model can thus be defined by setting equation (9) equal to equation (7), resulting in equation (10) (Francois and Hall, 2002):

(10) $$\widehat{M_{\iota,r}} = \widehat{X_{\iota,r}}$$
$$= E_{X(i,r)}\widehat{P^*_{\iota,r}} = \sum_v N_{(i,v),(r,r)}\,\widehat{P_{(\iota,v),r}} + \sum_v \sum_{s\neq r} N_{(i,v),(r,s)}\,\widehat{P_{(\iota,v),s}}$$
$$= \sum_v N_{(i,v),(r,r)}\left[P^*_r + \widehat{T_{(\iota,v),r}}\right] + \sum_v \sum_{s\neq r} N_{(i,v),(r,s)}\left[\widehat{P^*_s} + \widehat{T_{(\iota,v),s}}\right]$$

Where,

$\widehat{P^*_{\iota,r}}$ = Internal price for goods from country *r*

E_X = Elasticity for export supply

Welfare and revenue effects

The revenue effects under the GSIM model can be calculated by solving equation (10) for world prices, back solving equation (8) for export quantities and solving equation (9) for import quantities (Francois and Hall, 2002). By combining the aforementioned effects with the PE measures of changes in producer and consumer surplus, the net welfare effects can be calculated. Equation (11) defines the changes in producer surplus and equation (12) formalises the changes in consumer surplus (Francois and Hall, 2002):

(11) $$\Delta PS = R^0_{(i,r)} * \widehat{P^*_{(\iota,r)}} + 0.5R^0_{(i,r)} * \widehat{P^*_{(\iota,r)}} * \widehat{X_{\iota,r}}$$
$$= \left(R^0_{(i,r)} * \widehat{P^*_{(\iota,r)}}\right) * \left(1 + \frac{E_{x(i,r)} * \widehat{P^*_{\iota,r}}}{2}\right)$$

Where,

$R^0_{(i,r)}$ = Benchmark export revenues (bilateral or total, valued at world prices)

(12) $$\Delta CS_{(i,v)} = \left(\sum_r R^0_{(i,v),r} * T^0_{(i,v),r}\right) * \left(0.5E_{M(i,v)}\widehat{P^2_{(\iota,v)}} * sign\left(\widehat{P_{(\iota,v)}}\right) - \widehat{P_{(\iota,v)}}\right.$$

With:

$$\widehat{P_{(\iota,v)}} = \sum_{r} \theta_{(i,v),r}\, \widehat{P_r^*} + \widehat{T_{(\iota,v),r}}$$

Trade creation and diversion

Based on the defined system and the respective equations, the results of the GSIM model can be categorised into trade creation or trade diversion. Trade creation is the result of tariff reductions, while trade diversion is the result of tariff changes on imports from third countries (Francois and Hall, 2002). Equation (13) depicts trade creation and equation (14) defines trade diversion:

(13) $TC_{(i,v),r} = M_{(i,v),r} * (N_{(i,v),(r,r)} \widehat{T_{(\iota,v),r}}$

(14) $TD_{(i,v),r} = M_{(i,v),r} * \sum_{s \neq r} N_{(i,v),(r,s)}\, \widehat{T_{(\iota,v),s}}$

5.2.1 Data

Overall, the data availability on iron ore trade is fairly abundant and easily accessible. The primary source of iron ore trade data comes from trade associations including United Nations (UN) Comtrade. The UN Comtrade Commodity Trade Statistics division provides iron ore import and export statistics on a country basis. For the majority of the specified countries, the available trade data is from the year 2018. With regard to LDCs trade data limitations were more strongly felt. Given LDCs are not a specified region, the UN's list of LDCs (2018) was used to identify the countries that constitute to that list. The trade flows between LDCs and the remaining specified countries were derived from the UN Comtrade database by summing the import and export valuations in the given year. Similar issues were faced in trade data gathering for the RoW and intra-EU27 trade. In order to calculate the iron ore trade values for the RoW, the respective trade values had to be subtracted from the global total iron ore trade value, which was derived from Deloitte (2019). For intra-EU27 trade, the iron ore trade values for all the EU member states, except the UK, had to be derived from the UN Comtrade database and summed up. The UK's iron ore trade values were also retrieved from UN Comtrade. These calculations were necessary and ensured that trade between the EU27, UK, Australia, New Zealand, China, Brazil, US, LDCs, and the RoW not to be counted twice.

Non-tariff measure estimation and tariff data

The NTMs estimation data for iron ore for the EU27, Australia, and the remaining specified countries required under the GSIM model are based on the UNCTAD TRAINS database and secondary literature. The UNCTAD TRAINS database provides detailed information on NTMs and NTBs on a country and product-specific basis. Additionally, in order to accurately estimate the NTMs for iron ore, further secondary research was conducted. The NTMs utilized for the GSIM are primarily based on the findings of Ecorys (2009a) and Berden and Francois (2015). In their study, Ecorys (2009a) quantifies NTMs for various products for the EU and US with regard to the EU-US trade relationship and estimates NTMs of 11.9% for the steel and metals sector, for which iron ore is one of the major input materials. As steel and metals are highly dependent on iron ore, and many of the same trade barriers apply (e.g. production methods and standards, transport barriers), one is able to assume similar NTMs and NTBs between the products. In addition to their findings, Berden and Francois (2015) also estimate NTMs of 11.9% for the steel and metals sector. Both studies assess the impact of NTMs alignment between the EU and US under

further trade agreements and estimate a NTMs reduction of 15% as a consequence. Based on the findings in the aforementioned secondary literature, the GSIM model used for this study will also apply a NTMs rate of 11.9% on iron ore imports, which will be reduced by 15% to a NTMs rate of approximately 10% under the EU-Australia FTA. With regards to intra-country and intra-regional trade, e.g. within the EU27, a reduced NTMs rate of 5.95% was assumed based on the UNCTAD TRAINS database. The NTMs are not estimated to be zero – even within country – as iron ore imports still face testing, inspecting, labelling and content requirements throughout all the specified countries. Intra-RoW NTMs are assumed to be higher, at the original NTMs estimate of 11.9%, as the RoW grouping contains different countries with different standards and regulations and because many of the RoW countries have not implemented trade agreements and thus face higher NTMs and NTBs for iron ore.

The tariffs for iron ore imports and exports for the specified countries under this model are also based on the World Integrated Trade Solutions (WITS) database, more specifically the WITS UNCTAD TRAINS database. The WITS database provides tariff data for specific imports on a country basis as of 2018. According to the gathered data, the specified countries under the GSIM model currently do not have tariffs on iron ore imports. Brazil is the exception and according to WITS the country has an import tariff on iron ore of 2%. As such, the tariff input variable required under the GSIM model is kept at 0% and thus is not required to be reduced with the introduction of the EU-Australia FTA. The same applies to Brazil as the country will not alter its tariff structure under the FTA and will remain at tariffs of 2%.

Demand, supply and substitution elasticities

The values for the iron ore supply, demand and substitution elasticities have been estimated on the basis on secondary research and literature. Firstly, Fernandez (2018) provides demand elasticities for various for mineral commodities, including aluminium and steel, for several different countries. As aluminium and steel require large amounts of iron ore as an input material one is able to assume similar elasticities between aluminium, steel and iron ore. According to the paper of Fernandez (2018), Australia has a demand elasticity of -0.179, the UK of -0.416, Brazil of -0.414, the US of -0.306, whereas the remaining countries or regions (the EU27, New Zealand, China, LDCs and the RoW) are estimated to fall within the instrumental variable estimation of the world consumption function of -0.3.

With regards to the elasticities of supply and substitution for iron ore scarce literature is available. As a result, the elasticities of supply and substitution have been standardized with an elasticity of supply of 0.8 and an elasticity of substitution of 4. Mathiesen and Mæstad (2004) estimate an elasticity of supply for steel at a range of approximately 0.5 to 2.0 in their study. Maasoumi, Prowse and Slottje (2002) also show similar findings and estimate the supply elasticity of steel slightly higher at 0.8 to 5.9. As with the previous estimates, steel requires iron ore as a major input material and thus it is possible to assume a similar range of supply elasticities for iron ore. As the estimated elasticity range represents quite a large gap, the supply elasticity of 0.8 was chosen for all the specified countries under the GSIM model as the value appears in both studies. Mathiesen and Mæstad (2004) also estimate substitution elasticities for iron and steel at a range of approximately 0.5 to 8 in their study. Hence, the middle value of 4 as the elasticity of substitution of iron ore was chosen for all the specified countries.

5.2.2 Specifications of the simulated GSIM scenario

The GSIM will model one scenario in which the introduction of an EU-Australia FTA will alter the iron ore industry's landscape. With the implementation of the FTA a marginal reduction in NTMs for iron ore trade is expected caused through an increase in trade alignment between the EU and Australia, and the respective industries that require iron ore as an input material. Iron ore tariffs are not reduced in this model, except for Brazil, as these are generally at zero percent already. The country specification in the GSIM model for this study is as follows: EU27, the UK, Australia, New Zealand, China, Brazil, the US, LDCs, and the RoW. The country choice is based on the main parties involved in the FTA negotiations and the major exporting and importing countries active in the iron ore industry. New Zealand was added for proximity reasons to Australia and because the country is currently also in simultaneous FTA negotiations with the EU. In light of the Brexit negotiations and the thereof resulting uncertainties, the UK was taken into account separately from the EU28. LDCs are included in this study as it is important for stakeholders and governments to analyse the potential impact of trade agreements on poorer regions and countries.

5.2.3 Required outputs generated under the GSIM model

Based on the inputs, the GSIM model generates various economic variables. Across the specified regions for this study the model simulates estimates of iron ore trade values, changes in bilateral trade flows, output change, price effects, supply and demand structure, and welfare. These economic variables are necessary for the analysis of the impacts of the EU-Australia FTA on each of the sustainability pillars. With the model's results on bilateral trade flows, welfare, prices, output, supply and demand structure we answer the question to which extent the FTA between the EU and Australia will affect the global supply and demand for iron ore, production and trade. As the GSIM also provides estimates on consumer and producer welfare, prices and revenues we address the social pillar and answer what the FTA will mean for the consumer and producers active in the iron ore industry. With the bilateral trade flows, output and price effects we can also conduct a causal chain analysis for analysing the potential human rights impacts in both the EU and Australia. Similarly, the environmental pillar requires the estimates of bilateral trade flows and output for a causal chain analysis to determine to what extent will there be an increase in vessel-related and iron ore-related emissions. The final pillar, the port logistics and infrastructure pillar, also requires the bilateral trade flow and output results of the GSIM model to evaluate the impact of changes in iron ore exports for ports in Australia.

5.3 The conversion approach from values to volumes

Within the methodologies of traditional trade and policy analysis and trade models an often-required data input variable is trade values. Both the CGE and GSIM are simulation models that require trade values in order to simulate the effects under a policy change or shock. For the objective of this study we need to bridge the gap from traditional trade analysis and trade models with transport economics in order to determine how trade effects materialise into quantities in ports. This issue is addressed by implementing a conversion approach. With regards to iron ore trade the conversion approach is straightforward as we are able to convert iron ore trade values

into iron ore trade volumes based on the iron ore price of approximately €59.5 per tonne according to the Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2018). With the ability to convert iron ore trade values into volumes, we can determine the effects of the EU-Australia FTA on overall changes in iron ore trade volumes and the capacity and logistics effects at iron ore export ports resulting thereof.

5.4 The qualitative analysis approach

In order to answer the main research question and the formulated sub-research questions, we supplement the quantitative analyses of this study under the CGE and GSIM model with a qualitative analysis. The qualitative analysis is primarily derived from causal chains from the quantitative analyses and also based on secondary literature including previous expert work, impact assessments, studies and industry reports. Table 8 shows the areas of research of this study which are covered by the CGE model, the GSIM model and the additional qualitative work under the multi-pronged approach.

The economics pillar of this study is analysed based on the results of the CGE model and the GSIM model. In order to answer how the EU-Australia FTA will impact the EU and Australia economically as well as how the FTA will impact the global demand, supply, production and trade for iron ore the CGE model simulates the effects on GDP, macro-exports and imports, total welfare, consumer price index (CPI), sector exports and output for the minerals industry. The GSIM model explicitly covers the effects on the iron ore industry with a focus on bilateral trade flows, total welfare, prices, supply and demand. The economic impact assessment does not require additional qualitative work as both models directly simulate the potential effects of the FTA.

The social pillar is based on the results of the CGE model, the GSIM model and additional qualitative work. To provide an in-depth understanding of what the EU-Australia FTA would imply for employment, producers and consumers in the iron ore industry, the impact analysis is complemented by qualitative work covering the current state of play of social aspects in terms of industry sales and service income, value-added, employment, wages and prices. The CGE model then provides insights into the effects on total welfare, CPI, employment structure and wages, while the GSIM adds results on detailed consumer and producer welfare effects, prices and revenues.

To analyse how the FTA will impact the most important human rights Australia and the EU are responsible are for we use the CGE model, the GSIM model and additional qualitative analysis. Similar as for the social pillar, the human rights pillar requires a qualitative analysis to identify the current state of play of the human rights framework and human rights record performance with a focus on the Human Development Index (HDI) and Freedom House Democracy Index. Based on previous studies, the most relevant human rights for the iron ore industry include the right to work, the right to an adequate standard of living, the right to a clean environment and general labour standards. The impact analysis follows causal chains from the quantitative results of the CGE model, which provides estimates on sector exports and output, CO_2 emissions and prices, and the GSIM model, which provides results on bilateral iron ore trade flows, output and prices.

The environmental pillar analysis is also based on all three methods: the CGE model, the GSIM model and a qualitative analysis. To determine to what extent there will be an increase in vessel-related and iron ore-related emissions, affecting the environment, the pillar requires a snapshot of the current environmental performance in the EU and Australia. The World Input-Output Database (WIOD) (2012) provides publications on environmental accounts specifically for the water transport and mining/ quarrying sector with a focus on GHG and non-GHG emission into the air. The environmental impact assessment the follows causal chains from the quantitative results of the CGE model, which provides estimates on CO_2 emissions under the FTA, and the GSIM model, which provides results on bilateral trade flows and output.

Finally, the port logistics and infrastructure pillar also requires a qualitative analysis in addition to the CGE and GSIM model results. To identify one main port of focus for the impact analysis, the major Australian iron ore export ports have to be screened and scoped based on their characteristics, e.g. their port authority (PA), active mining companies, total tonnage, commodity breakdown with a focus on iron ore, vessel movements and export destinations. The impact analysis of the port then follows causal chains from the quantitative results of the CGE model, which provides estimates on sector exports and output, and the GSIM model, which provides results on bilateral trade flows and output. Here, the conversion approach from iron ore values to volumes in applied to identify the effects on the port in terms of tonnage.

Table 8 shows that under the chosen multi-pronged approach the different methods reinforce and complement each other, making the total sum of analysis in this study stronger and more profound. Throughout the five areas of research the CGE model provides more general results, while the GSIM specifies the potential effects in more detail, e.g. under the social pillar in which the CGE model only estimates total welfare effects under the FTA, whereas the GSIM model clearly breaks down the welfare effects into consumer and producer effects. The same applies to the remaining pillars. Through the addition of the qualitative analysis section, the impact analysis becomes more accurate by introducing detailed background information.

Table 8: Areas of research under the multi-pronged approach

Areas of research	CGE model	GSIM model	Additional qualitative analysis
Economic How will the FTA between the EU and Australia affect the global supply and demand for iron ore, production and trade?	GDP, macro-exports & imports, welfare, sector CPI, sector exports, sector output	Bilateral trade flows, welfare, prices, output, supply and demand structure	n.a.
Social What will the FTA mean for the employment and producers active in the iron ore industry as well as for iron ore consumers?	Welfare, CPI, employment structure, wages	Consumer and producer welfare, prices, revenues	Current state of play of social aspects in the AUS and EU iron ore industry: sales and service income, value added, employment, wages, prices Derived from: TSIA of BKP Economic Advisors (2019 forthcoming), LSE's ex-ante impact assessment study (2017), labour market reports of the AUS Government, labour surveys by EUROSTAT and the Australian Bureau of Statistics
Human rights How will the FTA impact the most important human rights Australia and the EU are responsible for?	Sector exports, output, CO_2 emissions, prices	Bilateral trade flows, output, prices	Current state of play of HR framework in AUS and EU iron ore industry: snapshot of current HR ratifications and HR record performance (HDI score and Freedom House Democracy Index), scoping of most important HR frameworks relevant for the iron ore industry (right to work, right to an adequate standard of living, labour standards and the right to a clean environment) Derived from: TSIA of BKP Economic Advisors (2019 forthcoming) and LSE's ex-ante impact assessment study (2017)

Areas of research	CGE model	GSIM model	Additional qualitative analysis
Environmental To what extent will there be an increase in vessel-related and iron ore-related emissions, affecting the environment?	Macro-CO_2 emissions	Bilateral trade flows, output	Current state of play of environment in AUS and EU iron ore industry: WIOD environmental accounts on maritime- and iron ore related emissions into the air (GHG and non-GHG emissions) Derived from: TSIA of BKP Economic Advisors (2019 forthcoming) and LSE's ex-ante impact assessment study (2017), and data from the WIOD environmental accounts
Port logistics & infrastructure What will be the impact of changes in iron ore exports for ports in Australia and how should/could they cope?	Sector exports, sector output	Bilateral trade flows, output	Current state of play of iron ore export ports in AUS: scoping of major iron ore export ports and their characteristics (PA, active mining companies, total tonnage, commodity breakdown with a focus on iron ore, vessel movements and export destinations), choice of one port to identify impact of FTA Derived from: iron ore industry reports, publications from the Department of Infrastructure and Regional Development of the Australian Government and the Department of Jobs, Tourism, Science and Innovation of the Western Australian Government, as well as reports from the respective PAs and active mining companies

6. Impact results and analysis

For the following impact assessment, we employ a multi-pronged approach in order to answer the main and all the sub-research questions. To keep the structure of the impact analysis in line with the formulated research question, the following section does not report the results per method used but per focus point indicated in the main research question. That is why Section 6.1 covers the economic impacts, Section 6.2 assesses the social impacts, Section 6.3 analyses the potential human rights impacts, Section 6.4 studies the environmental impacts and Section 6.5 investigates the potential port infrastructure and logistics impacts under the EU-Australia FTA.

6.1 Economic impact analysis

The results of the economic modelling under the CGE model show that the introduction of the EU-Australia FTA has an overall positive effect on the EU27 and Australia. According to the CGE model results, the EU27 faces GDP increases of 0.1% under both scenarios, while Australia's GDP will grow only marginally. With regards to welfare both the EU27 and Australia will gain by €4.1 billion and €2.2 billion respectively under the ambitious scenario. The CGE model also projects an increase in total exports and imports of both parties. The total exports and imports of the EU27 are projected to grow by 0.1% under both scenarios while for Australia the total exports and imports grow by 0.7% and 1% respectively under the ambitious scenario. In terms of consumer prices, the CGE model forecasts a decrease of 0.1% for Australia under both scenarios, while prices in the EU27 will only increase by 0.1% under the ambitious scenario. Table 9 shows the overall economic CGE results under the potential EU-Australia FTA.

Table 9: Overall economic impact results under the CGE model

Economic variables	CGE results			
	Ambitious scenario		Conservative scenario	
	EU27	AUS	EU27	AUS
GDP (%)	0.1	0.0	0.1	0.0
Welfare (€ mln)	4,086	1,371	2,176	875
Total exports (%)	0.1	0.7	0.1	0.4
Total imports (%)	0.1	1.0	0.1	0.5
Total CPI (%)	0.1	-0.1	0.0	-0.1

Source: CGE results provided by DG Trade (2019)

Under the model's minerals sector, which includes the iron ore industry, the CGE model simulates positive bilateral export changes between the EU27 and Australia. Under the ambitious scenario of the model, the EU's minerals exports to Australia grow by 8.0%, while Australia only faces a marginal export increase of 0.2%. The output within the minerals sector of both parties will face negligible changes under the two scenarios. In terms of prices in the minerals sector, the CGE model estimates a marginal decrease of 0.1% in Australia under the ambitious scenario. Prices in the EU27's minerals sector remain unaffected. Table 10 includes an overview of the main economic results for the minerals sector under the CGE model.

Table 10: Main economic sector impact results under the CGE and GSIM model

Economic variables	CGE results				GSIM results	
	Ambitious scenario		Conservative scenario			
	EU27	AUS	EU27	AUS	EU27	AUS
Bilateral sector exports (%)	8.0	0.2	0.7	0.1	7.1	7.0
Sector output (%)	0.0	0.0	0.0	0.0	-0.0	0.0
Sector CPI (%)	0.0	-0.1	0.0	0.0	-0.0	0.0
Supply & demand (%)	n.a.	n.a.	n.a.	n.a.	0.0	0.0

Source: CGE results provided by DG Trade (2019), UN Comtrade (2018), author's own calculations

Although the CGE model simulates the global market equilibrium under two scenarios, we identify a linkage between the CGE model's minerals sector and the GSIM model's iron ore industry results. As the CGE model, the results of the GSIM model project positive effects for the EU27, Australia and the Australian iron ore industry under the FTA. In terms of bilateral iron ore trade flows, the GSIM model estimates a 7.0% increase for the EU27 and a 7.1% increase for Australia, which supports the findings of the increased bilateral sector exports under the CGE model's ambitious and conservative scenario. Concerning iron ore sector output the GSIM forecasts low and marginal changes – the EU27 reduces its iron ore output by 0.0% while Australia increases its output by 0.0%, similarly as in the CGE model. However, the sector output results under the CGE model are slightly higher as the results exist for the more general sector and thus include downstream industry demand. As the GSIM does not incorporate downstream effects, the model slightly underestimates these impacts. The prices of iron ore are marginally affected in the EU27, where the model forecasts a 0.0% decrease, while in Australia the prices for iron ore remain unchanged. These results are mirrored in the findings of the CGE model which projects no changes in prices except for a marginal decrease of 0.1% for Australia under the ambitious scenario. The GSIM model also provides insights into the new global iron ore supply and demand structure and throughout the specified countries, including the EU27 and Australia, the model predicts a limited change of 0.0%. See Table 10 for an overview of the main GSIM model results. After cross-validating the results on iron ore under the two methodologies, we observe that the GSIM model supports the main minerals sector findings of the CGE model.

Overall, the findings of the CGE and GSIM model predict similar effects for the iron ore industry under the EU-Australia FTA in terms of bilateral trade, output and prices. However, the GSIM model provides more in-depth insights into the effects as it focuses explicitly the iron ore industry. In terms of welfare, the model estimates positive welfare effects for the iron ore industry under the FTA – the EU27 faces an increase in welfare of €0.9 million and Australia experiences positive welfare effects of €1.5 million. The GSIM covers the total iron ore exports and imports of the specified countries within the model and predicts that the EU27 will decrease its iron ore exports by 0.6% while Australia will face a slight increase of 0.3%. The total iron ore imports of the EU27 and Australia are also projected to increase by 1.6% and 0.7% respectively.

In general, the increase in bilateral iron ore trade flows under the GSIM model is caused by the reduction of NTMs between the countries, making trade more attractive. As a result of the NTMs reduction in iron ore trade, the new bilateral trade values will increase as one can see in Table 11. A further important point of analysis

under the GSIM model is the trade creation and diversion effects caused by the FTA with a particular focus on the EU27, Australia, China and Brazil. Table 12 depicts that Australian exports to the EU27 will increase in light of Australian exports diverting away from China. Although, the decrease in Australian exports to China of 0.0% is marginal, the change illustrates a decrease in the Australian export dependency on China under the EU-Australia FTA. Furthermore, Brazil's iron ore exports to the EU27 are expected to decrease marginally of 0.0%, while the country's exports to the UK will also decrease by 0.2%. This shows that under the FTA the EU's dependency on iron ore imports originating from Brazil will decrease, causing a diversion of Brazil's exports from the EU27 to China, resulting in an increase of 0.0% in Brazil-China trade flows. Under the EU-Australia FTA, China and Brazil are expected to face slight decreases in their baseline iron ore import and export structure, while the EU and Australia are expected to increase their bilateral trade flows. Table 11 also clearly shows and supports the findings of the trade creation and diversion effects caused by the introduction of the FTA. The Australian iron exports to the EU27 will increase by a total of €381.8 million at the expense of Australian exports to China decreasing by €368.0 million. Brazil's exports to the EU27 fall by €95.4 million and will be diverted to China, causing an increase in bilateral trade flows of €112.2 million.

Table 11: Bilateral trade flow effects for the iron ore industry (€ million)

	EU27	UK	AUS	NZ	China	Brazil	US	LDC	ROW	Total
EU	+0.0	-33.7	0.3	0.0	1.8	0.0	2.8	0.0	23.5	**-5.4**
UK	-0.1	0.0	0.2	0.0	-0.0	-0.0	-0.0	-0.0	-0.0	**0.0**
AUS	**381.8**	**234.6**	0.0	-0.0	**-368.0**	-0.0	-0.0	0.0	-117.2	**131.2**
NZ	0.0	0.0	-0.0	0.0	0.1	0.0	0.0	0.0	0.0	**0.1**
China	-0.0	-0.0	-0.0	0.0	0.0	0.0	-0.0	0.0	-0.0	**0.0**
Brazil	**-95.4**	**-37.3**	-0.2	0.0	**112.2**	0.0	-0.6	0.0	9.9	**-11.5**
US	-0.2	-0.0	-0.1	0.0	0.4	0.0	0.0	0.0	-0.1	**0.0**
LDC	-4.9	-1.1	0.0	0.0	4.83	0.0	0.0	0.0	0.0	**-1.1**
ROW	-150.0	-72.3	-0.0	0.0	91.2	0.0	-0.9	0.0	101.8	**-30.3**
Total	**131.3**	**90.1**	**0.2**	**0.0**	**-157.6**	**0.0**	**1.3**	**0.0**	**17.8**	**83**

Source: UN Comtrade (2018), author's own calculations

Table 12: Changes in bilateral iron ore trade flows (%)

	EU27	UK	AUS	NZ	China	Brazil	US	LDC	ROW
EU27	0.0	-0.2	**7.1**	0.1	0.0	0.0	0.0	0.1	0.0
UK	-0.2	NA	**6.9**	NA	-0.2	-0.2	-0.2	-0.1	-0.2
AUS	**7.0**	**6.8**	NA	0.0	**0.0**	0.0	0.0	NA	0.0
NZ	NA	NA	0.0	NA	0.0	NA	NA	NA	NA
China	0.0	-0.2	0.0	NA	NA	0.0	0.0	0.0	0.0
Brazil	**0.0**	**-0.2**	0.0	NA	**0.0**	NA	0.0	NA	0.0
US	0.0	-0.2	0.0	0.0	0.0	0.0	NA	NA	0.0
LDC	0.0	-0.2	NA	NA	0.0	NA	NA	0.0	0.0
ROW	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: UN Comtrade (2018), author's own calculations

Overall, the slight decrease in trade values can be explained with various economic impacts caused through the introduction of the EU-Australia FTA, modelled by the GSIM. First, one can observe a slight decrease in iron ore prices in the EU27, whereas prices in the UK are likely to increase by 0.0%. In the remaining specified countries and regions, the prices for iron ore remain unchanged (see Table 13). Additionally,

iron ore output decreases marginally by approximately 0.0% in the EU27. Australia and the UK on the other hand marginally increase their output by 0.0% and 0.0% respectively. The majority of the remaining specified regions also slightly decreases its output (see Table 13). Based on these findings, one is able to say that overall the output in iron ore trading countries will not change largely with the introduction of an EU-Australia FTA.

Table 13: Change in producer price and output (%)

Country	Change in producer price (%)	Change in output (%)
EU27	**-0.0**	**-0.0**
UK	**0.0**	**0.0**
AUS	0.0	0.0
NZ	0.0	0.0
China	0.0	0.0
Brazil	0.0	0.0
US	0.0	0.0
LDC	0.0	0.0
ROW	0.0	0.0

Source: UN Comtrade (2018), author's own calculations

Finally, the GSIM provides a more detailed breakdown of the welfare effects under the GSIM. Table 14 shows that the welfare effects for the EU27, the UK and Australia are positive. All three parties are estimated to gain by €0.9 million, €0.6 million and €1.5 million respectively. The breakdown of the welfare effects into consumer and producer welfare effects will occur in the social impact analysis of this study. These positive welfare effects were to be expected as a reduction in NTMs under the FTA reduces overall time and capital spent in order to comply with customs processes, certification processes and general administrative activities. As such, one would expect an increase in overall iron ore demand. However, as Table 14 also indicates, the new demand for the mineral remains unchanged across all specified countries. With regards to Brazil's and China's welfare effects under the EU-Australia FTA, the impacts are expected to be negative for both countries. In light of trade diversion caused by the FTA, China is expected to face the largest welfare decrease of €1.2 million. Brazil on the other hand will also face a slight decrease in welfare of approximately €0.1 million.

Table 14: Welfare effects (€ million) and changes in iron ore demand and supply (%)

Country	Net welfare effects (€ million)	Changes in iron ore demand (%)	Changes in iron ore supply (%)
EU27	**0.9**	0.0	0.0
UK	**0.6**	0.0	0.0
AUS	**1.5**	0.0	0.0
NZ	0.0	0.0	0.0
China	**-1.2**	0.0	0.0
Brazil	**-0.1**	0.0	0.0
US	0.0	0.0	0.0
LDC	0.0	0.0	0.0
ROW	-0.2	0.0	0.0

Source: UN Comtrade (2018), author's own calculations

6.2 Social impact analysis

6.2.1 Current state of play of social aspects in the iron ore industry

This section covers the social impacts, with a focus on the iron ore industry, under the EU-Australia FTA. In order to analyse the impacts an overview of the current social state of play in the Australian and the EU's iron ore industry is provided. As mentioned before, the Australian metal ore mining industry, especially the iron ore industry, plays a vital role in the country's economic performance. According to the Australian Bureau of Statistics (2016), the sales and service income of the country's active iron ore miners and exporters amounted to €62.6 billion in 2014-2015, which represents a 12.6% drop compared to the previous year. The industry value-added of the industry in the same year accounted for approximately €41.0 billion – also representing a 20.7% decrease compared to 2013-2014. The total Australian metal ore mining industry employed a total of 65,035 people as of June 2014, out of which 29,306 were employed in iron ore mining. Compared to 2013-2014, this number decreased by 3.0%. The majority of the employees active in the iron ore industry are employed in Western Australia and in 2017, the Western Australian iron ore industry employed 53,221 people alone. In 2014, the total wages in the Australian mining industry amounted to €23.3 billion. According to the Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2018), the price for one tonne of iron ore as of May 2018 was approximately €59.5. Table 15 shows the key social figures of the Australian iron ore industry.

Table 15: Overview of the key social figures in the Australian iron ore industry

Figure	Australian iron ore industry (2014)
Sales and service income	€62.6 billion (2014)
Industry value added	€41.0 billion (2014)
Employment	65,035 people (2014), with 53,221 employees in WA
Mining industry total wages	€23.3 billion (2014)
Iron ore price	€59.5 per tonne (May 2018)

Source: Australian Bureau of Statistics (2016), Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2018), author's own calculations

Only limited data is available specifically concerning the EU's iron ore industry, however Eurostat (2019) provides comprehensive statistics and data for the EU's metal ore mining sector and the mining and quarrying industry. In 2016, the metal ore mining sector contributed €4.8 billion in value-added for the EU, which represents approximately 10% of the total mining and quarrying industry value-added – the lowest among the sectors contributing to the mining and quarrying industry. In the metal ores mining sector, the EU has roughly 400 active enterprises which employ approximately 47,700 people. In 2016, the average personnel costs per head in the mining and quarrying sector was at €43,100, totalling to approximately €21.7 billion. Eurostat (2016) states, that in 2009 the personnel costs in the metal ores mining sector was €1.4 billion with a total turnover of €5.9 billion. Table 16 shows the key social figures of the EU's metal ores mining industry.

Table 16: Overview of the key social figures in the EU's metal ore mining sector

Figure	EU's metal ore mining sector
Sales and service income	€5.9 billion (2009)
Industry value added	€3.2 billion (2016)
Employment	47,700 people (2016)

Figure	EU's metal ore mining sector
Mining industry total wages	€21.7 billion (2016)
Iron ore price	€59.5 per tonne (May 2018)

Source: Eurostat (2016 and 2019)

6.2.2 Potential social impacts

The potential social effects under the EU-Australia FTA are derived primarily from the economic results of the econometric models used (see Sections 5.1 and 5.2), which include estimates on main social aspects, including wages, employment, prices, iron ore consumers and producers. According to the results of the CGE model, the CPI in the minerals sector does not increase for both the EU27 and Australia under the conservative scenario. In the ambitious scenario, the CPI will decrease marginally in the EU27 and decrease by 0.1% for Australia. The CGE model also includes employment forecasts based on the respective industries. Under both scenarios, the EU27 is expected to face limited negative changes in the employment structure of the minerals industry. The Australian minerals sector is also expected to marginally decrease its structure in terms of skilled and unskilled labour. The CGE model also includes wage-level projections in the economies and estimates no change in wages for the EU27, while wages in Australia will increase by 0.3% and 0.2% respectively under the ambitious and conservative scenario. Table 17 provides a concise overview of the social impacts modelling results under the CGE model.

The GSIM model complements the findings of the CGE model by depicting similar results and providing additional results for the impacts of the FTA on iron ore consumers and producers. With regards to the CPI change under the FTA, the GSIM also depicts a marginal decrease of 0.0% for both EU27 and Australian iron ore consumers, similarly as in the CGE model. From an Australian producer perspective, the EU-Australia FTA is attractive. Under the FTA, Australian iron ore producers are expected to see an increase of €2.6 million in producer revenues, which is positive, but only marginally so (the €2.6 million represents an increase of 0.01% in revenues). Furthermore, Australian producer surplus is expected to increase by €1.5 million with the implementation of the FTA. For the EU27's iron ore producers, the effects of the FTA are slightly negative. The revenues of the EU's iron ore producers are expected to fall by approximately €0.2 million, which represents a decrease of 0.0%. The producer surplus of the EU's iron ore producers is also expected to decrease marginally, by approximately €0.1 million (see Table 17).

Consumers of iron ore in both the EU27 and Australia can expect marginal effects under the EU-Australia FTA. Consumer surplus for the EU27 is expected to increase by approximately €1.0 million, caused by a marginal decrease of 0.0% in iron ore prices. This has a value chain effect captured in the general equilibrium analysis. As such, total iron ore consumption by the steel, automotive and other sectors, will grow slightly by 0.0%. For Australian iron ore consuming sectors, the results seem similar to the EU27. Consumer surplus in Australia will grow marginally by €1,312.6, which is the result of a price decrease in iron ore of 0.0%. As such, same as for EU27 iron ore consumers, the total consumption of iron ore in Australia will increase marginally by 0.0%. Table 17 provides an overview of the main social impact results under the GSIM model.

Table 17: Main social impact results under the CGE and GSIM model

Social variables	CGE results				GSIM results	
	Ambitious scenario		Conservative scenario			
	EU27	AUS	EU27	AUS	EU27	AUS
CPI change in the minerals and iron ore sector (%)	-0.0	-0.1	0.0	0.0	-0.0	-0.0
Change in skilled labour in the minerals sector (%)	-0.0	-0.0	-0.0	0.0	n.a.	n.a.
Change in unskilled labour in the minerals sector (%)	-0.0	-0.0	-0.0	0.0	n.a.	n.a.
Change in total wages (%)	0.0	0.3	0.0	0.2	n.a.	n.a.
Change in iron ore producer revenues (€ mln)	n.a.	n.a.	n.a.	n.a.	-0.2	2.6
Change in iron ore producer revenues (%)	n.a.	n.a.	n.a.	n.a.	-0.0	0.0
Change in iron ore producer surplus (€ mln)	n.a.	n.a.	n.a.	n.a.	-0.1	1.5
Change in iron ore consumer surplus (€ mln)	n.a.	n.a.	n.a.	n.a.	1.0	0.0
Change in total iron ore consumption (%)	n.a.	n.a.	n.a.	n.a.	0.0	0.0

Source: CGE results provided by DG Trade (2019), UN Comtrade (2018), author's own calculations

6.3 Human rights impact analysis

6.3.1 Current human rights framework in Australia and the EU

This chapter covers the human rights impacts within the iron ore industry under the EU-Australia FTA. In order to analyse the impacts an overview of the current human rights framework in the Australian and the EU's iron ore industry has to be provided. This section will focus on and detail the core human rights ratifications in place in both the EU and Australia. Under the EU-Australia Partnership Framework, Australia is required to oblige, commit, safeguard and promote human rights (BKP Economic Advisors, 2019 forthcoming). As such, Australia has a high record on human rights and thus has committed to the majority of core international human rights treaties and International Labour Organisation (ILO) Conventions. There are various methods to measure the human rights performance of a country. According to the Freedom House Democracy Index (2019), Australia has an aggregate score of 98 points out of 100 points, indicating a high-level democracy and high protection of political and civil rights (Freedom House, 2019). Similar results are provided by the Human Development Index (HDI), which gives Australia a score of 0.939 points out of a total of 1.0 points, which is the third highest rank in the world (BKP Economic Advisors, 2019 forthcoming). Australia has such a high score due to its relatively high life expectancy, standard of living and education standards (United Nations Development Programme (UNDP), 2018 and BKP Economic Advisors, 2019 forthcoming).

The EU's human rights record performance differs from member state to member state, however under the EU Charter, especially the EU Charter of Fundamental Rights (CFR), all member states are required to oblige, commit, safeguard and promote human rights values and principles, and thus all EU member states have

ratified the core ILO Conventions (BKP Economic Advisors, 2019 forthcoming). The ratings of EU democracy levels according to Freedom House (2019) range from 72 to 100 points out of a total of 100 points, indicating a medium-high to high-level of democracy and high protection of political and civil rights throughout the EU (BKP Economic Advisors, 2019 forthcoming). With regards to UNDP's HDI, the EU member states rank highly in human development as a consequence of being required to commit to the EU CFR and the Lisbon Treaty. The majority of EU member states thus have high life expectancies, high standards of living and high education standards (BKP Economic Advisors, 2019 forthcoming).

Overall, both Australia and the EU have a strong human rights record and performance. However, both parties, as many other countries around the world, face several human rights challenges and issues that require special and constant attention. The issues include women's rights, rights of discrimination, labour rights of migrant workers, migrants and asylum seekers, rights of indigenous people (especially in the case of Australia) and several more (BKP Economic Advisors, 2019 forthcoming). In order to improve the current human rights situation, and the future human rights situation under the EU-Australia FTA, continuous supervision and the drive for improvement is required (BKP Economic Advisors, 2019 forthcoming). For the objective of this impact analysis, the human rights crucially important to the iron ore industry of Australia and the EU will be analysed. These human rights include the *right to work*, *the right to an adequate standard of living*, *labour standards* and *the right to a clean environment*. According to LSE Enterprise (2017) and BKP Economic Advisors (2019 forthcoming), these human rights are all expected to be impacted under a potential EU-Australia FTA.

6.3.2 Potential human rights impact

According to LSE Enterprise (2017) and BKP Economic Advisors (2019 forthcoming), the majority of human rights and trade and trade-related measures under the potential EU-Australia FTA stand in a cause-effect relationship to each other. This means that potential human rights impacts can be expected when the economic modelling, e.g. under a CGE or GSIM model, suggests changes in trade, output, emissions, welfare or tariff revenues. With regard to the iron ore industry, the trade and trade-related measures of interest under the FTA include: the liberalisation of tariffs for iron ore, the facilitation of trade and investment in the areas of energy and raw materials, the reduction of NTMs and NTBs to iron ore trade, and the inclusion of additional labour and environmental standards in the iron ore industry (BKP Economic Advisors, 2019 forthcoming).

Under the liberalisation of tariffs for iron ore the potentially affected human rights include *the right to work* [Art. 15 CFR, Art. 6 International Covenant on Economic Social and Cultural Rights (ICESCR), Art. 23 Universal Declaration of Human Rights (UDHR), Art. 11 Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), Art. 27 Convention on the Rights of Persons with Disabilities (CRPD) and Art. 5 Convention on the Elimination of All Forms of Racial Discrimination (CERD)], *the right to an adequate standard of living* [Art. 11 (ICESCR), Art. 27 Convention on the Rights of the Child (CRC), Art. 28 (CRPD) and Art. 25 (UDHR)], *and the right to a clean environment* [Art. 37 (CFR), Art. 14 (CEDAW), Art. 24 (CRC), Art. 25 (UDHR), Art. 12 (ICESCR)] (BKP Economic Advisors, 2019 forthcoming). Under the facilitation of trade and investment in the areas of energy and raw materials

the potentially affected human rights include: *right to an adequate standard of living* [Art. 11 (ICESCR), Art. 27 (CRC), Art. 28 (CRPD), Art. 25 (UDHR)] and *the right to a clean environment* [Art. 37 (CFR), Art. 14 (CEDAW), Art. 24 (CRC), Art. 25 (UDHR) and Art. 12 (ICESCR)] (BKP Economic Advisors, 2019 forthcoming).

Under the reduction of NTMs and NTBs to iron ore trade the potentially affected human rights include: *the right to an adequate standard of living* [Art. 11 (ICESCR), Art. 27 (CRC), Art. 28 (CRPD) and Art. 25 (UDHR)], *the right to a clean environment* [Art. 37 (CFR), Art. 14 (CEDAW), Art. 24 (CRC), Art. 25 (UDHR), Art. 12 (ICESCR)], and *the right to work* [Art. 15 (CFR), Art. 6 (ICESCR), Art. 23 (UDHR), Art. 11 (CEDAW), Art. 27 (CRPD) and Art. 5 (CERD)] (BKP Economic Advisors, 2019 forthcoming).

Under the inclusion of additional labour and environmental standards in the iron ore industry the potentially affected human rights include: *the right to a clean environment* [Art. 37 (CFR), Art. 14 (CEDAW), Art. 24 (CRC), Art. 25 (UDHR), Art. 12 (ICESCR)], RBC and CSR (UN Global Compact, UN Guiding Principles on Business and Human Rights, OECD Guidelines for Multinational Enterprises), and *labour rights* (prohibition of forced labour, elimination of discrimination at work, right to just and favourable working conditions, prohibition of child labour) (BKP Economic Advisors, 2019 forthcoming).

Overall, the EU-AUS FTA will directly but marginally affect the aforementioned human rights. To begin with, *the right to work* of the EU's and Australian iron ore workers will be directly impacted under the FTA. As the Australian iron ore sector output is expected to grow according to the GSIM results, indicating an increase in competitiveness, *the right to work* will be positively but marginally impacted. The EU's output on the other hand is projected to decrease slightly, slightly negatively affecting *the right to work* through a decrease in sector competitiveness and jobs. The CGE model results however suggest, that both the EU's and Australian minerals sector will face job losses under the FTA, which will negatively but negligibly impact *the right to work*. Through a decrease in employment numbers in both iron ore sectors, *the right to an adequate standard of living* will be indirectly and marginally impacted as less income will be available for previous iron ore workers (BKP Economic Advisors, 2019 forthcoming). The impacts on *the right to an adequate standard of living* are of a mixed nature, as from a more macro-economic perspective the prices and costs will reduce, causing increases in consumer welfare in both the EU and Australia, and improving the standards of living for the EU and Australian population. Additionally, in light of NTM and NTB reductions and alignment under the FTA the variety and quality of iron ore will improve, also positively impacting *the right to an adequate standard of living.* Furthermore, *the right to a clean environment* will be positively and indirectly influenced by the reduction and alignment of NTMs and NTBs, promoting and encouraging an increase in sharing of environmental goods and technologies (BKP Economic Advisors, 2019 forthcoming). In light of increased cooperation and trade liberalisation under the FTA, one can also expect direct but minor impacts on *the right to a clean environment* through an increase in cooperation in the research and development of sustainable and renewable energies. Improvements in the technology and its promotion will positively impact *the right to a clean environment* as well as *the right to an adequate standard of living.* However, the GSIM and CGE results indicate that under the FTA the emissions of the iron ore industry are expected to increase, which will impact *the right to a clean environment* negatively but marginally. Finally,

the introduction and inclusion of additional iron ore labour and environmental standards in domestic laws, the FTA will have a direct impact on *labour rights*, CSR and RBC policies of businesses, and *the right to a clean environment.* Through the introduction into national legislation, environmentally and socially friendly business practices and operations can be ensured (BKP Economic Advisors, 2019 forthcoming).

6.4 Environmental impact analysis

6.4.1 Current state of play maritime related emissions

In this section the impact of the EU-Australia FTA on Australian iron ore- and maritime related emission to the air is analysed. In order to do so, the current state of play of the iron ore- and maritime related emissions is provided. According to the WIOD (2012) data base, one is able to identify the emissions to the air by sector and pollutant. For the purpose of this study, the two sectors of interest of the Australian economy are the water transport sector and the mining and quarrying sector (see Table 18). The relevant emission types for this analysis include GHG and non-GHG emissions as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), nitrogen oxide (NO_x), sulphur oxide (SO_x), carbon monoxide (CO), non-methane volatile organic compound (NMVOC) and ammonia (NH_3).

As Table 18 shows, the largest emissions to the air within the Australian water transport sector is CO with 2,557.6 tonnes, followed by NO_x (921.3 tonnes), NMVOC (432.3 tonnes) and CO_2 (100.8 tonnes). However, these emissions only represent 0.4%, 0.5%, 0.3% and 0.2% of the respective total emissions under the respective emission types. For the mining and quarrying sector of Australia, which includes the iron ore industry, the largest emission to the air include CH_4 with a total of 6,006.9 tonnes, followed by NO_x (2,441.4 tonnes) and CO_2 (1,173.1 tonnes). Here, the percentage shares of the total emission are slightly higher: the CH_4 emissions in the mining and quarrying sector account for approximately 2.2%, while the CO_2 and NO_x emissions amount to 1.8% and 1.3% respectively.

Table 18: Australia's emissions into the air in tonnes (2012)

Emission type	Water transport	Percentage of total emissions (%)	Mining and Quarrying	Percentage of total emissions (%)
CO_2	100.8	0.2	1,173.1	1.8
CH_4	7.2	0.0	6,006.9	2.2
N_2O	22.6	0.1	5.2	0.0
NO_x	921.3	0.5	2,441.4	1.3
SO_x	19.6	0.1	159.0	0.7
CO	2,557.6	0.4	296.5	0.1
NMVOC	432.3	0.3	485.7	0.3
NH_3	0.4	0.0	10.4	0.0

Source: WIOD (2012)

The WIOD database does not provide environmental accounts specifically for the EU, however the environmental accounts for Germany are available. As Germany is a major importer and processer of iron ore, and thus represents a vital part in the EU-Australia iron ore trade structure, we take the WIOD environmental accounts of the

country and scale these numbers up to 100% for the EU as a whole. Germany is responsible for the bulk of the iron ore imports, in fact the country accounts for approximately 39.1% of the EU's total iron ore imports (excluding the UK's import share). In order to scale up the Germany's environmental accounts for the EU27 as a whole we multiply the data sets by a factor of 2.56 (=100/39.1).

Table 19 shows the EU27's emission into the air by emission type and by the region's water transport sector and mining and quarrying sector. As the table depicts, the largest emissions into the air in the EU27's water transport sector is NO_x with 144,802.8 tonnes, followed by SO_x with 75,152.2 tonnes and CO_2 with 7,028 tonnes. The NO_x and SO_x emissions represent large shares of the EU27's total emission – 9.4% and 15.1% respectively – while the CO_2 emissions represent approximately 0.9% of the region's total CO_2 emissions. For the mining and quarrying sector, the largest emission is CH_4 with 467,257 tonnes, followed by SO_x with 37,536.8 tonnes and NO_x with 13,241.5 tonnes. The CH_4 emissions caused by the mining and quarrying industry account for 21.5% of the total CH_4 emissions, while the SO_x and NO_x emissions respectively represent a total of 7.5% and 0.9% of the total emissions.

Table 19: The EU27's emissions into the air in tonnes (2012)

Emission type	Water transport	Percentage of total emissions (%)	Mining and Quarrying	Percentage of total emissions (%)
CO_2	7,028	0.9	12,811.2	1.6
CH_4	491.2	0.0	467,257	21.5
N_2O	153.3	0.1	327.2	0.2
NO_x	144,802.8	9.4	13,241.5	0.9
SO_x	75,152.2	15.1	37,536.8	7.5
CO	4,063.7	0.1	3,955.2	0.1
NMVOC	5,292.1	0.4	706	0.1
NH_3	288.9	0.1	71.1	0.0

Source: WIOD (2012)

6.4.2 Potential environmental impact

This section covers the quantitative impact assessment of the EU-Australia FTA on iron ore trade- and vessel-related emissions. In order to determine the increase in emissions under the FTA, the estimation will be calculated by multiplying the baseline emission values sourced from the WIOD data base with the potential trade and output growth values derived from the GSIM model. The calculations will be complemented by the CO_2 emission estimates under the CGE model.

As Table 20 shows, Australia is expected to face marginal increases in all emission types with the introduction of the EU-Australia FTA at an average trade growth of 6.9% and output growth of 0.0%. The emissions in the Australian water transport sector will increase with CO remaining the largest emission type with 2,734.1 tonnes. The second largest emission type after the introduction of the FTA is NO_x with 984.8 tonnes, while the third largest is NMVOC with 462.1 tonnes. The CO_2 emissions caused by the water transport sector increase to 107.7 tonnes. With regard to the Australian quarrying and mining industry, the emission estimates increase as well. The largest emission type within the sector remains with CH_4 emissions, causing 6,024.9 tonnes of emissions into the air. NO_x and CO_2 emissions remain the second

and third largest emission in the quarrying and mining industry with 2,448.8 tonnes and 1,176.6 tonnes respectively. Overall, in light of an increase in trade activity and output, the emissions in the Australian water transport and mining and quarrying sector will increase. The CGE model results show similar findings with regards to the FTA's impact on CO_2 emissions. The model incorporates the total CO_2 emission increases for all specified countries and regions and predicts that the total CO_2 emissions of Australia increase under both the ambitious and conservative scenario. The total carbon dioxide emissions are expected to increase by 0.1% and 0.3% respectively. The CGE calculations also provide a breakdown of CO_2 emissions by energy products (by coal, oil, gas and oil products). Australia is expected to face marginal increases of 0.1% in coal, gas and oil products while oil's CO_2 emissions will grow by 0.2%. In the ambitious scenario Australia will increase its emissions under gas to 0.9%, while the remaining CO_2 emission positions will all increase by 0.1% (see Table 21 and tables in Annex III). Thus, the EU-Australia FTA will entail marginal negative effects for the country's air emissions.

Table 20: Estimation of air emissions impact by type for Australia (tonnes)

Emission type	Baseline water transport	Baseline mining and quarrying	Average trade growth (%)	Output growth (%)	Estimation water transport GHG effect	Estimation mining and Quarrying GHG effect
CO_2	100.8	1,173.1	6.9	0.0	107.7	1,176.6
CH_4	7.2	6,006.9	6.9	0.0	7.7	6,024.9
N_2O	22.6	5.2	6.9	0.0	24.1	5.2
NO_x	921.3	2,441.4	6.9	0.0	984.8	2,448.8
SO_x	19.6	159.0	6.9	0.0	21.0	159.4
CO	2,557.6	296.5	6.9	0.0	2,734.1	297.4
NMVOC	432.3	485.7	6.9	0.0	462.1	487.2
NH_3	0.4	10.4	6.9	0.0	0.4	10.4

Source: WIOD (2012), author's own calculations

Table 21: CO_2 emission results under the CGE model (%)

GCO_2	EU	Australia
Ambitious scenario		
Coal	0.0	0.2
Oil	0.0	0.2
Gas	0.1	0.9
Oil products	0.0	0.2
Conservative scenario		
Coal	0.0	0.1
Oil	0.0	0.2
Gas	0.0	0.1
Oil products	0.0	0.1

Source: CGE results provided by DG Trade (2019)

Table 22 shows the estimation of air emissions by type for the EU27. As it depicts, the EU-Australia FTA will entail an increase in air emissions caused by the region's water transport sector. With the EU27's average trade growth rate of 6.9%, which is derived from the GSIM, the EU27's largest emission type after the implementation of the FTA remains with NO_x, emitting approximately 154,794.1 tonnes into the air. The second largest emitter is SO_x with 80,337.7 tonnes, while CO_2 will cause roughly

7,512.8 tonnes of emissions. With regard to the EU27's mining and quarrying sector, the emission estimates are expected to be lower than the baseline values due to the overall decrease of approximately 0.0% in iron ore output in the EU27. However, as the output decrease is marginal, CH_4 remains the largest emission type with 462,584 tonnes. The second largest emission under the FTA will remain with the SO_x emissions in the mining and quarrying sector, causing approximately 37,161.4 tonnes. The decrease in the output also slightly decreases the NO_x and CO_2 emissions to 13,109.1 tonnes and 12,683.1 tonnes respectively. Overall, in light of an increase in trade activity the emissions in the EU27's water transport sector will increase. The reduction in iron ore output will slightly decrease the air emissions in the EU's mining and quarrying sector. The CGE results support the findings of the GSIM model. For the EU27, the carbon dioxide emissions are projected to grow by 0.0% under the conservative scenario and by 0.1% under the ambitious scenario. The CGE calculations also provide a breakdown of CO_2 emissions by energy products (by coal, oil, gas and oil products). Table 21 provides an overview of the CO_2 emission results under the CGE model. The EU27's CO_2 emissions will not be affected under conservative scenario while under the ambitious scenario, only the CO_2 emissions under gas will increase by 0.1% (see Table 21 and tables in Annex III). Thus, the EU-Australia FTA will entail slightly negative effects for the EU's air emissions.

Table 22: Estimation of air emissions impact by type for the EU27 (tonnes)

Emission type	Baseline water transport	Baseline mining and quarrying	Average trade growth (%)	Output growth (%)	Estimation water transport GHG effect	Estimation mining and quarrying GHG effect
CO_2	7,028	12,811.2	6.9	-0.0	7,512.8	12,683.1
CH_4	491.2	467,257	6.9	-0.0	525.1	462,584.5
N_2O	153.3	327.2	6.9	-0.0	163.9	323.9
NO_x	144,802.8	13,241.5	6.9	-0.0	154,794.1	13,109.1
SO_x	75,152.2	37,536.8	6.9	-0.0	80,337.7	37,161.4
CO	4,063.7	3,955.2	6.9	-0.0	4,344.1	3,915.6
NMVOC	5,292.1	706	6.9	-0.0	5,657.3	699
NH_3	288.9	71.1	6.9	-0.0	308.8	70.3

Source: WIOD (2012), author's own calculations

Figure 9: International Maritime Organisation (IMO) 2020 Sulphur guidelines

The environmental impact analysis shows that EU-Australia FTA entails a marginally negative impact on GHG and non-GHG emissions. However, the EU-Australia FTA negotiations are currently occurring at the same time as various environmental policy measures, the most important for the maritime industry being the IMO2020 Sulphur guidelines. The IMO2020 reform is aimed at reducing the overall air emissions and pollution caused by shipping. Under IMO2020, which will come in force by the 1st January 2020, the current global sulphur cap of 3.5% will be reduced to 0.5%, limiting the global SOx emissions drastically, which "[…] will improve the air quality and protect the environment" (IMO, 2019).

As of the January 2020, shipowners have to comply with this reform and thus are required to adapt their current maritime operations accordingly. There are several compliance options available for shipowners, including the use of alternative fuels (e.g. liquified natural gas, liquified petroleum gas or other sulphur free fuels), the installation of exhaust gas cleaning systems (scrubbers), or the use of marine gas oil or low sulphur oil (IMO, 2019). These options have their respective benefits and drawbacks, but their main objective remains the same: the improvement of the air quality and the protection of the environment. As such, the increase in usage of cleaner and alternative fuels and the thereof decrease in

GHG emissions into the air, could lead the transport industry into a low-carbon future with increased energy efficiency. The IMO2020 supports the IMO2050 reform, which is aimed at reducing the total annual GHG emission by 50% by 2050 (IMO, 2019). The IMO2020 initiative thus is a crucially important measure that helps the EU-Australia FTA in becoming environmentally friendlier and cleaner. As such, the emission projections under the environmental impact analysis of this study can be expected to be lower than calculated in light of the IMO2020.

6.5 Port and logistics impact analysis

6.5.1 Current state of play of major Australian iron ore export ports

In this section the impact of the EU-Australia FTA on major Australian ports is analysed. As mentioned before, the three largest iron ore exporting ports in Australia are located in the Pilbara region and include Port Hedland, Cape Lambert and Dampier. Table 23 provides an overview of the three Australian ports and their major characteristics. As it depicts, Port Hedland is the largest bulk export port in Western Australia and also in the world with a total of approximately 519.3 million tonnes tonnage in 2017-2018. The export-import structure shows that the port is focused entirely on exporting bulk commodities, especially iron ore (98.3% of the exports). The Pilbara Ports Authority granted the use of the port to three major miners: FMG, BHP Billiton and Atlas iron which own the majority of assets on the port. These assets include 15 berths, 13 ship loaders, 13 car dumpers, various water- and landside equipment and most importantly a well-developed rail network and tracks connecting the port to the companies' mines in the hinterland. To satisfy the iron ore demand in the market, the miners are required to constantly grow their iron ore sales by maintaining and improving their port, marine and landside infrastructure. Thus, periodic investments into port upgrades for capacity increases are required (Pilbara Ports Authority, 2018 and Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019).

Cape Lambert, officially known as Port Walcott, is the second largest bulk export port in Australia, however the gap in terms of annual tonnage between Port Hedland and Cape Lambert is immense. In 2017-2018, Cape Lambert handled a total tonnage of roughly 182 million tonnes, 64.9% less than Port Hedland. As Port Hedland, Cape Lambert is an export-oriented port with 95.3% of its shipments comprising of iron ore. Interestingly, the vessel movements at Cape Lambert are slightly higher, indicating that the port handles smaller bulk carriers compared to Port Hedland. Robe Riving Mining Company, a subsidiary of Rio Tinto, is the sole and exclusive operator at Cape Lambert and operates eight berths, five car dumpers, four ship loaders, various water- and landside equipment and most importantly, as at Port Hedland, a well-developed and connected rail network. The most recent investment into the port was initiated in the third quarter of 2019 aimed at refurbishing and upgrading the port (overall operational site, dolphins and jetties) (Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019 and Rio Tinto, 2018 and 2019a).

Cape Lambert is closely followed by Dampier, the third largest bulk exporting port. Dampier handled a total tonnage of 177.3 million tonnes in 2017-2018, out of which 176.3 million tonnes were exports. Out of these 176.3 million tonnes 82.6% was iron ore, 12.6% was liquified natural gas (LNG), 2.1% was salt and 2.7% were other bulk commodities. With 9,583 vessel movements in 2017-2018, Dampier has the largest

amount of vessel movements out of all the three ports, indicating that primarily small ships berth at the port. Similar as at Cape Lambert, Rio Tinto is the sole operator of the port and handles five berths, three car dumpers, three ship loaders, various additional important operational equipment, and most importantly, as all the others aforementioned ports, rail tracks connecting the iron ore mines to the port. In 2018, Dampier announced that by 2020, the port will undergo several port upgrades worth approximately €62.3 million to increase the overall efficiency and handling capacity (Pilbara Ports Authority, 2018, Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019 and Rio Tinto, 2018 and 2019a).

Table 23: Overview of major iron ore exporting ports in Australia (2017-2018)

Ports	Annual tonnage (mt)	Total exports (mt)	Total imports (mt)	Commodity breakdown of exports	Vessel movements	Port Authority	Port operators	Owned assets of operators	Major investment projects
Port Hedland	519.3	517.7	1.7	98.3% iron ore, 0.7% lithium, 0.7% salt, 0.3% other	6,221	Port Hedland Port Authority (Pilbara Ports Authority)	FMG, BHP Billiton and Atlas Iron	15 berths, 13 ship loaders, 13 car dumpers, rail tracks, conveyors, stockpiles, screenhouses, warehouses, marine facilities	Standard port, marine and landside infrastructure maintenance and upgrades
Cape Lambert (Port Walcott)	182	180.7	1.3	95.3% iron ore, 2.2% salt, 2.5% other	6,480	Port Walcott Port Authority	Robe River Mining Company (owned by Rio Tinto)	8 berths, 5 car dumpers, 9 stackers, 6 reclaimers, 4 ship loaders, rail tracks, conveyors, stockpiles, screenhouses, warehouses, marine facilities	Port upgrades, refurbishments and maintenance works of site, dolphins and jetties beginning Q3 2019
Dampier	177.3	176.3	1.0	82.6% iron ore, 12.6% LNG, 2.1% salt, 2.7% other	9,583	Dampier Port Authority (Pilbara Ports Authority)	Rio Tinto	5 berths, 3 car dumpers, 7 stackers, 6 reclaimers, 3 ship loaders, rail tracks, conveyors, stockpiles, screenhouses, warehouses, marine facilities	Port upgrades and refurbishments beginning in 2020 for €62.3 million

Source: Pilbara Ports Authority (2018), Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2019), Rio Tinto (2018 and 2019a)

6.5.2 Expected impacts in volume terms

As covered in the economic impact assessment of this study, the EU-Australia FTA entails several effects on bilateral iron ore trade between the EU and Australia. As Table 12 depicts, bilateral iron ore trade flows from Australia to the EU increase by 7.0% while the EU's iron ore exports to Australia grow by 7.1%. Table 12 also shows that as a consequence of the FTA, Australian exports will divert away from China while the EU's dependency on Brazil's iron ore exports will also decrease. Table 11 presents these trade flow changes in values and illustrates that Australian exports to the EU increases by approximately €381.8 million while the exports to China decrease by €368 million. Under the FTA, Brazil's iron ore exports to the EU fall by €95.4 million while the exports to China increase by €112.2 million.

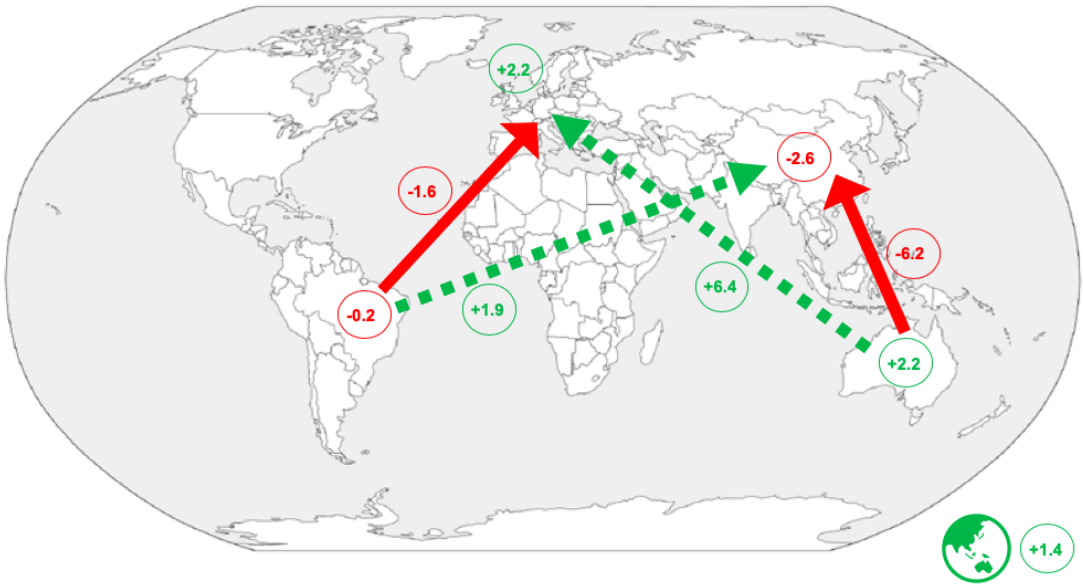
In terms of overall tonnage trade, similar patterns are observed. Table 24 shows the effects of the EU-Australia FTA on iron ore tonnage trade. Australian iron ore exports to the EU increase by 6.4 million tonnes, which are diverted away from China at an expense of 6.2 million tonnes. Overall, the Australian iron ore exports will increase by 2.2 million tonnes under the FTA, while the country's iron ore imports do not change. The increase in the EU's iron ore exports to Australia are marginal and negligible. The total tonnage of the EU's exports decreases by approximately 0.1 million tonnes while the imports increase by 2.2 million. As a result of the FTA, the EU's iron ore imports from Brazil reduce by 1.6 million tonnes, decreasing Brazil's total exports by 0.2 million tonnes. Under the trade agreement, Brazil diverts 1.9 million tonnes of its exports to China, although China's total imports decrease by 2.6 million tonnes. The globally traded iron ore tonnage increases marginally by 1.4 million tonnes under the EU-Australia FTA. Figure 10 provides an overview of the main changes in iron ore tonnage trade in which the green dotted lines represent an increase and the red solid lines a decrease.

Table 24: Bilateral trade flow effects for the iron ore industry (million tonnes)

	EU27	UK	AUS	NZ	China	Brazil	US	LDC	ROW	Total
EU	0.0	-0.6	**0.0**	0.0	0.0	0.0	0.0	0.0	0.4	**-0.1**
UK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AUS	**6.4**	3.9	0.0	0.0	**-6.2**	0.0	0.0	0.0	-2.0	**2.2**
NZ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
China	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brazil	**-1.6**	-0.6	0.0	0.0	**1.9**	0.0	0.0	0.0	0.2	**-0.2**
US	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LDC	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
ROW	-2.5	-1.2	0.0	0.0	1.5	0.0	0.0	0.0	1.7	-0.5
Total	**2.2**	1.5	0.0	0.0	**-2.6**	0.0	0.0	0.0	0.3	**1.4**

Source: UN Comtrade (2018), author's own calculations

Figure 10: Main changes in iron ore tonnage trade (million tonnes)



Source: Author's own creation based on author's own calculations under UN Comtrade (2018)

6.5.3 Expected impacts on the Western-Australian ports

The bilateral trade increases of the EU and Australia of 7.1% and 7% respectively (see Table 12), amount to a total increase in iron ore tonnage trade of approximately 2.2 million tonnes for Australia and 2.1 million tonnes for the EU (see Section 6.5.2). According to the Government of Western Australia, Department of Mines, Industry Regulation and Safety (2018), the 29 active iron ore mines in Australia sold 826 million tonnes of iron ore in 2017-2018. Under the CGE and GSIM model results output under the EU-Australia FTA is expected to increase marginally by 0.0% and 0.0% respectively. Based on the CGE model's output estimates of the minerals sector, the Australian iron ore sector increases its output to 850.8 million tonnes under both scenarios. As the GSIM model focuses solely on the iron ore industry, unlike the CGE model, the new output estimates are slightly lower at 828.5 million tonnes. Based on the findings of the GSIM model, we can predict a marginal iron ore output increase of approximately 2.5 million tonnes as a consequence of the EU-Australia FTA. Table 25 details the changes in the total iron ore production under the CGE and GSIM model. The increase in traded tonnage between the EU and Australia and the increase in total iron ore production in Australia support the previous findings of occurring trade diversion, primarily from China.

Table 25: Changes in the total iron ore production in Australia

CGE output results		GSIM output results (%)	Total production under CGE output results (mln tonnes)		Total production under GSIM output results (mln tonnes)
Ambitious scenario (%)	Ambitious scenario (%)		Ambitious scenario	Conservative scenario	
0.0	0.0	0.0	850.8	850.8	828.5

Source: CGE results provided by DG Trade (2019), UN Comtrade (2018), author's own calculations

Out of the 826 million tonnes of iron ore that were exported in 2017-2018, Port Hedland accounted for the largest share of exports with 61.6% and approximately 508.9 million tonnes. The second largest share in exports was Dampier with 20.8% and 172.2 million tonnes. Dampier is closely followed by Cape Lambert with a total of 145.6 million tonnes, which represents roughly 17.6% of the total iron ore exports. The three major Australian iron ore export ports have a very similar export destination structure with their largest destination being Asia. For Port Hedland the major export destinations include China (83%), Japan (8%), South Korea (6%), Taiwan (2%) and the RoW (1%). Dampier also exports primarily to China (80%), Japan (6%), South Korea (5%), Taiwan (5%) and the EU (4%). Cape Lambert's main export destination also includes China (84%), Japan (11%) and South Korea (5%) (Pilbara Ports Authority, 2018, Government of Western Australia, Department of Jobs, Tourism, Science and Innovation, 2019 and Rio Tinto, 2018 and 2019a).

6.5.4 Expected impacts on Dampier

This section will focus on the port and logistics impacts under the EU-Australia FTA by specifically focussing on Dampier. For the purpose of a comprehensive analysis the Dampier port is suitable as it has the largest share of iron ore exports to the EU and the port is solely operated by one mining company, Rio Tinto, which provides the ability of more accurate and extensive information and data with regards to the port and its operations and logistics network. As Rio Tinto is also the largest active miner in the region, the company is the most probable to satisfy the increase in iron ore demand in the EU by increasing its production. Furthermore, as the port is the smallest of the three identified ports, the effects under the FTA will be more prevalent for the Port of Dampier as the scale of impact will be larger compared to the already large Port Hedland. Finally, as Dampier already has large upgrade and extension plans for 2020, including the impacts of the EU-Australia FTA into those investment projects could give a boost to the port's competitiveness. As such, especially for Dampier it would be important to pro-actively look at the potential effects of the EU-Australia FTA, and its projected effects and include these potential impacts and changes in its future infrastructure plans in order to remain or even become a stronger and more competitive bulk and iron ore export port in Australia.

With the introduction of the EU-Australia FTA, Australian exports to the EU are expected to go up by 7% while EU exports to Australia would increase by 7.1%. This amounts to 6.4 million tonnes and 5,022.9 tonnes respectively. Because Dampier's market share in iron ore exports to the EU is approximately 21% (Pilbara Ports Authority, 2018), this means potentially the increase in tonnage of iron ore exports to the EU going through Dampier, could be 1.3 million tonnes. With the average deadweight size of the vessels in Dampier being approximately 183,569.5 tonnes (Pilbara Ports Authority, 2018), the port can expect an increase in seven to eight port calls per year in order to cope with the 1.3 million tonnes tonnage increase. The port will thus face an increase in port calls and vessel movements, both requiring higher cargo handling capabilities, higher cargo handling efficiency with larger cargo storage capabilities.

Additionally, the GSIM model predicts an iron ore output increase of 2.5 million tonnes under the FTA. The effects of the EU-Australia FTA on the iron ore producers can be projected directly onto the Port of Dampier as both the miners and the port are dependent on each other along their highly vertically integrated supply chains. Out of

2.5 million tonnes, approximately 2.2 million tonnes are shipped to the EU via the three major export ports. As Dampier, accounts for a market share of 21% in exports to the EU, the port can expect an output increase of roughly 462,000 tonnes. Increases in output and capacity of the miners translates into higher activity and capacity requirements at the port. As the miners have to ship the mined iron ore via rail to the port, an increase in rail transport frequency and cargo size requires Dampier to improve its rail logistics network in order to remain efficient. As Dampier is a primary exporter to the EU and in light of these potential impacts, the port is expected to face positive effects in on its position as the primary iron ore export port, which will strengthen largely under the EU-Australia FTA, increasing its attractiveness over Port Hedland and Cape Lambert.

6.5.5 Strategic and managerial recommendations for Dampier

Increases in the output and trade of iron ore at Dampier requires increases in capacity and efficiency in cargo handling capabilities at the port in order to remain competitive. Figure 11 shows the current set up of Dampier, with the East Intercourse Island and Parker Point being the designated iron ore terminals and Mistaken Island as the salt terminal. The managerial and investment recommendations for Dampier will focus solely on the port's two iron ore terminals.

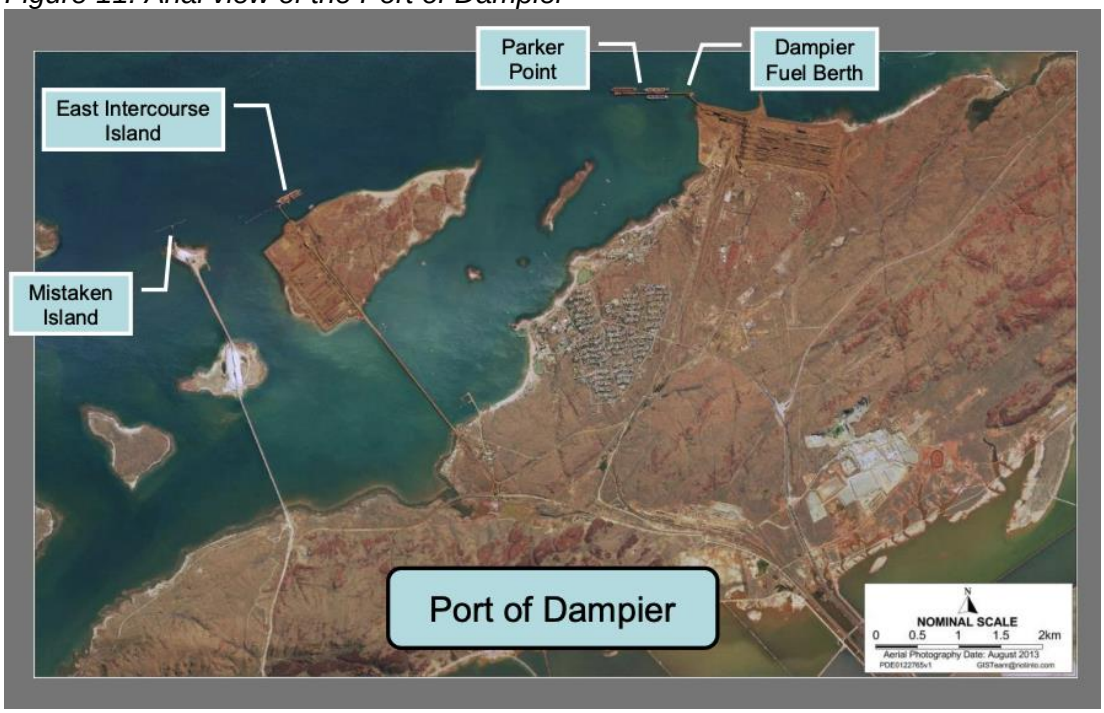
With its current infrastructure and logistics set up, Dampier will face several challenges in coping with the increase in vessel port calls and export tonnage increases. East Intercourse Island currently holds one berth and a lay-in berth (see Figure 12), and in light of an increase of seven to eight ship calls per year and the 1.3 million tonnes of exports going through the port, an transformation of the lay-in berth to an actual berth or an extension of the wharf for additional berthing capabilities would be highly attractive for the port to berth more vessels. As the East Intercourse Island is quite large in size, building additional wharfs and maximising the available land would serve as an attractive additional option for Dampier and Rio Tinto to handle the additional seven to eight vessels. Extensions to the already existing wharf and the construction of a new one, would also require investments into new and improved jetties, conveyer belt systems, mooring dolphins and ship loaders. Figures 13 and 14 show the current infrastructure at the Parker Point in the Port of Dampier, which contains four more additional berths and one designated fuel berth. Similar as in the case of the East Intercourse Island, the Port of Dampier and Rio Tinto have to consider the extension and renewal of the current wharf in order to cope with the increase in vessels and iron ore tonnage. However, in the case of Parker Point, the land use is already maximised, making it somewhat impossible to construct additional wharfs.

Due to draught issues, the loading and unloading points for bulker vessels has to be further away from the coast. Thus, as in the case of East Intercourse Island and Parker Point, the geographical position of the islands is crucially important in deciding where to build new wharfs. As one can see in Figure 11 two more islands have the ability to serve iron ore terminals. In the case of still existing draught issues for these two islands, the Port of Dampier and Rio Tinto have to consider dredging options in order to extend either East Intercourse Island or Parker Point.

Figure 15 shows the current rail network connecting Rio Tinto's iron ore mines in the hinterland with the Port of Dampier. In light of the iron ore output increases of 462,000

tonnes more iron ore will be transported from the mines to Dampier. In the case of maximum utilisation of the rail network, Rio Tinto has to consider expanding or constructing new rail lines, while the Port of Dampier is required to adapt to these changes. This includes investments into Dampier's infrastructure corridor, which includes an increase in the number of car dumpers, transfer stations, stockyards, stackers, conveyer belt systems and warehouses to handle the influx of more iron ore.

Figure 11: Arial view of the Port of Dampier

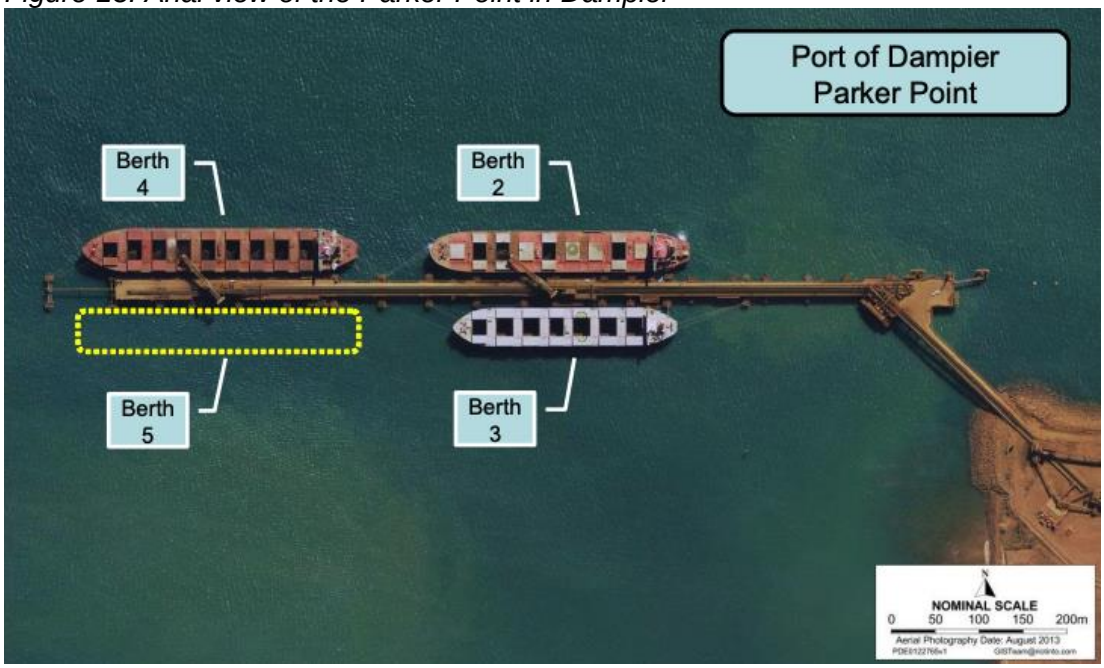


Source: Rio Tinto (2019)

Figure 12: Arial view of the East Intercourse Island in Dampier

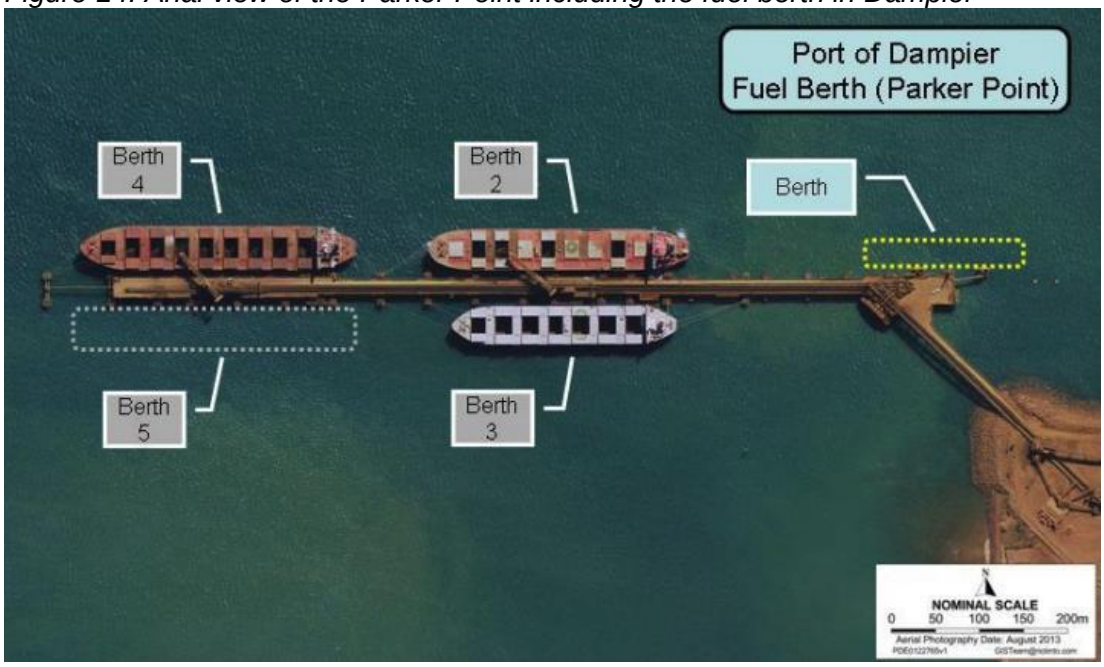
Source: Rio Tinto (2019)

Figure 13: Arial view of the Parker Point in Dampier



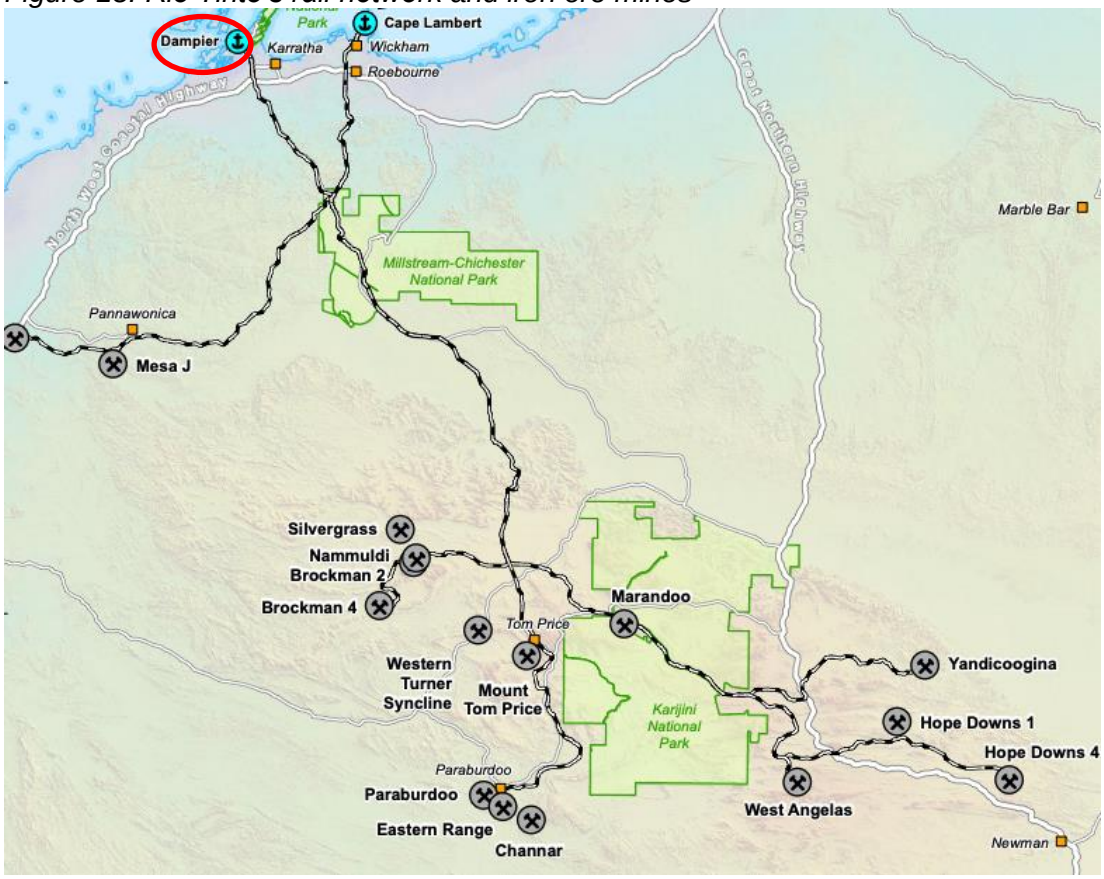
Source: Rio Tinto (2019)

Figure 14: Arial view of the Parker Point including the fuel berth in Dampier



Source: Rio Tinto (2019)

Figure 15: Rio Tinto's rail network and iron ore mines



Source: Rio Tinto (2018)

7. Conclusions

Main findings

The aim of this study was to answer the main research question of how the EU-Australia FTA will impact trade, society, human rights, environment and port infrastructure and logistics with a clear focus on Australia's iron ore industry. The idea behind the question is that under a potential FTA, a reduction in NTMs, NTBs and additional trade barriers will have an impact on Australia's iron ore industry, one of the largest sectors and exports of the country. In order to provide a comprehensive impact analysis of the FTA, not only the economic impacts were analysed, but also the effects on the society, human rights, environment and Australian ports were included. As such, the main research question was subdivided into six sub-research questions.

First, the multi-pronged approach proved itself as the best methodological approach to cover the both the iron industry in particular and global and intersectoral interlinkages. The CGE model, complemented by the GSIM model and additional qualitative work provided the ability to analyse the implications of the EU-Australia FTA more comprehensively and holistically. The general nature of the CGE model in combination with the sector specificity of the GSIM model and the in-depth qualitative analysis allowed the elimination of the weaknesses of the respective methods.

Second, the most relevant and crucial pillar of analysis is the economic impact of the EU-Australia FTA on the iron ore industry. The findings of the CGE and GSIM suggest that under the FTA both the EU27 and Australia will face marginal positive effects. The bilateral iron ore trade between both parties will increase under the expense of trade diversion effects reducing the EU27's iron ore imports from Brazil and reducing the Australian iron ore exports to China. Overall, the iron ore industry of the EU27 and Australia will experience positive net welfare effects under the FTA.

Third, as an FTA will not only encompass economic effects, the social impact of the EU-Australia FTA had to be included as a second pillar of analysis. The third research question was formulated in order to identify the effects of the FTA on iron ore producers and consumers, sector employment, wages and prices in both Australia and the EU. The CGE and GSIM model, with the addition of a qualitative analysis, identified sector specific wage and employment effects, which indicate that the EU27's iron ore producers will face limited negative welfare effects, whereas the Australian producers will benefit slightly under the FTA. The iron ore consumers in both parties will benefit marginally under the agreement in terms of welfare effects and prices.

Fourth, a change in trade policies will entail effects on ratified human rights. Thus, it is of crucial importance to include a human rights pillar of analysis to determine potential weaknesses in the current framework within the iron ore industry. The sub-research question was added to complete the standardized structure of a TSIA and thus relies on a qualitative analysis based on secondary literature. The research indicates that human rights impacts are to be expected in light of economic effects on trade, output, wages, welfare or tariff revenues, as human rights and trade and trade-related measures stand in a cause-effect relationship. An FTA will entail the liberalisation of tariffs, NTMs and NTBs, the facilitation of trade and investment, as well as the introduction of additional labour and environmental standards in the iron

ore industry. Thus, with the implementation of the FTA limited positive are to be expected with regards to *the right to an adequate standard of living* and *labour standards,* and marginal negative impacts on *the right to work* and *the right to a clean environment.*

Fifth, as a consequence of increased iron ore trade flows between the EU27 and Australia the fifth sub-research question was formulated in order to project and estimate the potential increases in vessel-related emissions. As an additional section to the environmental pillar of analysis the emission estimates of the mining and quarrying sector of both parties were included. The estimates are based on the findings under the GSIM model which are multiplied with the respective estimates from the WIOD (2012) environmental accounts and then complemented by the CGE model's CO_2 emission estimates. Under the FTA, the vessel-related emissions to the air of both Australia and the EU27 will slightly increase as a result from an increase in iron ore trade. The largest vessel-related emission type to the air for the Australian water transport sector is CO, while for the EU27 it is NO_x. The quarrying and mining sectors of both parties will also face a marginal increase in emissions to the air under the FTA.

The final pillar of analysis that was required for this study is defined by the sixth sub-research question and deals with the Australian port and logistics impact. To satisfy the sub-research question, one Australian iron ore export port had to be chosen based on a qualitative and tabular screening approach. Dampier suited the impact analysis well due to its size, its sole operator structure and as it serves as one of the main iron ore export ports to the EU. The expected impacts on Dampier are derived from the GSIM results and indicate that the port will face positive impacts. Due to the increase in Australian iron ore tonnage trade going through the port and total output, Dampier will face increases in capacity, vessel movements and port calls. As such, the port is required to handle increases in cargo handling capacity, cargo handling efficiency and cargo storage capabilities from both the iron ore miners and vessels. Dampier is expected to face positive regional port competitiveness effects as it will remain and strengthen its attractive position as the primary iron ore export port for the EU under the FTA. The port is however required to initiate investment and expansion plans under the FTA.

Policy recommendations

For the respective pillars of analysis, we have formulated policy recommendations. These policy recommendations are drafted to support the FTA negotiations between the EU and Australia and are grouped based on the economic, social, human rights and environmental pillar within this study.

- **Economic policy recommendations:**
  From an economics perspective, the EU-Australia FTA is advantageous for both parties. The NTMs, NTBs and tariff liberalisation effects under the agreement cause significant impacts, especially for the iron ore industry. In order to enhance the economic effects under the FTA, both the EU and Australia should strive for further NTM and NTB reductions by aligning and reducing various testing, inspection and content requirements for iron ore imports. Additionally, to maximise the effects on small- and medium sized companies active in the iron ore industry, the EU and Australia should introduce a task force aimed at boosting the performance of such companies by explaining and promoting the benefits under

the FTA. As a further initiative to mitigate negative economic effects and ensure sustainable growth within the industry, the EU and Australia should implement an additional task force acting as a support and supervision unit that periodically conducts inclusive stakeholder surveys and studies to measure the effects of the FTA after its implementation. This will allow both parties to act and react proactively to any unforeseen and unexpected impacts (BKP Economic Advisors, 2019 forthcoming).

- **Social policy recommendations:**
  In order to reduce these negative effects and protect and support the employees, several measures and plans should be introduced by the Australian Government and the EU in cooperation with the iron ore industry. These measures include the implementation of dedicated unemployment support funds, the introduction of job training and career advice seminars, as well as the organisation of job fairs and workshops, and company diversification consulting programmes. With the introduction of these measures, new skills can be taught, creating the opportunity of new jobs in cooperating sectors. These programmes will help and aid workers in improving and increasing their skill set to maintain in the sector or start work in other industries/ sectors. To ensure further sustainable growth in the future, the companies active in the sector are required to introduce solid corporate social responsibility (CSR) and reasonable business conduct (RBC) practices in order to reduce issues including accidents at work, improve working conditions, and encourage environmentally friendly performance (BKP Economic Advisors, 2019 forthcoming).

- ***Human rights policy recommendations:***
  To minimise the negative effects on human rights under the EU-Australia FTA both the EU and Australia are recommended to implement several strategies. As the largest and most important human rights impact will be on *the right to work*, both governments should consider the creation of dedicated support funds to protect the iron ore workers, who are negatively affected by the FTA. The objective of such a fund is to provide specialised development programmes and trainings for these workers in order for them to find new employment within the industry or in other industries. In order for both parties to successfully implement the fund and oversee its process and development, it is also recommended to introduce a supervision and monitoring mechanism in form of a specialised unit, which conducts repeated human rights impact assessments within the sector (BKP Economic Advisors, 2019 forthcoming). The EU and Australia are also recommended to finalise and implement their additional iron ore labour and environmental standards into their domestic laws. Through completing this inclusion, the labour and environmental standards will become binding and all parties active within the sector are required to comply. As such, there will be a deep alignment of CSR and RBC initiatives into the business practices of all stakeholders, largely and positively impacting the aforementioned rights. This inclusion can also be effectively executed with the addition of a profound sustainable development chapter within the FTA negotiations. Here, Australia and the EU are also required to implement a supervisory unit ensuring that all the laws are followed and supported by the actors within the industry by conducted periodical surveys and due diligences (BKP Economic Advisors, 2019 forthcoming).

- ***Environmental policy recommendations:***
  The provided air emission estimates do not consider current or planned environmental legislations and policy reforms in the maritime industry or on a (supra-) national level. The most crucial environmental policy reform within the maritime industry includes the IMO2020 and IMO2050 reform. Both reforms are aimed at reducing the overall air emissions and pollution caused by shipping. On a supra-national level several initiatives and strategies have been introduced, e.g. the Paris Agreement and the United Nation's (UN) Sustainable Development Goals (SDGs). The Paris Agreement was signed in 2015 and aims to align various countries in combatting climate change in order to limit a global temperature rise below two degrees Celsius, however countries are able to join these efforts willingly by being a signee (United Nations Framework Convention on Climate Change, 2019). The same applies to the UN's SDGs, a strategic plan in which 17 goals were formulated to address and solve current global challenges by 2030, which can be followed by one's own volition (UN, 2019). In light of these reforms, if followed and supported by Australia and the EU, the air emission estimates caused within their shipping and iron ore industries might be lower. In order to achieve improved environmental accounts and reduce these negative externalities, both countries have to deeply align their policies and actions in accordance with IMO2020, IMO2050, the Paris Agreement and the UN's SDGs. All the active shipping companies, the ports, and the companies within the respective industries are required to follow these principles. If properly enforced by the governments, a great reduction in air emissions and overall environmentally unfriendly activities and operations can be achieved. The Paris Agreement and the UN's SDGs can be enforced more easily when transformed and included in EU and Australian national legislation and laws (BKP Economic Advisors, 2019 forthcoming).

Limitations and areas for further research

Overall, the chosen multi-pronged methodological approach suited this study particularly well and provided the ability to answer the main research and all the sub-research questions. The CGE model, complemented by the GSIM model and a qualitative analysis enabled the analysis of a future situation in the iron ore industry under an EU-Australia FTA. The CGE model's general nature in combination with the sector specificity of the GSIM model and the additional in-depth qualitative work extended the sphere of analysis, making it more comprehensive and holistic. However, it is important to note that the CGE and GSIM are models with their own limitations and constraints. Consequently, these model restrictions encourage areas for further research. First, as this study is of a holistic and comprehensive nature, the GSIM model entailed a one-scenario-simulation of the policy change under the FTA. For further research, it would be beneficial and interesting to simulate multiple scenarios with various sets of input data. The large range of modelled scenarios would provide the ability for an extensive comparative analysis which would increase the accuracy of the FTA impact estimations. Furthermore, the UK was separated from the EU28 in light of Brexit negotiations, however the impact of Brexit on the EU-Australia FTA was not the focus of this study. As Brexit poses a threat to the order of global trade an assessment of the impacts of Brexit on iron ore trade, in multiple scenarios, under the FTA would be a significant contribution to the already scarcely available EU-Australia FTA impact assessment literature.

Bibliography

Australian Bureau of Statistics (2016). *Mining Operations, Australia, 2014-15, Key Figures.* Available at: *https://www.abs.gov.au/ausstats/abs@.nsf/0/D96FCC4AEEA50923CA2568A90013940B?Opendocument*

APEC (2009). *Further Analytical Study on the Likely Economic Impact of an FTAAP*. (2009/CSOM/010). Singapore: APEC 2009 Singapore.

API (2018). *EU-ASEAN FTA Report*. (API Report No.2). London: Institute for Democracy and Economic Affairs.

Australian Government, Department of Foreign Affairs and Trade (2017). *Australia's Goods Trade with the European Union*. Canberra: Australian Government, Department of Foreign Affairs and Trade, Statistics Section, Office of Economic Analysis.

Australian Government, Department of Industry, Innovation and Science (2018). *Iron Ore – Resources and Energy Quarterly March 2018*. Canberra: Australian Government, Department of Industry, Innovation and Science.

Australian Government, The Treasury (2016). *Australia's Economic and Fiscal Outlook*. Available at: *https://treasury.gov.au/speech/australias-economic-and-fiscal-outlook*

Bacchetta, M, Beverelli, C, Fugazza, M, Grether, J, Helble, M, Nicita, A, Piermartini, R and Cadot, O (2012). *A Practical guide to trade policy analysis*. Geneva: World Trade Organization.

Banks, J, Carson, J, Nelson, B and Nicol, D M (2001). *Discrete-Event System Simulation*. (Vol. 5). Upper Saddle River: Prentice Hall.

Berden, K and Francois, J (2015). *Quantifying Non-Tariff Measures for TTIP*. (CEPS-CTR Project "TTIP in the Balance" Paper No. 12 and CEPS Special Report No. 116). Brussels: Centre for European Policy Studies.

BKP Economic Advisors (2019 forthcoming). *Trade Sustainability Impact Assessment in support of FTA negotiations between the European Union and Australia*. Brussels: European Commission.

Burfisher, M E (2011). *Introduction to Computable General Equilibrium Models*. Cambridge: Cambridge University Press.

Clingendael (2017). *Free Trade – Thematic Study Clingendael – Strategic Monitor 2017*. The Hague: The Clingendael Institute.

Delegation of the European Commission to Australia and the Australian Government of Foreign Affairs and Trade (2009). *European Union–Australia Partnership Framework A strategic partnership built on shared values and common ambition*. Yarralumla: Delegation of the European Commission to Australia.

Deloitte (2017). *Trade Compass™: Web-Based Service to Utilize FTAs*. Tokyo: Deloitte Touche Tohmatsu Limited.

Deloitte (2019). *Overview of the steel and iron ore market*. Moscow: Deloitte CIS Research Center.

DG For External Policies (2018). *Free Trade Agreement between the EU and the Republic of Singapore – Analysis*. Brussels: European Parliament, Policy Department.

DG Trade (2019). *CGE results provided by DG Trade for the preparation of the TSIAs of the EU-Australia FTA and EU-New Zealand FTA under BKP Economic Advisors*. Brussels: European Commission.

Ecorys (2009). *The impact of Free Trade Agreements in the OECD – The impact of an EU-US FTA, EU-Japan FTA and EU-Australia/New Zealand FTA*. Rotterdam: Ecorys Nederland BV.

Ecorys (2009a). *Non-Tariffs Measures in EU-US Trade and Investment – An Economic Analysis.* (OJ 2007/S 180-219493). Rotterdam: Ecorys Nederland BV.

Ecorys (2017). *SIA in support of the negotiations on a Transatlantic Trade and Investment Partnership (TTIP) – Final Report*. Brussels: European Commission, DG for Trade.

European Commission (2018). *EU-Australia Trade Agreement Launching trade negotiations with Australia*. Brussels: European Commission.

European Commission (2019). *Countries and regions – Australia*. Available at: *http://ec.europa.eu/trade/policy/countries-and-regions/countries/australia/*

European Commission, DG for Trade (2019). *European Union: Trade in goods with Australia*. Available at: *https://webgate.ec.europa.eu/isdb_results/factsheets/country/details_australia_en.pdf*

European Union External Action Service (2017). *The European Union and Australia sign Framework Agreement to deepen cooperation*. Available at: *https://eeas.europa.eu/headquarters/headquarters-homepage/30798/european-union-and-australia-sign-framework-agreement-deepen-cooperation_en*

Eurostat (2016). *Mining of metal ore statistics – NACE Rev. 2.* Available at: *https://ec.europa.eu/eurostat/statistics-explained/index.php/Archive:Mining_of_metal_ores_statistics_-_NACE_Rev._2*

Eurostat (2019). *Mining and quarrying statistics – NACE Rev. 2*. Available at: *https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mining_and_quarrying_statistics_-_NACE_Rev._2#Structural_profile*

Fernandez, V (2018). “Price and income elasticity of demand for mineral commodities”. *Resources Policy*, vol. 59, issue C, pp 160-183.

Francois, J and Hall, H K (2002). *Global Simulation Analysis of Industry-Level Trade Policy*. New York: World Integrated Trade Solutions (WITS).
Freedom House (2019). *Freedom in the World Countries*. Available at: https://freedomhouse.org/report/countries-world-freedom-2019

Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2018). *Western Australia Iron ore Profile – June 2018*. Perth: Government of Western Australia, Department of Jobs, Tourism, Science and Innovation.

Government of Western Australia, Department of Jobs, Tourism, Science and Innovation (2019). *Western Australia Iron ore Profile – February 2019*. Perth: Government of Western Australia, Department of Jobs, Tourism, Science and Innovation.

Government of Western Australia, Department of Mines, Industry Regulation and Safety (2017). *Iron Ore – A look at Western Australia*. Available at: *http://www.dmp.wa.gov.au/Investors/Iron-Ore-1482.aspx*

Government of Western Australia, Department of Mines, Industry Regulation and Safety (2018). *Western Australia Mineral and Petroleum Statistics Digest: 2017-18*. Perth: Government of Western Australia, Department of Mines, Industry Regulation and Safety.

Grumiller, J, Raza, W, Staritz, C, Tröster, B, von Arnim, R and Grohs, H (2018). *The economic and social effects of the EU Free Trade Agreement with Vietnam*. Vienna: Austrian Foundation for Development Research.

IMO (2019). *Low carbon shipping and air pollution control*. Available at: *http://www.imo.org/en/MediaCentre/HotTopics/GHG/Pages/default.aspx*

Kawasaki, K (2014). *The Relative Significance of EPAs in Asia-Pacific*. (RIETI Discussion Paper Series 14-E-000). Tokyo: The Research Institute of Economy, Trade and Industry.

Kim, S, Park, I. and Park, S (2013). “A Free Trade Area of the Asia Pacific (FTAAP): Is It Desirable?”. *Journal of East Asian Economic Integration*, vol. 17, No 1, pp 3-25.

Lee, H and Itakura, K (2014). *TPP, RCEP, and Japan’s Agricultural Policy Reforms*. (OSIPP Discussion Paper Series, DP-2014-E-003). Osaka: Osaka School of International Public Policy.

Lofgren, H, Harris, R L, Robinson, S, Thomas, M and El-Said, M (2002). *A Standard Computable General Equilibrium (CGE) Model in GAMS*. Washington D.C.: International Food and Policy Research Institute.

LSE (2015). *Trade Sustainability Impact Assessment of the Free Trade Agreement between the European Union and Japan —final report*. Brussels: European Commission.

LSE (2017). *Ex-ante study of the EU- Australia and EU-New Zealand trade and investment agreements - final report*. Brussels: European Commission.

Maasoumi, E, Prowse, S D and Slottje, D J (2002). *Measuring Market Power in the Steel Industry.* Dallas: Southern Methodist University and KPMG LLP.

Mathiesen, L and Mæstad, O (2004). "Climate Policy and the Steel Industry: Achieving Global Emission Reductions by an Incomplete Climate Agreement". *The Energy Journal,* vol. 25, No 4, pp 91-114.

Parliament of the Commonwealth of Australia (2006). *Review of Australia-New Zealand Trade and Investment Relations*. Available at: *https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Completed_Inquiries/jfadt/nz_cer/report/chapter1*

Petri, P A and Plummer, M G (2016). *The Economic Effects of the Trans-Pacific Partnership: New Estimates*. (Working Paper Series 16-2). Washington: Peterson Institute for International Economics.

Pilbara Ports Authority (2018). *Pilbara Ports Authority*. Available at: *https://www.pilbaraports.com.au/*
Qi, C and Zhang, X (2017). "The economic impacts of the China-Australia Free Trade Agreement – A general equilibrium analysis". *China Economic Review*, No 47, pp 1-11.

Rio Tinto (2018). *Cape Lambert Port A Marine Structures Refurbishment Project*. (Environmental Review Document, Section 38 Referall). London: Rio Tinto.

Rio Tinto (2019). *Ports*. Available at*: https://www.riotinto.com/australia/pilbara/ports-9754.aspx*

Rio Tinto (2019a). *Port Handbook – Dampier and Port Walcott*. London: Rio Tinto.

Schüler, D, Degreif, S, Dolega, P, Hay, D, Manhart, A and Buchert, M (2017). *EU raw material import flows – acknowledging non-EU environmental and social footprints*. (Strategic Dialogue on Sustainable Raw Materials for Europe (STRADE) No. 02/2017). Freiburg: Oeko-Institut eV.

UN Comtrade (2018). *UN Comtrade data base*. Available at: *https://comtrade.un.org/db/dqBasicQueryResults.aspx?px=H1&cc=26&r=36&y=2018*

United Nations Development Programme (2018). *Australia – Human Development Indicators*. Available at: *http://hdr.undp.org/en/countries/profiles/AUS*

United Nations Framework Convention on Climate Change (2019). *The Paris Agreement*. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

UN (2018). *List of Least Developed Countries (as of December 2018).* Available at: https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf

UN (2019). *About the Sustainable Development Goals*. Available at: https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Walmsley, T, Strutt, A, Minor, P and Rae, A (2018). *Impacts of the Comprehensive and Progressive Agreement for Trans- Pacific Partnership on the New Zealand Economy – A Dynamic Computable General Equilibrium Analysis*. Boulder: ImpactEcon.

Walras, L (1874). *Elements of Pure Economics or the Theory of Social Wealth*. Abingdon: Routledge.

Wing, I S (2004). *Computable General Equilibrium Models and Their Use in Economy-Wide Policy Analysis*. (Technical Note No. 6 of the MIT Joint Program on the Science and Policy of Global Change). Cambridge: Massachusetts Institute of Technology.

WTO (2019). *What is the WTO?*. Available at: https://www.wto.org/english/thewto_e/whatis_e/whatis_e.htm

WTO Secretariat (2019). *Evolution of Regional Trade Agreements in the world, 1948-2019*. Available at: https://www.wto.org/english/tratop_e/region_e/region_e.htm

Annexes

I. Annex I: GSIM model results

Table I.1: New trade quantities (€)

	EU27	UK	AUS	NZ	China	Brazil	US	LDC	ROW
EU27	2,242,609.5	167,709,287.5	35,246.7	827.3	34,649,883.7	1,410.0	68,763,674.0	67,131.7	510,414,048.8
UK	598,485.5	0.0	30,914.4	0.0	122,329.3	515.7	63,782.5	66,432.6	35,463.3
AUS	51,886,687.9	32,803,355.8	0.0	127,529.4	31,611,394,890.0	740.1	1,778,055.0	0.0	6,806,306,438.7
NZ	0.0	0.0	21,877.6	0.0	103,956,411.5	0.0	0.0	0.0	0.0
China	169,344.6	4,231.7	125,374.1	0.0	0.0	822.8	55,287.8	3,457.4	334,801,472.1
Brazil	2,857,312,475.1	145,836,760.2	15,157,039.8	0.0	13,777,260,736.5	0.0	244,378,205.4	0.0	3,883,802,240.6
US	5,322,744.4	61,927.3	2,790,871.0	3,760.7	74,473,281.6	1,072.7	0.0	0.0	695,778,673.4
LDC	199,564,049.1	4,544,948.0	0.0	0.0	280,928,130.9	0.0	0.0	39,146.4	90,555.4
ROW	4,238,147,065.6	280,329,357.6	1,821,862.5	1,924.7	14,813,168,455.3	3,719.1	201,941,441.8	49,300.9	178,576,867,012.5

Source: UN Comtrade (2018), author's own calculations

Table I.2: Change in bilateral trade flows (%)

	EU27	UK	AUS	NZ	China	Brazil	US	LDC	ROW
EU27	0.0	-0.2	7.1	0.1	0.0	0.0	0.0	0.1	0.0
UK	-0.2	NA	6.9	NA	-0.2	-0.2	-0.2	-0.1	-0.2
AUS	7.0	6.8	NA	0.0	0.0	0.0	0.0	NA	0.0
NZ	NA	NA	0.0	NA	0.0	NA	NA	NA	NA
China	0.0	-0.2	0.0	NA	NA	0.0	0.0	0.0	0.0
Brazil	0.0	-0.2	0.0	NA	0.0	NA	0.0	NA	0.0
US	0.0	-0.2	0.0	0.0	0.0	0.0	NA	NA	0.0
LDC	0.0	-0.2	NA	NA	0.0	NA	NA	0.0	0.0
ROW	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: UN Comtrade (2018), author's own calculations

Table I.3: Change in output (%)

Country or region	Change in output (%)
EU27	-0.00826
UK	0.03395
Australia	0.00304
New Zealand	0.00080
China	-0.00003
Brazil	-0.00049
US	0.00000
LDC	-0.00211
ROW	-0.00014

Source: UN Comtrade (2018), author's own calculations

Table I.4: Effects on producers

Country or region	Change in producer price (%)	Change in FOB (or ex-factory) price (%)	Change in producer revenues (%)	Value of change in producer revenues (€)
EU27	-0.01	-0.01	-0.02	-145,668.9
UK	0.04	0.04	0.08	701.2
Australia	0.00	0.00	0.01	2,637,163.2
New Zealand	0.00	0.00	0.00	1,876.9
China	0.00	0.00	0.00	-249.9
Brazil	0.00	0.00	0.00	-231,383.1
US	0.00	0.00	0.00	22.2
LDC	0.00	0.00	0.00	-23,037.0
ROW	0.00	0.00	0.00	-608,391.0

Source: UN Comtrade (2018), author's own calculations

Table I.5: Effects on consumers

Country or region	Change in consumer price (%)	Change in total consumption (%)
EU27	-0.0120	0.02
UK	-0.0893	0.13
Australia	-0.0059	0.01
New Zealand	0.0036	0.00
China	0.0018	0.00
Brazil	0.0011	0.00
US	-0.0017	0.00
LDC	0.0091	-0.01
ROW	-0.0001	0.00

Source: UN Comtrade (2018), author's own calculations

Table I.6: Welfare effects

Country or region	Change in producer surplus (€)	Change in consumer surplus (€)	Net welfare effects (€)
EU27	-80,927.2	984,325.1	903,398.0
UK	389.5	620,997.8	621,387.3
Australia	1,465,090.7	1,312.6	1,466,403.2
New Zealand	1,042.7	-5.3	1,037.4
China	-138.8	-1,212,012.3	-1,212,151.1
Brazil	-128,546.2	-0.1	-128,546.3
US	12.3	9,901.4	9,913.7
LDC	-12,798.4	-22.6	-12,821.0
ROW	-337,995.0	136,872.9	-201,122.1

Source: UN Comtrade (2018), author's own calculations

II. Annex II: CGE methodology applied by BKP Economic Advisors

The following section describes the economic analysis approach used by BKP Economic Advisors (2019 forthcoming) for the preparation of the TSIA of the EU-Australia FTA for the EC. The methodological approach is copied from the final report of the TSIA.

"The starting point for the economic analysis in this report is the modelling (a Computable General Equilibrium (CGE) model) undertaken by the Commission (in the study supporting the impact assessment carried out by LSE Enterprise, 2017), which is an appropriate and accepted approach for analysis of trade agreements dealing with traditional issues of cross-border trade in goods and services. The economic variables for focus include trade flows (bilateral exports and imports; exports and imports to the rest of the world); investment; output; prices; welfare and GDP; and fiscal revenues. Further analysis, in subsequent reporting, will be based on the revised CGE simulation results from DG Trade. The analysis will also include a discussion on the limitations of the CGE results (e.g. pertaining to preference utilisation and not including innovation/dynamic FDI effects).

We will build on this analysis by providing a qualitative and, to the extent possible, quantitative, assessment of the main non-tariff measures (NTMs), investment and other behind-the-border issues of relevance to the EU-AUS FTA. These include:
Strict phytosanitary import regulations in Australia for fresh fruits and vegetables;
Australia's Electrical Equipment Safety System (EESS) that applies to the import of all electrical equipment and requires various testing, documentation and certification procedures, imposing direct and indirect costs on EU SMEs; and foreign investment above certain defined thresholds is subject to screening in Australia, which has become more complex over time, with additional screening mandated for sensitive sectors such as media, real estate, defence, telecommunications, air transport and airports, encryption and security.

Since these issues are addressed in quite some detail in the ex-ante study, the SIA will identify, describe and analyse the main remaining tariff barriers and NTMs affecting trade relations between the EU and Australia. The focus of this analysis will be qualitative, since a quantitative treatment would require an extension to the CGE modelling, which has not been requested, and the quantitative analysis already undertaken has largely exhausted the possibilities of the existing CGE model. We anticipate that information on NTMs will emerge primarily from stakeholder consultations and multilateral and bilateral monitoring (e.g., the WTO TPRM, EU Market Access Database, and also – if applicable to EU or AUS – the US Special 301 and other reports), as well as business surveys (including the surveys undertaken as part of this SIA). We will also pay attention to any NTMs in the area of Intellectual Property Rights.

We will complement this qualitative analysis by undertaking quantitative assessments of government procurement and investment liberalization under the EU-AUS FTA – given the appropriate legal frameworks in the EU and Australia (i.e. in the EU with respect to EU overall and EU Member State procurement, and in Australia with respect to the Australian federal as well as Australian State and Territory governments). We will do this by estimating structural gravity models of procurement and investment separately (see Boxes below), using data on public imports from the

World Input Output Database (WIOD; Timmer et al., 2015) over 2000-2014 and data on bilateral FDI from the OECD and UNCTAD over 2000-2017, respectively. The economic analysis will also describe the government procurement and FDI landscapes in the EU and Australia, including for major sectors, the important legislative requirements governing liberalization in each case, as well as the opportunities and challenges that EU SMEs will face in accessing Australia's procurement market at all levels, especially SMEs involved in the main sectors.

Box II.1: Gravity approaches to Foreign Direct Investment

We estimate a structural gravity model of bilateral FDI flows and stocks using data on inward FDI from the OECD over 2005-2017 for the following 36 OECD partners: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, UK and USA.

We use the Poisson Pseudo-Maximum Likelihood or the PPML estimator (Silvana and Tenreyro, 2006) to examine the effect of preferential investment liberalization in the EU-AUS FTA on the bilateral FDI flows and stocks. The PPML accounts for both the incidence of zero FDI flows and stocks and heteroskedasticity of the error term in estimation, leading to unbiased estimates. The estimating equations (1) and (2) take the following form:

$$FDI^{F}_{ijt} = \exp(\beta_0 + \beta_1 PIA_{ijt} + \beta_2 BIT_{ijt} + \lambda_{it} + \lambda_{jt} + \lambda_{ij}) + \mu_{ijt} \quad (1)$$

$$FDI^{S}_{ijt} = \exp(\beta_0 + \beta_1 PIA_{ijt} + \beta_2 BIT_{ijt} + \lambda_{it} + \lambda_{jt} + \lambda_{ij}) + \mu_{ijt} \quad (2)$$

where the dependent variables in the two equations are bilateral inward FDI flows and stocks in country i from country j at time t in € million; PIA_{ijt} is a binary dummy indicating membership of a trade agreement with provisions on investment between two FDI partners; BIT_{ijt} is a binary dummy indicating membership of a bilateral investment treaty between two FDI partners; and μ_{ijt} is the error term. We include three-way fixed effects (λ_{it}, λ_{jt}, λ_{ij}) to account for multilateral resistance (for instance see Anderson & Yotov, 2012) as well as endogeneity (for instance see Baier & Bergstrand, 2007; Baier et al. 2014) in estimation.

Box II.2: Gravity approaches to Public Procurement

We use the Poisson Pseudo-Maximum Likelihood or the PPML estimator (Silvana and Tenreyro, 2006) to examine the effect of preferential procurement liberalization in the EU-AUS FTA on bilateral procurement. The PPML accounts for both zero trade flows and heteroskedasticity of the error term in estimation, leading to unbiased estimates. The estimating equation (3) takes the following form:

$$M^{G}_{ijt} = \exp(\beta_0 + \beta_1 GPA_{ijt} + \beta_2 PPA_{ijt} + \lambda_{it} + \lambda_{jt} + \lambda_{ij}) + \mu_{ijt} \quad (3)$$

where the dependent variable is public imports in country j from country i at time t in € million; GPA_{ijt} is a binary dummy indicating membership of the GPA; PPA_{ijt} is a binary dummy indicating membership of trade agreements with provisions on government procurement; and μ_{ijt} is the error term. We include three-way fixed effects (λ_{it}, λ_{jt}, λ_{ij}) to account for multilateral resistance (for instance see Anderson & Yotov, 2012) as well as endogeneity (for instance see Baier & Bergstrand, 2007; Baier et al. 2014) in estimation.

On rules of origin (RoO), the economic analysis will include an overview of RoO practices in Australia, highlighting whether there have been any recent RoO violations (issues with certificates/fraud and verification issues), thereby providing an assessment of the capacity to administer RoO. Complementary information will be

collected through interviews with stakeholders, notably customs and traders. A focus will be put on SMEs, both in the EU and Australia, regarding their experience with RoOs, in order to identify options for a simplified RoO regime for SMEs in the EU-AUS FTA.

The assessment of the impact of the EU-AUS FTA on SMEs will be based on:
The investigation, study and interpretation of the project results on implications of legal uncertainty for SMEs in case dispute resolution is needed; and
The "SME test" reflecting the "think small first principle" suggested in the ToR and described in the Better Regulation Guidelines. The analysis will focus on identifying the sectors where SMEs could be more strongly impacted by the EU-AUS FTA.

With respect to global value chain (GVC) integration, the analysis will use the OECD-WTO Trade in Value Added (TiVA) database to establish the current positions of Australia in GVCs, and particularly in value chains involving EU firms. We will also identify the characteristics in terms of (i) the sectors in which GVCs play a particular role for Australia; (ii) the role which Australian and EU firms play in value chains involving both partners, i.e. whether they are value chain organizers or participants in value chains organized by third parties; (iii) the importance of backwards and forwards linkages and the position of FTA partner firms in the chain; and (iv) the potential contribution which the FTA may have on the strengthening Australia's participation in GVCs. We will then estimate the effect of preferential liberalization in the EU-AUS FTA on bilateral backward and foreign participation by estimating a structural gravity model using TiVA data from the OECD over 2000-2011. We will also complement these quantitative estimates with a qualitative analysis. This will be based on information provided by private sector organizations to identify important sectors from a GVC-participation perspective and to identify options on how the FTA could facilitate GVC involvement, such as through a focus on intermediates or business services which are important for GVC development.

Geographically, the effects of the EU-AUS FTA will be determined for the following regions/countries: Australia; the EU; the EU Outermost Regions; Turkey; and LDCs. To the extent possible, the analysis of effects will be quantitative, using CGE results and statistical analysis of the main trade links and changes in tariffs.

In assessing the effects of the EU-AUS FTA on the EU's Outermost Regions, as well as on LDCs, we will add value to existing studies by (i) looking at the PACER Plus group in more detail; and (ii) analysing the impact on the EU's outermost regions for the first time at all. The methodology involved will entail a sector-disaggregated analysis. In a first step, the economic modelling results will be used to determine the sectors in the EU and Australia that would benefit (or lose out) from the FTA in terms of increased (or decreased) bilateral exports, total exports and output. In a second step, a matching analysis will be undertaken to examine the extent to which the most affected sectors in the two partner countries are also export sectors in LDCs/outermost regions (to either Australia or the EU). If there is competition, then LDC/outermost region sectors could be negatively affected through preference erosion and/or increased competitive pressure on third markets. The effects will be determined qualitatively, distinguishing, if applicable, the countries or regions, which might be positively or negatively affected by the EU-AUS FTA" (BKP Economic Advisors, 2019 forthcoming).

III. Annex III: CGE results provided by DG Trade

Table III.1: Impact of the EU-Australia FTA on GDP (%)

Country	Ambitious scenario	Conservative scenario
EU	0.0	0.0
UK	0.0	0.0
Australia	0.2	0.1
New Zealand	0.5	0.3
Turkey	0.0	0.0
USA	0.0	0,0
Canada	0.0	0.0
Japan	0.0	0.0
Korea	0.0	0.0
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	0.0	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.1	-0.1
LDC	0.0	0.0
China	0.0	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.2: Impact of the EU-Australia FTA on value of GDP (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.1
UK	0.1	0.0
Australia	0.0	0.0
New Zealand	0.6	0.3
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	0.0	0.0
Korea	-0.1	-0.1
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	-0.1	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.3	-0.1
LDC	0.0	0.0
China	0.0	0.0
Hong Kong	0.0	0.0

Country	Ambitious scenario	Conservative scenario
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.3: Impact of the EU-Australia FTA on overall welfare (€)

Country	Ambitious scenario	Conservative scenario
EU	4,086	2,176
UK	961	444
Australia	1,371	875
New Zealand	567	381
Turkey	6,7	-1,9
USA	-445	-232
Canada	-7	-5
Japan	-217	-206
Korea	-418	-305
EFTA	-55	-18
EU FTAS	-203	-120
ASEAN	-752	-380
ASEAN TPP	-88	-32
Vietnam	-20	-16
Pacific	-83	-39
LDC	-47	-26
China	-894	-377
Hong Kong	40	12
ROW	-1157	-668

Source: CGE results provided by DG Trade (2019)

Table III.4: Impact of the EU-Australia FTA carbon dioxide emissions (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.0
UK	0.0	0.0
Australia	0.3	0.1
New Zealand	0.6	0.3
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	0.0	0.0
Korea	0.0	0.0
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	0.0	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.2	-0.1
LDC	0.0	0.0

Country	Ambitious scenario	Conservative scenario
China	0.0	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

III.5: Impact of the EU-Australia FTA on respective carbon dioxide emissions (%)

	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Ambitious Scenario																			
Coal	0.0	0.1	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0
Oil	0.0	0.6	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.3	0.0	0.0	0.0	0.0
Gas	0.1	-0.1	0.9	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.1	0.0	0.0
Oil pct	0.0	0.1	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Conservative Scenario																			
Coal	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Gas	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Oil pct	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.6: Impact of the EU-Australia FTA on real wages (%)

	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Ambitious Scenario																			
Land	-0.4	-0.9	1.5	1.8	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
UnskLab	0.0	0.1	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
SkLab	0.0	0.1	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Capital	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NatlRes	-0.1	0.1	0.2	2.1	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.2	0.0	-0.1	0.0	0.0
Conservative Scenario																			
Land	-0.1	0.0	0.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0

	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
UnskLab	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
SkLab	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NatlRes	-0.1	-0.1	0.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.7: Impact of the EU-Australia FTA on CPI (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.0
UK	0.1	0.0
Australia	-0.1	-0.1
New Zealand	0.1	0.0
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	0.0	0.0
Korea	0.0	0.0
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	0.0	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.1	0.0
LDC	0.0	0.0
China	0.0	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.8: Impact of the EU-Australia FTA on volume of exports (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.0
UK	0.2	0.1
Australia	0.8	0.4
New Zealand	0.7	0.4
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	0.0	0.0
Korea	0.0	0.0
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	0.0	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.2	-0.1
LDC	0.0	0.0
China	0.0	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.9: Impact of the EU-Australia FTA on value of exports (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.1
UK	0.3	0.1
Australia	0.7	0.4
New Zealand	1.1	0.5
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	0.0	0.0
Korea	0.0	0.0
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	0.0	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.3	-0.1
LDC	0.0	0.0
China	0.0	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.10: Impact of the EU-Australia FTA on volume of imports (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.1
UK	0.2	0.1
Australia	0.9	0.5
New Zealand	2.0	0.9
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	-0.1	0.0
Korea	-0.1	-0.1
EFTA	-0.1	0.0
EU FTAS	0.0	0.0
ASEAN	-0.1	0.0
ASEAN TPP	0.0	0.0
Vietnam	0.0	0.0
Pacific	-0.4	-0.2
LDC	0.0	0.0
China	-0.1	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.11: Impact of the EU-Australia FTA on value of imports (%)

Country	Ambitious scenario	Conservative scenario
EU	0.1	0.1
UK	0.3	0.1
Australia	1.0	0.5
New Zealand	2.0	0.9
Turkey	0.0	0.0
USA	0.0	0.0
Canada	0.0	0.0
Japan	-0.1	0.0
Korea	-0.1	-0.1
EFTA	0.0	0.0
EU FTAS	0.0	0.0
ASEAN	-0.1	0.0
ASEAN TPP	-0.1	0.0
Vietnam	0.0	0.0
Pacific	-0.4	-0.2
LDC	0.0	0.0
China	-0.1	0.0
Hong Kong	0.0	0.0
ROW	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.12: Impact of the EU-Australia FTA on EU sector employment under the ambitious scenario (%)

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Rice	0.1	-0.2	-0.2	-0.1	0.0
Cereals	0.0	-0.1	-0.1	-0.2	0.0
Vegetables and fruit	-0.1	-0.2	-0.2	-0.2	0.0
Oilseeds	0.1	-0.2	-0.2	-0.1	0.0
Sugar	0.1	-0.2	-0.2	-0.2	0.0
Fiber crop	0.0	-0.1	-0.1	-0.1	0.0
Bovine meat	-0.6	-1.5	-1.5	-1.4	0.0
Other animal products	0.1	0.0	0.0	0.0	0.0
Other meat	0.2	0.0	0.0	0.0	0.0
Dairy	0.1	-0.1	-0.1	-0.1	0.0
Wood and paper	0.2	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.0	0.0	0.0
Coal	0.3	-0.2	-0.2	-0.1	0.0
Oil	0.1	-0.1	-0.1	-0.1	0.0
Gas	0.4	0.4	0.4	0.4	0.0
Minerals	0.0	0.0	0.0	0.0	0.0
Other food	0.2	0.0	0.0	0.0	0.0
Beverages & tobacco	0.2	0.0	0.0	0.0	0.0
Textiles	0.2	0.0	0.0	0.0	0.0
Chemicals	0.2	0.0	0.0	0.0	0.0
Oil products	0.2	-0.1	-0.1	0.0	0.0
Metal products	0.3	0.0	0.0	0.0	0.0
Non metal products	0.3	0.0	0.0	0.1	0.0
Motor vehicles	0.4	0.3	0.3	0.3	0.0
Machinery	0.3	0.1	0.1	0.2	0.0
Elect. machinery	0.2	-0.1	-0.1	-0.1	0.0
Electricity	0.2	0.0	0.0	0.0	0.0
Utilities	0.3	0.0	0.0	0.1	0.0
Transport services	0.3	-0.1	-0.1	0.0	0.0
Comm services	0.3	0.0	0.0	0.0	0.0
Financial services	0.2	0.0	0.0	0.0	0.0

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Other services	0.3	0.0	0.0	0.0	0.0
CGDS	0.2	0.0	0.0	0.1	0.0

Source: CGE results provided by DG Trade (2019)

Table III.13: Impact of the EU-Australia FTA on EU sector employment under conservative scenario (%)

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Rice	0.0	-0.1	-0.1	0.0	0.0
Cereals	0.0	0.0	0.0	0.0	0.0
Vegetables and fruit	-0.1	-0.2	-0.2	-0.2	0.0
Oilseeds	0.0	-0.1	-0.1	-0.1	0.0
Sugar	0.1	0.0	0.0	0.0	0.0
Fiber crop	0.0	0.0	0.0	0.0	0.0
Bovine meat	0.2	0.2	0.2	0.3	0.0
Other animal products	0.0	0.0	0.0	0.0	0.0
Other meat	0.1	0.0	0.0	0.0	0.0
Dairy	0.1	0.1	0.1	0.1	0.0
Wood and paper	0.1	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.0	0.0	0.0
Coal	0.1	-0.1	-0.1	-0.1	0.0
Oil	0.0	-0.1	-0.1	-0.1	0.0
Gas	0.0	-0.1	-0.1	-0.1	0.0
Minerals	0.0	0.0	0.0	0.0	0.0
Other food	0.1	0.0	0.0	0.0	0.0
Beverages & tobacco	0.1	0.0	0.0	0.0	0.0
Textiles	0.1	0.0	0.0	0.0	0.0
Chemicals	0.1	-0.1	0.0	0.0	0.0
Oil products	0.1	0.0	0.0	0.0	0.0
Metal products	0.1	0.0	0.0	0.0	0.0
Non metal products	0.1	0.0	0.0	0.0	0.0
Motor vehicles	0.2	0.2	0.2	0.2	0.0
Machinery	0.1	0.0	0.0	0.0	0.0
Elect. machinery	0.0	-0.1	-0.1	-0.1	0.0
Electricity	0.1	0.0	0.0	0.0	0.0
Utilities	0.1	0.0	0.0	0.0	0.0
Transport services	0.1	0.0	0.0	0.0	0.0
Comm services	0.1	0.0	0.0	0.0	0.0
Financial services	0.1	0.0	0.0	0.0	0.0

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Other services	0.1	0.0	0.0	0.0	0.0
CGDS	0.1	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.14: Impact of the EU-Australia FTA on Australian sector employment under ambitious scenario (%)

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Rice	-0.5	0.2	0.3	0.6	0.0
Cereals	-0.3	-0.1	-0.1	0.0	0.0
Vegetables and fruit	-0.1	0.1	0.2	0.2	0.0
Oilseeds	0.1	0.6	0.7	0.8	0.0
Sugar	-0.2	0.7	0.8	1.1	0.0
Fiber crop	-0.5	-0.3	-0.3	-0.2	0.0
Bovine meat	2.8	5.0	5.0	5.2	0.0
Other animal products	-0.2	0.1	0.1	0.2	0.0
Other meat	-0.8	-0.3	-0.2	0.2	0.0
Dairy	-0.6	-0.1	-0.1	0.2	0.0
Wood and paper	-0.8	-0.2	-0.2	0.2	0.0
Fishing	-0.1	0.1	0.1	0.2	0.0
Coal	-1.0	-0.3	-0.1	1.1	0.0
Oil	-0.1	0.3	0.3	0.4	0.0
Gas	-1.3	-1.5	-1.4	-1.0	0.0
Minerals	-0.2	0.0	0.0	0.1	0.0
Other food	-0.7	-0.2	-0.1	0.3	0.0
Beverages & tobacco	-0.5	0.2	0.3	0.7	0.0
Textiles	-0.8	-0.4	-0.3	0.1	0.0
Chemicals	-1.0	-0.8	-0.7	-0.3	0.0
Oil products	-0.7	-0.1	0.0	0.3	0.0
Metal products	-0.8	-0.3	-0.2	0.2	0.0
Non metal products	-0.8	-0.4	-0.3	0.1	0.0
Motor vehicles	-1.5	-2.0	-1.9	-1.5	0.0
Machinery	-1.7	-2.4	-2.3	-1.9	0.0
Elect. machinery	-0.7	-0.2	-0.1	0.4	0.0
Electricity	-0.8	-0.2	-0.1	0.3	0.0
Utilities	-0.5	0.5	0.6	1.1	0.0
Transport services	-0.8	-0.2	-0.1	0.4	0.0
Comm services	-0.7	0.0	0.1	0.5	0.0
Financial services	-0.7	-0.1	0.0	0.4	0.0

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Other services	-0.8	-0.2	-0.1	0.4	0.0
CGDS	-0.3	0.6	0.7	0.8	0.0

Source: CGE results provided by DG Trade (2019)

Table III.15: Impact of the EU-Australia FTA on Australian sector employment under conservative scenario (%)

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Rice	-0.1	0.1	0.1	0.2	0.0
Cereals	-0.1	0.0	0.0	0.0	0.0
Vegetables and fruit	0.2	0.3	0.3	0.3	0.0
Oilseeds	0.3	0.5	0.5	0.6	0.0
Sugar	-0.1	0.0	0.0	0.2	0.0
Fiber crop	0.0	0.0	0.0	0.1	0.0
Bovine meat	0.0	0.1	0.1	0.2	0.0
Other animal products	0.2	0.3	0.3	0.3	0.0
Other meat	-0.2	-0.1	0.0	0.2	0.0
Dairy	-0.3	-0.4	-0.3	-0.2	0.0
Wood and paper	-0.3	-0.2	-0.2	0.0	0.0
Fishing	0.0	0.1	0.1	0.1	0.0
Coal	-0.2	0.0	0.1	0.7	0.0
Oil	0.1	0.2	0.2	0.3	0.0
Gas	0.0	0.2	0.3	0.5	0.0
Minerals	0.0	0.0	0.0	0.1	0.0
Other food	-0.2	-0.1	-0.1	0.1	0.0
Beverages & tobacco	0.0	0.3	0.4	0.6	0.0
Textiles	-0.1	0.2	0.3	0.5	0.0
Chemicals	-0.2	-0.1	0.0	0.2	0.0
Oil products	-0.2	0.0	0.0	0.1	0.0
Metal products	-0.2	0.0	0.0	0.2	0.0
Non metal products	-0.2	-0.1	0.0	0.2	0.0
Motor vehicles	-0.8	-1.5	-1.4	-1.2	0.0
Machinery	-0.4	-0.5	-0.4	-0.2	0.0
Elect. machinery	-0.1	0.2	0.3	0.5	0.0
Electricity	-0.2	0.0	0.0	0.2	0.0
Utilities	-0.1	0.3	0.3	0.6	0.0
Transport services	-0.2	-0.1	0.0	0.2	0.0
Comm services	-0.2	0.0	0.0	0.3	0.0
Financial services	-0.2	-0.1	0.0	0.2	0.0

Sector	Land	Unskilled Labour	Skilled Labour	Capital	Natural Resources
Other services	-0.2	-0.1	0.0	0.2	0.0
CGDS	0.0	0.3	0.3	0.4	0.0

Source: CGE results provided by DG Trade (2019)

Table III.16: Impact of the EU-Australia FTA on sector output under the ambitious scenario (%)

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	-0.1	0.0	0.4	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	-0.1	0.0
Cereals	-0.1	-0.1	-0.1	-1.7	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Vegetables and fruit	-0.2	-0.1	0.1	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Oilseeds	-0.1	0.0	0.6	-0.9	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	-0.2	-0.4	0.8	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0
Fiber crop	-0.1	0.0	-0.4	-0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0
Bovine meat	-1.4	-2.5	4.6	4.1	0.0	0.0	0.1	0.1	0.4	0.0	-0.1	0.1	0.1	0.0	0.3	0.0	0.0	0.1	0.0
Other animal products	0.0	0.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other meat	0.0	0.4	-0.1	-1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	-0.1	-0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0
Wood and paper	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	-0.1	-0.1	0.3	0.2	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0
Oil	-0.1	-0.1	0.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Gas	0.3	0.8	-0.8	0.3	0.0	-0.1	-0.1	-0.4	0.0	0.0	0.0	-0.2	-0.1	0.0	0.1	-0.1	0.0	-0.1	0.0
Minerals	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other food	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Beverages & tobacco	0.0	0.0	0.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Textiles	0.0	0.0	-0.1	-0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	-0.3	0.0	0.0	0.0	0.0
Chemicals	0.0	0.1	-0.5	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Oil products	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	0.0	0.4	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	0.0	-0.1	0.0	-1.1	0.0	0.0	0.0	0.0
Non metal products	0.1	0.1	-0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Motor vehicles	0.3	0.4	-1.8	-2.7	0.1	0.0	0.0	-0.2	-0.4	0.0	0.0	-0.3	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Machinery	0.1	0.4	-2.2	-2.8	0.0	-0.1	-0.1	0.0	0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.4	0.0	0.0	-0.1	0.0
Elect. machinery	-0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Electricity	0.0	0.1	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Utilities	0.1	0.1	0.6	1.7	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.4	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comm services	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Financial services	0.0	-0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.17: Impact of the EU-Australia FTA on sector output under the conservative scenario (%)

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	0.0	0.0	0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Cereals	0.0	0.0	0.0	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vegetables and fruit	-0.2	-0.2	0.2	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Oilseeds	-0.1	-0.1	0.5	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	-0.1	0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Fiber crop	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Bovine meat	0.2	0.4	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	-0.1	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other meat	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	0.1	0.1	-0.3	-0.8	0.0	0.0	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood and paper	0.0	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas	-0.1	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Minerals	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other food	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Beverages & tobacco	0.0	0.0	0.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Textiles	0.0	0.0	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Chemicals	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Oil products	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	0.0	0.2	0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0
Non metal products	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor vehicles	0.2	0.3	-1.4	-1.3	0.1	0.0	0.0	-0.1	-0.3	0.0	0.0	-0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Machinery	0.0	0.1	-0.3	-0.6	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Elect. machinery	-0.1	-0.1	0.3	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Electricity	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.3	0.7	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comm services	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial services	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.18: Impact of the EU-Australia FTA on sector CPI under the ambitious scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	0.1	0.0	-0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cereals	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.0
Vegetables and fruit	-0.1	-0.1	0.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Oilseeds	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Fiber crop	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0
Bovine meat	-0.2	-1.4	0.5	0.5	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Other animal products	0.0	-0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Other meat	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	0.0	0.0	-0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Wood and paper	0.1	0.1	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas	0.1	0.4	-2.0	0.2	0.0	0.0	0.0	-0.1	-0.1	0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	0.0
Minerals	0.0	0.0	-0.1	0.8	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1
Other food	0.0	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beverages & tobacco	0.0	-0.1	-0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Textiles	0.0	0.0	-0.4	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chemicals	0.0	0.0	-0.6	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Oil products	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	0.1	0.1	-0.5	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Non metal products	0.1	0.1	-0.7	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Motor vehicles	0.1	0.1	-1.3	-1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Machinery	0.0	0.0	-1.2	-0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elect. machinery	0.0	0.0	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Electricity	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Transport services	0.0	0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Comm services	0.1	0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Financial services	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Other services	0.1	0.1	-0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.19: Impact of the EU-Australia FTA on sector CPI under the conservative scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	0.0	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cereals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vegetables and fruit	-0.1	-0.1	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Oilseeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fiber crop	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bovine meat	0.1	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other animal products	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Other meat	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dairy	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood and paper	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Minerals	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other food	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beverages & tobacco	0.0	-0.1	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Textiles	0.0	0.0	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chemicals	0.0	0.0	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Oil products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal products	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Non metal products	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Motor vehicles	0.0	0.0	-0.9	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Machinery	0.0	0.0	-0.4	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elect. machinery	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transport services	0.0	0.0	-0.2	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comm services	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial services	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

Table III.20: Impact of the EU-Australia FTA on EU sector exports under the ambitious scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	-0.2	-0.7	-0.4	0.1	-0.4	-0.4	-0.4	-0.5	-0.5	-0.3	-0.5	-0.6	-0.5	-0.5	-0.8	-0.4	-0.5	-0.6	-0.4
Cereals	-0.3	-0.1	1.0	2.8	0.1	0.2	0.2	0.3	0.6	0.1	0.2	0.6	0.5	1.0	1.4	0.2	0.4	0.2	0.2
Vegetables and fruit	-0.3	-0.4	8.4	2.4	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.0	0.1	0.1	1.5	0.1	0.1	0.2	0.1
Oilseeds	-0.2	-0.2	1.0	1.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.1	-0.3	-0.3	-0.3	-0.3	-0.1	-0.3	-0.3	-0.2	-0.3
Sugar	-0.4	-1.2	0.2	-0.1	-0.3	-0.4	-0.4	-0.5	-0.5	-0.1	-0.4	-0.5	-0.5	-0.5	-0.3	-0.4	-0.4	-0.4	-0.4
Fiber crop	-0.1	-0.2	1.2	3.3	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.2	0.0	0.1	0.7	0.1	0.5	0.1	0.0
Bovine meat	-3.4	-19.6	2.5	4.2	0.1	0.4	0.2	0.8	1.6	0.1	-0.1	1.1	0.9	0.0	1.9	0.0	0.5	0.3	0.1
Other animal products	-0.1	-0.3	3.2	0.6	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.1	0.0	0.0
Other meat	0.0	-0.2	1.1	30.4	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2
Dairy	-0.6	-0.5	48.6	29.4	0.1	-0.1	-0.1	-0.2	-0.3	-0.1	-0.2	0.0	0.3	0.2	0.7	0.1	0.3	-0.2	0.0
Wood and paper	-0.1	-0.1	21.3	4.1	-0.3	-0.5	-0.5	-0.5	-0.5	-0.2	-0.5	-0.5	-0.5	-0.5	-0.7	-0.4	-0.5	-0.5	-0.4
Fishing	0.0	-0.1	5.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.0
Coal	-0.3	-0.2	96.3	96.2	-0.5	-0.4	-0.4	-0.7	-0.6	-0.3	-0.5	-0.6	-0.6	-0.6	-1.1	-0.4	-0.5	-0.6	-0.5
Oil	-0.2	0.0	14.9	14.0	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.4	-0.2
Gas	-4.0	-2.7	3572.8	2611.8	-5.1	-5.1	-5.2	-7.1	-6.9	-2.9	-5.5	-8.1	-7.2	-5.0	-5.8	-5.3	-5.4	-6.3	-5.2
Minerals	0.0	0.1	8.0	9.8	-0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-1.0	0.0	-0.1	0.0	-0.1

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Other food	-0.1	-0.1	11.2	12.5	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2
Beverages & tobacco	-0.1	-0.8	6.7	6.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1
Textiles	-0.3	-0.2	103.4	101.1	-0.4	-0.5	-0.5	-0.5	-0.5	-0.3	-0.5	-0.5	-0.5	-0.5	-0.8	-0.5	-0.5	-0.5	-0.5
Chemicals	-0.1	-0.1	20.3	26.5	-0.3	-0.4	-0.4	-0.4	-0.5	-0.1	-0.4	-0.5	-0.5	-0.5	-0.7	-0.4	-0.5	-0.4	-0.4
Oil products	0.0	0.1	4.3	8.2	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.3	-0.1	-0.1	-0.1	-0.1
Metal products	-0.1	0.0	54.1	52.0	-0.4	-0.5	-0.5	-0.6	-0.7	-0.4	-0.6	-0.7	-0.6	-0.6	-1.4	-0.5	-0.6	-0.6	-0.5
Non metal products	0.0	0.0	58.2	53.4	-0.3	-0.4	-0.4	-0.4	-0.5	-0.2	-0.4	-0.6	-0.4	-0.4	-0.7	-0.3	-0.4	-0.3	-0.4
Motor vehicles	0.0	0.0	52.1	43.0	-0.2	-0.4	-0.4	-0.5	-0.7	-0.2	-0.4	-0.6	-0.5	-0.5	-0.9	-0.4	-0.4	-0.3	-0.4
Machinery	-0.2	-0.1	60.4	62.4	-0.4	-0.6	-0.6	-0.7	-0.7	-0.3	-0.6	-0.7	-0.7	-0.7	-1.1	-0.5	-0.6	-0.6	-0.5
Elect. machinery	-0.3	-0.3	58.4	53.0	-0.5	-0.6	-0.6	-0.7	-0.7	-0.4	-0.6	-0.6	-0.6	-0.6	-1.1	-0.5	-0.6	-0.6	-0.6
Electricity	0.0	0.1	-0.6	0.3	-0.3	-0.4	-0.3	-0.4	-0.6	-0.1	-0.4	-0.5	-0.4	-0.4	-0.6	-0.3	-0.4	-0.4	-0.3
Utilities	0.0	0.0	7.8	9.1	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4	-0.3	-0.3	-0.8	-0.2	-0.3	-0.3	-0.3
Transport services	-0.1	0.0	6.9	7.5	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2
Comm services	-0.1	-0.1	7.2	7.6	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.2	-0.2	-0.6	-0.2	-0.3	-0.2	-0.2

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Financial services	-0.1	-0.1	7.8	8.3	-0.2	-0.2	-0.2	-0.3	-0.4	-0.2	-0.3	-0.3	-0.3	-0.2	-0.5	-0.2	-0.3	-0.2	-0.3
Other services	-0.1	0.0	7.4	8.3	-0.2	-0.3	-0.3	-0.3	-0.4	-0.2	-0.3	-0.4	-0.3	-0.3	-0.7	-0.3	-0.3	-0.3	-0.3

Source: CGE results provided by DG Trade (2019)

Table III.21: Impact of the EU-Australia FTA on EU sector exports under the conservative scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	-0.1	-0.1	-0.2	0.0	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.4	-0.3	-0.3	-0.5	-0.3	-0.3	-0.4	-0.3
Cereals	0.1	0.0	0.0	0.2	-0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Vegetables and fruit	-0.3	-0.4	7.4	1.7	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.1	0.0
Oilseeds	-0.1	-0.1	0.9	1.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2
Sugar	0.0	0.0	0.1	-0.1	-0.2	-0.3	-0.2	-0.3	-0.3	-0.1	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.3	-0.3	-0.2
Fiber crop	-0.1	0.0	0.7	2.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.1	-0.1	0.0	-0.1	-0.1
Bovine meat	0.6	3.7	0.1	0.6	-0.1	-0.2	-0.2	-0.3	-0.3	-0.1	-0.3	-0.3	-0.2	-0.3	0.0	-0.2	-0.2	-0.1	-0.2
Other animal products	-0.1	-0.5	2.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Other meat	0.0	0.0	0.9	29.4	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.1
Dairy	0.1	0.1	47.8	27.2	-0.1	-0.2	-0.1	-0.3	-0.6	-0.1	-0.2	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	-0.3	-0.2
Wood and paper	0.0	-0.1	20.7	5.0	-0.1	-0.3	-0.3	-0.3	-0.3	-0.1	-0.3	-0.3	-0.3	-0.3	-0.4	-0.2	-0.3	-0.3	-0.2
Fishing	0.0	-0.1	5.0	1.2	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0	-0.1
Coal	-0.1	-0.1	-0.3	-0.4	-0.2	-0.2	-0.2	-0.4	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.5	-0.2	-0.3	-0.3	-0.3
Oil	-0.1	0.0	0.0	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1
Gas	-0.3	-0.2	1.5	1.2	-0.4	-0.4	-0.5	-0.6	-0.6	-0.2	-0.5	-0.7	-0.6	-0.4	-0.5	-0.4	-0.4	-0.5	-0.4
Minerals	0.0	0.0	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.4	0.0	0.0	0.0	0.0
Other food	0.0	-0.1	11.2	12.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Beverages & tobacco	-0.1	-0.8	6.7	5.8	0.0	-0.1	-0.1	-0.1	-0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1
Textiles	-0.2	-0.2	47.8	47.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.4	-0.3	-0.3	-0.3	-0.3
Chemicals	-0.1	-0.1	6.5	9.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.3	-0.2	-0.2	-0.4	-0.2	-0.2	-0.2	-0.2
Oil products	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	-0.1	0.0
Metal products	-0.1	0.0	21.7	21.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.2	-0.3	-0.4	-0.3	-0.3	-0.7	-0.2	-0.3	-0.3	-0.3
Non metal products	0.0	0.0	22.4	17.3	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2
Motor vehicles	0.0	0.0	37.7	22.2	-0.1	-0.2	-0.2	-0.3	-0.4	-0.1	-0.2	-0.4	-0.3	-0.3	-0.4	-0.2	-0.2	-0.2	-0.2
Machinery	-0.1	-0.1	21.1	19.5	-0.2	-0.3	-0.3	-0.4	-0.4	-0.2	-0.3	-0.4	-0.3	-0.3	-0.5	-0.3	-0.3	-0.3	-0.3
Elect. machinery	-0.2	-0.2	12.7	11.9	-0.2	-0.3	-0.3	-0.4	-0.4	-0.2	-0.3	-0.3	-0.3	-0.3	-0.5	-0.3	-0.3	-0.3	-0.3
Electricity	0.0	0.0	-0.3	0.0	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2
Utilities	0.0	0.0	7.8	7.9	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.1	-0.4	-0.1	-0.2	-0.2	-0.1
Transport services	-0.1	0.0	6.9	7.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1
Comm services	-0.1	-0.1	7.3	7.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.3	-0.1	-0.2	-0.1	-0.1
Financial services	-0.1	-0.1	7.8	7.8	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1	-0.2	-0.1	-0.1	-0.3	-0.1	-0.2	-0.1	-0.1

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Other services	-0.1	0.0	7.5	7.8	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.3	-0.1	-0.2	-0.2	-0.2

Source: CGE results provided by DG Trade (2019)

Table III.22: Impact of the EU-Australia FTA on Australian sector exports under the ambitious scenario (%)

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EUFTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	112.7	111.8	0.5	0.9	0.5	0.4	0.4	0.3	0.4	0.6	0.3	0.3	0.3	0.3	0.1	0.4	0.4	0.2	0.3
Cereals	52.1	52.2	-0.3	1.3	-1.2	-1.1	-1.1	-1.0	-0.7	-1.2	-1.1	-0.8	-0.8	-0.4	-0.1	-1.0	-1.0	-1.1	-1.1
Vegetables and fruit	18.2	18.0	-0.4	1.1	-1.3	-1.2	-1.2	-1.0	-1.0	-1.2	-1.1	-1.2	-1.2	-1.2	0.2	-1.2	-1.3	-1.1	-1.2
Oilseeds	4.2	4.2	-0.9	-0.7	-0.9	-1.1	-1.1	-1.0	-1.0	-1.0	-1.1	-1.1	-1.1	-1.1	-0.8	-1.1	-1.1	-1.0	-1.1
Sugar	123.0	121.3	0.3	0.4	0.3	0.1	0.2	0.0	0.1	0.4	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.2
Fiber crop	0.6	0.5	-0.4	1.4	-1.0	-1.0	-1.0	-0.9	-0.9	-1.0	-1.0	-0.9	-1.0	-1.0	-0.4	-1.0	-0.6	-1.0	-1.0
Bovine meat	527.9	422.8	-0.6	0.5	-2.9	-2.6	-2.8	-2.3	-1.4	-2.8	-3.0	-1.9	-2.1	-3.0	-1.2	-3.0	-2.3	-2.7	-2.9
Other animal products	23.5	23.3	-0.3	-0.1	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7	-0.7	0.0	-0.7	-0.6	-0.7	-0.7
Other meat	2.5	2.3	-0.1	-1.8	-0.2	-0.2	-0.2	-0.3	-0.2	-0.1	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2
Dairy	86.2	86.4	-9.0	-1.3	1.0	0.8	0.8	0.6	0.6	0.7	0.7	0.9	1.1	1.0	1.5	1.0	1.2	0.7	0.9
Wood and paper	2.6	2.7	-1.3	1.1	1.8	0.7	0.7	0.7	0.6	1.0	0.7	0.6	0.6	0.6	0.5	0.8	0.7	0.7	0.8
Fishing	22.4	22.3	-0.1	0.5	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.3	-0.4
Coal	0.6	0.6	0.3	0.3	0.4	0.5	0.5	0.2	0.3	0.6	0.4	0.3	0.3	0.4	-0.2	0.5	0.3	0.3	0.3
Oil	0.4	0.5	0.5	0.8	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3
Gas	6.9	7.8	-19.9	-6.5	6.2	6.2	6.1	4.7	4.8	7.1	6.0	4.4	5.1	6.2	5.3	5.9	5.5	5.5	5.9
Minerals	0.2	0.3	-0.1	2.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	-0.9	0.1	0.0	0.1	0.0
Other food	74.2	74.2	-1.5	-0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EUFTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Beverages & tobacco	17.7	16.9	-1.7	-0.2	0.3	0.3	0.2	0.2	0.1	0.3	0.2	0.1	0.2	0.2	0.1	0.3	0.2	0.2	0.2
Textiles	37.9	37.9	-2.1	-2.6	18.2	0.8	0.8	0.8	0.8	1.1	0.8	0.8	0.8	0.8	0.5	0.9	0.8	0.8	0.8
Chemicals	10.7	10.7	-3.4	-1.3	10.1	1.4	1.4	1.3	1.3	1.6	1.3	1.2	1.3	1.3	1.0	1.3	1.2	1.3	1.4
Oil products	2.2	2.2	0.4	0.9	7.8	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.1	0.4	0.4	0.4	0.4
Metal products	5.4	5.5	-2.8	-2.7	1.5	1.3	1.3	1.2	1.1	1.4	1.2	1.1	1.2	1.2	0.3	1.3	1.3	1.3	1.3
Non metal products	21.3	21.4	-3.9	-1.2	21.1	0.9	0.9	0.7	0.7	1.1	0.8	0.6	0.7	0.8	0.4	0.9	0.8	0.9	0.8
Motor vehicles	16.0	16.0	-7.1	-5.6	20.9	1.9	1.9	1.8	1.6	2.1	1.9	1.6	1.8	1.8	1.4	1.9	1.9	2.0	1.9
Machinery	10.1	10.1	-8.2	-8.3	10.1	1.0	1.0	1.0	0.9	1.3	1.0	0.9	1.0	1.0	0.5	1.1	1.0	1.0	1.1
Elect. machinery	5.2	5.2	-0.7	0.6	12.9	1.0	1.0	1.0	0.9	1.3	1.0	1.0	1.0	1.0	0.5	1.1	1.0	1.0	1.0
Electricity	1.1	1.3	0.6	1.5	0.9	0.8	0.8	0.7	0.6	1.0	0.8	0.7	0.7	0.7	0.6	0.8	0.7	0.8	0.8
Utilities	10.9	0.6	-0.7	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.2	0.3	-0.3	0.3	0.2	0.3	0.3
Transport services	9.2	0.5	-1.2	-0.6	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.1	0.4	0.3	0.3	0.4
Comm services	9.3	0.5	-0.8	-0.4	0.4	0.3	0.3	0.3	0.2	0.4	0.3	0.3	0.3	0.4	0.0	0.4	0.3	0.4	0.3
Financial services	9.1	0.3	-0.4	0.1	0.2	0.2	0.2	0.1	0.0	0.3	0.2	0.1	0.2	0.2	-0.1	0.2	0.1	0.2	0.2

Sector	EU	UK	AUS	NZ	TK	US	CAN	JP	KOR	EFTA	EUFTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Other services	9.1	0.5	-0.7	0.2	0.3	0.2	0.2	0.2	0.1	0.3	0.2	0.1	0.2	0.2	-0.2	0.3	0.2	0.2	0.2

Source: CGE results provided by DG Trade (2019)

Table III.23: Impact of the EU-Australia FTA on Australian sector exports under the conservative scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	0.7	0.7	0.4	0.7	0.5	0.4	0.4	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.2	0.4	0.4	0.3	0.4
Cereals	0.1	0.1	0.0	0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1
Vegetables and fruit	19.2	19.0	0.0	1.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	0.6	-0.4	-0.4	-0.3	-0.4
Oilseeds	5.1	5.2	-0.2	0.0	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2
Sugar	0.5	0.5	0.2	0.4	0.4	0.3	0.4	0.3	0.3	0.5	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Fiber crop	1.7	1.7	0.1	1.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	0.1	-0.1	-0.1	-0.1	-0.1
Bovine meat	0.5	0.3	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.3	0.2	0.2	0.3	0.2
Other animal products	24.2	23.8	-0.1	0.3	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	0.3	-0.2	-0.2	-0.2	-0.2
Other meat	2.8	2.9	0.0	-2.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Dairy	0.8	0.8	-9.4	-2.8	0.9	0.8	1.0	0.7	0.4	0.9	0.7	0.7	0.8	0.8	0.9	0.9	0.8	0.7	0.8
Wood and paper	2.4	2.4	-1.4	0.3	1.7	0.6	0.6	0.6	0.6	0.8	0.6	0.6	0.6	0.6	0.5	0.7	0.6	0.6	0.6
Fishing	22.6	22.5	0.0	0.6	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.4	-0.3	-0.3	-0.4
Coal	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.4	0.3	0.2	0.2	0.3	0.0	0.4	0.3	0.2	0.2
Oil	0.3	0.4	0.3	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Gas	0.9	0.9	0.4	1.8	0.7	0.7	0.7	0.5	0.5	0.8	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.7
Minerals	0.1	0.2	0.1	1.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0	0.0	0.0	0.0
Other food	74.4	74.2	-1.5	-0.5	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	TPP	VT	Pacific	LDC	China	HK	ROW
Beverages & tobacco	17.6	16.8	-1.8	-0.5	0.3	0.2	0.2	0.2	0.1	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Textiles	37.5	37.5	-0.7	-0.9	18.1	0.7	0.7	0.6	0.6	0.8	0.7	0.7	0.6	0.7	0.5	0.7	0.7	0.7	0.7
Chemicals	9.7	9.7	-0.9	-0.2	9.4	0.7	0.7	0.7	0.7	0.8	0.7	0.6	0.7	0.7	0.5	0.7	0.6	0.7	0.7
Oil products	1.9	1.9	0.2	0.4	7.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
Metal products	4.5	4.6	-1.0	-0.8	0.8	0.7	0.7	0.7	0.6	0.8	0.7	0.6	0.7	0.7	0.3	0.7	0.7	0.7	0.7
Non metal products	20.7	20.7	-1.4	0.0	20.7	0.5	0.5	0.4	0.4	0.6	0.5	0.4	0.4	0.5	0.3	0.5	0.5	0.5	0.5
Motor vehicles	14.7	14.7	-5.4	-2.9	20.1	1.2	1.2	1.1	1.0	1.3	1.2	1.1	1.2	1.2	1.0	1.2	1.2	1.3	1.2
Machinery	9.5	9.5	-2.6	-2.2	9.7	0.7	0.7	0.7	0.6	0.9	0.7	0.6	0.7	0.7	0.5	0.7	0.7	0.7	0.7
Elect. machinery	4.8	4.8	0.4	0.9	12.6	0.8	0.8	0.7	0.7	0.9	0.7	0.7	0.7	0.7	0.5	0.8	0.8	0.8	0.8
Electricity	0.7	0.7	0.4	0.7	0.5	0.5	0.5	0.5	0.4	0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5
Utilities	10.8	0.4	-0.8	-0.9	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.1	0.3	0.3	0.3	0.3
Transport services	9.1	0.4	-1.2	-0.9	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Comm services	9.1	0.4	-0.9	-1.0	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Financial services	9.1	0.3	-0.4	-0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.3

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	TPP	VT	Pacific	LDC	China	HK	ROW
Other services	9.1	0.4	-0.7	-0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.1	0.3	0.3	0.3	0.3

Source: CGE results provided by DG Trade (2019)

Table III.24: Impact of the EU-Australia FTA on aggregate sector exports under the ambitious scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	-0.3	0.3	1.1	-0.2	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	-0.5	0.0	0.0	0.0	0.0
Cereals	-0.1	-0.1	-0.2	-2.0	-0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.6	0.3	0.0	-1.2	0.0	0.1	0.0	0.1
Vegetables and fruit	-0.2	0.0	-0.2	5.3	-0.1	0.0	0.0	0.0	0.0	-0.2	0.0	0.1	0.0	0.0	0.5	-0.1	0.0	-0.1	-0.1
Oilseeds	-0.2	0.0	0.7	-1.2	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	-0.4	-0.4	4.8	-1.1	-0.1	0.0	-0.1	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	-0.5	-0.1	0.0	-0.1	0.0
Fiber crop	0.0	0.3	-0.6	-1.3	-0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.0	-0.1	0.0	0.0	0.0	0.0
Bovine meat	-3.5	-0.7	8.9	5.8	-1.6	0.1	0.2	-2.9	0.3	-2.8	-1.4	0.8	0.4	-1.1	0.4	-0.1	-0.8	-0.2	-0.2
Other animal products	-0.1	0.1	0.4	0.9	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Other meat	0.0	0.6	-0.2	-0.7	-0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.1	0.0	-0.2	0.0	0.1	-0.1	0.0
Dairy	-0.1	-0.1	1.6	0.9	0.2	0.1	-0.2	0.2	-0.4	-0.4	0.3	0.5	0.3	0.3	-0.1	0.3	-0.1	0.1	0.3
Wood and paper	0.0	0.3	0.8	-1.3	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.0	0.5	0.0	0.0	-0.1	0.1
Fishing	0.0	0.0	0.1	-1.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	-0.1	0.0	-0.1	0.0
Coal	-0.3	-0.4	0.3	-0.4	-0.2	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	-0.1	-0.1	0.7	-0.1	-0.1	0.0	-0.1
Oil	-0.1	-0.2	0.3	-0.8	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.1	0.3	0.0
Gas	5.7	12.9	4.9	-9.6	-0.3	-1.1	-0.1	-1.0	-0.6	0.0	-0.2	-0.5	-0.2	-0.3	0.2	-0.3	-0.9	-1.2	0.0
Minerals	-0.1	-0.1	0.0	-5.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	-0.1	0.0
Other food	0.0	0.2	1.3	0.7	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Beverages & tobacco	-0.1	0.1	3.3	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0
Textiles	0.1	0.6	5.2	2.6	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.1	-1.2	0.0	0.0	-0.1	0.0
Chemicals	0.0	0.1	1.9	2.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	-0.1	0.0
Oil products	0.0	-0.1	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	-0.1	0.0
Metal products	0.0	0.8	1.3	-1.7	0.0	0.0	0.1	0.1	0.1	-0.1	0.2	0.0	-0.1	0.0	-1.3	0.0	0.0	0.0	0.0
Non metal products	0.2	0.5	1.8	-2.1	0.0	0.0	-0.1	0.0	0.1	0.1	-0.1	0.0	-0.2	-0.1	0.4	0.0	0.0	0.0	0.0
Motor vehicles	0.4	0.7	2.1	-1.0	0.1	-0.1	-0.1	-0.3	-0.6	0.1	0.0	-0.7	-0.1	0.0	0.8	0.0	-0.2	-0.1	0.0
Machinery	0.3	0.8	0.9	-1.9	0.0	-0.2	-0.2	0.0	0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.9	-0.1	-0.1	-0.1	0.0
Elect. machinery	-0.1	0.3	1.5	-0.3	-0.1	0.0	0.0	0.1	0.2	-0.1	0.0	0.2	0.0	0.1	0.8	-0.1	0.0	0.0	-0.1
Electricity	-0.1	-0.3	0.9	-0.4	0.0	0.1	0.0	0.2	0.3	0.1	0.1	0.4	0.3	0.2	0.4	0.0	0.1	0.1	0.1
Utilities	-0.2	-0.3	2.1	2.4	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.3	0.2	0.1	0.6	0.1	0.2	0.0	0.1
Transport services	0.0	-0.2	1.5	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0
Comm services	-0.1	-0.3	2.2	0.5	0.0	0.2	0.1	0.1	0.3	0.1	0.1	0.3	0.2	0.1	0.6	0.1	0.1	0.1	0.1
Financial services	-0.1	-0.3	1.4	0.8	0.0	0.2	0.1	0.2	0.3	0.1	0.1	0.3	0.2	0.1	0.7	0.1	0.1	0.1	0.1

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Other services	-0.1	-0.3	1.6	0.2	0.0	0.1	0.0	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.6	0.0	0.1	0.0	0.1

Source: CGE results provided by DG Trade (2019)

Table III.25: Impact of the EU-Australia FTA on aggregate sector exports under the conservative scenario (%)

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Rice	-0.1	0.0	0.3	-0.6	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	-0.2	0.0	0.0	0.0	0.0
Cereals	0.0	-0.1	-0.1	-1.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.0	-0.2	0.0	0.1	0.0	0.0
Vegetables and fruit	-0.2	-0.2	0.6	6.1	-0.1	0.0	0.0	0.0	0.1	-0.2	0.0	0.1	0.0	0.0	0.4	-0.1	0.0	-0.1	-0.1
Oilseeds	-0.1	-0.1	1.6	-0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	-0.1	0.3	-0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0
Fiber crop	-0.1	-0.1	0.0	-0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bovine meat	0.6	0.1	0.1	-0.2	0.4	0.1	0.1	0.9	0.2	0.7	0.5	0.2	0.1	0.4	0.5	0.1	0.4	0.1	0.1
Other animal products	-0.1	-0.1	0.9	1.5	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Other meat	0.0	-0.1	0.1	0.6	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.2	0.0	0.0	-0.2	0.0	0.0	0.0	0.0
Dairy	0.2	0.3	0.6	-1.0	0.0	-0.2	0.2	-0.1	-0.7	-0.2	0.1	0.2	0.1	0.1	-0.3	0.1	-0.3	-0.1	0.1
Wood and paper	0.0	0.5	0.6	-0.5	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-0.1	0.0	0.2	0.0	0.0	0.0	0.0
Fishing	0.0	0.0	0.1	-1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Coal	-0.1	-0.2	0.2	0.0	-0.1	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	-0.1	0.3	-0.1	-0.1	0.0	0.0
Oil	-0.1	-0.1	0.3	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Gas	-0.3	-0.3	0.6	-1.2	0.0	0.1	0.0	0.3	0.2	0.0	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Minerals	0.0	0.0	0.0	-2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Other food	0.1	0.2	1.3	1.2	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.1	0.0
Beverages & tobacco	0.0	0.1	3.3	1.9	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0
Textiles	0.0	0.3	5.2	3.9	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	-0.6	0.0	0.0	0.0	0.0
Chemicals	0.0	0.0	1.5	4.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0

Sector	EU	UK	AUS	NZ	TK	USA	CAN	JP	KOR	EFTA	EU FTAs	ASEAN	ASEAN TPP	VT	Pacific	LDC	China	HK	ROW
Oil products	0.0	0.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Metal products	-0.1	0.3	0.8	-0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	-0.1	0.0	-0.5	0.0	0.0	0.1	0.0
Non metal products	0.1	0.2	2.0	-0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.1	0.0
Motor vehicles	0.3	0.6	1.8	-0.1	0.1	-0.1	0.0	-0.2	-0.5	0.0	0.0	-0.5	-0.1	0.0	0.3	0.0	-0.1	0.0	0.0
Machinery	0.0	0.2	1.4	0.3	0.0	-0.1	-0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0
Elect. machinery	-0.2	-0.1	1.3	1.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Electricity	-0.1	-0.1	0.5	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.1
Utilities	-0.1	-0.1	2.0	3.0	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.0	0.0
Transport services	0.0	-0.1	1.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Comm services	0.0	-0.1	2.1	0.9	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0
Financial services	-0.1	-0.1	1.4	1.3	0.0	0.1	0.0	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.3	0.0	0.0	0.0	0.0
Other services	0.0	-0.2	1.6	0.8	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0

Source: CGE results provided by DG Trade (2019)

IV. Annex IV: Current EU-Australia tariffs and NTMs

Table IV.1: Tariffs in the EU-Australia trade by HS Chapter (2016, % simple average tariffs)

Product	Product Name	AUS tariffs on EU imports			EU tariffs on Aus imports		
		AHS	BND	MFN	AHS	BND	MFN
01	LIVE ANIMALS	0.00	1.00	0.00	1.21	2.25	1.21
02	MEAT AND EDIBLE MEAT OFFAL	0.00	0.00	0.00	5.96	5.41	5.96
03	FISH AND CRUSTACEANS, MOLLUSCS AND OTHER AQUATIC I	0.00	0.00	0.00	11.45	12.78	11.45
04	DAIRY PRODUCE; BIRDS' EGGS; NATURAL HONEY; EDIBLE	0.07	0.73	0.18	10.90	10.10	10.90
05	PRODUCTS OF ANIMAL ORIGIN, NOT ELSEWHERE SPECIFIED	0.77	1.56	0.28	0.09	0.11	0.09
06	LIVE TREES AND OTHER PLANTS; BULBS, ROOTS AND THE	0.00	0.56	0.00	6.64	6.11	6.64
07	EDIBLE VEGETABLES AND CERTAIN ROOTS AND TUBERS	3.03	5.46	2.31	6.16	6.01	6.16
08	EDIBLE FRUIT AND NUTS; PEEL OF CITRUS FRUIT OR MEL	1.41	2.47	1.34	6.60	6.58	6.60
09	COFFEE, TEA, MATÉ AND SPICES	0.00	0.06	0.00	3.12	3.12	3.12
10	CEREALS	0.00	0.71	0.00	1.20	7.68	1.20
11	PRODUCTS OF THE MILLING INDUSTRY; MALT; STARCHES;	0.90	3.68	0.80	8.82	9.60	8.82
12	OIL SEEDS AND OLEAGINOUS FRUITS; MISCELLANEOUS GRA	0.48	1.92	0.54	1.58	1.62	1.58
13	LAC; GUMS, RESINS AND OTHER VEGETABLE SAPS AND EXT	0.68	2.67	0.83	2.42	2.42	2.42
14	VEGETABLE PLAITING MATERIALS; VEGETABLE PRODUCTS N	0.00	0.75	0.00	0.00	0.00	0.00
15	ANIMAL OR VEGETABLE FATS AND OILS AND THEIR CLEAVA	1.82	3.89	2.05	5.65	5.45	5.65
16	PREPARATIONS OF MEAT, OF FISH OR OF CRUSTACEANS, M	1.21	4.70	1.21	13.78	14.10	13.78
17	SUGARS AND SUGAR CONFECTIONERY	2.68	7.83	1.91	13.10	13.10	13.10
18	COCOA AND COCOA PREPARATIONS	3.75	8.50	2.50	6.66	6.66	6.66
19	PREPARATIONS OF CEREALS, FLOUR, STARCH OR MILK; PA	4.37	6.61	4.06	10.65	10.65	10.65
20	PREPARATIONS OF VEGETABLES, FRUIT, NUTS OR OTHER P	4.30	8.91	4.37	17.79	16.86	17.79
21	MISCELLANEOUS EDIBLE PREPARATIONS	1.20	3.28	1.09	9.61	9.37	9.61
22	BEVERAGES, SPIRITS AND VINEGAR	3.69	8.49	3.97	3.94	3.94	3.94

Product	Product Name	AUS tariffs on EU imports			EU tariffs on Aus imports		
		AHS	BND	MFN	AHS	BND	MFN
23	RESIDUES AND WASTE FROM THE FOOD INDUSTRIES; PREPA	0.00	1.00	0.00	2.25	2.55	2.25
24	TOBACCO AND MANUFACTURED TOBACCO SUBSTITUTES	0.00	11.60	0.00	40.95	40.95	40.95
25	SALT; SULPHUR; EARTHS AND STONE; PLASTERING MATERI	0.85	2.96	0.83	0.25	0.24	0.25
26	ORES, SLAG AND ASH	0.00	0.70	0.00	0.00	0.00	0.00
27	MINERAL FUELS, MINERAL OILS AND PRODUCTS OF THEIR	0.35	1.50	0.29	0.60	1.04	0.60
28	INORGANIC CHEMICALS; ORGANIC OR INORGANIC COMPOUND	0.45	9.63	0.48	4.61	4.56	4.61
29	ORGANIC CHEMICALS	0.68	8.59	0.71	4.51	4.11	4.51
30	PHARMACEUTICAL PRODUCTS	1.31	2.30	1.21	0.00	0.67	0.00
31	FERTILISERS	0.00	9.00	0.00	4.43	4.33	4.43
32	TANNING OR DYEING EXTRACTS; TANNINS AND THEIR DERI	4.22	9.52	3.63	5.71	5.81	5.71
33	ESSENTIAL OILS AND RESINOIDS; PERFUMERY, COSMETIC	3.95	8.70	3.31	2.41	2.40	2.41
34	SOAP, ORGANIC SURFACE-ACTIVE AGENTS, WASHING PREPA	4.15	10.00	3.91	1.90	1.87	1.90
35	ALBUMINOIDAL SUBSTANCES; MODIFIED STARCHES; GLUES;	2.28	5.79	1.25	5.70	5.46	5.70
36	EXPLOSIVES; PYROTECHNIC PRODUCTS; MATCHES; PYROPHO	3.06	10.00	3.13	6.42	6.42	6.42
37	PHOTOGRAPHIC OR CINEMATOGRAPHIC GOODS	3.86	8.10	3.33	4.60	5.50	4.60
38	MISCELLANEOUS CHEMICAL PRODUCTS	2.40	9.38	2.16	5.33	5.09	5.33
39	PLASTICS AND ARTICLES THEREOF	4.83	10.24	4.64	6.12	5.72	6.12
40	RUBBER AND ARTICLES THEREOF	4.63	15.14	4.42	3.22	3.20	3.22
41	RAW HIDES AND SKINS (OTHER THAN FURSKINS) AND LEAT	4.85	13.35	4.55	2.66	2.64	2.66
42	ARTICLES OF LEATHER; SADDLERY AND HARNESS; TRAVEL	4.29	15.37	3.63	4.38	4.57	4.38
43	FURSKINS AND ARTIFICIAL FUR; MANUFACTURES THEREOF	4.56	12.94	4.38	2.02	2.02	2.02
44	WOOD AND ARTICLES OF WOOD; WOOD CHARCOAL	4.29	4.34	3.83	2.06	1.84	2.06
45	CORK AND ARTICLES OF CORK	2.93	4.83	1.67	4.31	4.31	4.31
46	MANUFACTURES OF STRAW, OF ESPARTO OR OF OTHER PLAI	0.00	0.33	0.00	3.30	3.11	3.30
47	PULP OF WOOD OR OF OTHER FIBROUS CELLULOSIC MATERI	0.00	0.00	0.00	0.00	0.00	0.00

Product	Product Name	AUS tariffs on EU imports			EU tariffs on Aus imports		
		AHS	BND	MFN	AHS	BND	MFN
48	PAPER AND PAPERBOARD; ARTICLES OF PAPER PULP, OF P	4.30	9.26	4.11	0.00	0.00	0.00
49	PRINTED BOOKS, NEWSPAPERS, PICTURES AND OTHER PROD	2.70	4.32	1.97	0.00	0.00	0.00
50	SILK	0.88	16.14	0.63	5.23	5.23	5.23
51	WOOL, FINE OR COARSE ANIMAL HAIR; HORSEHAIR YARN A	4.59	12.80	3.80	3.39	3.39	3.39
52	COTTON	4.98	28.44	4.94	6.84	6.84	6.84
53	OTHER VEGETABLE TEXTILE FIBRES; PAPER YARN AND WOV	0.45	2.60	0.77	4.80	4.80	4.80
54	MAN-MADE FILAMENTS; STRIP AND THE LIKE OF MAN-MADE	4.75	18.12	4.67	6.78	6.78	6.78
55	MAN-MADE STAPLE FIBRES	4.45	19.94	4.18	6.97	6.97	6.97
56	WADDING, FELT AND NONWOVENS; SPECIAL YARNS; TWINE,	4.02	6.75	3.75	6.00	5.98	6.00
57	CARPETS AND OTHER TEXTILE FLOOR COVERINGS	3.18	14.07	3.00	7.45	7.45	7.45
58	SPECIAL WOVEN FABRICS; TUFTED TEXTILE FABRICS; LAC	3.94	12.36	3.54	7.17	7.18	7.17
59	IMPREGNATED, COATED, COVERED OR LAMINATED TEXTILE	4.45	12.71	4.29	6.03	6.08	6.03
60	KNITTED OR CROCHETED FABRICS	5.00	24.15	5.00	7.86	7.86	7.86
61	ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, KNIT	4.68	41.55	4.61	11.67	11.68	11.67
62	ARTICLES OF APPAREL AND CLOTHING ACCESSORIES, NOT	4.64	41.31	4.57	11.29	11.29	11.29
63	OTHER MADE-UP TEXTILE ARTICLES; SETS; WORN CLOTHIN	4.27	23.44	3.99	10.41	10.33	10.41
64	FOOTWEAR, GAITERS AND THE LIKE; PARTS OF SUCH ARTI	3.74	19.64	3.63	11.39	11.39	11.39
65	HEADGEAR AND PARTS THEREOF	1.59	23.33	1.79	2.63	2.33	2.63
66	UMBRELLAS, SUN UMBRELLAS, WALKING STICKS, SEAT-STI	2.24	12.67	1.67	4.13	4.13	4.13
67	PREPARED FEATHERS AND DOWN AND ARTICLES MADE OF FE	0.00	2.38	0.00	2.83	2.83	2.83
68	ARTICLES OF STONE, PLASTER, CEMENT, ASBESTOS, MICA	4.33	10.21	3.93	1.12	1.09	1.12
69	CERAMIC PRODUCTS	4.64	9.35	4.31	5.17	5.19	5.17
70	GLASS AND GLASSWARE	3.31	11.12	2.83	5.50	5.48	5.50
71	NATURAL OR CULTURED PEARLS, PRECIOUS OR SEMI-PRECI	2.75	5.68	1.17	0.80	0.81	0.80
72	IRON AND STEEL	4.35	5.76	4.09	0.05	0.05	0.05

Product	Product Name	AUS tariffs on EU imports			EU tariffs on Aus imports		
		AHS	BND	MFN	AHS	BND	MFN
73	ARTICLES OF IRON OR STEEL	4.65	11.06	4.39	1.76	1.77	1.76
74	COPPER AND ARTICLES THEREOF	4.29	3.94	3.83	3.26	3.28	3.26
75	NICKEL AND ARTICLES THEREOF	0.45	0.33	0.33	0.79	0.79	0.79
76	ALUMINIUM AND ARTICLES THEREOF	4.72	4.84	4.38	6.05	6.08	6.05
78	LEAD AND ARTICLES THEREOF	1.15	0.50	0.50	1.25	1.81	1.25
79	ZINC AND ARTICLES THEREOF	1.07	0.31	0.31	2.50	2.50	2.50
80	TIN AND ARTICLES THEREOF	0.00	0.00	0.00	0.00	0.00	0.00
81	OTHER BASE METALS; CERMETS; ARTICLES THEREOF	0.00	0.00	0.00	3.44	3.28	3.44
82	TOOLS, IMPLEMENTS, CUTLERY, SPOONS AND FORKS, OF B	4.38	13.88	4.18	3.12	3.12	3.12
83	MISCELLANEOUS ARTICLES OF BASE METAL	4.85	16.47	4.72	2.23	2.21	2.23
84	NUCLEAR REACTORS, BOILERS, MACHINERY AND MECHANICA	3.32	8.09	2.88	1.62	1.65	1.62
85	ELECTRICAL MACHINERY AND EQUIPMENT AND PARTS THERE	2.93	8.65	2.77	2.28	2.46	2.28
86	RAILWAY OR TRAMWAY LOCOMOTIVES, ROLLING STOCK AND	4.39	15.08	4.62	1.79	1.71	1.79
87	VEHICLES OTHER THAN RAILWAY OR TRAMWAY ROLLING STO	3.33	12.92	3.35	5.55	5.48	5.55
88	AIRCRAFT, SPACECRAFT, AND PARTS THEREOF	0.00	2.65	0.00	1.64	1.96	1.64
89	SHIPS, BOATS AND FLOATING STRUCTURES	3.23	15.00	3.25	1.35	1.40	1.35
90	OPTICAL, PHOTOGRAPHIC, CINEMATOGRAPHIC, MEASURING,	0.71	2.19	0.71	1.50	1.89	1.50
91	CLOCKS AND WATCHES AND PARTS THEREOF	0.68	3.13	0.50	4.05	4.05	4.05
92	MUSICAL INSTRUMENTS; PARTS AND ACCESSORIES OF SUCH	1.52	5.22	1.18	3.15	3.15	3.15
93	ARMS AND AMMUNITION; PARTS AND ACCESSORIES THEREOF	1.67	4.06	1.53	2.49	2.50	2.49
94	FURNITURE; BEDDING, MATTRESSES, MATTRESS SUPPORTS,	4.36	14.08	4.25	1.92	1.62	1.92
95	TOYS, GAMES AND SPORTS REQUISITES; PARTS AND ACCES	3.94	14.76	3.82	2.31	2.30	2.31
96	MISCELLANEOUS MANUFACTURED ARTICLES	3.26	13.11	2.89	3.23	3.36	3.23
97	WORKS OF ART, COLLECTORS' PIECES AND ANTIQUES	0.00	0.86	0.00	0.00	0.00	0.00

Source: UNCTAD Trains in BKP Economic Advisors (2019 forthcoming)