



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**China-Australia Free Trade Agreement:
Implications for Australian agriproducts trade and farm economies**

Richard J. Culas¹ and Krishna P. Timsina²

¹ School of Agricultural and Wine Sciences

Charles Sturt University, PO Box 883, Orange NSW 2800, Australia.

Email: rculas@csu.edu.au (corresponding author)

² Nepal Agricultural Research Council

Socioeconomics and Agricultural Research Policy Division, Khumaltar, Lalitpur, Nepal

Email: krishnatimsina2000@gmail.com

Selected paper presented at the
63rd AARES Annual Conference at Melbourne, Vic from 12-15 February 2019

This paper has been independently reviewed and is published by
The Australasian Agricultural and Resource Economics
Society Ltd on the AgEcon Search website at
<http://ageconsearch.umn.edu/>
University of Minnesota, 1994 Buford Ave
St. Paul MN 55108-6040, USA

Published 2019

© Copyright 2019 by Authors' names.

All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Abstract

The trade between Australia and China was minimal prior to 1972; however substantial increase in merchandise trade occurred from the 1970's through to 2011-12, which was generated through the continuous development of economic relationships between the two countries. The China-Australia Free Trade Agreement (ChAFTA) became enforced on the 20th December 2015 to strengthen the relationship between the two countries with a view to expanding their export and import industries. Specifically, ChAFTA includes the elimination or reduction of trade barriers between the countries in the form of tariffs or quotas. Removal of trade barriers will enable Australian local industries to explore new markets and investment opportunities. In particular, the agreement will provide major preferential market access for Australia with an advantage over its major agricultural competitors, including the United States, Canada and the European Union. The barriers to Australian agricultural exports will be removed across a range of products including beef, lamb, pork, dairy, wine, hides and skins, horticulture, barley and other grains, seafood and processed food.

This paper reviews the potential benefits of free trade with China in relation to major agricultural commodities and their possible impacts on the development of farm economy and regional Australia. Analysis shows ChAFTA will be beneficial to increase the welfare in Australia but varies across the regions. Overall merchandise export trade is dominated by Western Australia along with low proportion of import merchandise trade with China, which shows WA will take more advantage of ChAFTA compared to other States and Territories. However, benefits received for specific sectors are varying across the States and Territories. Result revealed Victoria will be benefitted more from dairy (whole milk production); Queensland will be benefitted more from beef and New South Wales (NSW) will be benefitted more from summer crops, sheep meat, oilseed crops and wool compared to other States and Territories.

In addition, this paper also analyses the possible impact of ChAFTA on excluded commodity (wheat) using Revealed Comparative Advantage (RCA) index. Result shows higher RCA on Australian wheat to trade with China compared to the world and other countries which having free trade agreement with Australia. In addition, among different States, South Australia has more RCA on wheat trade with China followed by Victoria, Western Australia and New South Wales. Therefore, it would be worthy to start negotiation for preferential FTA on wheat with China.

Key words:

China-Australia Free Trade Agreement (ChAFTA), Trade barriers, Agricultural export, Farm economy, Revealed Comparative Advantage (RCA), Regional Australia

1. Introduction

Trade between Australia and China was unofficial before federation in 1901. During the Second World War, the bilateral trade was felt but did not pick up significantly until 1946-47 (Au-Yeung *et al.*, 2012). In 1972, Australia and China agreed on close diplomatic relationship to open both economies for trade. Similarly, China had made major economic reforms in 1978. Until 2001, Australia's trade with China had always been below 5% of total world trade (Au-Yeung *et al.*, 2012). But the process of economic reform in China has got impetus after accession of China to the World Trade Organization (WTO) in 2001 (Keller, Li & Shiue, 2011; Tisdell, 2003). Au-Yeung *et al.* (2012) reported that China's share of Australia's total merchandise trade rose from 1 per cent in 1972 to almost 25 per cent in 2011-12.

In 2003, Australia-China Trade and Economic Framework was signed after setting an agenda of wide range of activities for expanding the bilateral trade and economic relationship (DFAT/MOC, 2005). As a part of framework, both countries agreed to conduct feasibility study of bilateral Free Trade Agreement (FTA) before entering into FTA negotiations. They agreed on 18 April 2005 to begin negotiations into a Free Trade Agreement. China-Australia Free Trade Agreement (ChAFTA) came into force on 20 December 2015 after a decade of about 21 negotiation meetings on several sensitive issues such as agricultural tariffs and quotas, manufactured goods, services, temporary entry for skilled workers and foreign investment (DFAT, 2016a; Au-Yeung *et al.*, 2012). It is believed that ChAFTA will have a beneficial impact on the Gross Domestic Product (GDP) of both Australia and China. It is estimated that, by 2030 Australia's GDP will be 0.7 per cent higher than otherwise, and 0.1 per cent higher in the GDP of China (CIE, 2009).

Currently, Australia has ten FTAs in force with New Zealand, Thailand, Singapore, Chile, the United States of America, the Association of South East Asian Nations (ASEAN), Korea,

Malaysia, Japan and China (DFAT, 2016b), while negotiations for another six are now underway (Thurbon, 2015). Before entering into the ChAFTA, the producers and exporters whom trade between China and Australia had faced significant tariffs on Agricultural products which put them at a competitive disadvantage to countries that previously had an FTA with China. It is assumed that ChAFTA not only balances out pricing for those countries having an FTA with China but it provides significant advantage to Australia over world larger players, such as Canada, the United States and European Union. In this context, this paper analyses the implications of ChAFTA for Australian agriproducts trade and regional economies.

Section 2 provides theoretical context on the welfare implications of reduction of tariffs and the impacts of changes in relative prices on the production and consumption of agricultural commodities. Section 3 details the Australian agricultural exports and the opportunities for different agricultural commodities under the ChAFTA. Section 4 elaborates the advantages of ChAFTA in relation to improving regional (Australian States and Territories) economies. Section 5 analyses the prospects for trading agricultural commodities that are currently excluded under the ChAFTA, specifically Australian wheat. Conclusion is given in Section 6.

2. Theoretical context

An FTA is an international treaty that eliminates barriers to trade and enables stronger trade and commercial ties, contributing to enlarged economic integration and cooperation between participating countries. It can cover entire regions with multiple countries or link just two countries (DFAT, 2016b). FTA may not always benefit all parties equally. For example ex- post evaluation of the India–ASEAN FTA concluded ASEAN has benefitted more than India (Bhattacharyya & Mandal, 2016). But India gains higher in terms of welfare and real GDP from the proposed FTA between India and Bangladesh (Kim *et al.*, 2014). FTA helps to increase the competitive position

through providing access to market, improved technology and a free flow of investment (Islam, 2004). Preferential FTA with specific countries may increase benefit to that particular country (Kim *et al.*, 2014). Free trade encourages countries to specialize and benefit from the application of the principle of comparative advantage. It enhances the competition and lowers the prices through greater use of innovative technology and technology transfer between the paired nations. It will also help to breakdown the domestic monopolies and provide greater choice for firms and consumers. It allows each country to obtain a higher level of production and consumption which cannot be obtained in isolation (Economics, 2016).

The paired nations involved in free trade will receive higher welfare compared to nations without trade (Figure 1 and 2). Farajzadeh *et al.* (2012) reported reduction of tariffs raises the welfare; however, the higher income households will be better off more compared to others. Welfare change is attributable to a change of relative prices when real expenditure kept constant (Newbery, 1995). Figure 2 showing the shifts in relative price (where relative price of commodity X is lower or the relative price of commodity Y is higher), where consumption and production are adjusted to new prices with a higher level of welfare. Consumers buy more when relative price is lower and producers sell more when relative price is higher and vice-versa. Welfare change is the net effect of trade creation (positive welfare) and trade diversion (negative welfare) caused by the free trade agreements.

The trade creation occurs between member nations as cheaper imports from one member replace higher cost local production whereas trade diversion occurs when lower cost imports from a non-member are replaced with higher cost imports from member countries (Hodgkinson and Jordaan, 2006). Kennedy and Hilbun (2012) reported Australia-United States free trade agreement (AUSFTA) has been a greater trade creation catalyst for Australia than for the United States. Market size and distance between the pair nations affects the benefits from FTA. The positive

correlation with the market sizes of pair nations and negative correlation with the distance between them has been observed (Gu & Shen, 2014). Kim *et al.* (2014) reported FTA generates substantial relative price shifts that arise mainly from lower import price which can have larger sectoral impacts (Kim *et al.*, 2014). Different sectors and commodities may have positive and adverse effect of FTA in the same country (Hndi *et al.*, 2016; Kim *et al.*, 2014; Chandran & Sudarsan, 2012; Veeramani & Saini, 2011; Nagoor & Kumar, 2010; Sarker and Jayasinghe, 2007).

Trade barriers obstruct the equilibrium condition by creating discrepancies between the international and domestic prices of tradable goods (Franklin, 2000). There are two types of trade barriers; tariffs which mean duties or taxes on imported goods designed to increase the price to the same level or above the existing domestic price and non-tariff barriers such as import quotas, subsidies, anti-dumping, technical standards and health regulations (Economics, 2016; Ma, 2011). Trade theory claims that trade liberalization by minimizing non-tariff and tariff barriers increase efficiency, trade flows and scale economies that contribute to promote economic growth (Wacziarg, 1997; Barro & Sala-i-Martin, 1995). Through minimizing trade barriers, local industries are enabling to explore new market while expanding current business (Grimson, 2014). Non-tariff trade barriers have been becoming more effective compared to tariff trade barriers especially in the industrial countries (Ma, 2011).

Quotas on foreign competition generally increase the quality of the product traded but can reduce the domestic consumer surplus of the product traded (Lutz, 2005). Economics (2016) reported that the welfare loss associated with quotas may be higher than tariffs. Therefore, quotas are less frequently used than tariffs. The imposition of tariffs lead to higher price which losses the consumer surplus (Figure 3). But there is a gain in domestic producer surplus as domestic producers receive a higher price than they would have without the tariff (Figure 4). In totality, the reduction in consumer surplus is higher than producer surplus which increases the welfare loss.

Shaikh (2009) reported increment in Pakistani's consumer's surplus after joining the South Asian Free Trade Agreement (SAFTA). Brox (2003) reported Canadian consumers have increased shares in consumption of all categories of goods and a significant decrease in the share of saving after formation of free trade agreement of Canada with the United States. FTA will be beneficial for countries which have higher priority for tariff elastic goods compared to countries that have priority for tariff inelastic goods (Bhattacharyya & Mandal, 2016). Applied General Equilibrium (AGE), Computable General Equilibrium (CGE) and Gravity modeling have been used for analysing the effects of a wide range of trade policies. Using an AGE modeling approach, Adams *et al.* (1997) reported the welfare effect of trade policies on industries and consumers in response to changes in relative prices. Several studies have been conducted using CGE modelling approach to analyse the effect of bilateral and regional free trade agreements (for example, Kim *et al.*, 2014; Shaikh, 2009; Raihan, 2009; Park, 2006).

The gravity model has also been extensively used to analyse the trade flows after its introduction by Tinbergen (1962) and Linneman (1966). This model has become more transparent, better understood, and widely accepted for trade analysis (Sarker and Jayasinghe, 2007). Recently this model has been used to analyze the impact of free trade agreements with agricultural trade flow in general and selected agricultural commodities such as red meat, grains, vegetables, fruits, sugar, honey, Oilseeds, dairy, and live animals (Hndi *et al.*, 2016; Sarker and Jayasinghe, 2007).

3. Australian agricultural exports

ABARES (2015) reported meat and live animals ranks first position (32.6%) on value of Australian agricultural exports in 2014/15 followed by grains, oilseeds and pulses (28.2%), industrial crops (12.1%- cotton, sugar and wine); livestock and livestock products (7.9%); wool (7.8%); dairy (6.2%); and horticulture (5.1%). Out of total exported meat and live animals, 68%

of export was beef. Similarly, in case of total grains, oilseeds and pulses export, 59% of the export was wheat. Australian export market valued at more than A\$41 billion per annum. With rising personal income, population growth and the emerging middle class in Asia, it offers the major market for over 60% of Australian agricultural exports (Batt, 2015). Around 21% of Australia's total agricultural exports are destined for China (Ziebell, 2014). Moreover, China is Australia's single most important market (29%) among Asian and Middle East countries (ABARE, 2015). CIE (2009) reported that total agricultural sector exports of Australia will be increased by 14% (increased by 84% in case of export to China as a result of the ChAFTA) by the end of 2030.

After announcement of ChAFTA, there is a reduction in Chinese tariffs applied to a number of Australian agricultural imports. The FTA will reduce tariffs to a zero level from the baseline level for different products for a first 11 years period. This includes products such as Australian dairy, live animals, barley, beef, lamb and mutton, edible fruits and vegetables, sea foods, hides skins and leather etc. But there are no changes to market access or tariffs for Australian wheat, maize, rice, sugar, cotton, and soybeans (Table 1). Products like cotton and wool, which comprised more than 40% of Australian agricultural exports to China, are not likely to see any great benefit from the deal (Ziebell, 2014). However, it creates duty free quota for Australian wool, that ChAFTA will provide an additional quota of 30,000 tonnes for wool, though a quota of 287,000 tonnes is already in place which is provided at 1% WTO's tariff rate to Australia. Moreover, China will increase this volume by 5 per cent per annum which will reach close to 63,500 tonnes of greasy wool by 2024, all at duty-free rates. This is the best outcome China has given in any of its FTAs to date (DFAT, 2016a). However, If Australia crosses the quotas, China has right to impose a tariff of 38% to the Australian wool (Ziebell, 2014).

Beef and Dairy are champions under the agreement (up to 25% tariff elimination within 4-11 years). But, China introduces few agricultural trade barriers to trade through discretionary

safeguards (which permit higher tariff above a trigger level) for Australian whole milk powder exports and beef (Ziebell, 2014). In case of all other dairy products, Australia will receive unrestricted preferential access (DFAT, 2016a). China has provided a quota of 170,000 tonnes of beef to Australia (DFAT, 2016a), which is only 12.6% of current beef production in Australia (ABARES, 2015). However, there is also a set of evaluation process to consider removal of the safeguard (DFAT, 2016a). The tariff for Australian barley will be cut to zero level immediately, which is currently at 3% and this will provide an immediate gain to the Australian barley producers/exporters. A detail of the baseline tariff level, new tariff level and the respective duration for the products are presented in Table 1.

4. Benefit of ChAFTA on Australian regional economies

ChAFTA will help to benefit Australia through making Australian exports more competitive in the growing Chinese market. It will reduce the costs of importing from China and can improve the consumer welfare (consumer surplus) in Australia. China is number one export market for Australian commodities which had a two ways trade value of A\$150 billion in 2014-15 (DFAT, 2016c). This market is important across Australian States and Territories. Mai *et al.* (2005) reported the expansion in Australian agriculture and food through the removal of border protection on merchandise trade between Australia and China. They also reported States/Territories which are over-represented in agriculture and mining tend to benefit more compared to States/Territories that are over represented in clothing. Among the different States and Territories, Western Australia had highest (41%) trade with China followed by New South Wales (25%), Victoria (23%), Queensland (21%), South Australia (20%), Northern Territory (20%), and Tasmania (19%) of their total trade in 2014-15 (Figure 5). China was top merchandise

export trade destination for all Australian States whereas Northern Territory had exported more to Japan than China (Appendix 2).

The share of total export merchandise trade of different States and Territories on total Australian merchandise export trade with China was not in same proportion as of each States and Territories own trade with China. The total merchandise export share was found highest in Western Australia (68%) followed by Queensland (14%), New South Wales (7%), Victoria (5%), South Australia (3%), and Tasmania (1%) (Figure 6). Less than 1% is found in Australian Capital and Northern Territories (Appendix 1). The import merchandise trade from China was found highest in New South Wales (47%) followed by Victoria (28%), Queensland (11%), Western Australia (9%), Northern Territory (2%), and Australian Capital Territory 1%) (Figure 6). Overall merchandise export trade was dominated by Western Australia along with low proportion of import merchandise trade with China, which shows Western Australia will take more advantage of ChAFTA compared to other States and Territories. Mai (2005) reported in the same line and concluded that from the removal of border protection on merchandise trade with China, Western Australia will benefits more followed by New South Wales, Queensland, South Australia, Tasmania, Northern Territory, and Australian Capital Territory.

Mai (2005) carried out the study on the impact of FTA between Australia and China by simulating the three aspects of the FTA, i.e. removal of border protection on merchandise trade; trade liberalization; and investment facilitation and services. He reported that all aspects would have a positive impact on the output of all Australian States and Territories. Among all States and Territories, New South Wales benefits more from FTA followed by Victoria, Western Australia, Queensland, South Australia, Tasmania, Australian Capital Territory, and Northern Territory.

A study on potential regional impact of FTA in Australia on single agriculture commodity is not found. So, we take production share of different exportable commodities by Australian States and Territories as a proxy to compare the potential benefits of FTA among the Australian States and Territories. In totality States will be benefited more than the Australian Capital Territory for all the exportable commodities. Mai (2005) also reported the same results that the gains for Australian Capital Territory from the removal of border protection on merchandise trade are comparatively small as its economy is dominated by the public Administration and dwelling services. Among the States, Tasmania will be benefitted less compared to the other States (Figure 7 & Appendix 3).

In dairy (whole milk production), Victoria will be benefitted more followed by New South Wales, Tasmania, South Australia, and both Western Australia and Queensland (Figure 7 & Appendix 3). In 2014-15, Australia had exported dairy worth A\$295 million to China (DFAT, 2016a). However, Ziebell (2014) reported that to fully exploit the benefit of ChAFTA, Australian dairy producers need further economies of scale in farming and investment in processing capacity as well as should plan to mitigate the effects of future droughts. Western Australia is the leading winter crops producer in Australia. Western Australia will benefit more from ChAFTA through producing winter crops (barley, canola, chickpeas, faba beans, filed peas, lentils, linseed, lupins, oats, safflower, triticale and wheat) followed by New South Wales, South Australia, Victoria, Queensland, and Tasmania (Figure 7 & Appendix 3). Among different winter crops, wheat, barley, and canola are the major exportable items in Australia. However, as per current agreement, wheat will not benefit from ChAFTA due to its exclusion in tariff reduction list (DFAT, 2015). IIT (2015) reported that New South Wales and Victoria has strong Revealed Comparative Advantage (RCA) in cereals trade with China compared to South Australia.

Queensland will benefit more from beef export, followed by New South Wales, Western Australia/Australian Territories, South Australia, and Tasmania (Figure 7 & Appendix 3). High quality beef demand is growing rapidly in China. Australia had supplied about 40% of imported beef to China in 2014/15, worth A\$789 million. To capitalize on the growing demand for high quality beef in China, the ChAFTA can provide competitive advantage over large beef exporters in the world (DFAT, 2016a).

New South Wales is the leading producers of summer crops (cottonseed, grain sorghum, maize, mung, beans, navy beans, peanuts, rice, and sunflower), sheep meat, oilseed crops (linseed, safflower seed, sesame seed, soybeans, and sunflower seed) and wool in Australia. New South Wales will benefit more than other States and Territories from ChAFTA through producing and trading the above mentioned summer crops (Figure 7 & Appendix 3). There is no production of summer crops in South Australia and Tasmania and a very minimal production in Western Australia. Therefore, those States will receive no or minimal benefits from ChAFTA through trading summer crops. Australia is the second most sheep meat suppliers to China after New Zealand. In the existing 12 to 23 % tariff imposition, Australia had exported sheep meat to China worth A\$359 million in 2014-15. Therefore, after reduction of tariffs on sheep meat, Australian farmers can compete with New Zealand farmers to increase their trade and profitability (DFAT, 2016a). Similarly, Australian wool has 63% market share in China which is far higher than New Zealand (14%) (DFAT, 2016a). Mai (2005) also reported that Tasmania can benefit more through expansion in wool production.

In case of Wine, China has been increasing its import dramatically; doubling in size since last five years, worth A\$2.1 billion in 2014-15. Australia is the third largest exporter to China for Wine, worth \$269 million in 2014-15. It may take advantage of ChAFTA; however Australia should compete with both Chile and New Zealand, which have preferential wine access to China under their FTAs (DFAT, 2016a). South Australia has strong RCA in beverages, spirits and vinegar trade with China compared to other States and Territories (IIT, 2015). China has rapidly

growing demand for Australian horticultural products. In 2014-15, Australia has exported horticultural products worth A\$111 million whereas it was only worth A\$14 million in 2009-10. So the Australian farmers will enjoy more benefits after reduction of higher tariffs (up to 30%) in horticultural products (DFAT, 2016a). However, IIT (2015) reported that South Australia has a comparative disadvantage in its trade of edible vegetables and certain roots and tubers with China.

5. Impact of ChAFTA on excluded commodities

Australian commodities such as wheat, maize, rice, sugar, cotton, soybeans, etc. are not included under ChAFTA for tariffs elimination (DFAT, 2015). Among the different excluded commodities in ChAFTA, wheat and cotton were exported from Australia in 2014-15 (DFAT, 2016d). Out of two commodities, cotton was exported only from New South Wales (A\$676 million) and Queensland (A\$738 million). So, we have chosen wheat as a major exportable commodity to explore the current situation of wheat production in Australia, its export scenarios, domestic use, comparative advantage and potential impact of ChAFTA.

The main reason behind the selection of wheat is that it was a major exportable commodity among the grains, oilseeds, pulses, and horticultural crops. Wheat export alone constitutes 63% of total grains export, 49% of the total for grains, oilseeds and pulses exports, and 41% of the total for grains, oilseeds, pulses, and horticultural crops exports (ABARES, 2015). It is a major winter crop in Australia produced mainly in the States such as Western Australia, New South Wales, Victoria, South Australia, and Queensland (DAWR, 2016). Australia had produced 25303 kt of wheat in 12613 thousand hectare (ha) with average productivity of 2.01t/ha in 2013-14, which is 3.5% of total world production. Out of total production in Australia, Western Australia had produced the highest (39%) followed by New South Wales (26%), South Australia (17%), Victoria (13%), Queensland (4%), and Tasmania (less than 1%) (Figure 7 & Appendix 3). DFAT (2016)

reported that wheat generates A\$2-3 billion in the Western Australia economy per annum. Out of total Australian wheat production, about 74% (18612 kt) was exported to 31 countries and remaining 26% was used for domestic purpose in 2013-14. Among different countries, China was the major importer (1491 kt) of Australian wheat after Indonesia (3720 kt) in 2013-14 (ABARES, 2015).

5.1 Comparative advantage analysis of wheat

Even though the usefulness and powerful influence of trade theories, it has been found difficult to use the theoretical concept of comparative advantage in empirical analyses, particularly when trying to measure the comparative advantage in examining trade performance since the concept of comparative advantage generally takes into account autarkic variables (autarkic relative prices and autarkic production costs) which are not observable (Sanidas & Shin, 2010). Therefore, the concept of Revealed Comparative Advantage (RCA) has also been used based on post-trade variables in order to identify the fundamental pattern of comparative advantage. Balassa (1965) had coined the idea of how to measure a RCA. However, he adopted Liesner's (1958) idea of using relative export performance, and proposed using the ratio of export shares as an index for the RCA. Balassa Index (BI) of the RCA can be written as:

$$BI_{ij} = \frac{X_{ij} / X_i}{X_{wj} / X_w} = \frac{X_{ij} / X_w}{X_i / X_w}$$

It can be extended as $X_i = \sum_j X_{ij}$; $X_{wj} = \sum_i X_{ij}$; $X_w = \sum_i \sum_j X_{ij}$.

Where, X denote the exports, i a specific country, j a specific commodity, w the world or any reference group of countries taken into consideration. The BI method is basically comparing a given sector's export performance of a given country and exports of the given sector are

distributed among countries in proportion to their share of world exports (Bowen, 1983). It can be used to compare across sectors within a particular country or across countries with respect to a particular sector (IIT, 2015; Sanidas & Shin, 2010). How much of comparative advantage or disadvantage a particular country gained during the specific period of time can be measured directly by comparing the calculated index values. If the value of the RCA index is larger than 1, equal to 1 and less than 1, it is considered to be revealed comparative advantage, neutral and revealed comparative disadvantage, respectively over world, particular countries or regions that are taken into consideration.

In our analysis, we examine the Australia's RCA on wheat with world, China, and other countries which have free trade agreements with Australia. In particular, we look at the RCA on wheat at different Australian States with the world, China, and other countries to identify the States RCA on wheat. We have used export data of 2014-2015 from different sources (DFAT, 2016d; WTO, 2016; Workman, 2016; Appendix 4) for calculating the RCA index. Result shows that Australia has a RCA on wheat trade with the world, China, and other countries (those involved in wheat export) which have free trade agreements with Australia. Among all, Australia has a stronger RCA on wheat trade with China (40232) followed by ASEAN (2056), the United States of America (5.70) and the world (4.08).

The results also reveal that the world, the USA and the ASEAN have also RCA of wheat trade with China; however they all have lower RCA compared to Australia's RCA on wheat trade with China. Among different Australian States and Territories, only four States (New South Wales, Victoria, Western Australia, and South Australia) had exported wheat in 2014-2015, so we have considered only those States when calculating the RCA index. In case of Australian States, all exporting States have RCA on wheat trade with the world, the USA, the ASEAN, and China, but a higher RCA is found with China. IIT (2015) reported that South Australia has a higher RCA of

cereals trade with the world compared to China. But in case of wheat, South Australia has more RCA to trade with China compared to the world. Moreover the results show, among the different States, that South Australia has a higher RCA followed by Victoria, Western Australia, and New South Wales on wheat trade with China (Appendix 4). In 2014-15, Australia has exported about 48% of wheat to the ASEAN countries (Appendix 5). These shows that ChAFTA could be a facilitator to trade wheat by providing additional market access to China after reducing some level of tariffs on it.

5.2 Scope of wheat export increment from Australia to China

The Chinese population is projected to reach 1.38 billion by 2017 (CM, 2015). We have estimated wheat requirements for Chinese population based on the projected population in 2017 and per capita consumption of wheat (Appendix 6). Three years (2012-13 to 2014-15) averages were used for calculating wheat production in China (MT), wheat export to China from Australia (MT), total wheat trade by Australia (MT), etc. The result shows that Chinese own wheat production is insufficient (9.7 MT) to meet the projected national requirement by 2017 (Appendix 6).

China had imported 3.5MT of wheat in 2016 whereas the imported quantity was 6.77MT in 2013 (IM, 2016). Australia has been exporting on average 1.2 MT of wheat per annum to China, which is only 6.4% of total Australian wheat export (ABARES, 2015). Due to growing population and increasing demand for wheat in China, it seems that Australia has a good scope to increase (up to 8.5 MT per annum) wheat export to China (Figure 8 & Appendix 6). Moreover, this quantity may increase in future as Chinese population will reach to 1.45 billion by 2029 (SCMP, 2015). RT (2016) reported that China has given priority for Russian wheat as it has an advantage of being higher quality and meeting the food safety standards. In this situation, Australia should maintain

the quality and meet the food safety standards to take advantage over other wheat exporting countries like Russia.

6. Conclusion

Currently, Australia has ten FTAs in force with New Zealand, Thailand, Singapore, Chile, US, the ASEAN, Korea, Malaysia, Japan, and China. ChAFTA came into force on 20 December 2015. In 2015, China was Australia's single most important market (29%) among Asian and Middle East countries. Some of the authors reported that total agricultural sector exports from Australia can be increased by 14% (increased by 84% in case of export to China) by the end of 2030, which shows a good opportunity arising from the ChAFTA for both countries. Australia will benefit from reduced tariffs to Australian products such as Australian dairy, live animals, barley, beef, lamb and mutton, edible fruits and vegetables, sea foods, hides skins and leather, etc. from their baseline level tariffs to zero level tariffs within 11 years. Beef and dairy are champions under the agreement (up to 25% tariff elimination within 4-11 years). But China introduces few agricultural trade barriers to trade through discretionary safeguards for Australian whole milk powder exports and beef. However, initiation of evaluation process to consider safeguards is good news to Australian beef and dairy entrepreneurs.

The benefits from ChAFTA will not be equal across the States and Territories, the States/Territories which are over-represented in agriculture tend to benefit more compared to States/Territories those are over represented in clothing. Overall merchandise export trade is dominated by Western Australia along with low proportion of import merchandise trade with China, which shows Western Australia will be benefitted more from the ChAFTA compared to other States and Territories. However, the benefits received for specific sectors are varying across the States and Territories. For example, Victoria will be benefitted more from dairy (whole milk

production); Queensland will be benefitted more from beef and New South Wales will be benefitted more from summer crops, sheep meat, oilseed crops, and wool compared to other States and Territories. However, there are no changes in the tariffs for Australian wheat, maize, rice, sugar, cotton, and soybeans (excluded commodities).

Among those excluded commodities, we have analysed the RCA of wheat with the world, China, and other countries which have free trade agreements with Australia to explore the opportunity for wheat export expansion to China. We found higher RCAs on Australian wheat with China compared to the world and other countries which have free trade agreements with Australia. In addition, among the different States, South Australia has a higher RCA on wheat trade with China followed by Victoria, Western Australia, and New South Wales. Since wheat has a higher RCA, tariff elimination or reduction for this product can bring significant benefits to the rural areas (regional economies) of Australia (IIT, 2015). Therefore, it is necessary to start negotiation to develop protocols with China for preferential FTA on wheat. Moreover, agreement with other countries should also be taken into consideration during such negotiation, for example, Korea has eliminated 1.8% tariff on wheat and 8% tariff on wheat gluten (IIT, 2015). Welfare gain from increasing export of wheat from Australia to China after reducing current tariffs (65%) and import of other manufactured products from China can be an interesting area of future research.

References

- ABARES (2015), "Agricultural commodity statistics 2015", Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Canberra ACT 2601.
- Adams, P., Huff, K., MacDougall, R., Pearson, K. and Powell, A. (1997). "Medium- and long-run consequences for Australia of an APEC free trade area: CGE analysis using the GTAP and Monash modes", *Asia Pacific Economic Review*, Vol. 3 No. 11, pp. 19-42.
- Au-Yeung, W., Keys, A. and Fischer, P. (2012). "Australia-China: Not just 40 years. Economic Roundup". Issue 4.
- Balassa, B. (1965). "Trade liberalisation and revealed comparative advantage", *The Manchester School of Economic and Social Studies*, Vol. 33, pp. 99-123.
- Barro, R. and Martin, S-I. (1995). "Economic Growth", McGraw-Hill, New York, NY.
- Batt, P. J. (2015). "Australia's 'Five Strong Pillar Economy': Agriculture", available at: <http://theconversation.com/australias-five-strong-pillar-economy-agriculture-40388>
- Bhattacharyya, R. and Mandal, A. (2016), "India–ASEAN Free Trade Agreement: An ex post evaluation", *Journal of Policy Modeling*, Vol. 38, pp. 340–352.
- Bowen, H. (1983), "On the theoretical interpretation of indices of trade intensity and revealed comparative advantage", *Review of World Economics*, Vol. 119, pp. 464-472.
- Brox, J. A. (2003). "The impact of free trade with the United States on the pattern of Canadian consumer spending and savings", *North American Journal of Economics and Finance*, Vol. 14, pp. 69–87.
- Chandran, B. P. S. and Sudarsan, P. K. (2012). "India–ASEAN Free Trade Agreement implications for fisheries", *Economic and Political Weekly*, Vol. XLVII No. 16, pp. 65–70.
- CIE (2009). "Estimating the Impact of an Australia–China Trade and Investment Agreement 2008 Economic Modelling Update". Centre for International Economics Canberra &

Sydney, available at:

http://acbc.com.au/admin/images/uploads/Copy3report_fta_modelling.pdf

CM (2015), “China Population Clock”, available at: <http://countrymeters.info/en/China>

DAF (2016), “Western Australian Wheat Industry”, Department of Agriculture and Food, available at: <https://www.agric.wa.gov.au/grains-research-development/western-australian-wheat-industry>

DAWR (2016), “Wheat”, Department of Agriculture and Water Resources, available at:

<http://www.agriculture.gov.au/ag-farm-food/crops/wheat>

DFAT (2015), “FTA Text and Tariff Schedules”, available at:

<http://dfat.gov.au/trade/agreements/in-force/chafta/official-documents/Pages/official-documents.aspx>

DFAT (2016a), “China-Australia Free Trade Agreement: Factsheet: Agriculture and Processed Foods”, Department of Foreign Affairs and Trade, available at:

<http://dfat.gov.au/trade/agreements/in-force/chafta/fact-sheets/Documents/fact-sheet-agriculture-and-processed-food.pdf>

DFAT (2016b), “Free Trade Agreement: Factsheet. Published by Department of Foreign Affairs and Trade”, available at: <http://dfat.gov.au/trade/agreements/Pages/about-ftas.aspx>

DFAT (2016c), “ChAFTA - Benefits for Australian Business”, available at:

<http://dfat.gov.au/trade/agreements/in-force/chafta/fact-sheets/Pages/key-outcomes.aspx>

DFAT (2016d), “Australian Trade by States and Territories”, available at:

<http://dfat.gov.au/about-us/publications/Documents/australias-trade-by-state-and-territory-2014-15.pdf>

DFAT/MOC (2005), “Australia – China Free Trade Agreement Joint Feasibility Study”, Department of Foreign Affairs and Trade, Australia and the Ministry of Commerce, China.

Economics (2016), “Economics online: News analysis theory comment”, available at:

http://www.economicsonline.co.uk/Global_economics/Tariffs_and_quotas.html

Farajzadeh, Z., Bakhshoodeh, M. and Zibaei, M. (2012), “A general equilibrium analysis of trade liberalization impacts on agriculture and environment”, *African Journal of Agricultural Research*, Vol. 7 No. 31, pp. 4390-4400.

Franklin, R. R. (2000), “International Trade and Investment. Seventh edition”, The Wharton School University of Pennsylvania, South-Western Publishing Co.

Grimson, M. (2014), “Free Trade Agreements: What is an FTA and what are the benefits?”, available at: <http://www.abc.net.au/news/2014-04-07/free-trade-agreement-explained-bilateral-fta-tpp/5371314>

Gu, Z. H. and Shen, Y. (2014), “Political and Economic Determinants of Free Trade Agreements”, *Journal of Chinese Economic and Foreign Trade Studies*, Vol. 7 No. 2, pp. 110 – 124.

Hndi, B. M., Maitah, M. and Mustofa, J. (2016), “Trade Impacts of Selected Free Trade Agreements on Agriculture: The Case of Selected North African Countries”, *AGRIS on-line Papers in Economics and Informatics*, Vol. 8 No. 3, pp. 39 - 50.

Hodgkinson, A. and Jordaan, A. (2006), “Logic of an Australia-South Africa FTA”, *Journal of Policy Analysis and Reform*, Vol. 13 No. 2, pp. 147-160.

IIT (2015), “Trade Impact Study for South Australia in Relation to the China-Australia Free Trade Agreement”, Institute for International Trade, University of Adelaide, available at: <http://www.statedevelopment.sa.gov.au/upload/china/chafta-trade-impact-study.pdf>

IM (2016), “China Wheat Imports by Year”, Indexmundi, available at:

<http://www.indexmundi.com/agriculture/?country=cn&commodity=wheat&graph=imports>

- Islam, N. (2004), “Indo-Bangladesh economic relations: some thoughts”, *Economic and Political Weekly*, Vol. 39 No. 36, pp. 4069-4075.
- Kennedy, P. L. and Hilbun, B. (2012), A Determination of the Trade Impacts of the Australia-United States Free Trade Agreement”, *International Business & Economics Research Journal*, Vol. 11 No. 1, pp. 59-68.
- Keller, W., Li, B. and Shiue, C. H. (2011), “China's foreign trade: Perspectives from the past 150 years”, *The World Economy*, Vol. 34, pp. 853-92.
- Kim, C., Rahman, M. M. and Ara, L. A. (2014). “Economic impact of the proposed Bangladesh–India FTA: potentials and realities”, *South Asian Journal of Global Business Research*, Vol. 3 No. 2, pp. 135 – 153.
- Liesner, H. H. (1958), “The European Common Market and British Industry”, *The Economic Journal*, Vol. 68, pp. 302-316.
- Linneman, H. (1966), “An econometric study of world trade flows”, Amsterdam: North-Holland Publishing Co.
- Lutz, S. (2005), “The Effect of Quotas on Domestic Product Price and Quality”, *International Advances in Economic Research*, Vol. 11 No. 2, pp. 163–173.
- Ma, J. (2011), “Free Trade or Protection: A Literature Review on Trade Barriers”, *Research in World Economy*, Vol. 2 No. 1, pp. 69-76.
- Mai, Y. (2005), “Modelling the Potential Benefits of an Australia-China Free Trade Agreement: Impact on Australian States and Territories”, Centre of Policy Studies, Monash University, Clayton, Victoria 3800, Australia.
- Mai, Y., Adams, P., Fan, M., Li, R. and Zheng, Z. (2005), “Modelling the Potential Benefits of an Australia-China Free Trade Agreement”, Report prepared for the Australia-China FTA Feasibility Study.

- Nagoor, B. H. and Kumar, C. N. (2010), “Assessing the impact of the ASEAN–India FTA on the tea industry”, *Economic and Political Weekly*, Vol. 45 No. 44, pp. 112–116.
- Newbery, D. (1995), “The Distributional Impact of Price Changes in Hungary and in the United Kingdom”, *Economic Journal*, Vol. 105, pp. 847–63.
- Park, I. (2006), “East Asian regional trade agreements: do they promote global free trade?”, *Pacific Economic Review*, Vol. 11 No. 4, pp. 547-568.
- Raihan, S. (2009), “EU-India bilateral FTA: potential implications for the excluded low-income economies in Asia and Africa”, UNESCAP conference proceedings, Santiago, June 10-12, available at: <https://www.unescap.org/tid/artnet/mtg/Selim%20Raihan.pdf>
- RT (2016), “China to import more Russian wheat”, RT News, available at: <https://www.rt.com/business/341080-russia-wheat-exports-china/>
- Sanidas, E. and Shin, Y. (2010), “Comparison of Revealed Comparative Advantage Indices with Application to Trade Tendencies of East Asian Countries”, *Paper Presented at the 9th Korea and the World Economy Conference*, Incheon in 2010.
- Sarker, R. and Jayasinghe, S. (2007), “Regional trade agreements and trade in agrifood products: evidence for the European Union from gravity modeling using disaggregated data”, *Agricultural Economics*, Vol.37, pp. 93–104.
- SCMP (2015), “China's population to peak in 2029 under two-child policy: family planning official”, available at: <http://www.scmp.com/news/china/policies-politics/article/1877679/chinas-population-peak-2029-under-two-child-policy>
- Shaikh, F. M. (2009), “Analysis of bilateral trade liberalization and South Asian Free Trade Agreement (SAFTA) on Pakistan's economy by using CGE model”, *Journal of International Trade Law and Policy*, Vol. 8 No. 3, pp. 227 – 251.

- Thurbon, E. (2015), “ 10 years after the Australia-US free trade agreement: where to for Australia’s trade policy?”, *Australian Journal of International Affairs*, Vol. 69 No. 5, pp. 463-467.
- Timbergen J. (1962), “Shaping the world economy”, New York, NY: Twentieth Century Fund.
- Tisdell, C. (2003), “China’s rural poverty and its entry to the WTO”, *International Journal of Development Issues*, Vol. 2 No. 2, pp. 15-36.
- Veeramani, C. and Saini, G. K. (2011). “Impact of ASEAN–India preferential trade agreement on plantation commodities: A simulation analysis”, *Economic and Political Weekly*, Vol. 46 No. 10, pp. 83–92.
- Wacziarg, R. (1997), “Trade, Competition and Market Size”, Harvard University, Cambridge, MA.
- Workman, D. (2016), “Wheat Exports by Country”, available at:
<http://www.worldstopexports.com/wheat-exports-country/>
- WTO (2016), “Trade growth to remain subdued in 2016 as uncertainties weigh on global demand”, available at: https://www.wto.org/english/news_e/pres16_e/pr768_e.htm
- Ziebell, P. (2014), “Special Report: China-Australia Free Trade Agreement”, National Australia Bank Limited ABN, available at: <http://business.nab.com.au/wp-content/uploads/2014/11/nab-special-report-agribusiness-china-australia-free-trade-agreement.pdf>

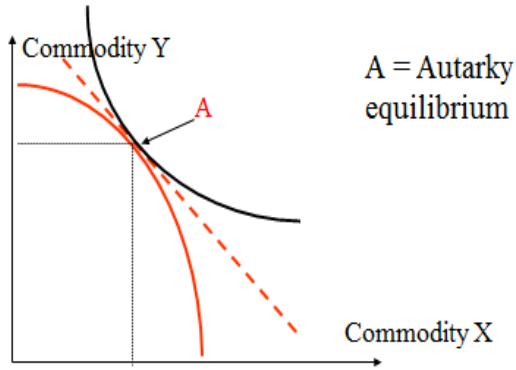


Figure 1: Production and consumption possibilities without trade

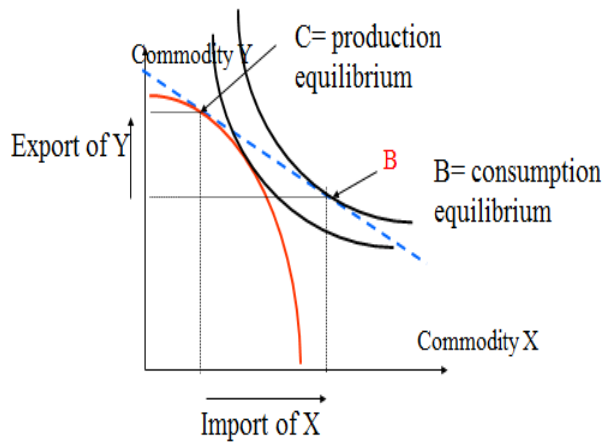


Figure 2: Production and consumption possibilities with trade

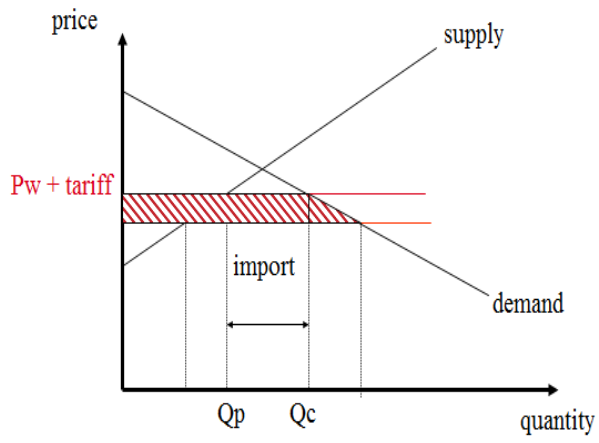


Figure 3: Consumer surplus due to imposed tariff

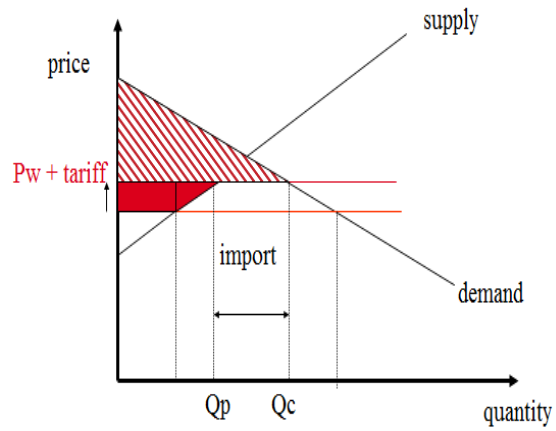


Figure 4: Producer surplus due to imposed tariff

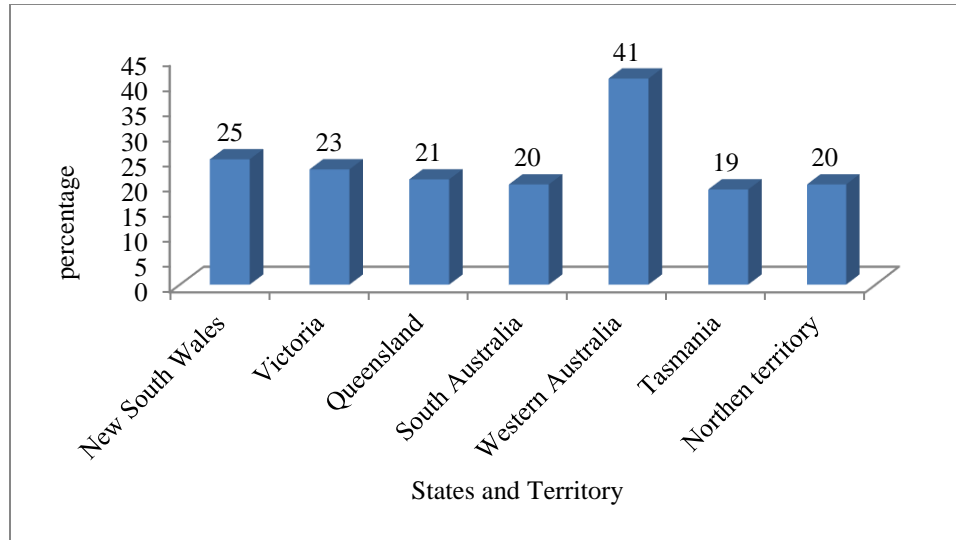


Figure 5: Percentage of different states/territory trade with China on their total trade in 2014-15.

Source (DFAT 2016c).

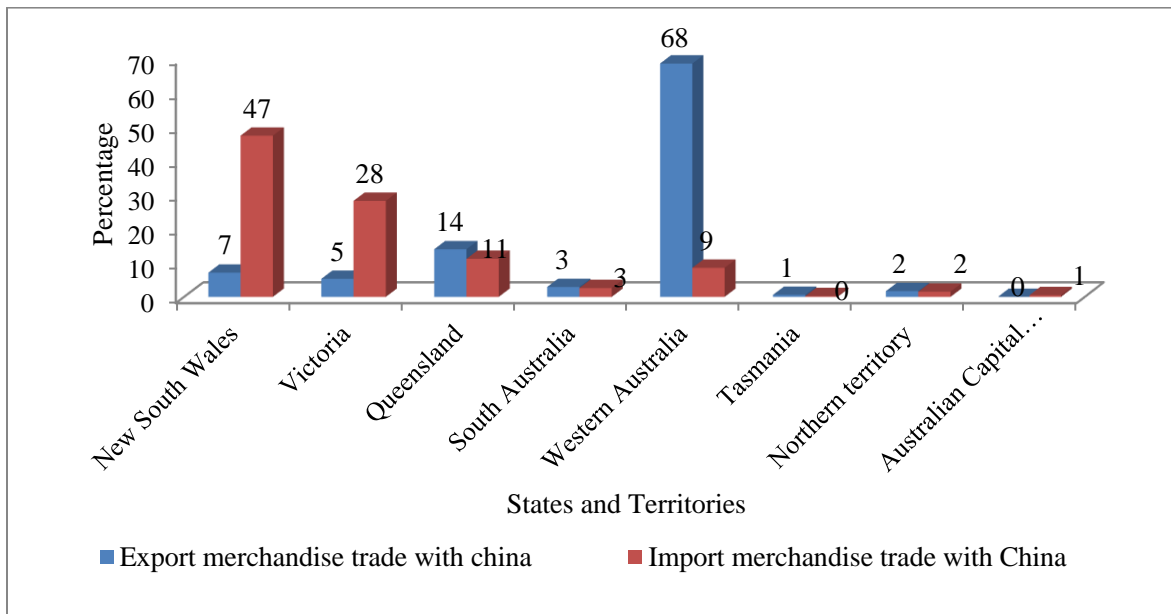


Figure 6: Share of total merchandise trade of different states and territories on Australian merchandise trade with China in 2014-15.

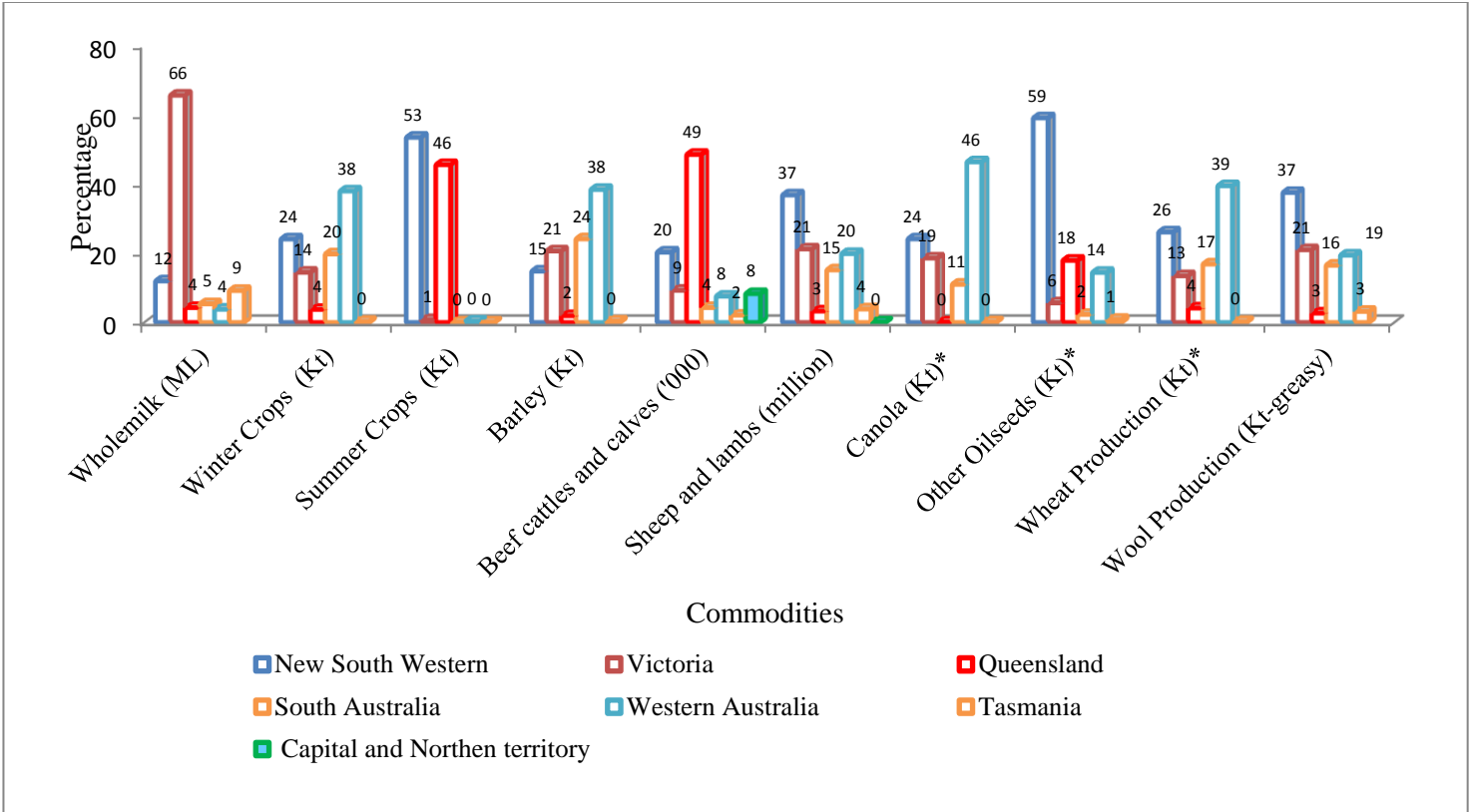


Figure 7: Production share of different commodities by Australian territory and states in 2014/15.

Note: * given in the figure represents the year 2013/14. Source: ABARES, 2015.

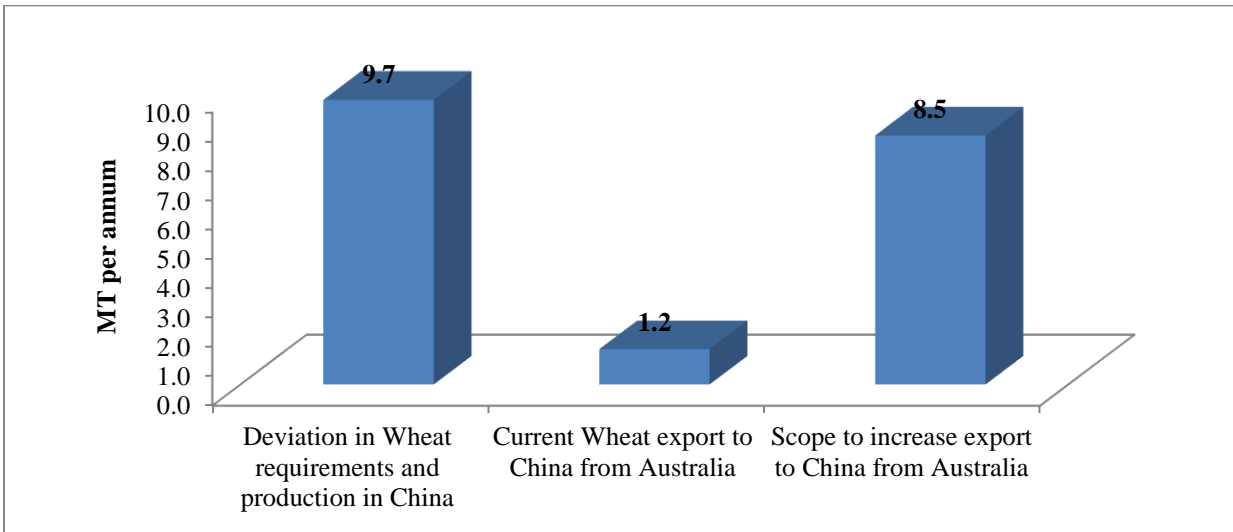


Figure 8: Estimation of wheat requirements in China and supply situation from Australia in 2017.

Table 1: Chinese tariff reductions for Australian commodities (Base year = 2015)

Commodities	Baseline-tariff (%)	New-tariff (%)	Duration (Years)
Live animals	10	0	4
Lamb and mutton	12-23	0	8
Live Fish	10.5 -17.5	0	4
Dairy produces**	12-25	0	4-11
Cut flower and flower buds	10-23	0	4
Edible vegetables	10-13	0	4
Edible fruits and nuts	10-25	0	4-8
Rye	3	0	Immediately
Barley	3	0	Immediately
Oats, Sorghum and Buckwheat	2	0	Immediately
Wool*	14-25	0	4
Wine	14-20	0	4
Beef**	12-25	0	9
Seafood	14-15	0	4
Hides, skins, etc.	5-14	0	2-7
Other oil seeds	10-20	0	4
Wheat	65	65	Not Included in FTA
Rice	65	65	Not Included in FTA

Maize	20-65	20-65	Not Included in FTA
Sugar	50	50	Not Included in FTA
Cotton, carded, not carded, comb	40	40	Not Included in FTA
Soybeans	3	3	Not Included in FTA

* Quotas ** discretionary safeguards. Source: DFAT 2015.

Appendix 1: Details of total Australian merchandise export and import from China in 2014-

15.

States and Territories	Total merchandise export from Australia (A\$ million)	Total export merchandise trade with china (A\$ million)	Total import merchandise trade with China (A\$ million)
New South Wales	37114	5717	27086
Victoria	23709	4258	16134
Queensland	46973	11241	6401
South Australia	11339	2337	1487
Western Australia	110696	55070	4888
Tasmania	2542	488	132
Northern Territory	6196	1354	865
Australian Capital Territory	6	0	291
Unallocated in Australia	17392	0	0
Total	255967	80465	57284

Source: DFAT 2016d.

Appendix 2: Trading position of Australian states and territories with China in 2014-15

States and Territories	Total merchandise trade with China	Total export trade with china	Total import trade with China	Remarks
New South Wales	1	2	1	After Japan
Victoria	1	1	1	
Queensland	1	1	1	
South Australia	1	1	1	
Western Australia	1	1	1	
Tasmania	1	1	1	
Northern Territory	2	2	2	After Japan
Australian Capital Territory	7	7	7	

Source: DFAT 2016d.

Appendix 3: Selected indicators for regional comparison of major exportable agricultural commodities from Australia (2014/15)

Descriptions	NSW	VIC	QLD	SA	WA	TAS	ACT & NT	Total Production
Australian production of wholemilk (ML)	1160	6390	411	516	364	891	NA	9732
Winter Crop Production (Kt)	9230	5532	1417	7574	14551	78	NA	38382
Summer Crop Production (Kt)	2161	29	1841	0	11	0	NA	4042
Barley (Kt)	1184	1650	150	1931	3075	24	NA	8014
Total beef cattles and calves ('000)	5325	2428	12755	1110	1973	534	2171	26296
Total Sheep and lambs (million)	26.71	15.36	2.34	10.971	14.406	2.77	0.04	72.61
Canola (Kt)*	922.4	710	0.9	419.4	1776.6	2.5	NA	3831.8
Other Oilseeds (Kt)*	37	3.5	11.2	1.4	9	0.5	NA	62.6
Wheat Production (Kt)*	6596	3396	1036	4254	9977	43	NA	25302
Shorn Wool Production (Kt-greasy)	130	72.6	9.1	57.1	67.2	10.8	NA	346.8

*indicates the year in 2013/14. NA-Not available.

Appendix 4: Revealed Comparative Advantage (RCA) analysis of Australian wheat export

Description	Total merchandise export trade	Total wheat export trade	% Sharing of wheat export trade to total merchandise export	RCA of wheat export to World	RCA of wheat export to China	RCA of wheat export to USA	RCA of wheat export to ASEAN
World (billion US\$)	15983	83	0.51930	NA	9845.0958	1.3956	503.2899
China (billion US\$)	2275	0.0012	0.00005	0.0001	NA	0.0001	0.05112
USA (billion US\$)	1505	5.6	0.37209	0.7165	7054.26357	NA	360.6201
ASEAN (billion US\$)	1163	0.012	0.00103	0.0019	19.56148	0.0027	NA
Australia (A\$million)	255967	5432	2.12215	4.0865	40232.399	5.7032	2056.715
New South Wales (A\$million)	37114	489	1.31756	2.5371	24978.78	3.5409	1276.937

Victoria (A\$million)	23709	654	2.75845	5.3118	52295.541	7.4133	2673.394
Queensland (A\$million)	46973	0	0	NA	NA	NA	NA
South Australia (A\$million)	11339	1300	11.46486	22.07	217354.5	30.81	11111.3
Western Australia (A\$million)	110696	2989	2.70019	5.199	51191.06	7.256	2616.93
Tasmania (A\$million)	2542	0	0	NA	NA	NA	NA
Northern Territory (A\$million)	6196	0	0	NA	NA	NA	NA
Australian Capital Territory (A\$million)	6.0	0	0	NA	NA	NA	NA

Source: DFAT 2016d. WTO 2016. Workman, 2016. ASEAN countries include Brunei, Cambodia,

Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam; NA means not applicable.

Appendix 5: Quantity of wheat export in 2014-15 from Australia to different countries which having FTA with Australia

Description	Quantity (Kt)	% sharing
China	930	5.6
New Zealand	521	3.1
Thailand	466	2.8
Singapore	96	0.6
ASEAN+	6351	38.3
Korea	1048	6.3
Malaysia	906	5.5
Japan	904	5.5
Chile	NE	
USA	NE	
Total export from Australia	16571	100

Source: ABARES 2015. + includes Vietnam, Indonesia and Philippines (None of the wheat was exported from Australia to other ASEAN countries such as Brunei, Cambodia, Laos, Myanmar).

NE-not exported.

Appendix 6: Estimation of wheat requirements in China and supply situation from

Australia

Description	Quantity
Chinese Population (Number)	1382494824
Average Wheat Consumption (Kg/person)*	96
Total Wheat Requirements in China per annum in 2017 (MT)	132.7
Total Wheat production in China per annum (MT)*	123
Deviation in Wheat requirements and production in China per annum (MT)	9.7
Total wheat trade by China per annum (MT)*	4.0
Wheat export to China from Australia per annum (MT)*	1.2
Total Wheat trade from Australia per annum (MT)*	18.7

Note: * indicates 3 years (2012-13 to 2014-15) average. Source: CM and SCMP 2015.