

# Australia-China Agricultural Trade: Dynamics and Prospects<sup>1</sup>

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## Abstract

China's increasing demand for agricultural imports presents enormous opportunities for Australian agricultural exports to this growing market. To best capture the emerging opportunities, it is pertinent for Australian agricultural industries to gain an in-depth understanding of the changing patterns of agricultural trade between Australia and China and the driving forces behind such dynamics. This paper adds to the understanding of Australia-China agricultural trade by constructing and examining several important trade-related indices, e.g., trade intensity index, revealed comparative advantage, and trade complementarity index. Implications are drawn for promoting future agricultural trade and cooperation between Australia and China.

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# **Australia-China Agricultural Trade: Dynamics and Prospects**

## **1. Introduction**

Trade between China and Australia has been fast expanding in the recent decade and China has now become Australia's second-largest export market (DFAT 2005). In particular, Australia's agricultural exports to China have increased rapidly and have almost trebled over the past decade, reaching A\$2.5 billion in 2004. This makes China Australia's third-largest agricultural export market. China's demand for agricultural commodities is expected to continue, driven by the effects of fast economic growth, higher incomes and rapid urbanisation (Chen 2004, Tian and Zhou 2005, Wang and Zhou 2005, Zhou, et al. 2005). Due to limited natural resources, China's domestic agricultural production will not be able to meet the increasing demand and agricultural imports are expected to rise (Chen 2004, DFAT 2005, Zhou and Tian 2005).

China's demand for increased agricultural imports presents enormous opportunities for Australian agricultural exports to this growing market. Following the conclusion of an Australia-China free trade agreement (FTA) feasibility study in March 2005, the two governments have agreed in April 2005 to commence negotiations for an FTA. When signed, this proposed FTA will further facilitate Australia's agricultural exports to China.

It is noted, however, to best capture the opportunities presented by the Chinese market, an in-depth understanding of the changing patterns of agricultural trade between Australia and China and the driving forces behind such dynamics is pertinent. While it is generally held that China presents many opportunities for Australian agricultural exports (see, for example, DFAT 2005, Mai, et. al 2005), studies of Australia-China agricultural trade patterns at the more disaggregated levels are scarce. Literature search shows that there is a lack of research that examines and compares agricultural trade in and between the two countries at high levels of disaggregation. It is, however, the finding of studies at the disaggregated levels that are of more direct relevance to the Australian industries in strategically developing markets in China. This study attempts to fill the gap of the literature.

The primary objectives of this study are to investigate the major trends of and changes in the bilateral agricultural trade between Australia and China; examine trade intensity, comparative advantages and trade complementarity associated with the two countries' agricultural trade, and draw implications for promoting future agricultural trade and cooperation between Australia and China.

In the next section, we first highlight Australia-China agricultural trade dynamics. Section 3 analyses agricultural trade complementarity between the two countries. Section 4 addresses the likely prospects of agricultural trade between Australian and China. The last section concludes the paper.

## **2. Australia-China Agricultural Trade Dynamics**

There are different methods to classify agricultural products for trade statistics. One classification adopted in the United Nations Comtrade Database, the Standard International Commodity Classification (SITC Revision III), has been widely used in various research. According to SITC, traded agricultural products include "food" and "agricultural raw material". "Food" includes SITC0 (Food and Live Animals), SITC1 (Beverages and

Tobacco), SITC4 (Animal and Vegetable Oils, Fats and Waxes). The subgroup SITC22 (Oil Seeds and Oleaginous Fruits) of SITC2 (Crude Materials, Inedible, except Fuels) is also placed in “food”. “Agricultural raw material” includes several subgroups of SITC2 (Crude Materials, Inedible, except Fuels), i.e., SITC21 (Hides, Skins and Furskins, raw), SITC23 (Crude Rubber), SITC25 (Pulp and Waste Paper), SITC26 (Textile Fibres), and SITC29 (Crude Animal and Vegetable Materials). In this study, we make use of data from United Nations Comtrade Database SITC Revision III and “agricultural products” include SITC0 (Food and Live Animal), SITC1 (Beverages and Tobacco), several subgroups of SITC2 (Crude Materials, Inedible, except Fuels), namely, SITC21 (Hides, Skins and Furskins, raw), SITC22 (Oil Seeds and Oleaginous Fruits), SITC26 (Textile Fibres), and SITC29 (Crude Animal and Vegetable Materials), and SITC4 (Animal and Vegetable Oils, Fats and Waxes). In this study, all the analyses of the bilateral trade and calculations of the indices are based on the values of Australia’s exports to China and Australia’s imports from China.

## 2.1 General trends

The volume of Australia’s agricultural trade with China was relatively small before 1994 but it has shown a strong increasing trend since then. The increase in the most recent years has been very remarkable. Australia’s exports to China have been far greater than its imports from China, resulting in a large trade surplus in favour of Australia (see Figure 1).

[Figure 1 here]

In terms of the share of Australia’s agricultural imports from China out of its total agricultural imports, it has been increasing steadily, reaching 5.4% in 2005. Its share of agricultural exports to China out of its total agricultural exports has also been increasing and reached 9.8% but it tends to fluctuate (Figure 2). Unstable production level of Australia’s agricultural products due to changes in weather and other conditions and China’s adjustments in trade policy are likely responsible for such fluctuations.

[Figure 2 here]

The share of China’s exports to Australia out of its total agricultural exports has been increasing steadily. This share has been, however, very small, being only 1.1% in 2005, suggesting Australia is not China’s major agricultural export market. On the other hand, its share of agricultural imports from Australia out of its total agricultural imports did not register an increase; instead, it has dropped from a peak of 10.1% in 1993 to 6.6% in 2005. This share has also fluctuated, and sometimes greatly, over the years (Figure 3).

[Figure 3 here]

At the disaggregated level, Australia’s major agricultural imports from China are food and live animals (SITC0). The share of Australia’s food and live animals imports from China out of its total agricultural imports from China was as high as 83% in 2005, increased from 71% in 1990 (see Table 1). Under SITC0, major commodity items imported include fish, crustaceans and molluscs (SITC03, 5.8% in 1990 and 22.3% in 2005), vegetables and fruits (SITC05, 38.5% in 1990 and 29.5% in 2005). The share of vegetable imports has increased while that of fruit imports has declined. Australia’s imports of sugar confectionary from China have increased from 0.6% in 1990 to 7.3% in 2005. Beverages and tobacco imports from China have also increased.

[Table 1 here]

Table 2 presents the share of Australia's agricultural commodity exports to China out of its total agricultural exports to China. This share for some export items have fluctuated between years and sometimes, dramatically. Textile fibres (SITC26) are the major exports to China accounting for 65% of Australia's total agricultural exports to China in 2005. Textile fibre exports are chiefly composed of cotton (SITC263, increased from 5.6% in 1990 to 14.3% in 2005) and wool (SITC268, increased from 22.8% in 1990 to 50.7% in 2005). The share of food and live animal exports fluctuated and has declined over time. It was 67.3% in 1990 but drooped to 20.2% in 2005. Under food and live animals, major commodity items exported include fish, crustaceans and molluscs (SITC03, 0.2% in 1990 and 4.6% in 2005), and barley (SITC043, 22.2% in 1990 and 6.1% in 2005). The share of barley exports was very unstable. Other major commodity exports include hides, skins and furskins (SITC21) and animal and vegetable oils, fats and waxes (SITC4).

[Table 2 here]

The analysis in this section suggests that Australia chiefly exports land-intensive commodities to China while China mainly exports labour-intensive products to Australia. China is increasingly becoming Australia's major agricultural export market but Australia is not China's major export market. The importance of the Chinese market to Australian exports is increasing. China's unstable pattern of imports from Australia may have some ramifications on Australia's export efforts. The likely signing up of a free trade agreement is expected to promote more stable agricultural trade between Australia and China.

## 2.2 Trade intensity

Several statistical indices can be used to measure trade between two nations. One such index is the trade intensity index (TII) (Brown 1949, Kojima 1964). TII appears in two forms, i.e., the export intensity index (XII) and import intensity index (MII). They can be defined as follows

$$XII_i = \frac{x_{ij} / X_{iw}}{M_{jw} / (M_w - M_{iw})} \quad (1)$$

and

$$MII_i = \frac{m_{ij} / M_{iw}}{X_{jw} / (X_w - X_{iw})} \quad (2)$$

where:

$XII_i$  = Country i's export intensity index

$MII_i$  = Country i's import intensity index

$x_{ij}$  = Country i's exports to country j

$X_{iw}$  = Country i's total exports to the world

$M_{jw}$  = Country j's total imports from the world

$M_w$  = World total imports

$M_{iw}$  = Country i's total imports from the world

$m_{ij}$  = Country i's imports from country j

$X_{jw}$  = Country j's total exports to the world  
 $X_w$  = World total exports  
i, j = Australia and China

Export and import intensity indices reflect the ratio of the share of country i's trade with country j relative to the share of world trade destined for country j. An index of greater (less) than unity has been interpreted as an indication of larger (smaller) than expected trade flow between the two parties concerned. Table 3 demonstrates that most export and import intensity indices are greater than unity, implying that Australia and China are trading greater than expected. Most importantly, the trade in SITCs 0 and 4 is "intensifying" in recent years. The trade in SITC 1 is smaller than expected in most cases, which tends to suggest that neither of the two countries is good at producing them. Nonetheless, for China export to Australia and Australia import from China, the trade in SITC 1 has increased over the years and has become greater than expected in recent years. Table 3 also shows that increases in the bilateral agricultural trade between Australia and China were substantial in the past few years and that China imported relatively more from Australia.

[Table 3 here]

At the SITC 2 and 3 digit level, trade intensity indices do not always show a clear pattern of increasing or decreasing. In most cases, they tend to change between years. Some commodities have a TII greater than (and in some cases far greater than) unity. They tend to be those commodities that have a comparative advantage to produce in a country. Full details of TII at the 2 and 3 digit levels can be obtained from the authors.<sup>2</sup>

### 3. Analysis of Agricultural Trade Complementarity

In this section, we examine agricultural trade complementarity between Australia and China. We first employ the Revealed Comparative Advantage (*RCA*) index to assess export potential of each of the two countries. We then calculate trade complementarity index (*TCI*) to measure how well the structures of Australia/China's exports match the structures of China/Australia's imports.

#### 3.1 Comparative Advantage

To compare export potential and competitiveness of each country in trade of a particular commodity group, the Revealed Comparative Advantage (*RCA*) index is often computed, using the following formula:

$$RCA_{ic} = \frac{x_{ic} / X_{iw}}{x_{cw} / X_w} \quad (3)$$

where:

$RCA_{ic}$  = revealed comparative advantage index of commodity group c for country i  
 $x_{ic}$  = value of exports of commodity group c by country i  
 $X_{iw}$  = value of total exports by country i

<sup>2</sup> We also examined whether and to what extent intra-industry trade (IIT) in agricultural commodities is taking place between Australia and China. Not unexpectedly, intra-industry agricultural trade between Australia and China is not extensive and hence the results are not reported in the paper. For those who are interested, full details of the IIT indices for all the commodity groups can be obtained from the authors.

$x_{cw}$  = value of world exports of commodity group c  
 $X_w$  = value of total world exports

Country i has a comparative advantage in exporting commodity group c when  $RCA_{ic}$  has a value greater than unity, that is, when country i's export share of commodity group c is large than the world export share of the same commodity group.<sup>3</sup> On the contrary, if  $RCA_{ic}$  is less than unity, country i has a comparative disadvantage.

At the highly aggregated level (SITC 1 digit), China has shown comparative advantage mainly in food and live animals. Australia also has comparative advantage in food and live animals but it is smaller than China's (see Table 4). Both countries do not show any comparative advantage in SITC 1 and 4. Clearly, RCAs based on highly aggregated data reveals limited information. In this study, we also calculated RCAs at the more disaggregated levels (SITC 2 and 3 digit levels). At the 2 digit level, RCAs are more realistically "revealed" and even more so at the 3 digit level (see Tables 5 and 6).

[Tables 4, 5 and 6]

According to Table 5, at the 2 digit level, Australia shows much greater comparative advantage in the production of several groups of commodities (e.g., 00: live animals; 01: meat and meat preparations; 02: dairy products and bird eggs; 04: cereal and cereal preparations; 11: beverages; 21: hides, skins and furskins; 26: textile fibres; and 41: animal oils and fats). China has relatively fewer groups of commodities that have comparative advantages (03: fish, crustaceans, mollusc; 05: vegetables and fruit; 26: textile fibres; and 29: crude animal and vegetable material) and in some cases the comparative advantages have in fact declined (e.g., 00: live animals; 01: meat and meat preparations; and 12: tobacco and tobacco manufactures).

The RCA indices based on 3-digit data provide even clearer information at the commodity level. Table 6 shows that Australia has strong comparative advantage in the production and supply of the following commodities:

- Bovine meat (011)
- Milk and cream (022)
- Wheat, meslin, unmilled (041)
- Barley, unmilled (043)
- Meal, flour of wheat, meslin (046)
- Hides, skins (ex. Furs), raw (211)
- Cotton (263)
- Wool and other animal hair (268)
- Animal oils and fats (411)

China has comparative advantage in the production and supply of the following commodities:

- Fish, fresh, chilled and frozen (034)
- Crustaceans, molluscs etc. (036)
- Rice (042)

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<sup>3</sup> It should be pointed out that this *RCA* index is asymmetric in the sense that it ranges from one to infinity for products in which a country has comparative advantage but only from zero to one for the case of comparative disadvantage. To correct this skewed distribution, several symmetric *RCA* indices have been proposed (e.g. Dulum et al. 1998 and Laursen 1998).

- Meal, flour of wheat, meslin (046)
- Vegetables (054)
- Wool and other animal hair (268)

The comparative advantage for some commodities has shown a declining trend. For Australia, these include: crustaceans, molluscs etc. (036) and rice (042). For China, oilseeds (222) and crude vegetable materials, nes (292). The change in the RCA indices for unmilled maize (044) was related to China's temporary large amounts of exports. The RCA index for Australia's sugar has declined dramatically and this is a puzzle to us as one would have thought Australia has a great comparative advantage in producing sugar. Further investigation is needed to understand the decline in the RCAs for Australia's sugar.

Tables 5 and 6 clearly show that there are few areas where there is an overlap in the two countries' comparative advantage. Hence, the two countries do not compete with each other in agricultural trade and indeed, the trade is very complementary. The two exceptions are meal, flour of wheat, meslin (046) and wool and other animal hair (268). In the case of wool, China's demand is so high (for processing and re-exporting) and there is a strong need to import from Australia.

### 3.2 Complementarity in agricultural trade

Trade complementarity index (TCI) correlates nation i's export specialisation pattern with nation j's import specialisation pattern across the spectrum of all traded products. TCI is a trade-weighted measure for sector s of the degree to which the relative-export-share structure of nation i's exports (RXSi) corresponds with the relative-import-share structure of nation j's imports (RMSj) across all k commodities within the s sector (Vollrath and Johnston 2001). The formula is:

$$TCI_{ij}^s \equiv \sum_{k \in s} [\theta^k * RXS_i^k * RMS_j^k] \quad (4)$$

where:

$$RXS_i^k \equiv \frac{X_{iw}^k / X_{iw}^s}{X_{ww}^k / X_{ww}^s} \equiv \frac{\text{share of k in country i's exports of s goods}}{\text{share of k in the world's exports of s goods}};$$

$$RMS_j^k \equiv \frac{M_{jw}^k / M_{jw}^s}{M_{ww}^k / M_{ww}^s} \equiv \frac{\text{share of k in country j's imports of s goods}}{\text{share of k in the world's imports of s goods}};$$

$$\theta^k \equiv \frac{X_{ww}^k}{X_{ww}^s} \equiv \text{share of k in global exports of s goods.}$$

$RXS_i^k$  is Balassa's revealed comparative advantage.  $RMS_j^k$  has the same structure, except that import rather than export data are used. In other words, the index can be interpreted as being a trade-weighted measure for sector s of the degree to which exporter i's profile of "comparative advantages" corresponds with the profile of "comparative disadvantages" for importer j. That is, this index depicts how specialisation in the commodity composition of nation i's exports to the global market meshes with the specialisation in the commodity composition of nation j's imports from the international market. There is always some degree of complementarity in bilateral specialisation patterns, provided i exports some goods that j imports within the sector s. TCI equal to one represents a threshold, with a value greater (less) than one showing a greater (lesser) level of complementarity in the composition of what

exporter  $i$  exports and what importer  $j$  imports than occurs between the average pair of countries. Figure 4 presents complementarity indices of Australia export to China and China export to Australia. They are calculated at the 2-digit level, across all agricultural commodities according to SITC from 1995 to 2004.

[Figure 4 here]

The TCIs in Figure 4 suggest that agricultural trade between Australia and China are very complementary. The TCIs for China export and Australia import are greater than those for Australia export and China import. This is likely due to the fact that (1) some agricultural products that Australian imports from China cannot be produced locally (e.g., some special products largely demanded by migrants and some of them have been processed), and (2) China chiefly imports Australia's wool, meat and barley to meet some demand for higher quality. Such products are also produced in China and the imports only accounts for a small portion of total consumption. It is noted that before 1998, the TCIs for China export to Australia and Australia export to China moved in the same direction. However, they moved in opposite directions since then. This tends to suggest that the complementarity for China to export agricultural products to Australia is increasing while that for Australia to export to China is declining. China seems to be enjoying more opportunities to export to the Australian market. On the other hand, while the China market is so important to Australia, Australia is yet to tap more opportunities to export more to China.

#### **4. Prospects of Agricultural Trade between Australian and China**

Our analysis suggests that, in terms of both trade compositions and factor endowments, there is strong complementarity in the trade of agricultural products between Australia and China. Currently, the volume of trade between the two countries is still small. Yet the scope of commodities traded is relatively extensive. Further trade expansion between the two countries will render huge benefits to both partners.

Further expansion in agricultural trade between Australia and China is desirable by both parties. Given that over 60% of Australia's agricultural products have to be exported, Australia has a strong need to export. China offers a potentially huge market for Australian products. China's demand for agricultural products will continue to rise. This is driven by several important factors such as (1) limited land and other natural resources, (2) increased demand as a result of income increase, and to some extent, increased demand by population increase, and (3) the demand for higher quality and diverse products as consumer tastes and preferences change. Australia's reputation in producing good quality products is advantageous to increase its exports to China. If the proposed FTA is signed, Australia will be in a much better position to secure more shares in the growing Chinese market.

China's competitiveness will be in the production of labour-intensive agricultural products and product processing. However, constrained by limited land and other important natural resources, there is limited chance for China to export such products in large volume to Australia. Currently, it is difficult for many Chinese products to meet Australian standards and exporting to Australia is not easy. If an FTA is signed and if Chinese producers can manage to produce products that meet Australian standards, China's agricultural exports to Australia will increase but unlikely to a great extent.

Australia has a very high labour cost and its competitiveness is in the production of land-intensive products. Australia's land-intensive products such as grains (e.g., barley, wheat, and

oats), animal products (wool, meats, dairy products) and cotton have great potential to export to China. As Chinese consumers' income further increases, the demand for higher quality and diverse products will increase. This will create enormous opportunities for Australia to export to China in the medium and longer term. However, in the near future, China's import of wheat from Australia is unlikely in a large quantity because current domestic production basically meets the consumption needs and any imports would be primarily for some special quality needs. The import of meats and dairy products is unlikely large either. However, China may continue to import barley at a large quantity.

It is expected that total trade volume between the two countries will further increase. While Australia's exports to China are expected to grow, so are the imports from China. However, Australia will continue to export more to China than it imports from China. Increased exports from Australia to China are unlikely to generate too much a shock to China's domestic production. This is mainly due to the fact that imports from Australia are chiefly for some niche market. Australian products, because of their higher quality or products that China does not produce, are not competing at the same level with those of locally produced low-cost products.

Although China's products have a higher complementarity to export to Australia, the increase in the volume of future exports is likely to be small. China chiefly exports some special products to the Australian market that are not generally demanded by the majority of the population but for catering the tastes and preferences of some Asian migrants. Products that China can export in a large quantity are unlikely to be accepted by Australia due to their inability to meet the Australian standards. Therefore, likewise, increased imports from China will not generate much negative impacts on Australian agricultural sector.

The high level of agricultural trade complementarity between Australia and China provides strong support, at least from agricultural sector's point of view, for an FTA between the two countries. If an FTA is signed, bilateral agricultural trade will increase further and both countries will benefit from the expansion. In passing, opposite agricultural production seasons in Australia and China represents another important complementarity, attractive to traders in both markets to import and export products based on seasonal differences.

## **5. Concluding Comments**

The volume of Australia's agricultural trade with China has increased remarkably since 1994, particularly in the last few years. Australia's exports to China have been far greater than its imports from China, resulting in a large trade surplus in favour of Australia. This pattern of agricultural trade between Australia and China is expected to continue.

Australia chiefly exports land-intensive commodities to China while China mainly exports labour-intensive products to Australia. China is increasingly becoming Australia's major agricultural export market but Australia is not China's major export market. The importance of the Chinese market to Australian exports is increasing. However, China's imports from Australia tend to fluctuate between years and sometimes to a great extent. China's unstable pattern of imports will have some ramifications on Australia's export efforts.

A large portion of agricultural trade between Australia and China is inter-industry trade. Intra-industry agricultural trade between the two countries is not extensive. Australia and China are trading greater than expected and the trade is "intensifying" in recent years. This study clearly suggests that there are few areas where there is an overlap in the two countries' comparative

advantage and thus the two countries do not compete with each other in agricultural trade and indeed, the trade is very complementary.

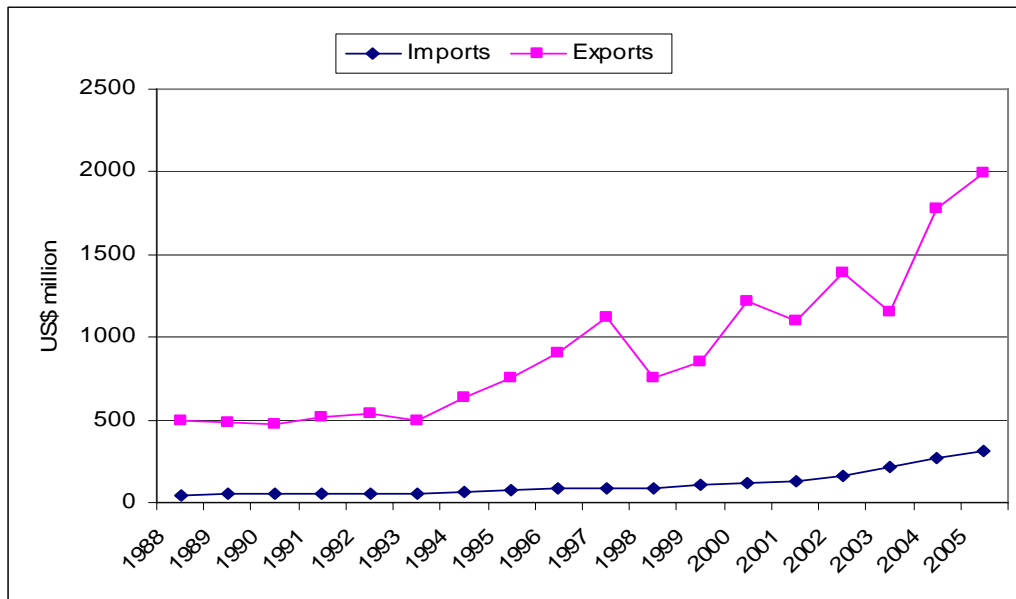
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Because the agricultural trade between the two countries are not directly competitive, Australia and China may consider not only promoting trade, but also promoting more general agricultural cooperation between them. Cooperation in areas of agricultural technology and management is likely to benefit China more than Australia. However, increased agricultural production in China may help China to export more. China's increased ability to export will enable China to import more from Australia and the world.

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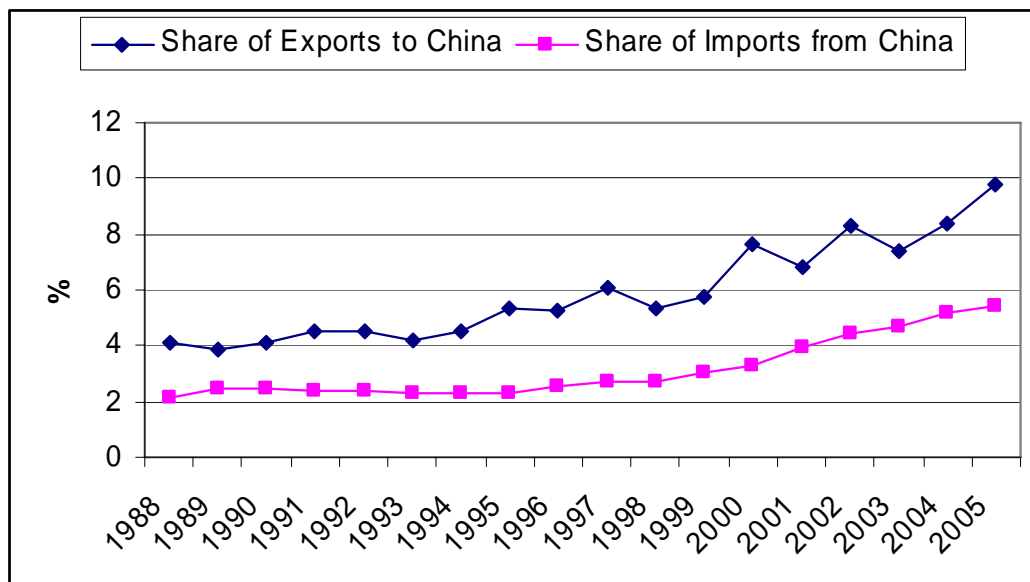
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Figure 1. Australia's Agricultural Trade with China



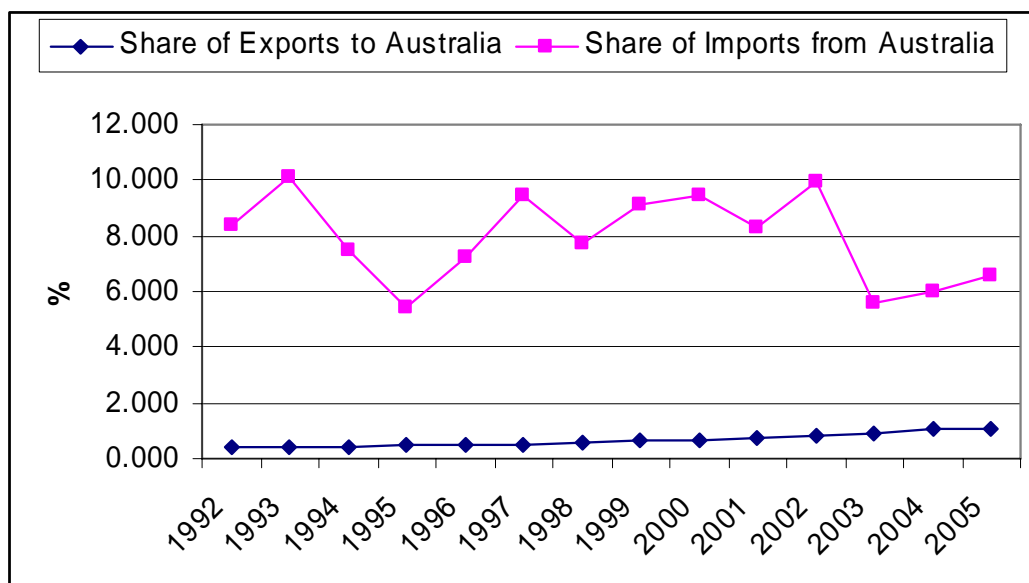
Source: Based on data extracted from United Nations Comtrade Database SITC Revision III, at current price (unstats.un.org/unsd/comtrade, accessed June 2006).

Figure 2. Share of Australian Agricultural Exports to and Imports from China out of its Total Agricultural Exports



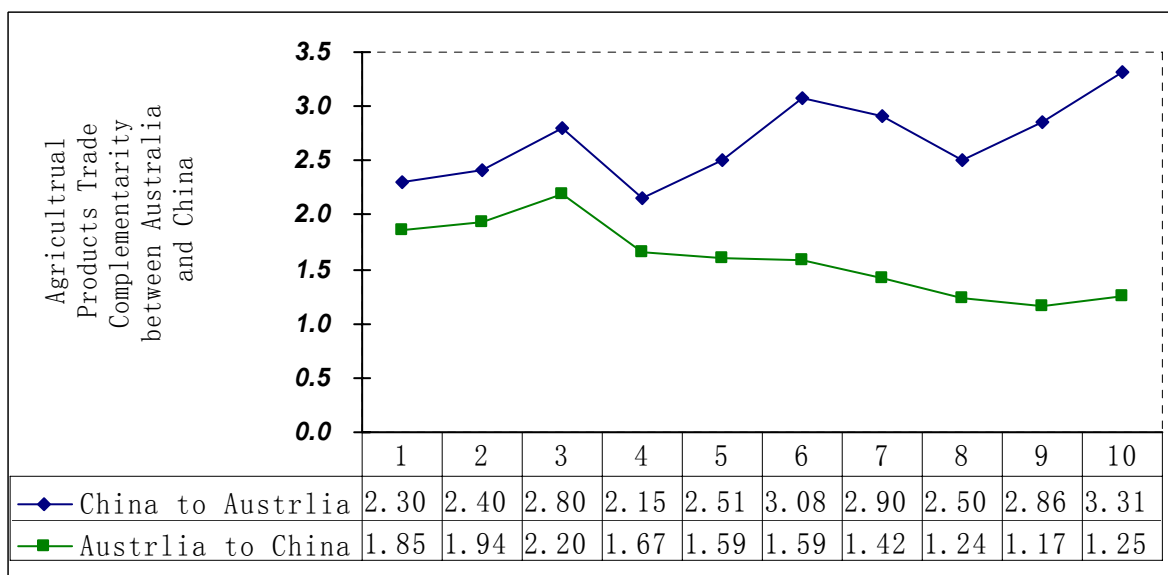
Source: Based on data extracted from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Figure 3. Share of Chinese Agricultural Exports to and Imports from Australia out of its Total Agricultural Exports



Source: Based on data extracted from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Figure 4. Agricultural Trade Complementarity between Australia and China



Source: Authors' own estimates using data from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Table 1. Share of Australia's Agricultural Commodity Imports from China out of Total Agricultural Imports from China (%)

Code	Item	1990	1995	2000	2004	2005
0	Food and live animals	70.82	74.74	73.35	84.49	83.15
03	Fish, crustaceans, mollusc	5.84	12.11	9.30	21.16	22.27
036	Crustaceans,molluscs etc	2.69	6.55	3.84	15.37	15.65
04	Cereals and cereal preparations	3.38	4.57	10.35	10.63	9.51
048	Cereal preparations	3.13	4.47	9.76	9.21	8.98
05	Vegetables and fruit	38.54	37.10	34.97	29.98	29.53
054	Vegetables	2.73	4.45	5.95	5.35	5.41
057	Fruit,nuts ecl.oil nuts	10.97	8.42	4.77	4.21	3.82
06	Sugars, sugar preparations and honey	1.07	1.67	4.92	8.82	9.24
062	Sugars, sugar preparations and honey	0.57	1.05	4.18	7.14	7.31
09	Miscellaneous edible products and preparations	7.17	12.63	10.06	9.10	7.77
098	Edible prod.prepryns,nes	7.15	12.63	10.06	9.09	7.77
1	Beverages and tobacco	0.79	2.90	9.07	5.77	6.75
12	Beverages	0.27	2.64	8.79	4.38	5.76
29	Crude animal and vegetable materials	7.81	12.81	9.22	4.86	4.22

Source: Based on data extracted from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Table 2. Share of Australia's Agricultural Commodity Exports to China out of Total Agricultural Exports to China

Code	Item	1990	1995	2000	2004	2005
0	Food and live animals	67.33	6.61	20.03	22.60	20.21
00	Live animals	0.24	0.02	0.56	5.78	2.33
01	Meat and meat preparations	0.58	2.22	1.88	2.94	2.63
02	Dairy products and birds' eggs	0.44	0.65	1.86	2.61	2.01
03	Fish, crustaceans, mollusc	0.20	0.98	1.58	3.16	4.60
04	Cereals and cereal preparations	65.54	0.36	12.56	6.37	6.86
043	Barley	22.19	0.00	12.49	5.95	6.10
21	Hides, skins and furskins, raw	0.27	4.67	6.47	7.91	6.50
26	Textile fibres	28.38	81.28	53.48	60.14	65.03
263	Cotton	5.61	3.72	0.97	8.71	14.29
268	Wool and other animal hair	22.75	77.36	52.41	51.43	50.74
29	Crude animal and vegetable materials	1.86	1.70	1.74	2.85	2.70
4	Animal and vegetable oils, fats and waxes	2.14	5.65	3.62	6.07	4.29

Source: Based on data extracted from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Table 3. Intensity of Agricultural Trade between Australia and China, 1995-2004

<b>Code</b>	<b>0</b>	<b>1</b>	<b>4</b>
	Food and Live Animals	Beverages and Tobacco	Animal and Vegetable Oils, Fats and Waxes
<b>Export intensity: Australia to China</b>			
1995	0.289	0.196	2.087
1996	0.836	0.324	2.746
1997	1.372	1.110	2.198
1998	1.786	0.645	2.088
1999	1.824	0.335	2.985
2000	1.601	0.129	5.058
2001	1.423	0.165	7.155
2002	2.208	0.185	4.079
2003	2.001	0.295	3.133
2004	1.370	0.406	3.353
<b>Export intensity: China to Australia</b>			
1995	0.840	0.187	0.236
1996	0.943	0.320	0.510
1997	0.867	0.708	0.528
1998	0.882	1.298	1.736
1999	0.994	1.533	3.003
2000	0.926	1.524	1.667
2001	1.153	1.349	2.247
2002	1.180	1.490	1.901
2003	1.215	1.884	2.320
2004	1.444	1.381	2.166
<b>Import intensity: Australia from China</b>			
1995	0.819	0.222	0.283
1996	0.899	0.377	0.561
1997	0.844	0.790	0.611
1998	0.838	1.368	1.899
1999	0.921	1.582	3.188
2000	0.860	1.557	1.670
2001	1.077	1.334	2.225
2002	1.092	1.445	2.086
2003	1.159	1.844	2.554
2004	1.388	1.346	2.485
<b>Import intensity: China from Australia</b>			
1995	0.278	0.229	2.227
1996	0.795	0.375	2.804
1997	1.336	1.231	2.344
1998	1.685	0.680	2.164
1999	1.682	0.348	3.019
2000	1.472	0.132	4.878
2001	1.313	0.164	6.878
2002	2.011	0.181	4.217
2003	1.866	0.293	3.147
2004	1.291	0.402	3.427

Source: Authors' own estimates using data from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Table 4. Revealed Comparative Advantage, Australia and China (at 1-digit level)

	<b>SITC0</b>		<b>SITC1</b>		<b>SITC4</b>	
	<b>Food and Live Animals</b>		<b>Beverages and Tobacco</b>		<b>Animal and Vegetable Oils, Fats and Waxes</b>	
	Australia	China	Australia	China	Australia	China
1995	0.970	0.979	0.268	0.836	0.247	0.578
1996	1.016	1.005	0.285	0.792	0.229	0.552
1997	0.997	1.041	0.309	0.590	0.212	0.825
1998	0.960	1.081	0.440	0.596	0.301	0.386
1999	0.973	1.066	0.498	0.456	0.277	0.187
2000	0.969	1.088	0.536	0.391	0.266	0.176
2001	0.952	1.106	0.583	0.456	0.249	0.175
2002	0.975	1.136	0.709	0.449	0.206	0.107
2003	0.964	1.159	0.942	0.410	0.256	0.101
2004	1.000	1.146	0.883	0.450	0.228	0.115

Source: Authors' own estimates using data from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Table 5. Revealed Comparative Advantage, Australia and China (at 2-digit level)

Code	Item		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
00	Live animals	A	1.480	1.592	1.775	1.382	1.554	1.441	1.791	2.044	2.560	1.899
		C	1.711	1.790	1.845	1.731	1.424	1.203	1.162	1.015	0.968	0.937
01	Meat, meat preparations	A	2.037	1.463	1.622	2.012	1.963	1.897	2.074	2.023	2.375	2.410
		C	1.047	1.111	1.004	0.948	0.836	0.818	0.944	0.792	0.714	0.738
02	Dairy products, bird eggs	A	1.275	1.399	1.366	1.640	1.597	1.680	1.570	1.635	1.455	1.383
		C	0.070	0.091	0.106	0.096	0.091	0.092	0.080	0.097	0.084	0.103
03	Fish, crustaceans, mollusc	A	0.565	0.456	0.475	0.495	0.520	0.503	0.455	0.457	0.516	0.401
		C	1.843	1.896	1.878	1.784	1.845	1.885	2.076	2.117	2.242	2.674
04	Cereals, cereal preprtns	A	1.336	2.195	2.328	2.111	1.960	1.826	1.742	1.779	1.465	2.113
		C	0.188	0.305	0.938	1.113	0.852	1.064	0.718	0.943	1.290	0.461
05	Vegetables and fruit	A	0.319	0.323	0.319	0.320	0.309	0.327	0.319	0.324	0.312	0.271
		C	1.532	1.418	1.375	1.355	1.340	1.284	1.416	1.406	1.468	1.594
06	Sugar, sugr. preprtns, honey	A	2.918	1.959	1.990	0.192	0.207	0.238	0.193	0.219	0.223	0.223
		C	0.781	0.864	0.604	0.636	0.542	0.629	0.539	0.610	0.550	0.612
07	Coffee, tea, cocoa, spices	A	0.138	0.135	0.115	0.108	0.135	0.146	0.143	0.157	0.192	0.170
		C	0.523	0.582	0.592	0.585	0.589	0.550	0.639	0.576	0.543	0.715
08	Animal feed stuff	A	0.499	0.466	0.462	0.511	0.637	0.753	0.607	0.646	0.742	0.694
		C	0.564	0.522	0.416	0.339	0.405	0.405	0.427	0.489	0.436	0.465
09	Misc. edible products etc	A	0.351	0.331	0.349	0.352	0.361	0.366	0.318	0.322	0.443	0.353
		C	0.609	0.677	0.802	0.974	0.949	0.943	0.974	0.945	0.905	0.936
11	Beverages	A	0.489	0.515	0.546	0.714	0.794	0.851	0.890	1.041	1.361	1.243
		C	0.444	0.426	0.415	0.420	0.427	0.381	0.401	0.384	0.317	0.379
12	Tobacco, tobacco manufact	A	0.057	0.071	0.055	0.074	0.057	0.047	0.052	0.075	0.105	0.099
		C	1.831	1.675	1.021	0.980	0.558	0.444	0.552	0.552	0.590	0.597
21	Hides, skins, furskins, raw	A	1.881	1.572	1.558	1.875	1.414	1.563	1.762	1.525	2.107	1.985
		C	0.260	0.160	0.197	0.149	0.088	0.052	0.046	0.052	0.036	0.035
22	Oil seed, toleaginus fruit	A	0.250	0.330	0.313	0.653	1.207	0.844	0.727	0.774	0.424	0.649
		C	1.434	1.108	0.559	0.666	0.963	0.845	0.891	0.796	0.736	0.746
26	Textile fibres	A	4.383	4.045	4.426	4.822	4.578	4.065	4.533	4.158	3.821	3.229
		C	0.994	1.025	1.107	1.046	1.878	1.567	1.191	1.290	1.160	1.050
29	Crude animal veg. materl	A	0.316	0.281	0.263	0.302	0.287	0.259	0.257	0.250	0.259	0.245
		C	2.492	2.392	2.397	2.191	1.995	1.992	1.852	1.614	1.496	1.710
41	Animal oils and fats	A	2.407	2.083	1.961	2.782	2.510	2.199	2.063	1.876	2.715	2.194
		C	0.024	0.019	0.036	0.048	0.039	0.155	0.097	0.109	0.096	0.174
42	Fixed veg. fats and oils	A	0.005	0.015	0.033	0.071	0.055	0.045	0.043	0.045	0.037	0.048
		C	0.800	0.679	1.070	0.450	0.203	0.181	0.190	0.114	0.096	0.097
43	Animal, veg. fats, oils, nes	A	0.244	0.253	0.306	0.341	0.318	0.280	0.257	0.285	0.315	0.322
		C	0.115	0.278	0.346	0.312	0.195	0.117	0.090	0.086	0.138	0.213

Source: Authors' own estimates using data from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).

Table 6. Revealed Comparative Advantage, Australia and China (at 3-digit level)

Code	Item		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
011	Bovine meat	A	4.602	3.701	3.832	4.640	4.361	4.238	5.398	5.364	5.492	5.339
		C	0.075	0.140	0.135	0.190	0.062	0.048	0.076	0.042	0.025	0.044
022	Milk and cream	A	1.566	1.857	1.700	1.925	1.806	1.872	1.833	2.073	1.714	1.657
		C	0.065	0.079	0.110	0.103	0.118	0.109	0.084	0.120	0.091	0.109
025	Eggs, birds, yolks, albumin	A	0.096	0.092	0.050	0.076	0.091	0.035	0.030	0.032	0.031	0.053
		C	0.863	0.954	0.935	0.845	0.674	0.710	0.742	0.738	0.774	0.949
034	Fish, fresh, chilled, frozen	A	0.177	0.141	0.183	0.229	0.299	0.286	0.285	0.310	0.326	0.203
		C	1.367	1.294	1.463	1.485	1.557	1.528	1.836	1.787	1.874	2.168
036	Crustaceans, molluscs etc	A	1.238	1.058	1.025	1.060	1.044	0.953	0.899	0.912	1.001	0.880
		C	1.891	1.590	1.496	1.364	1.384	1.283	1.375	1.483	1.546	1.780
041	Wheat, meslin, unmilled	A	2.857	4.701	5.056	4.985	4.590	4.334	4.297	4.166	3.510	5.015
		C	0.003	0.000	0.000	0.003	0.001	0.000	0.091	0.119	0.432	0.166
042	Rice	A	1.308	1.015	1.284	0.964	1.098	1.090	0.962	0.453	0.346	0.144
		C	0.103	0.555	1.455	3.983	2.868	2.691	1.727	1.829	2.102	1.075
043	Barley, unmilled	A	2.357	5.503	6.324	6.150	5.460	3.850	3.062	6.240	4.724	10.850
		C	0.003	0.003	0.027	0.034	0.015	0.001	0.001	0.001	0.007	0.005
044	Maize, unmilled	A	0.006	0.012	0.008	0.012	0.022	0.024	0.022	0.022	0.016	0.011
		C	0.041	0.087	2.831	1.970	1.683	3.257	1.957	3.068	4.125	0.712
046	Meal, flour of wheat, msln	A	0.446	0.588	0.720	1.290	1.338	1.043	1.202	1.314	1.303	1.473
		C	1.330	3.099	2.465	1.939	1.313	1.081	1.450	1.503	1.212	1.363
054	Vegetables	A	0.379	0.470	0.498	0.448	0.454	0.533	0.517	0.479	0.354	0.359
		C	2.059	2.113	2.045	1.939	1.959	1.742	1.899	1.846	1.879	1.964
057	Fruit,nuts excl.oil nuts	A	0.320	0.308	0.288	0.305	0.292	0.297	0.286	0.323	0.340	0.279
		C	0.502	0.452	0.433	0.401	0.355	0.327	0.328	0.372	0.410	0.475
061	Sugars, molasses, honey	A	3.586	2.326	2.422	0.138	0.150	0.177	0.122	0.146	0.172	0.191
		C	0.750	0.844	0.498	0.555	0.443	0.483	0.368	0.397	0.322	0.335
071	Coffee, coffee substitute	A	0.045	0.053	0.037	0.037	0.053	0.059	0.065	0.071	0.087	0.072
		C	0.016	0.016	0.054	0.062	0.069	0.039	0.070	0.080	0.096	0.102
222	Oilseed (sft. fix veg. oil)	A	0.214	0.318	0.313	0.621	1.134	0.791	0.683	0.757	0.406	0.566
		C	1.315	1.069	0.550	0.651	0.890	0.772	0.764	0.738	0.676	0.627
211	Hides, skins (ex. furs), raw	A	2.040	1.904	1.977	2.446	1.838	2.036	2.261	2.072	2.947	2.934
		C	0.263	0.165	0.168	0.123	0.083	0.038	0.037	0.045	0.026	0.010
263	Cotton	A	1.773	1.802	2.478	3.795	4.180	3.351	3.800	3.344	2.600	1.959
		C	0.149	0.046	0.017	0.230	1.364	1.163	0.305	0.773	0.430	0.044
268	Wool, other animal hair	A	12.703	12.131	12.411	12.552	11.768	11.128	11.532	12.745	12.778	11.498
		C	1.322	1.815	1.868	1.561	2.820	2.226	2.006	2.015	2.199	2.453
292	Crude veg. materials, nes	A	0.190	0.176	0.160	0.188	0.194	0.169	0.172	0.166	0.163	0.149
		C	1.438	1.272	1.245	1.020	0.940	0.864	0.878	0.820	0.748	0.773
411	Animal oils and fats	A	2.407	2.083	1.961	2.782	2.510	2.199	2.063	1.876	2.715	2.194
		C	0.024	0.019	0.036	0.048	0.039	0.155	0.097	0.109	0.096	0.174

Source: Authors' own estimates using data from United Nations Comtrade Database SITC Revision III (unstats.un.org/unsd/comtrade, accessed June 2006).