



# When Dragons and Kangaroos Trade: China's Rapid Economic Growth and its Implications for China and Australia

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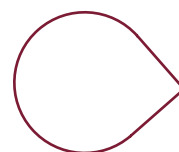
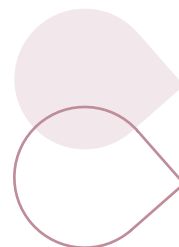
China's economy has experienced remarkable growth since its economic reform and is expected to maintain high growth in the coming decades. This paper looks at the implications of China's rapid growth and emergence in the global economy for its own economy and for the rest of world, with specific focus on Australia. The conclusion is that China will emerge as the second largest importer and exporter in the world by 2020. Although imports of many land-intensive agricultural products are projected to rise, exports of most labor-intensive products (eg horticulture, fishery and processed foods) are also going to grow in the future, which implies that China needs to continue restructuring its agricultural sector as the economy moves towards globalisation. The results also show that the opportunities from China's economic growth for the rest of world are projected to far surpass the adverse effects. With the exception of Russia, it is predicted that Australia will be the single biggest winner from China's rise in world markets.

China's economy has experienced remarkable growth since economic reforms were initiated in the late 1970s and pushed forward by a number of complementary policies. Since the mid-1980s, rural township and village-owned enterprises (TVEs) development; measures to provide a better market environment through domestic market reform; fiscal and financial expansions; the devaluation of exchange rate; trade liberalisation; the expansion of special economic zones to attract foreign direct investment (FDI); the state-owned enterprise (SOE) reform; agricultural market liberalisation, and many other reforms have all contributed to China's economic growth. In response, the annual growth rate of gross domestic product (GDP) was about nearly 10% in 1979–2004 (National Bureau of Statistics of China 2005).

China's rapid economic growth has been accompanied with a sharp transition domestically from an economy based on planning to one based on markets and an opening of China to the outside world. From an economy run by planners

in the 1970s and early 1980s, China's domestic economy has become remarkably integrated and competitive (Park et al. 1996; Rosen et al. 2004). Improvements in domestic markets have led to increased specialisation and higher productivity (de Brauw et al. 2004). At the same time China steadily expanded its role in international markets, increasing trade volume by nearly 15% annually from 1979 to 2004 (National Bureau of Statistics of China 2005). Within the agricultural sector, it has been shown that the composition of trade has changed, with China becoming a major importer of land-intensive staples and a major exporter of labour-intensive horticultural, livestock and aquaculture commodities (Huang et al. 2004).

While the past changes in China have been wrenching for both China and the rest of world, the changes may just be starting. According to the baseline projections of almost every major economic modeling team in the world (as summarised in Huang et al. 2006), economic growth is projected to continue in China at a minimum of more than 8% up until the mid-2010s



and in the range of 6–7% annually between 2010 and 2020. Estimates of future growth rates vary and some are even higher. If such growth continued through 2030 (even at 5% between 2020 and 2030), the economy of China will grow by five times or more over the coming 20 years or so. With the size of China's economy (it is projected that at least by 2020, China will become the third largest economy in the world), such rapid growth is likely to have profound impacts on China's own population and on the rest of the world – even when thinking about what will happen in the more modest scenarios. The impact is likely to be greatest for those countries that live in close proximity to China and those that are generally more liberalised economies.

This paper examines the implications of China's rapid growth and emergence in the global economy on its own economy and on one of its major trading partners in Asia and a country that is generally open – Australia. To meet this goal, this paper will pursue several specific objectives. First, the paper reviews the structures of the economies and trade regimes of China and Australia to show that there are possible benefits and costs to China's continued rapid growth. Second, the paper examines the expected impact on China's own economy and on Australia's economy if China's economic growth proceeds on what most economists agree are plausible growth rates. Third, the paper explores the implications of even faster growth. Finally, the paper projects the effects on the output of the food and non-food economies.

## A Tale of Two Countries

In some senses China and Australia could not be more different. China is a country with the largest population in the world with more than 1.3 billion people (National Bureau of Statistics of China 2006). In 2005, about 57% of the population lived and worked in rural areas. With extremely limited arable land, the average farm size is less than 0.5 hectares. With exception of several mining resources, such as coal, China is generally thought to be resource-poor. As a developing country its income levels, although rising, are still low, only about US\$5,878 in 2005 (2000 constant price) in purchase power parity terms (World Bank 2006).

With abundant labour resources, China has created an economy in the rural and urban sector that is producing labour-intensive commodities. In the agricultural sector, the shares of grains and oilseeds are falling and the shares of horticulture, livestock and aquaculture are growing (National Bureau of Statistics of China 2006). In the industrial sector, China is known for its manufacturing prowess, especially in the labour-intensive sectors of textiles, electronics, toys, etc. The movement towards a comparative advantage is seen most clearly in the evolution of the food trade patterns in China (Table 1). Since the 1980s, China has been importing relatively more land-intensive commodities (such as grain and edible oilseeds) and exporting relatively labour-intensive commodities (such as horticulture, livestock commodities and fishery products). The same is true when looking at the other major sectors.

In contrast, Australia is a country known for its small population and vast tracts of land and mineral resources. Although its population (about 20 million) is less than 2% of China's, its land area is about 80% of China's total land area. Despite its abundance of land, Australia is one of the most urbanised countries in the world with more than 95% of its population living in cities. Hence, unlike China its farm sizes are huge, more than 3000 hectares per household (Eastwood et al. 2004). Like most developed countries, the infrastructure and national education and research capacity is high. But Australia is somewhat special in also having a large minerals sector. In 2004, Australia's per capita GDP reached more than US\$32,000 – ranking 12th in the world.

With such rich resources and developed infrastructure, Australia's economy is based mostly on manufacturing and services. However, even though the agriculture and minerals sectors accounted for 3 and 5% of the economy respectively, they both contribute to the large export sector that is thought to be one of Australia's engines of growth. In fact, there are no other regions in the world that have export structures that are as highly reliant on food (including food and feed crops, processed foods, animals, energy and minerals). Clearly, given its relatively open trade policy and the importance of trade, Australia's scholars and policy-makers should be interested in understanding the effect of an expected future event, such as China's continued emergence as a global economic and trading power.

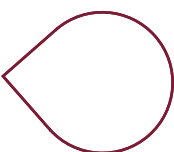
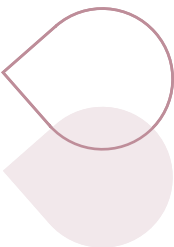


Table 1: Structure of China's food and feed trade: 1980–2002.

	1980	1985	1990	1995	2000	2001	2002
	US\$ million						
<b>Exports:</b>							
Live animals and meat	745	752	1,221	1,822	1,628	1,976	1,008
Dairy products	71	57	55	61	188	192	194
Fish	380	283	1,370	2,875	3,705	4,231	4,690
Grains, oils and oilseeds	481	1,306	1,237	1,608	2,667	1,835	2,422
Horticulture	1,074	1,260	2,293	3,922	4,367	4,931	6,402
Sugar	221	79	317	321	173	156	227
<b>Sub Total</b>	<b>2,972</b>	<b>3,737</b>	<b>6,493</b>	<b>10,609</b>	<b>12,728</b>	<b>13,340</b>	<b>14,943</b>
<b>Imports:</b>							
Live animals and meat	6	24	68	115	696	659	706
Dairy products	5	31	81	60	218	219	274
Fish	13	44	102	609	1,212	1,319	1,558
Grains, oils and oilseeds	2,472	1,065	2,535	6,760	4,163	5,343	5,825
Horticulture	104	92	113	259	677	866	838
Sugar	316	274	390	935	177	376	238
<b>Sub Total</b>	<b>2,916</b>	<b>1,530</b>	<b>3,289</b>	<b>8,736</b>	<b>7,143</b>	<b>8,782</b>	<b>9,439</b>
<b>Net Exports:</b>							
Live animals and meat	739	728	1,153	1,707	932	1,317	302
Dairy products	66	26	-26	1	-30	-27	-80
Fish	367	239	1,268	2,266	2,493	2,912	3,132
Grains, oils and oilseeds	-1,991	241	-1,298	-5,152	-1,496	-3,490	-3,403
Horticulture	970	1,168	2,180	3,663	3,690	4,065	5,564
Sugar	-95	-195	-73	-614	-4	-220	-11
<b>Total</b>	<b>56</b>	<b>2,207</b>	<b>3,204</b>	<b>1,873</b>	<b>5,585</b>	<b>4,558</b>	<b>5,504</b>

Source: National Bureau of Statistics of China, various years

## Methodology and Data

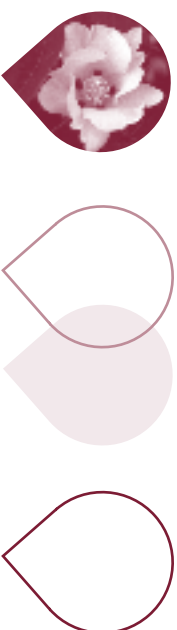
The main analytical tool used in this study is a model of global trade that is based on the Global Trade Analysis Project (GTAP) – a multi-region, multi-sector computable general equilibrium model. The model is fully described in Hertel (1997). It has been used to generate futuristic projections of policy impacts (Arndt et al. 1997; Hertel & Martin 1999; van Tongeren & Huang 2004).

The GTAP database (version 6) contains 57 sectors in each of the 87 regions. For the purposes of this study, the GTAP database has been aggregated into 14 regions and 18 sectors. Before the GTAP version 6 is applied, careful examination of its database and parameters for China is required resulting in substantial improvement in several aspects related

to agricultural input and output ratios; demand parameters; trade policies; and production values. Major data improvements to GTAP version 6 are discussed in Huang et al. (2006).

The central question of this study is to assess the implications of China's rapid economic growth in China and the rest of the world – in particular in Australia. Towards this end, two scenarios have been developed. They are a baseline and China's high GDP growth scenario.

The baseline was constructed using a recursive dynamic approach. The simulation was implemented by four steps (2001–05, 2006–10, 2011–15 and 2016–20) to reflect the change of endowment in different countries and periods. This procedure has been used in several other studies



(Hertel et al. 1999; van Tongeren & Huang 2004). As to the assumption on changing rates of GDP, population, labour supplies, capital and natural resources in different countries (regions) and periods has been fully demonstrated in the research of Huang et al. (2006). The baseline projection also includes a continuation of existing policies and the effectuation of important policy events related to international trade as they are known to date.

The important policy changes are: implementation of the remaining commitments from the General Agreement on Tariffs and Trade (GATT) Uruguay Round agreements; China's World Trade Organization (WTO) accession between 2001 and 2005; global phase out of the Multifibre Arrangement under the WTO Agreement on Textiles and Clothing (ATC) by January 2005; the European Union (EU) enlargement with Central and Eastern European countries (CEECs); and possible trade agreement in Doha negotiations during 2005–10. As there are still high uncertainties on the results of current Doha Round negotiations, the possible outcome was assumed by averaging the offers provided by the United

States (US), the EU and Cairns Group proposals in 2004. Details of these assumptions are adopted from van Tongeren and Huang (2004); some of the key parameters on China's trade liberalisation are provided in Huang et al. (2006).

Under China's high GDP growth scenario, all assumptions under the baseline scenario are held except for China's GDP growth and physical capital investment in the whole projection/simulation period. For China's GDP growth, the baseline GDP growths are replaced by those associated with China's high growth (Table 2). Under the high GDP growth scenario, it was assumed that annual GDP growth rate increased by 10% compared to those under the baseline scenario in 2006–20. Under the high GDP growth scenario, China's GDP will be more than double in the first 10 years. By 2020, total GDP will be about 4.8 times its GDP in 2000. If the growth continues at the rate estimated under the high growth scenario per capita GDP will reach 30,638 Yuan (or US\$3,782 at the current exchange rate) in 2020.

**Table 2:** Projection of China's economy: 2001–20 (high GDP growth scenario compared to baseline).

			Annual Growth Rate (%)			
	1985–95 <sup>a</sup>	1996–2000 <sup>a</sup>	2001–05 <sup>b</sup>	2006–10 <sup>b</sup>	2011–15 <sup>b</sup>	2016–20 <sup>b</sup>
<b>Baseline:</b>						
GDP	9.7	8.2	8.9	8.0	7.2	6.3
Per capita GDP	8.3	7.2	8.2	7.4	6.7	5.9
<b>High GDP Growth Scenario:</b>						
GDP	9.7	8.2	8.9	8.8	7.9	6.9
Per capita GDP	8.3	7.2	8.2	8.2	7.4	7.5
Population	1.37	0.91	0.72	0.61	0.54	0.41
		Per Capita GDP <sup>c</sup>				
		2000	2005	2010	2015	2020
<b>Baseline:</b>						
Yuan (RMB)		7,086	10,528	14,974	20,612	27,454
US\$ (official rate)		856	1,300	1,849	2,545	3,389
<b>High GDP Growth Scenario:</b>						
Yuan (RMB)		7,086	10,528	15,613	22,331	30,638
US\$ (official rate)		856	1,300	1,927	2,757	3,782
Population (billion)		1.267	1.308	1.348	1.382	1.409

<sup>a</sup> The numbers calculated from National Bureau of Statistics of China publications (various issues from 1985–2001).

<sup>b</sup> Estimation on GDP based on the predictions by several international research institutes (World Bank 1997; Asia Development Bank 2005). Population is from Toth et al. (2003).

<sup>c</sup> Values are in 2000 constant prices.

China's high GDP growth scenario (comparing it with the baseline scenario) has been analysed in order to examine questions such as:

- What will be likely impacts of more rapid growth in Chinese economy on other countries (especially Australia)?
- Which countries or regions could benefit or lose out from China's growth?
- What are the implications of more rapid economic growth in China on agriculture and food security in China and the rest of the world?

## Key Results: Impact on China

### The baseline scenario and China's economy

The results of baseline scenario analysis show that China will play an increasing role in the world economy. Because of higher economic growth in China than in the rest of the world, China's GDP shares of world exports will rise gradually, increasing from 3.8% in 2001 to 5.5% in 2010 and 6.8% in 2020. By 2020, China will become the third largest economy in the world, just behind the US and Japan (first in purchasing price parity terms).

Both imports and exports will continue to expand. There will be a few agricultural and food commodities that could experience significant decline in self-sufficiency, but they will not affect China's food security. By 2020, China's total export will account for 8.5% of the global trade (Table 3), which was 5.5% in 2001. Accompanying China's rapid economic growth and its rising importance in the global economy, China's agricultural and food sectors, as well as overall economy, will also experience significant structural changes.

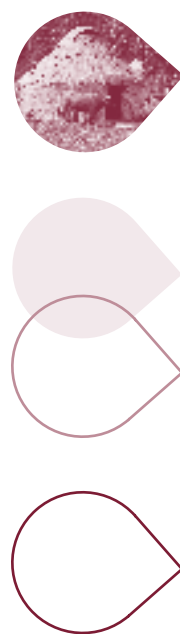
Under the baseline scenario, the most significant increase in agricultural imports will be in oilseeds. The imports are projected to increase from US\$6.4 billion in 2001 to US\$10.8 billion in 2020 (Figure 1a). As their exports will be minimal (Figure 1b), oilseed self-sufficiency will fall from 70% in 2001 to about 50% by 2020. Increasing imports of oilseeds are mainly due to rising domestic demand for both edible oils and livestock feed.

The production of cotton and other plant-based fibre is projected to expand overtime, mainly through their productivity growth, but it will also fall behind domestic demand. Similar to many other crops, fibre imports will rise with gradually falling self-sufficiency levels. Increasing imported fibres are required to meet demand from China's rapidly expanding textiles and apparel sector, which has created and will continue to generate employment for millions of rural people. There will be a small, but significant, rise in demand for cotton.

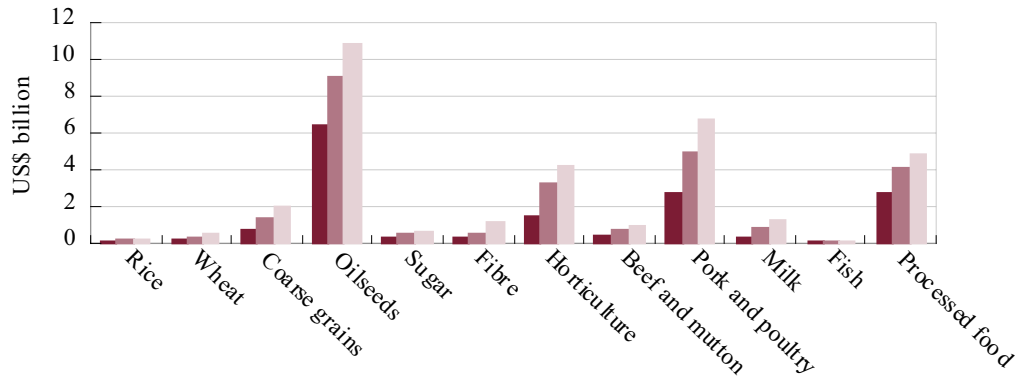
Among cereals, most of the imports are for feed grain (Figure 1a). By 2020, China will import nearly 20% of its coarse grains requirements (mainly maize) to meet increasing demand from the expansion of its domestic livestock sector. Although China will continue to import wheat, imports will be minimal because per capita demand for wheat is projected not to increase in 2010–15 and will fall thereafter. For food grains (rice and wheat), the simulated results show that China's rapid economic growth will not have any significant impacts on its trade.

On the other hand, China will export its most relatively labour-intensive products such as vegetables, fruits, fish and processed foods. The largest quantity of exports will be recorded in processed foods (Figure 1b). While China may import large values of horticultural products, exports will exceed the imports. Very low levels of net exports for horticulture and livestock products in the coming decades projected under the baseline simulation differ from many other projections based on partial equilibrium models (Huang & Rozelle 2003; Rosegrant et al. 2001), but are consistent with several studies that applied computable general equilibrium (CGE) kinds of models (Li et al. 1999; Ianchovichina & Martin 2004; Anderson et al. 2004). Although the basic conclusions are similar, the variations of magnitudes need further investigation.

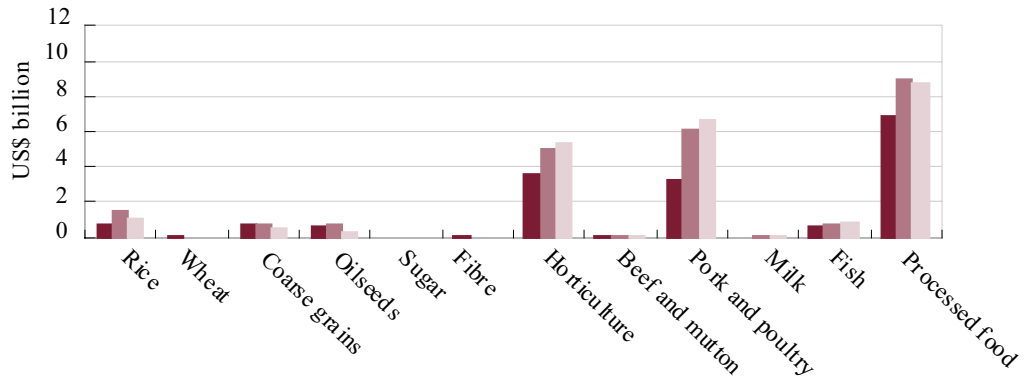
In summary, in terms of the importance of China's agricultural and food trade in global markets, it differs notably among commodities and between imports and exports (Figure 1). China's economic growth and trade liberalisation will facilitate domestic agricultural structural changes.



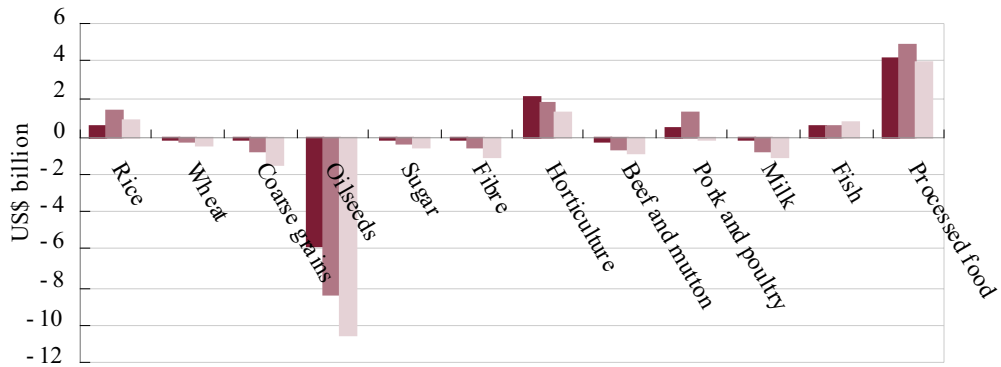
a) Imports



b) Exports

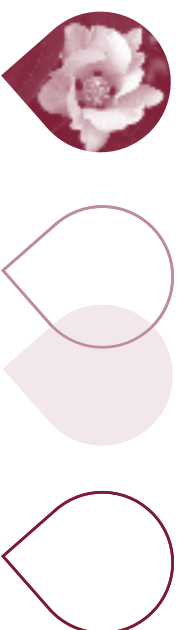


c) Net Exports



**Figure 1:** China’s agriculture and food trade: 2001–20 (under the baseline scenario).

Source: Simulation results



China's agriculture will gradually shift from land-intensive sectors with less comparative advantage to labour-intensive sectors with more comparative advantage.

China will play an increasing role in world markets for both importable commodities (eg oilseeds, livestock products, processed foods, coarse grain, fibre and sugar) and exportable commodities (eg processed foods, pork and poultry, horticulture and fish). While self-sufficiency levels of many commodities will fall with economic growth under a more liberalised trade environment, food grain (excluding feed grain) and overall food self-sufficiency will remain high.

China has a comparative advantage in many non-agricultural sectors. This is particularly true in the textiles, apparel, and manufacturing sectors. Under the baseline scenario, it was projected that China will continue to dominate and play increasing role in the world textiles and apparel sectors in the coming decades. Currently in this sector, China produces 30% more than its domestic demand and exported them to the world markets.

After 2010, the export as a percentage of domestic consumption will further increase to about 40%. Its net export will reach US\$20 billion in 2010 and about US\$40 billion in 2020 (Figure 2). The projected increases in domestic production and export of textiles and apparel

will accompany with the rising imports of raw material requirements such as cotton and wool for textile industry expansion. The export share of manufacturing goods will also increase rapidly from 5.5% in 2001 to 8.9% in 2020 (Table 3).

As expected, the imports of forestry products, energy and minerals will rise (Figure 2) and China's self-sufficiency in these areas will fall with economic growth. From an international perspective, however, the projected increases in imports of these commodities are not dramatic. In fact, they should be counted as moderate, given the size of China's economy and its scarcity in these resource-based sectors.

Among all resource-based industries, a significant rise in energy imports projected in the coming decades is worth examining closely (Figure 2). Under the baseline, that is, if the government policy does not respond to the rapid increase of energy imports, the self-sufficiency of energy will fall from 92% in 2001 to less than 67% in 2020.

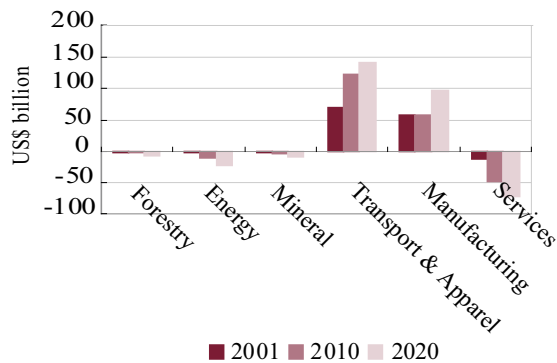
### The high GDP growth scenario and China's economy

Several interesting results are generated from the comparison of the results of high GDP growth scenario with those of the baseline scenario. First, the simulations show that the higher growth of China's economy will not have significant impacts on the overall food and agriculture economy in China.

**Table 3:** China's trade shares in the world: 2020 (high GDP growth scenario compared to baseline).

	Export Share (%)		Import Share (%)		Net Export Share (%)	
	Baseline	High GDP	Baseline	High GDP	Baseline	High GDP
Food and feed crops	3.9	3.7	9.8	10.3	-5.9	-6.6
Processed food	4.9	5.0	2.7	2.7	2.2	2.3
Animal products	6.1	5.5	6.7	7.5	-0.6	-1.9
Fibre	0.1	0.1	9.2	11.4	-9.1	-11.3
Energy	0.2	0.2	7.1	9.0	-6.9	-8.8
Mineral	2.0	1.6	23.4	29.4	-21.4	-27.8
Textiles/apparel	34.3	37.0	7.5	7.4	26.8	29.6
Manufacturing	8.9	9.5	6.9	7.4	2.1	2.1
Services	2.0	2.2	6.2	6.2	-4.2	-4.0
<b>Total</b>	<b>8.5</b>	<b>9.0</b>	<b>6.9</b>	<b>7.4</b>	<b>1.5</b>	<b>1.6</b>

Source: Simulation results



**Figure 2:** Net exports of non-agricultural sectors in China: 2001–20 (under baseline scenario).

Source: Simulation results

Although, a higher growth of China's economy is associated with a lower rate of self-sufficiency of nearly all agricultural and food commodities, the changes will be very minimal. Rising domestic demand resulting from additional income growth in the future will be less than what occurred in the past. Food income elasticities have been falling and will continue to fall with the rapid growth of China's economy.

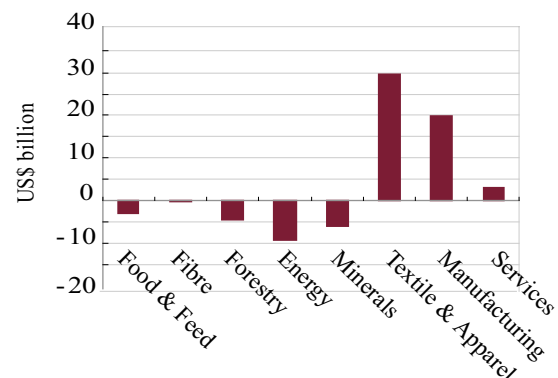
After 2010, all cereal grains will have negative income elasticities. Increases in income will lead to decline in per capita cereal consumption. The rates of self-sufficiency decline only 1% for all agricultural and food commodities, except for coarse grain (2%) and wheat (3%). The small impact of higher economic growth on agriculture and food security is also reflected in the small changes in China's net exports of food and feed (Figure 3), and small changes in China's import or export shares of agricultural and food commodities in the world markets (Table 3).

Second, with higher GDP growth, China would further restructure its agricultural and food economy in favour of the commodities with a greater comparative advantage. For example, the export shares of land-intensive food and feed crops sectors in the world trade will decline and their import shares will rise (Table 3). The high GDP growth scenario reduces the export share of animal products (5.5% in high GDP growth scenario, compared with 6.1% in the baseline scenario) because of

their positive income elasticities. As a whole, the net import of food and feed will increase by about US\$4 billion comparing with the baseline in 2020 (Figure 4a).

Third, China would further exploit its comparative advantage in textiles and apparel and manufacturing sectors under the higher economic growth assumption. Table 3 shows that export shares of textiles and apparel would increase from 34% in the baseline scenario to 37% under the high GDP growth scenario. As the import shares are almost similar to those of the baseline, the net export shares rise from 27 to 30% (Table 3) and net export value increases by about US\$15 billion (Figure 3). Although the change is not as large as textiles and apparel, the exports of manufacturing sector change in the same direction.

Last but not the least, China's imports of energy and mineral products would further rise with higher economic growth. For example, the shares of China's net imports in world trade in 2020 for energy and minerals will rise from 6.9 and 21.4%, respectively, in the baseline scenario to 8.8 and 27.8%, respectively, in the high GDP growth scenario (Table 3). Whether or not such a high level of dependence on imports for energy and mineral would undermine the sustainability of Chinese economy is an issue that has attracted great attention within and outside China.

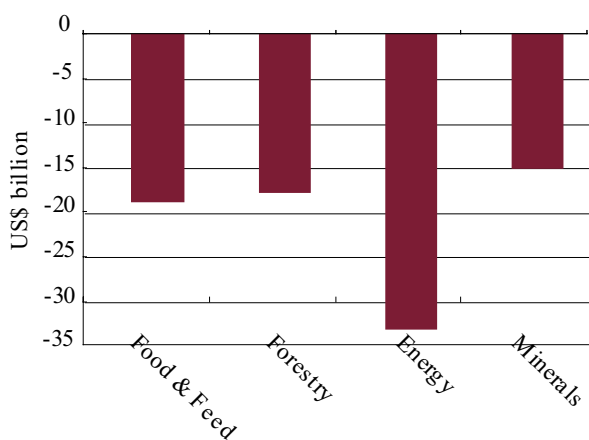


**Figure 3:** China's net export change: 2020 (high GDP growth scenario compared to baseline).

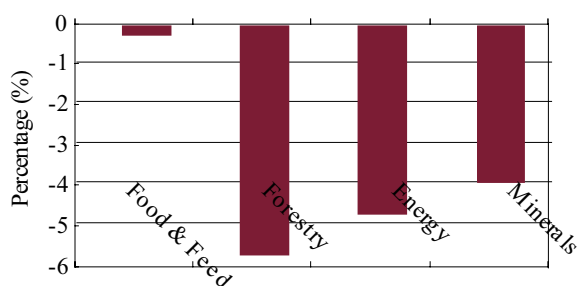
Source: Simulation results



a): Value of Chinese exports (high GDP growth scenario).



b): China's net exports as a percentage of world production (high GDP growth scenario compared to baseline).



**Figure 4:** Change in China's net exports of food and natural resource products: 2020 (high GDP growth scenario compared to baseline).

Source: Simulation results

## Key Results: Impact on Australia and the Rest of the World

The Chinese economy has been increasingly integrated into the world economy since its economic reform. The integration has occurred in both commodity trade and foreign direct investment (FDI) between China and rest of the world. In 2003, China ranked first in the world in terms of inward flows of FDI; second in terms of absolute purchasing power; and sixth in terms of real GDP (United Nations Conference on Trade and Development 2005). The increasing inflows of FDI has stimulated China's economic growth and promoted China's international trade.

## Key results from the baseline analysis

The main conclusion on the implications of China's rapid economic growth from the simulated baseline analysis is that China's growth will provide more opportunities than challenges to the rest of the world. In other words, overall the world will gain from China's economic expansion. For example, under the baseline scenario, China will significantly increase its imports of many land-intensive agricultural commodities (eg oilseeds, feeds, sugar and cotton) and also some labour-intensive products such as tropical and sub-tropical fruits, processed foods, some parts of pig and poultry (Figure 1a; Table 4). Increasing imports of these agricultural and food products will provide opportunities for many developing countries in South and Central America. For example, the exports of agricultural and food products from South and Central America to China will be more than doubled, from US\$3.9 billion in 2001 to US\$8.5 billion in 2020.

Rising imports of land-intensive agricultural commodities will also provide opportunities for Australia to expand their production and exports (Table 4). Specifically, as China expands its role in the world economy (as predicted by the baseline scenario), exports of agricultural and food products from Australia and New Zealand to China will rise by more than 100% from US\$2 billion in 2001 to US\$4 billion in 2020. Most of the rise will come from wool, beef and dairy (especially).

China's rapid economic growth, however, will not be associated with a significant rise in imports of many staple foods. As China's economy grows, the demand for rice, wheat and other cereal foods will not increase and may even fall after 2010. The only major cereal that will experience a growth in imports is maize used as feed. These results imply that China's rapid growth will not affect the world's food security. It also means that Australia should not expect to see rapidly rising exports of wheat to China in the coming years.

Horticulture is the most heterogeneous commodity, which China will both export and import in large volumes. The countries projected to have a significant increase in vegetables and fruits imported from China are mostly the developed countries and regions, such as Japan, South Korea, the EU, North America and Australia.



Table 4: Agriculture and food trade between China and other countries and regions: 2001–20.

	Imports from China			Exports to China			Net Exports to China	
	2001	2020	% Change	2001	2020	% Change	2001	2020
Australia and New Zealand	0.2	0.2	39	2.0	4.4	112.8	1.9	4.1
<b>Total</b>	<b>16.4</b>	<b>24.0</b>	<b>47</b>	<b>15.4</b>	<b>31.9</b>	<b>107.1</b>	<b>-1.0</b>	<b>7.8</b>

Source: Simulation results

Given the large investments made by producers in these countries, it could be that this will be an issue of growing importance. On the other hand, China will also import substantial horticultural products, particularly tropical and sub-tropical fruits, from Southeast Asia, South and Central America, Australia and New Zealand. Production and exports to China will expand with China's economic growth. In the case of horticultural trade, it could be a win or a lose scenario for different groups of producers inside Australia.

China's economic development and trade liberalisation also provides great opportunities for many countries to trade with China in the livestock sector (Figure 3). While China may increase exports of pork and poultry to East Asia (eg Japan and South Korea), the EU and the North American Free Trade Agreement (NAFTA) countries, and also imports from Australia, New Zealand, NAFTA and Southeast Asia are expected to rise substantially.

In summary, the shifting of China's agricultural structure in the coming decade under rapid economic growth will generate more trade in the agricultural and food sectors. This will provide opportunities for many producer groups in Australia. Producers that can adjust their production structures to take advantage of these will reap great benefits. Due to trade liberalisation (not China's economic growth), however, rising exports of several agricultural commodities in which China has a comparative advantage will challenge countries that are exporting the same commodities to world markets. Overall, however,

the impact of China's rapid economic growth on world and Australia's agricultural and food markets are smaller than what many may have expected.

As to the non-agricultural sectors, China will become more competitive in the manufacturing and textiles and apparel sectors. The trade surplus of these two sectors will increase over time (Figure 2; Table 5). However, the trade flows differ between these two sectors. China stays a net exporter of textiles and apparel products with all trade partners. NAFTA, the EU, and Japan and Korea will import large amounts of textiles and apparel products from China. Total imports of these four regions (plus Hong Kong, Taiwan, Macao) will account for nearly 80% of China's exports. Australia will also be a net importer (Table 5).

With respect to manufactured goods, China has a trade surplus and will continue to increase the surplus with its major trade partners in all but three regions (Japan and South Korea, the Russian Federation and Southeast Asia). By 2020, China will have a trade deficit of US\$70 billion in manufactured goods from the above three regions. In contrast, NAFTA countries, the EU, China's Hong Kong Special Administrative Region and Taiwan are the three largest importers of Chinese manufactured products (more than 80% in 2020), which could also have important policy implications for structural changes in these regions. Australia and New Zealand will increase its imports of manufacturing goods from US\$1.5 billion in 2001 to US\$3.2 billion in 2020 (Table 5).

Table 5: Net export of energy, minerals, textiles and apparel, manufacturing and services to China (US\$ billion).

	Energy		Mineral		Textiles and Apparel		Manufacturing		Services	
	2001	2020	2001	2020	2001	2020	2001	2020	2001	2020
Australia and New Zealand	0.1	0.4	1.2	2.7	-2.2	-3.3	-1.5	-3.2	0.0	0.3
<b>Total</b>	<b>3.4</b>	<b>22.1</b>	<b>3.9</b>	<b>10.4</b>	<b>-70.8</b>	<b>-141.6</b>	<b>-56.7</b>	<b>-96.2</b>	<b>11.9</b>	<b>70.9</b>

Source: Simulation results

**Table 6:** Output changes in different regions due to China's higher economic growth: 2020 (high GDP growth scenario compared to baseline).

	Hong Kong & Taiwan	India	ASEAN	Japan & Korea	Other Asia	Australia & New Zealand	NAFTA	South & Middle Africa	Enlarged EU	Russia	Rest of World
Food and Feed Crops	0.4	0.1	0.4	0.3	0.1	0.5	0.4	0.5	0.3	0.5	0.3
Processed Food	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.2
Animal Products	0.4	0.0	0.6	0.4	0.2	0.6	0.4	0.3	0.3	0.6	0.4
Fibre	-2.0	-0.9	-0.8	0.4	-1.1	-0.5	0.0	-0.5	4.4	-0.7	0.0
Forestry	1.1	0.5	4.0	0.9	1.4	6.6	1.6	1.3	4.8	17.1	5.0
Energy	3.1	2.7	3.3	4.0	3.9	2.9	2.7	2.7	3.0	3.0	3.1
Minerals	1.3	9.1	2.2	1.4	6.7	8.8	1.2	6.8	1.5	1.0	2.8
Textiles and Apparel	-3.6	-1.0	-3.3	-2.5	-2.0	-3.5	-1.6	-1.6	-2.6	-2.6	-2.6
Manufacturing	0.6	0.1	0.2	0.3	0.2	-0.6	0.0	-0.1	0.2	-1.1	-0.4
Services	0.1	-0.2	0.1	0.2	-0.2	0.5	0.0	0.1	0.1	0.8	0.2
<b>Total</b>	<b>0.12</b>	<b>-0.09</b>	<b>0.09</b>	<b>0.17</b>	<b>-0.16</b>	<b>0.49</b>	<b>0.05</b>	<b>0.13</b>	<b>0.10</b>	<b>0.77</b>	<b>0.20</b>

Source: Simulation results

In the next 20 years China will significantly increase its imports of energy and minerals (Table 5). Energy imports will increase rapidly from US\$3.4 billion to more than US\$22 billion. Oil imported from the Middle East and the Russian Federation will account for most of the increase in energy imports. Australia will increase energy exports (coal) marginally.

Although a large volume of increased mineral imports will come from NAFTA countries and South America, Australia will experience a large rise in the volume of exports to China (Table 5). Under the baseline scenario, the export of minerals will increase from \$US1.2 billion in 2001 to \$US2.7 billion in 2020. Increases in Chinese minerals imports are not only expected to increase the volume of exports from other countries, but should also trigger pressure for higher world prices. Exporters, like Australia, may be double winners.

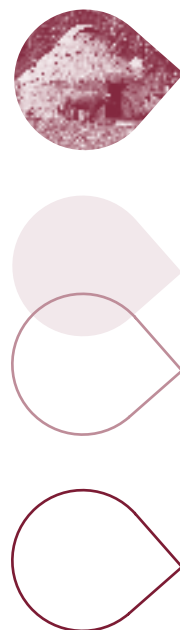
### The implications of China's high economic growth

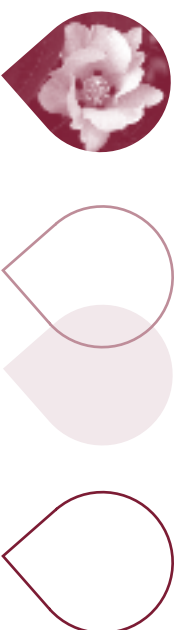
Under the high GDP growth scenario, China will generate more trade and nearly all countries or regions will gain from the faster

growth of China's economy. The signs and sizes of gains for each region from additional growth in China depend on the nature of its economic structure. Those countries that are largely complementary to China's economy will gain more from China's growth. Otherwise, when a country has a similar economic structure as that of China, adverse consequences could occur. For example, Russia (a country with a small population, large land resources, abundant energy and mineral resources) is projected to be the biggest winner from China's high growth – its output increases by 0.77% (Table 6). India, on the other hand, could lose marginally – its output actually falls by 0.09%.

Importantly, after Russia, Australia is the biggest winner from China's high GDP growth scenario – without output growing by 0.49% if China grows faster than expected. However, not all sectors win. While minerals (+8.8%), forestry (+6.6%) and services (+0.5%) are the biggest winners; the textiles and manufacturing sectors end up worse off with output falling by 3.5% and 0.6% respectively.

One concern that might arise from China's more rapid economic growth is the corresponding increase in the imports of the products in





forestry, energy and minerals sectors (Figure 3). While the rising resource imports may further provide economic growth opportunities for countries exporting these products, it could also challenge the conservation efforts in these countries. In addition, there may be potentially negative effects on other resource importing countries as world prices rise with China's increased imports.

To have a better understanding of the overall impact of China's rapid economic growth on the rest of the world, welfare analysis was applied. Table 7 shows that global welfare will increase by about US\$241 billion in 2020 under China's high GDP growth scenario (compared to the baseline), of which about US\$226 billion (93.7%) occurred in China and nearly US\$15 billion in the rest of world (6.3%). In terms of GDP, the rest of world (whole world excluding China) will have additional annual

growth of 0.12% in 2020 (compared to the baseline). Therefore, rapid economic growth in China is an important engine of the world economic development.

Table 7 also shows that nearly all regions could gain from China's economic expansion. Except for India and other South Asia nations, the welfare in all other nations rises. Moreover, the changes of welfare indicate that regions that are complementary with China will gain more from China's higher economic growth. As a consequence, with the exception of the Russian Federation, Australia will gain more than any other country in the world (+0.51%). This rise occurs because China will significantly increase its imports of energy and minerals, as well as many agricultural products from these regions compared to other regions. The exporting countries gain from increases in both price and volume associated with China's commodities.

**Table 7:** Welfare change in different regions due to China's higher economic growth: 2020 (high GDP growth scenario compared to baseline).

	Aggregate Welfare Effect (EV) US\$ billion	Change in Welfare (%)
China	226.2	10.6
Rest of World	14.8	0.09
China: Hong Kong and Taiwan	1.3	0.22
India	-1.4	-0.15
Japan and Korea	1.4	0.07
ASEAN	0.4	0.07
Other Asia	-0.2	-0.06
Australia and New Zealand	1.3	0.51
NAFTA	1.4	0.03
SAM	1.1	0.10
EU15	0.8	0.03
CEEC <sup>a</sup>	-0.2	-0.05
Russia	2.7	0.82
Rest of World	6.2	0.44
<b>Total</b>	<b>241.0</b>	<b>1.31</b>

<sup>a</sup> The 10 Central and Eastern European countries that became EU members on 1 May 2004.

Source: Simulation results

## Conclusions

China's economy has experienced remarkable growth since economic reforms were initiated in 1979 and it is expected to maintain high growth in the coming decades. The baseline projection shows that by 2020 China's per capita GDP will approach the average income of the current high-to-middle income countries. Total GDP in 2020 will be 4.3 times as large as that in 2000, making China the third largest economy in the world.

In this paper five major domestic implications of China's rapid economic growth were identified:

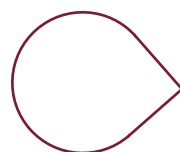
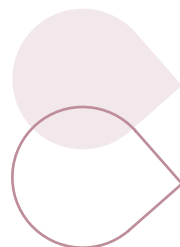
1. China will play an even greater role in the global economy. By 2020, China will emerge as the second largest importer and exporter in world. Continuously seeking favourable external trade and political environment is one of most important factors for China's sustainable economic growth.
2. Given China's commitments to agricultural and rural development, it is likely that China's rapid economic growth will threaten neither its own food security nor food security in the rest of the world; instead it may enhance both China's and the world's food supply.
3. China needs to continue restructuring its agricultural sector as the economy moves towards globalisation. China has a comparative advantage in horticulture, pork, poultry, fish and processed foods, and Chinese exports of these commodities will increase in the next two decades. To reap the opportunities resulting from trade liberalisation, China needs to continue creating a favourable development environment so that agriculture will undergo a successful restructuring.
4. While rapid economic growth under trade liberalisation will facilitate China's agriculture to shift towards sectors in which it has greater comparative advantage, the impacts may differ among farmers. Not every farmer in every region produces the same commodities. Farmers in many less developed provinces in the west and north, where most of less comparative agricultural products are produced, may not gain from trade liberalisation.
5. China's rapid economic growth under globalisation will have more substantial implications on its non-agricultural sectors. China has a stronger comparative advantage in many non-agricultural sectors, in particular textiles and apparel, and labour-intensive manufacturing.

China's rapid economic growth will provide both opportunities and challenges for the rest of the world, including Australia. Overall, the opportunities are projected to far surpass the challenges. First, China will significantly increase its imports of many land-intensive agricultural commodities (eg oilseeds, feeds, sugar and cotton) and also some labour-intensive products (eg tropic and sub-tropic fruits, processed foods, some parts of pig and poultry). Increasing imports of these agricultural and food products will provide opportunities for many developing countries in South and Central America and some developed countries, including Australia, to expand their production.

Second, China's rapid economic growth will not be associated with a rise in the imports of rice and wheat. The only major cereal that will experience a growth in imports is maize (for use as feed). These results imply that China's rapid growth is unlikely to threaten the world's overall staple food supply and will not lead to rising staple food prices in the world market. While good for importing countries, this also means that China will not be a large market in the future for Australia's wheat exports.

Third, China's exports of many horticultural products and processed foods will increase over time. Increasing exports of these commodities in which China has a comparative advantage will challenge those countries that are exporting the same commodities to world markets. As noted, some Australian producers will gain; others will lose.

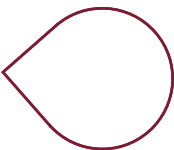
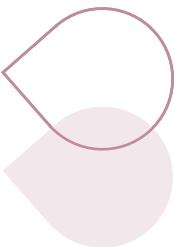
Fourth, China will become more competitive in the textiles and apparel sectors. This will have significant implications for many developing countries (eg India and other South Asian countries) that are currently exporting these products. Countries, such as Australia, will also lose. Because of gains elsewhere, the net gains are still positive.



Finally, China will significantly increase its imports of natural resource products. With the exception of Russia, Australia may be the single biggest beneficiary via increased exports of minerals. The simulations in this paper indicate that the rise demand for mineral will increase both the volume of exports from Australia and the global price of the commodity.

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