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Trade Liberalisation Scenarios for Wool Under an Australia-China Free Trade Agreement

by

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Working Paper No. G-156 October 2005

ISSN 1 031 9034 ISBN 0 7326 1563 1

The Centre of Policy Studies (COPS) is a research centre at Monash University devoted to quantitative analysis of issues relevant to Australian economic policy.

Abstract

This study analyses the effects of removing Tariff Rate Quota (TRQ) and other barriers on wool imports into China using the Monash Multi-Country (MMC) model, a dynamic Computable General Equilibrium Model of Australia, China and the Rest of the World. The study suggests that TRQ on greasy wool represents the most restrictive barriers to wool imports into China, if the current level of quota holds. The elimination of TRQ on greasy wool is found to boost Chinese imports of wool from Australia and Chinese exports of textiles and clothing products to the Rest of the World significantly. The Australian wool and Chinese textiles and clothing industries stand to gain from the elimination of TRQ on greasy wool. Both countries also gain in terms of a slightly higher growth in real GDP and real GNP due to the elimination of TRQ on wool imports into China.

JEL classification: D58 F15 Q17
Key words: Wool, China, FTA

Acronyms and Initials

CGE	Computable General Equilibrium
CoPS	Centre of Policy Studies
DFAT	Department of Foreign Affairs and Trade, Australia
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GNE	Gross National Expenditure
GNP	Gross National Product
GTAP	Global Trade Analysis Project
MMC	Monash Multi-Country
MOFCOM	Ministry of Commerce, People's Republic of China
nec	not elsewhere classified
ROW	Rest Of the World
TRQ	Tariff Rate Quota
WTO	World Trade Organisation

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Executive summary

- This study analyses the effects of various trade liberalisation scenarios for wool under an Australia-China Free Trade Agreement. The analytical framework is a multi-country, multi-sector computable general equilibrium model, the Monash-Multi-Country (MMC) model. The MMC model contains three economies: Australia, China and the Rest of the World (ROW) region.
- We simulate two scenarios for eliminating barriers to China's imports of wool from Australia:
    - Partial elimination – elimination of Tariff Rate Quota (TRQ) for greasy wool; and
    - Complete elimination – elimination of TRQ quota and in-quota tariff for greasy wool, elimination of TRQ in-quota tariff for lightly processed wool, and elimination of mandatory wool testing for both greasy and lightly processed wool.
- In our analysis, the two policy-change scenarios were compared with two business-as-usual scenarios:
    - Baseline case – assumes China's greasy wool imports from Australia increases at an average annual rate of 9.8 per cent between 2005 and 2015; and
    - Potential case – assumes China's greasy wool imports from Australia grow at an average annual rate of 10.8 per cent between 2005 and 2015.
- Removing trade barriers to China's wool imports from Australia benefits both countries in terms of real GDP and GNP. Relative to their levels in the business-as-usual scenarios in 2015,
    - Partial elimination increases Australia's real GDP by US$80-96 million and real GNP by US$308-366 million;
    - Complete elimination increases Australia's real GDP by US$100-117 million and real GNP by 369-430 million;

- Partial elimination increases China's real GDP by US$425-441 million and real GNP by US$125-129 million; and
- Complete elimination increases China's real GDP by US$441-457 million and real GNP by US$129-134 million.

- The elimination of barriers increases export demand for Australian wool. Our simulations indicate that, relative to their levels in the business-as-usual scenarios in 2015:
  - Partial elimination increases China's greasy-wool imports from Australia by US$480-550 million;
  - Complete elimination increases China's greasy-wool imports from Australia by US$520-600 million; and
  - Complete elimination increases China's imports of lightly processed wool from Australia by 34 million.
- This means that, from 2005 to 2015:
  - Partial elimination increases annual growth of China's greasy-wool imports from Australia by 1.8 percentage points;
  - Complete elimination increases annual growth of China's greasy-wool imports from Australia by 2 percentage points; and
  - Complete elimination increases annual growth of China's imports of lightly processed wool from Australia by 0.4 percentage points.
- Consequently, output and employment in the Australian wool industry expands. Relative to their levels in the business-as-usual scenarios in 2015,
  - Partial elimination increases Australian greasy-wool production by 7.8-8.8 per cent;
  - Complete elimination increases Australian greasy-wool production by 8.6-9.5 per cent; and
  - Complete elimination increases Australian lightly-processed-wool production by about 1 per cent.

- At the farm level, farm cash income from wool increases by A$1760-2160 or 15-18 cents per kg relative to its business-as-usual scenarios in 2015.
- The elimination of barriers to China's wool imports from Australia makes Chinese textiles and wearing apparel industries more competitive internationally, with output and employment in these industries expanding due to increased export demand. Relative to their levels in the business-as-usual scenarios in 2015,
    - Partial elimination increases ROW imports from China of textiles by US$258-283 million and wearing apparel by US$428-468 million; and
    - Complete elimination increases ROW imports from China of textiles by US$269-294 million and wearing apparel by US$475-515 million.
- Based on the simulations reported in this study, the TRQ quota on greasy wool is the most restrictive barriers to China's wool imports from Australia.

1. Introduction

In May 2005, Australia and China commenced the negotiation of a Free Trade Agreement (FTA) that promises to bring the economic partnership between the two countries to a new stage. With Australia as the largest suppler of wool and China the largest supplier of wearing apparel in the world market, bilateral trade in wool forms an important aspect of the partnership. While China's wool imports from Australia have been growing rapidly in the past ten years, there exist significant policy impediments to wool trade such as Tariff Rate Quotas (TRQs) and mandatory wool testing. This paper reports a modelling analysis that simulates the effects of eliminating various barriers to China's imports of wool from Australia:

- Partial elimination – elimination of TRQ quota restrictions for greasy wool;
- Complete elimination – elimination of TRQ tariffs and quotas for greasy wool, elimination of TRQ tariffs for lightly processed wool, and elimination of the mandatory wool testing for both greasy and lightly processed wool.

The two scenarios are simulated against two sets of business-as-usual forecasts for future wool demand in China between 2005 and 2015:

- *Baseline case*. This is largely based on the modelling assumptions used for DFAT analysis (Mai et. al. 2005), which resulted in China's greasy wool imports from Australia increasing at an average annual rate of 9.8 per cent.
- *Potential case*. This is based on a more optimistic view on factors shaping the bilateral wool trade. In this case, China's greasy wool imports from Australia are assumed to grow at an average annual rate of 10.8 per cent between 2005 and 2015.

As the report by ITS Global (2005) provides in-depth summary of background information including barriers to wool trade, this report will focus on the description of the modelling framework, assumptions and modelling results. Section two of this report contains a textual description of the modelling framework. Section three lists assumptions about the two sets of views on business-as-usual forecast with current barriers to wool imports in place. Sections four and five report the effects of the partial and complete elimination scenarios. Section six provides a concluding summary.

2. Analytical framework: the Monash-Multi-Country model

The analytical framework used in this study is the Monash-Multi-Country (MMC) model. The MMC model is an advanced dynamic Computable General Equilibrium (CGE) model of the Australian, Chinese and the Rest of the World economies. It was used to analyse the effects of an Australia-China FTA for the joint feasibility studies conducted by the Australian Department of Foreign Affairs and Trade (DFAT) and Chinese Ministry of Commerce (MOFCOM).

The core CGE theory of the MMC model is based on that of a single country model of Australia, the ORANI model (see Dixon et. al. 1982 and Horridge 2001). The dynamic mechanism of the MMC model is based on that of a single country dynamic model of Australia, the MONASH model (see Dixon and Maureen 2002). MMC uses a multi-country CGE database, the Global Trade Analysis Project (GTAP) database (See Hetel 1997 and Dimaranan and McDougall 2002). The MMC model recognises bilateral investment flows between countries by sector and is useful in analyzing investment liberalization of a particular industry (see Mai 2004). The rest of this section provides a non-technical description of the model.

The model is a large system of linearised equations. The equations are mathematical representation of demand and supply conditions in goods, services and factor markets. The demand and supply equations are derived from the behaviour of various economic agents: producers, consumers, governments, exporters, importers, and investors. Such behaviour (described in more details below) determines the reaction of the economic agents to changes in relative prices and economic environment. The model assumes that all the goods, services and factor markets start from an equilibrium represented in the model database. A change in economic policy (such as a tariff reduction) or economic environment (such as a drought) leads to a new equilibrium in which demand equals to supply for all goods, services and factor markets. The model serves to calculate changes to equilibrium quantities and prices of goods, services and factors (and other economic indicators) caused by the change in economic policy or environment.

The model recognises up to 57 industries each produces a category of goods or services such as greasy wool, textiles, wearing apparel, and construction. In each industry **producers** use 3 production factors (land, a combination of skilled and

unskilled labour, and a combination of capital owned by Australian, Chinese and the Rest of the World economies) and up to 57 goods and services as inputs to produce its output. In their production, producers mix material inputs and a combination of all production factors in fixed proportions. They determine the combination of production factor according to the relative prices of the production factors. If labour becomes relatively more expensive than capital, producers substitute labour for capital. In determining their demand for material inputs and production factors, producers exhibit optimisation behaviour of minimising costs to produce a certain level of output. Once the level of a material input is determined, producers chose to buy the material input from domestic or foreign sources according to relative prices. When tariff on wool is reduced in China, Chinese textile producers choose to use more imported wool because it becomes less expensive relative to domestically produced wool. Technological change happens when producers can produce the same level of output using less of one (or all) material input(s) or production factor(s). The output produced by each industry is sold either domestically or exported.

Consumers in the model purchase various categories of goods from different sources (imported or domestically produced). They consume a bundle of necessities and luxury goods. The luxury part of their consumption is linked to their income. They exhibit optimisation behaviour in their choice of luxury consumption by maximising their utility subject to budget constraints. Consumers choose between imported and domestically produced goods according to their relative prices. When tariff on wearing apparel is reduced, consumers choose to buy more imported clothing because it becomes less expensive relative to domestically produced clothing.

Governments in the model collect direct and indirect taxes (including tariffs) and have budget expenditures. **Investors** minimise costs when they purchase various goods (imported and domestically produced) and services (mainly construction) for capital creation. Governments and investors exhibit similar behaviours to producers and consumers in their purchasing choice of imported versus domestically produced goods.

Once the level of imports for a commodity is determined by the choices of users (producers, consumers, governments and investors), **importers** can then determine which country/region to import from, again, according to relative prices. When Australia reduces its tariff on clothing imports from China under a bilateral FTA,

importers choose to import more clothing from China because it becomes relatives less expensive compared to clothing produced in the Rest of the World region.

The dynamic aspect of the model enables us to analyse the effects of a policy change under a growth perspective. Under this perspective, the effects of a policy change are viewed as a change in the way the economies evolve into the future. This is achieved by producing a business-as-usual scenario from 1997 (the year of the model database) to a future year (2015 in this study). The business-as-usual scenario contains our view on what would happen to 2015 without the policy changes. It forms a bench mark with which we compare the growth path of the economies with the policy changes implemented (in this case, elimination of border protection on wool in China).

In other words, under a dynamic perspective, the calculation of the effects of a policy change depends on our view of future. For example, for an industry with a shrinking output, a negative policy impact on the industry means negative growth in output. However, for a rapidly expanding industry in the business-as-usual situation, a negative policy impact could merely mean a slower rate of positive growth rather than a negative growth in the level of output.

The business-as-usual scenario is obtained by simulating year-to-year changes happened from 1997 to 2015 to the three economies in the model, such as, growth of macroeconomic indicators, industry output and employment, and trade in wool (more detailed assumptions are listed in section three). This is made possible through the **dynamic mechanisms** in the model determining accumulation of physical capital and foreign assets and liabilities over time. The accounting of the accumulation of foreign assets and liabilities allows the accounting of GNP that is GDP plus return from foreign assets net of interest paid on foreign liabilities.

The accumulation of physical capital allows investment (net of depreciation) in a previous year be added onto the productive stock of capital in the current year. Investment in a particular industry by a particular country/region is determined by a reverse logistic function linking growth in capital stock with expected rate of return. In the current version of MMC, the expected rate of return is determined under static expectations. Under static expectations, investors only take account of current rentals and asset prices when forming current expectations about rates of return.

The MMC model also contains a global TRQ quota for greasy wool. The technique for modelling TRQs (see Harrison and Pearson 2002) has been applied in the analysis of TRQ quotas under the context of WTO trade negotiations (Aziz and Pearson 2000). The Aziz/Pearson study assumed maximum rent-seeking: once the TRQ quota is filled, both in-quota and out-quota imports are subject to the out-quota rate. In the MMC model, the technique for modelling TRQ quota is adapted so that we can also simulate the situation in which the in-quota import volume is subject to an in-quota rate and the out-quota import volume is subject to a separate out-quota rate.

3. Alternative business-as-usual scenarios

We assume that the elimination of trade barriers to wool will commence in 2006. To analyse the effects of the policy change, we compare the policy scenario (the economic growth path with the policy change in-place) with the business-as-usual scenario from 2005 to 2015. The business-as-usual scenario shows how the economies in the model are likely to evolve without a FTA. To gain a better understanding of the policy change, we formulated two sets of the business-as-usual scenarios: baseline case and potential case. This section describes assumptions underlining the business-as-usual scenarios.

Our modelling starts from the GTAP database (Dimaranan and McDougall 2002) which is a snapshot in 1997 of the economic structures of various economies in the world and the economic linkages between them[1]. In the simulation of the business-as-usual scenarios, we inform the model how the Australian, Chinese and the Rest of the World (ROW) economies evolved from 1997 to 2005 using historical and forecast data. The main sources of the historical and forecast data are Access Economics (a private consulting firm located in Australia), Woolmark Company, the Australian Bureau of Statistics, the World Bank, the International Monetary Fund, Economist Intelligence Unit, the United Nation, the China National Bureau of Statistics, and the Chinese Academy of Social Sciences.

From 2005 to 2015, we use the forecast data, plus information obtained from our own simulation of history, to formulate two alternative business-as-usual scenarios. The growth rates of key economic and trade indicators in the baseline and potential cases,

[1] In the MMC model, the database was aggregated to three country/regions: Australia, China and the ROW region.

expressed as average annual growth rates between 2005 and 2015, are presented in Tables 1 and 2. These indicators include real GDP, consumption, investment, exports and imports at the macroeconomic level, industry output and bilateral trade between Australia and China. Common features of the two business-as-usual scenarios include:

- Rapid growth in Chinese real GDP at a rate twice that of Australia's real GDP;
- Growth in trade volumes in both countries in excess of growth in real GDP; and
- Continued shifts from manufacturing to services in Australia and declining shares of agriculture and mining in Chinese real GDP.

We assume that real GDP of ROW grows at an average annual rate of 2.4 per cent between 2005 and 2015.

The key difference between the baseline and potential cases is the growth in Chinese imports of greasy wool from Australia. For the baseline case, China's greasy-wool imports from Australia grow by 9.8 per cent annually from 2005-2015. For the potential case, China's greasy-wool imports from Australia grow at a higher rate of 10.8 per cent per annum during the same period (Table 2).

The more optimistic trade growth in the potential case is based on three factors:

- the growth in apparel wool demand at the manufacturing stage in China as forecast by the Woolmark company over 2004-2010;
- imports take an increasing share of demand; and
- Australia takes an increasing share of imports (consistent with past trends).

4. Partial elimination

In the partial elimination scenario, we simulate the elimination of the TRQ quota for greasy wool in 2006. The partial elimination scenario is designed to analyse the effects of removing TRQ quotas on China's wool imports from Australia. We choose to concentrate on imports of Australian greasy wool instead of imports of greasy and lightly processed wool largely because of data limitations. Note that by concentrating on greasy wool we gain a good understanding of the effects of removing TRQ quotas on wool generally (i.e. on greasy as well as lightly-processed fibres). In 2004, the

TRQ quota for greasy wool was filled, while the TRQ quota for lightly processed wool was only half filled (ITS Global 2005). Furthermore, trade in greasy wool accounts for nearly 80 per cent of the value of the total Chinese wool imports from Australia in recent years (calculated from DFAT STARS UN database).

In modelling the elimination of TRQ quota on greasy wool trade, we assume that the quota is filled from 2004 onwards in the two business-as-usual scenarios. In the policy scenario, the quota is eliminated in 2006. The effects of the elimination of TRQ quota on greasy wool are measured as deviations of various economic indicators from their levels in the baseline and potential cases respectively (Tables 3 and 4).

4.1 Macroeconomic effects

The macroeconomic impacts of the elimination of TRQ quota on greasy wool are small for Australia and China, but generally positive. Compared with the business-as-usual scenarios, the level of real GDP for both Australia and China is elevated by 0.01 per cent; or US$80-96[2] million for Australia and US$425-441 million for China in 2015. Increased real GDP in the two countries is achieved through a higher capital stock.

For Australia, an improvement in the terms of trade converts the increase in real GDP into an even larger percentage increase in real Gross National Product (GNP) and real household consumption (Table 3). For China, cheaper wool imports lower production costs for its textiles and wearing apparel industries. Lower production costs lead to increased output and exports from the directly affected industries. It also leads to a minor deterioration in China's terms-of-trade which offsets the positive effects of the increase in real GDP on real GNP and consumption. As a result, the level of real GNP and consumption remain largely unchanged compared to the business-as-usual scenarios (see Table 4).

The elimination of the TRQ quota on greasy wool leads to a significant increase in China's imports from Australia: 2-2.3 per cent or US$440-500 million in 2015 relative to their business-as-usual levels (Table 3 and Figure 1). Australia's imports from China, on the other hand, experience only a moderate increase of 0.2 per cent or US$50-60 million compared to the business-as-usual scenarios (Table 4 and Figure 1).

[2] The range in results comes from the difference in the business-as-usual assumptions, i.e. baseline and potential cases.

Removing TRQ quota on greasy-wool imports makes China's manufacturing (especially textiles and wearing apparel) more competitive in the world market. ROW imports from China increase significantly due to the partial elimination: 0.1 per cent or US$1,000-1,120 million in 2015 relative to business-as-usual (Figure 2).

4.2 Industry results

The impact of the partial elimination at industry level is much more dramatic in percentage change terms. By 2015, partial elimination:

- increases the level of China's greasy-wool imports from Australia by 18-18.9 per cent or US$480-550 million (Table 3);
- increases the level of output for the Australian greasy wool industry by 7.8-8.8 per cent (Table 3);
- increases the level of employment for the Australian greasy wool industry by 11.2-12.6 per cent (Table 3);
- increases sheep farm cash income of the sheep industry by 5.6-6.3 per cent or A$1760-1980 (Table 3); and
- reduces the output of Chinese greasy wool industry by 8.7-9 per cent compared to the business-as-usual scenarios (Table 4).

In this study, we have taking into account the low substitutability between Australian and Chinese wool. The elasticity of substitution between wool produced in Australia and China in the MMC model is much lower than that in the standard GTAP database. When the global TRQ quota is eliminated (as is the case in this simulation), Chinese greasy wool faces increased competition from greasy wool produced in both Australian and the Rest of the World region.

Because Chinese greasy wool industry enjoys a healthy growth in the business-as-usual scenarios, the negative effects of partial elimination on Chinese greasy-wool production means a slower rate of expansion rather than a contraction (Figures 3 and 4). China's textiles and wearing apparel industries, on the other hand, benefit from the partial elimination (Tables 4 or Figure 5).

4.3 Optimistic business-as-usual forecast leads to larger effects

In simulating the elimination of TRQ quota, we assume that the quota is allocated to exporting countries/regions according to their share in total Chinese imports of greasy wool in each year of simulation. In other words, we assume that the in-quota imports are subject to the in-quota rate of 1 per cent while the out-quota imports are subject to the out-quota rate of 38 per cent[3]. Under this assumption, the higher the import volumes, the more restrictive is the TRQ.

Consequently, compared with the potential case (where Chinese imports of greasy wool from Australia grow faster due to a more optimistic forecast of demand in China), the impact of the elimination of TRQ quota on greasy wool is larger than the impact simulated against the baseline case. Partial elimination leads to one-percentage-point larger increase (18.9 instead of 18 per cent) in China's greasy wool imports from Australia under the potential case than under the baseline case (Table 3). When simulated against the potential case, partial elimination also leads to a larger increase in Australia's the production of greasy wool and a larger decrease in China's production of greasy wool (Tables 3 and 4).

5. Complete elimination

In this policy scenario, we assume that, in addition to the elimination of TRQ quota on greasy wool, the in-quota rate of 1 per cent for greasy-wool and 3 per cent for lightly-processed-wool are eliminated. Furthermore, we assume the mandatory wool testing on Chinese imports of both greasy and lightly processed wool from Australia is abolished. The tariff equivalent of the mandatory wool testing is estimated by ITS Global to be 0.15 percent. The total change to the tariff equivalents for China's imports of greasy wool from Australia is therefore 1.15 percentage points, and for China's imports of lightly processed wool from Australia is 3.13 percentage points.

Lightly processed wool is not a separate industry in the GTAP and therefore MMC database. It is part of the textiles industry, and accounted for 70 per cent of Chinese textiles imports from Australia in recent years (calculated from DFAT STARS UN

[3] Alternatively, we can assume that, as soon as the TRQ quota is filled, the effective tariff rate on all imports (both in-quota and out-quota) is 38 per cent due to maximum rent-seeking. The truth is more likely to be in between the two extreme cases. This means that the TRQ is likely to be more restrictive when the import volume is larger, as is assumed in this study.

data). In the simulation of complete elimination, the 3.13-percentage-points reduction in tariff equivalents for Chinese imports of lightly processed wool is applied to 70 per cent of the total Chinese imports of textiles from Australia.

The effects of the complete elimination scenario are presented in Tables 5 and 6 and Figures 6 to 16.

5.1 Macroeconomic effects

The additional elimination of trade barriers reinforced only marginally the effects of the partial elimination. For Australia, the complete elimination brings about a slightly larger increase in real GDP and GNP than the partial elimination (Figures 6 and Table 5). For China the complete elimination leads to a slightly larger increase in real GDP but not much increase in real GNP due to a further worsening in terms of trade (Figure 7 and Table 6).

Complete elimination also reinforced the bilateral trade pattern of the partial elimination. Complete elimination leads to a larger increase in China's imports from Australia and ROW imports from China relative to their business-as-usual levels (Figures 8 and 9).

5.2 Industry effects

For greasy wool by 2015, complete elimination increases China's imports from Australia by 19.6-20.5 per cent (one percentage point larger than partial elimination) or US$520-600 million. This means that complete elimination increases by 2 percentage points the annual growth rate of China's greasy-wool imports from Australia (Figures 10 and 11). As a result, Australian greasy-wool output increases by 8.6-9.5 per cent (Figure 12); and employment by 12.2-13.6 per cent relative to business-as-usual scenarios (Table 5). Complete elimination increases farm cash income in sheep industry by 6.2-6.9 per cent or A$1940-2160 relative to business-as-usual scenarios (Table 5).

For lightly processed wool by 2015, complete elimination increases China's imports from Australia by 3.8 per cent or US$34 million relative to business-as-usual (Table 5). This means that complete elimination increases by 0.4 percentage points the annual growth rate of China's imports of lightly processed wool from Australia (Figure 13). Consequently, complete elimination increases Australian output of lightly

processed wool by about 1 per cent relative to business-as-usual by 2015 (Figure 12 and Table 5).

Complete elimination reduces Chinese output of greasy wool by 9-9.3 per cent relative to the business-as-usual scenarios (Table 6). As China's greasy wool industry enjoys a healthy growth in the business-as-usual scenarios, the negative output impact means a slower rate of expansion rather than contraction (Figures 14 and 15).

China's textiles and wearing apparel industries, on the other hand, benefit from the complete elimination. Output of these industries exhibits positive deviation from the business-as-usual scenarios (Figure 16 or Tables 6).

6. Concluding summary

Removing trade barriers to China's wool imports from Australia benefits both countries in terms of real GDP and GNP. It increases export demand for the Australian wool industry and makes Chinese textiles and wearing apparel industries more competitive internationally. Consequently, Australian wool industry and Chinese textiles and wearing apparel industries expand relative to the business-as-usual scenarios.

The TRQ quota on greasy wool is the most restrictive barrier to China's wool imports from Australian. Our simulations indicated that eliminating the TRQ quota on greasy wool can increase the annual growth of China's imports of greasy wool from Australia by 1.8 percentage points in the next ten years (Figure 10 and 11).

From 2005 to 2015, complete elimination of barriers to wool trade can increase the annual growth of China's greasy-wool imports from Australia by 2 percentage points (Figures 10 and 11); and that of China's lightly-processed-wool imports from Australia by 0.4 percentage points (Figure 13).

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Table 1

Baseline and potential cases: macroeconomic indicators

Average annual growth rates 2005-2015, per cent

	Baseline case		Potential case	
	Australia	China	Australia	China
Macroeconomic indicators				
Real GDP	3.3	6.7	3.3	6.7
Real Consumption	3.4	5.8	3.4	5.8
Real Investment	2.9	6.6	2.9	6.6
Export volumes	3.9	9.2	3.9	9.2
Import volumes	3.7	8.2	3.7	8.2
Output of aggregated sectors				
Agriculture	2.4	2.6	2.4	2.7
Mining	3.2	6.3	3.2	6.3
Manufacturing	2.1	7.4	2.1	7.4
Services	3.4	6.7	3.4	6.7

Source: Simulation results.

Table 2

Baseline and potential cases: bilateral trade flows

	Australian imports from China		Chinese imports from Australia	
	Average annual growth in volumes 2005-2015 Per cent	Volumes[a] 2005 US$million	Average annual growth in volumes 2005-2015 Per cent	Volumes[a] 2005 US$million
Baseline case				
Total	8.5	12130	8.8	9279
Agriculture	*3.3*	46	*7.3*	2012
Greasy wool	n.a.	n.a.	**9.8**	1006
Mining	*11.4*	110	*7.7*	2166
Manufacturing	*8.1*	11242	*9.9*	4366
Lightly processed wool	*n.a.*	n.a.	10.8	319
Services	*13.0*	728	*9.4*	742
Potential case				
Total	8.5	12130	8.9	9279
Agriculture	*3.3*	46	*7.9*	2012
Greasy wool	n.a.	n.a.	**10.8**	1006
Mining	*11.4*	110	*7.7*	2166
Manufacturing	*8.1*	11242	*9.9*	4366
Lightly processed wool	*n.a.*	n.a.	10.8	319
Services	*13.0*	728	*9.4*	742

Source: Simulation results.

[a] Measured in 2005 US dollars. n.a. not applicable.

Table 3

Partial elimination: Effects on Australia

Deviations from baseline, 2015

	Baseline case	Potential case
Macroeconomic indicators		
Real GDP (%)	0.01	0.01
Real GDP (US$million)	80	96
Real GNP (%)	0.04	0.05
Real GNP (US$million)	308	366
Real Consumption (%)	0.03	0.04
Export volumes (%)	0.02	0.02
Import volumes (%)	0.16	0.19
Terms of Trade (%)	0.16	0.19
Capital stock (%)	0.02	0.02
Real wage (%)	0.06	0.07
Output by industry (%)		
Agriculture	1.0	1.1
Greasy wool	7.8	8.8
Mining	-0.2	-0.2
Manufacturing	-0.1	-0.1
Lightly processed wool	-0.2	-0.2
Services	0.0	0.0
Sheep industry farm cash income		
%	5.6	6.3
A$	1765	1978
Cents per kg	15	17
Employment by industry (%)		
Agriculture	1.4	1.6
Greasy wool	11.2	12.6
Mining	-0.3	-0.4
Manufacturing	-0.1	-0.2
Lightly processed wool	-0.2	-0.2
Services	0.0	0.0
Volumes of Chinese imports from Australia		
Total (%)	2.0	2.3
Total (US$million)	443	515
Agriculture (%)	11.7	12.8
Agriculture (US$million)	490	567
Greasy wool (%)	18.0	18.9
Greasy wool (US$million)	478	551
Lightly processed wool (%)	-0.2	-0.3
Lightly processed wool (US$million)	-2	-2

Source: Simulation results.

Table 4

Partial elimination: Effects on China

Deviations from baseline, 2015

	Baseline case	Potential case
Macroeconomic indicators		
Real GDP (%)	0.01	0.01
Real GDP (US$million)	425	441
Real GNP (%)	0.00	0.00
Real GNP (US$million)	125	129
Real Consumption (%)	0.00	0.00
Export volumes (%)	0.06	0.07
Import volumes (%)	0.06	0.06
Terms of Trade (%)	-0.05	-0.05
Capital stock (%)	0.03	0.03
Real wage (%)	0.04	0.05
Output by industry (%)		
Agriculture	-0.1	-0.2
Greasy wool	-8.7	-9.0
Mining	0.0	0.0
Manufacturing	0.0	0.1
Textiles	0.2	0.3
Wearing apparel	0.2	0.2
Services	0.0	0.0
Employment by industry (%)		
Agriculture	-0.2	-0.3
Greasy wool	-13.0	-13.4
Mining	0.0	0.0
Manufacturing	0.0	0.1
Textiles	0.2	0.2
Wearing apparel	0.2	0.2
Services	0.0	0.0
Volumes of Australian imports from China		
Total (%)	0.2	0.2
Total (US$million)	53	62
Manufacturing (%)	0.2	0.2
Manufacturing (US$million)	47	55
Textiles (%)	0.3	0.3
Textiles (US$million)	8	8
Wearing apparel (%)	0.4	0.4
Wearing apparel (US$million)	8	9

Source: Simulation results.

Table 5

Complete elimination: Effects on Australia

Deviations from baseline, 2015

	Baseline case	Potential case
Macroeconomic indicators		
Real GDP (%)	0.01	0.01
Real GDP (US$million)	100	117
Real GNP (%)	0.05	0.05
Real GNP (US$million)	369	430
Real Consumption (%)	0.04	0.05
Export volumes (%)	0.03	0.03
Import volumes (%)	0.20	0.23
Terms of Trade (%)	0.19	0.22
Capital stock (%)	0.02	0.03
Real wage (%)	0.07	0.09
Output by industry (%)		
Agriculture	1.0	1.2
Greasy wool	8.6	9.5
Mining	-0.2	-0.2
Manufacturing	-0.1	-0.1
Lightly processed wool	0.8	0.7
Services	0.0	0.0
Sheep industry farm cash income		
%	6.2	6.9
A$	1939	2159
Cents per kg	16	18
Employment by industry (%)		
Agriculture	1.5	1.7
Greasy wool	12.2	13.6
Mining	-0.4	-0.4
Manufacturing	-0.1	-0.2
Lightly processed wool	0.8	0.7
Services	0.0	0.0
Volumes of Chinese imports from Australia		
Total (%)	2.6	2.9
Total (US$million)	563	637
Agriculture (%)	12.7	13.8
Agriculture (US$million)	534	614
Greasy wool (%)	19.6	20.5
Greasy wool (US$million)	521	597
Lightly processed wool (%)	3.8	3.8
Lightly processed wool (US$million)	34	34

Source: Simulation results.

Table 6

Complete elimination: Effects on China

Deviations from baseline, 2015

	Baseline case	Potential case
Macroeconomic indicators		
Real GDP (%)	0.01	0.01
Real GDP (US$million)	441	457
Real GNP (%)	0.00	0.00
Real GNP (US$million)	129	134
Real Consumption (%)	0.00	0.00
Export volumes (%)	0.07	0.08
Import volumes (%)	0.06	0.07
Terms of Trade (%)	-0.09	-0.10
Capital stock (%)	0.03	0.03
Real wage (%)	0.05	0.05
Output by industry (%)		
Agriculture	-0.1	-0.2
Greasy wool	-9.0	-9.3
Mining	0.0	0.0
Manufacturing	0.1	0.1
Textiles	0.2	0.3
Wearing apparel	0.2	0.2
Services	0.0	0.0
Employment by industry (%)		
Agriculture	-0.2	-0.3
Greasy wool	-13.5	-13.8
Mining	0.0	0.0
Manufacturing	0.1	0.1
Textiles	0.2	0.3
Wearing apparel	0.2	0.2
Services	0.0	0.0
Volumes of Australian imports from China		
Total (%)	0.2	0.3
Total (US$million)	66	75
Manufacturing (%)	0.2	0.3
Manufacturing (US$million)	59	67
Textiles (%)	0.5	0.5
Textiles (US$million)	12	13
Wearing apparel (%)	0.4	0.5
Wearing apparel (US$million)	9	10

Source: Simulation results.

Table 7

Partial and Complete elimination: ROW imports from China

Deviations from baseline, 2015

	Baseline case		Potential case	
	%	US$million	%	US$million
Partial elimination				
Total (%)	0.06	995	0.07	1124
Manufacturing (%)	0.07	982	0.08	1102
Textiles (%)	0.32	258	0.35	283
Wearing apparel (%)	0.18	428	0.20	468
Complete elimination				
Total (%)	0.07	1075	0.07	1207
Manufacturing (%)	0.07	1063	0.08	1184
Textiles (%)	0.33	269	0.37	294
Wearing apparel (%)	0.20	475	0.22	515

Figure 1

Partial elimination:

Effects on bilateral trade between Australia and China

Deviations from business-as-usual by 2015, US$million

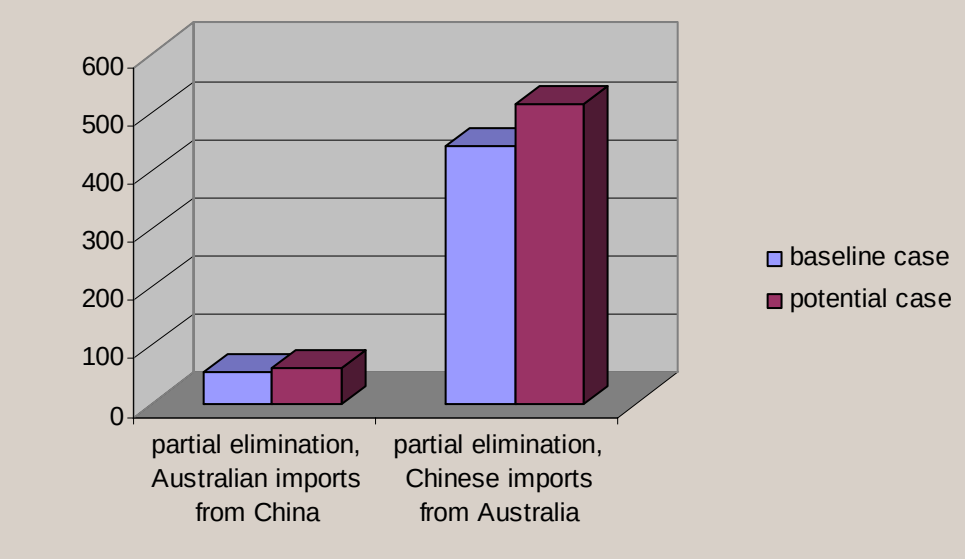

Figure 2

Partial elimination:

Effects on bilateral trade between China and ROW

Deviations from business-as-usual by 2015, US$million

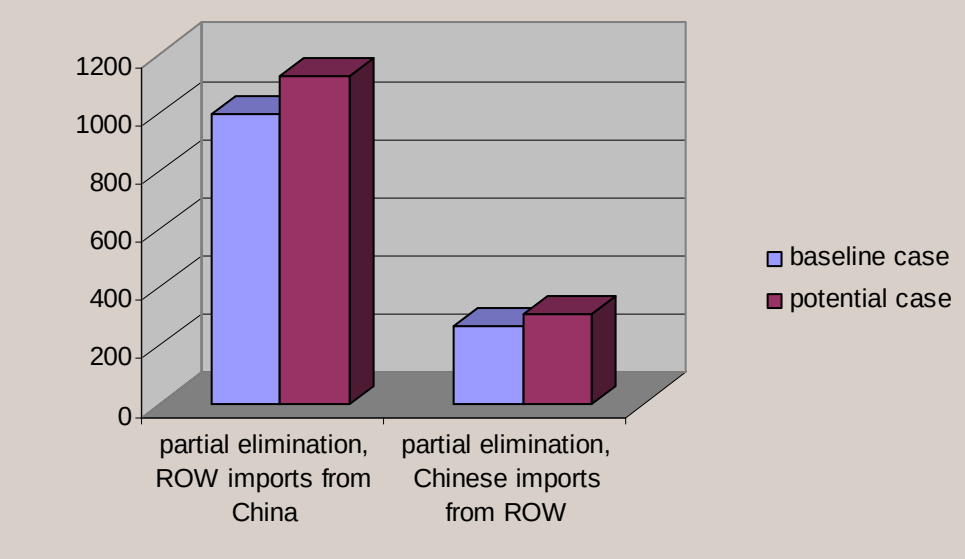

Figure 3

Baseline case, Chinese greasy wool industry:

slower rate of expansion instead of contraction

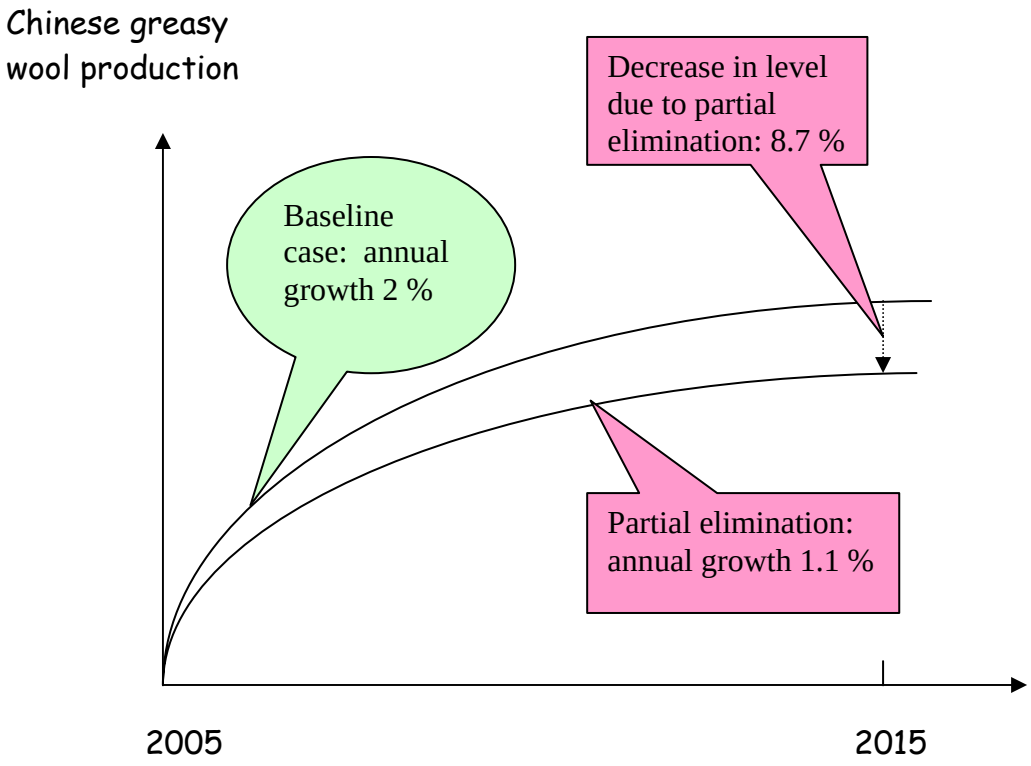

Figure 4

Potential case, Chinese greasy wool industry:

slower rate of expansion instead of contraction

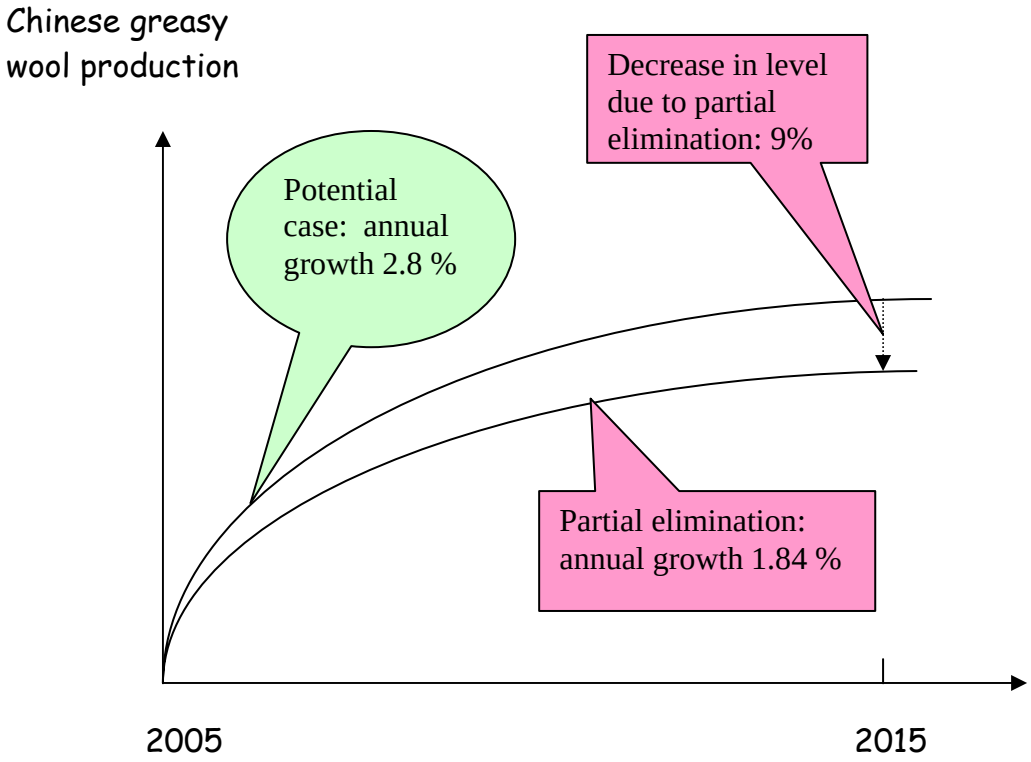

Figure 5

Partial elimination:

Effects on Chinese textiles and wearing apparel production

Deviations from business-as-usual by 2015, per cent

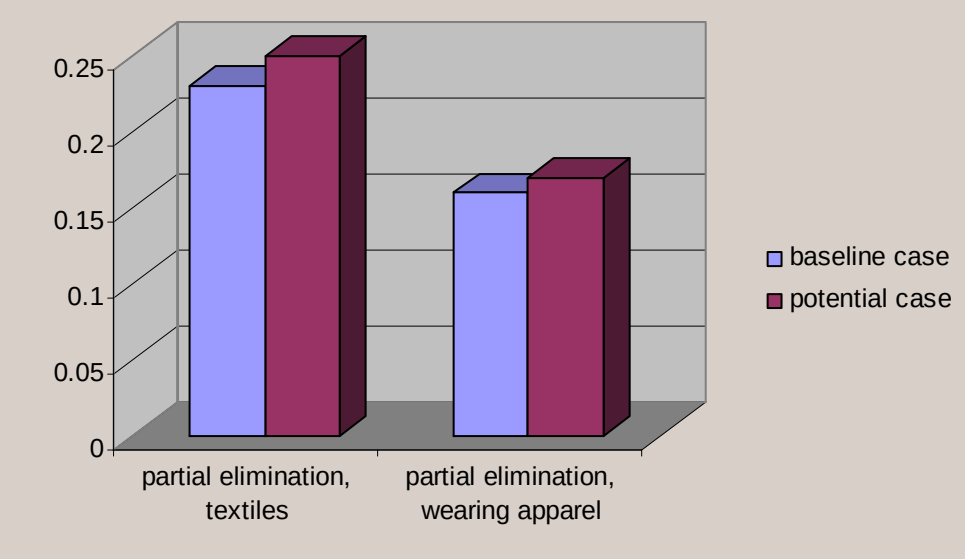

Figure 6

Partial and complete elimination:

Effects on Australia's real GDP and GNP

Deviations from business-as-usual by 2015, US$million

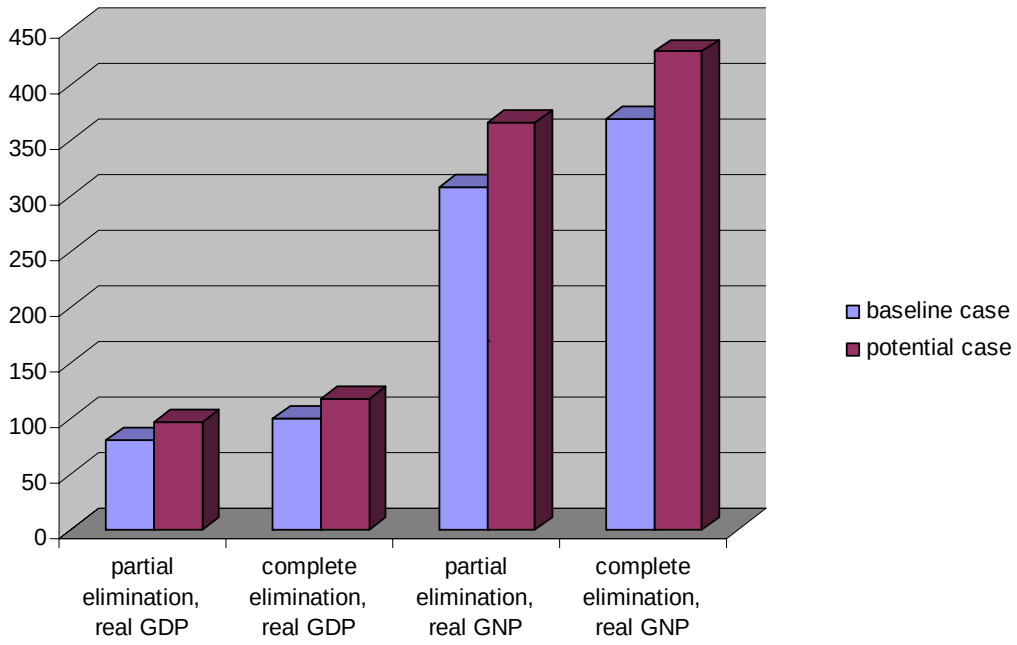

Figure 7

Partial and complete elimination:

Effects on China's real GDP and GNP

Deviations from business-as-usual by 2015, US$million

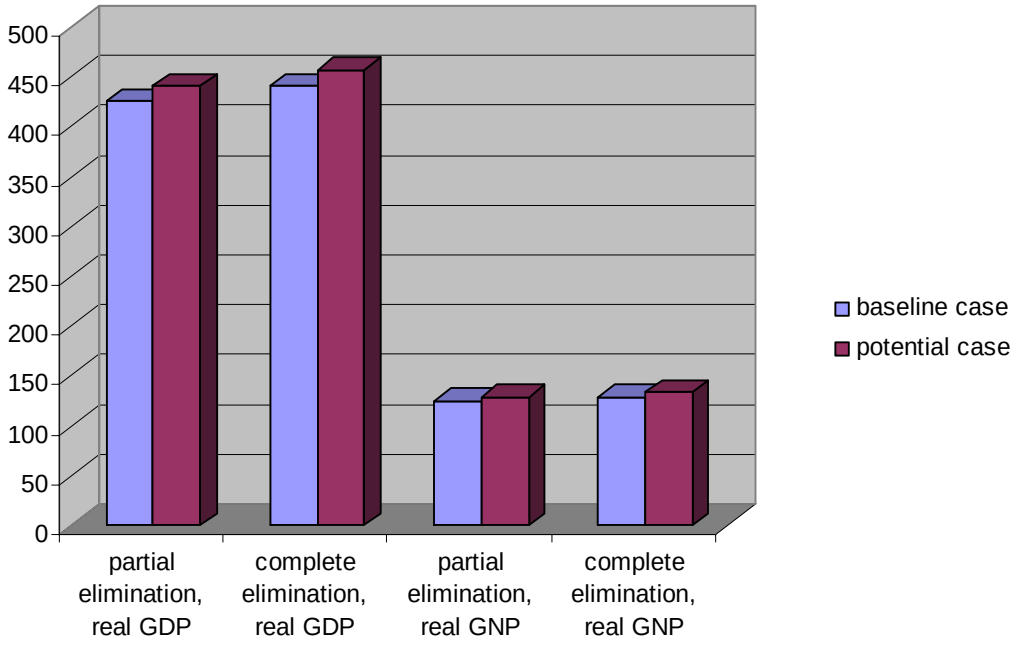

Figure 8

Partial and complete elimination:

Effects on bilateral trade between Australia and China

Deviations from business-as-usual by 2015, US$million

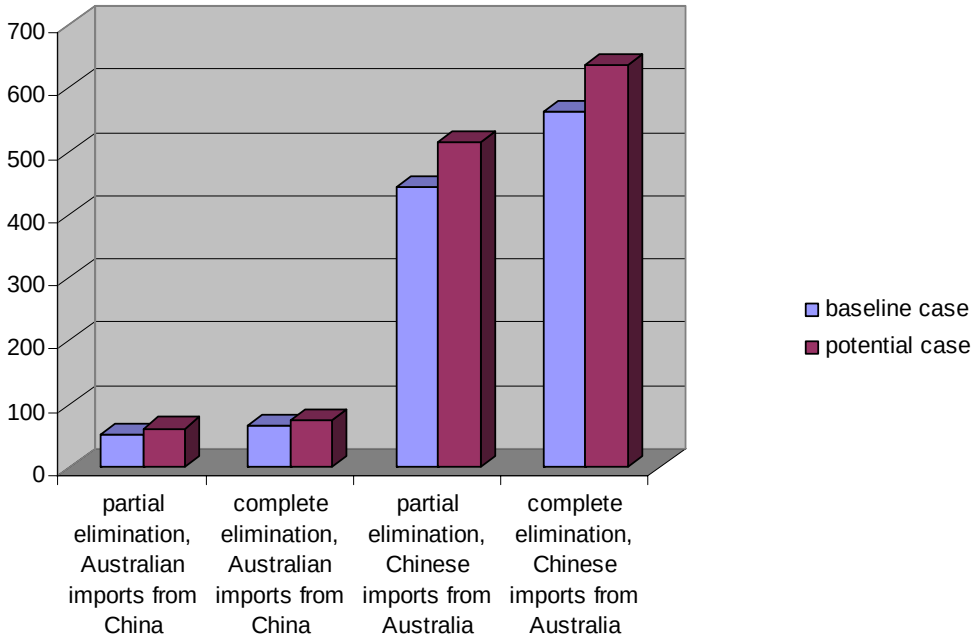

Figure 9

Partial and complete elimination:

Effects on bilateral trade between China and ROW

Deviations from business-as-usual by 2015, US$million

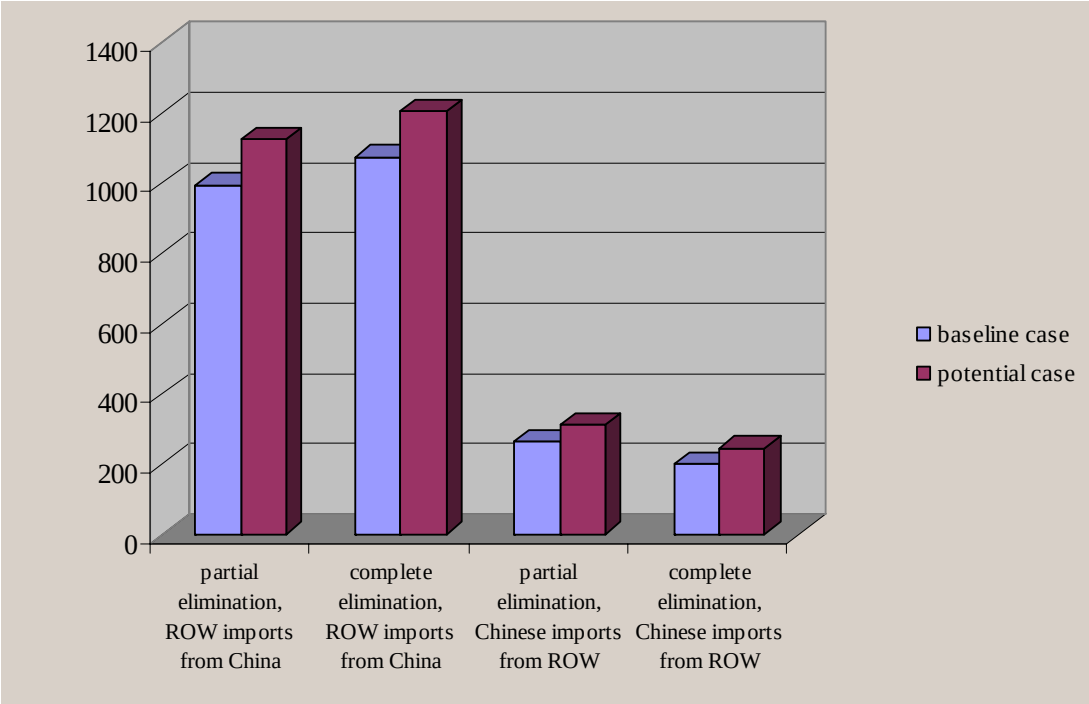

Figure 10

Baseline case:

Effects on China's imports of greasy wool from Australia

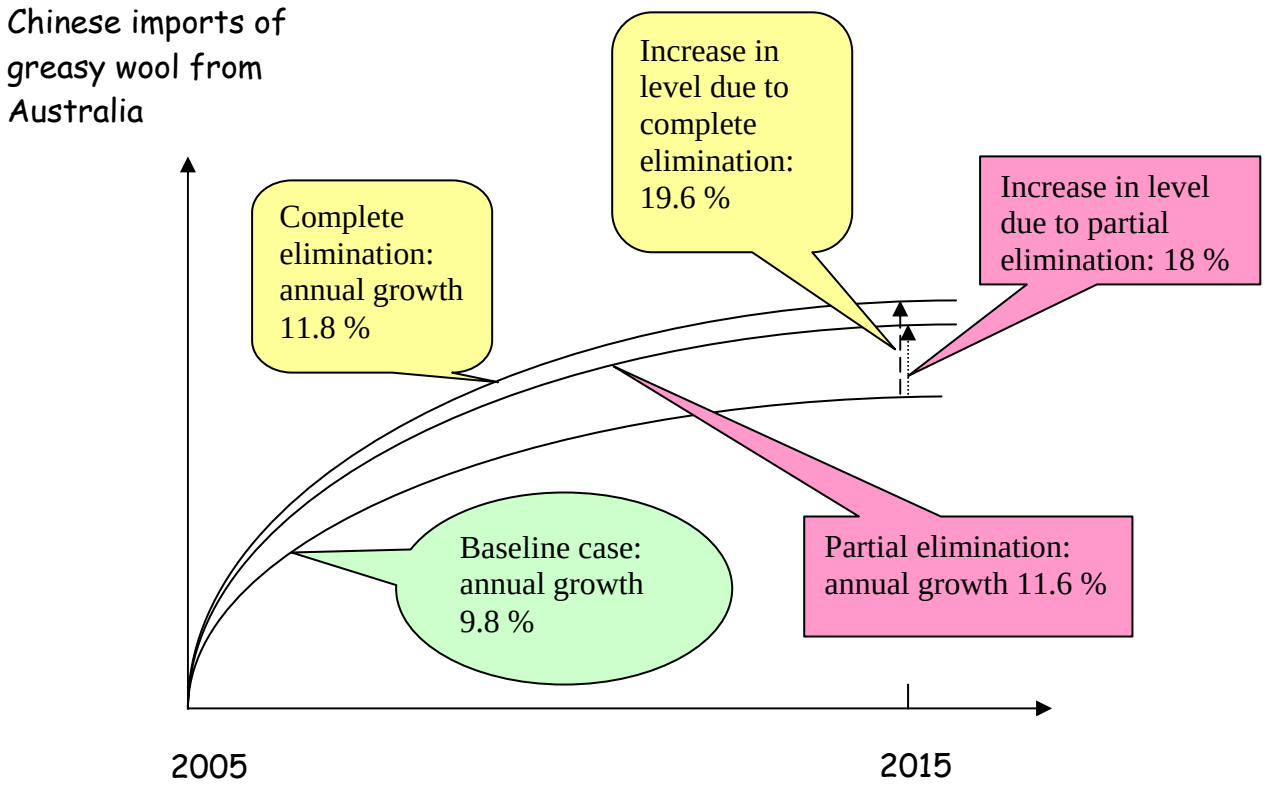

Figure 11

Potential case:

Effects on China's imports of greasy wool from Australia

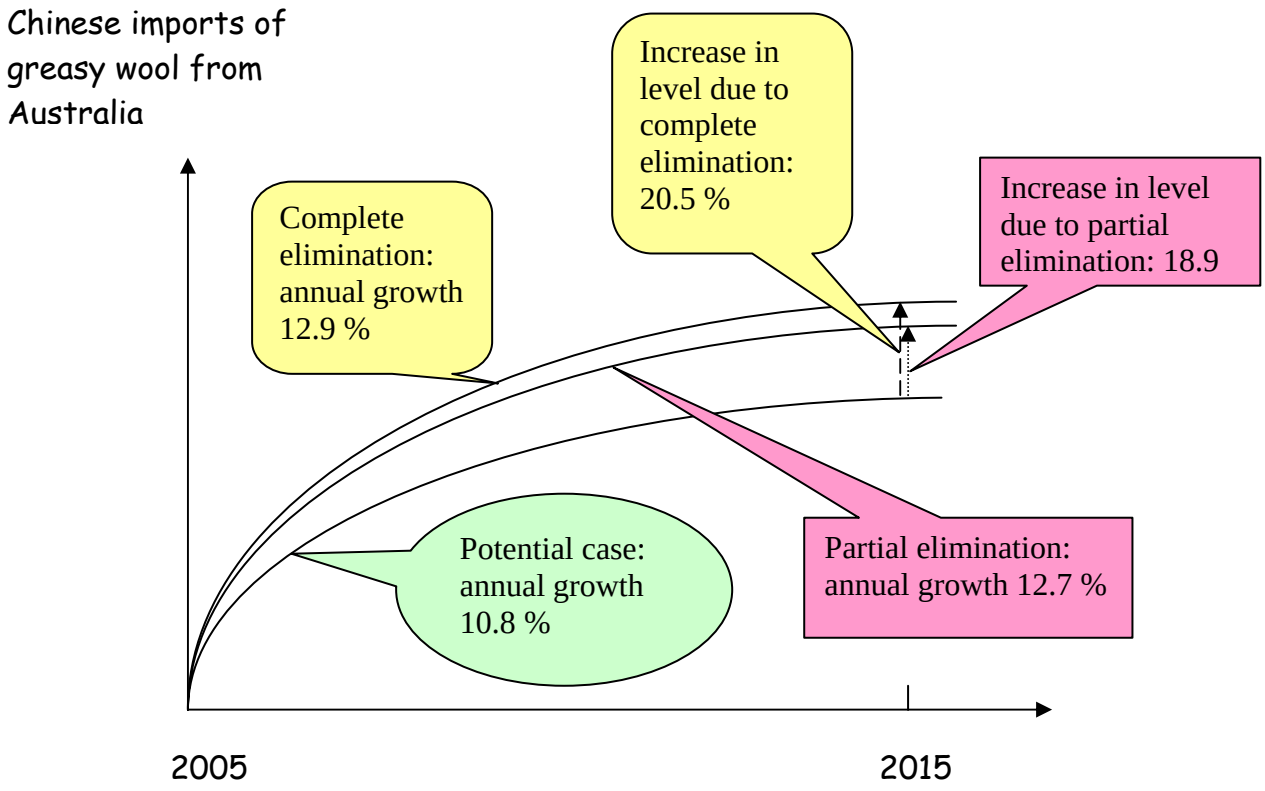

Figure 12

Partial and complete elimination:

Effects on Australian wool production

Deviations from business-as-usual by 2015, per cent

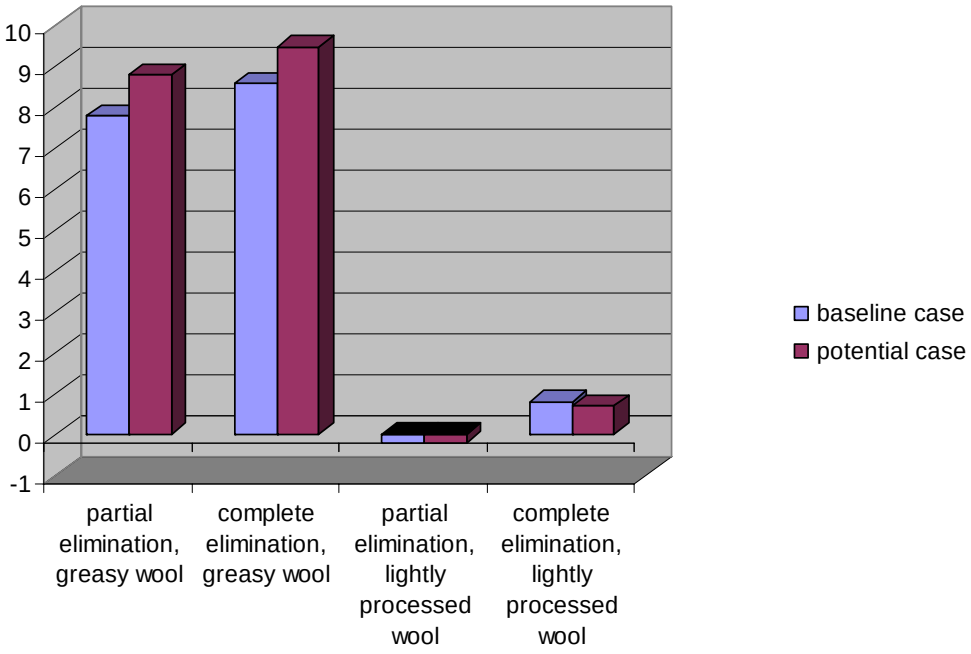

Figure 13

Baseline and potential case: effects on China's imports of lightly processed wool from Australia

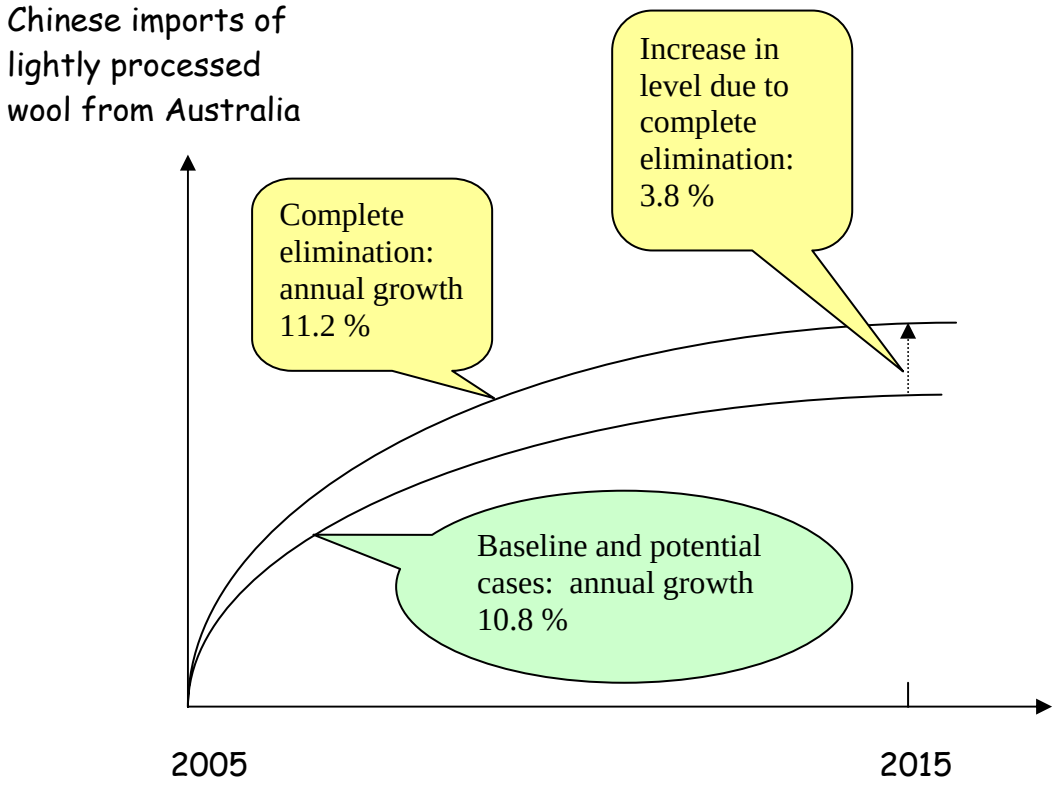

Figure 14

Baseline case, Chinese greasy wool industry:

slower rate of expansion instead of contraction

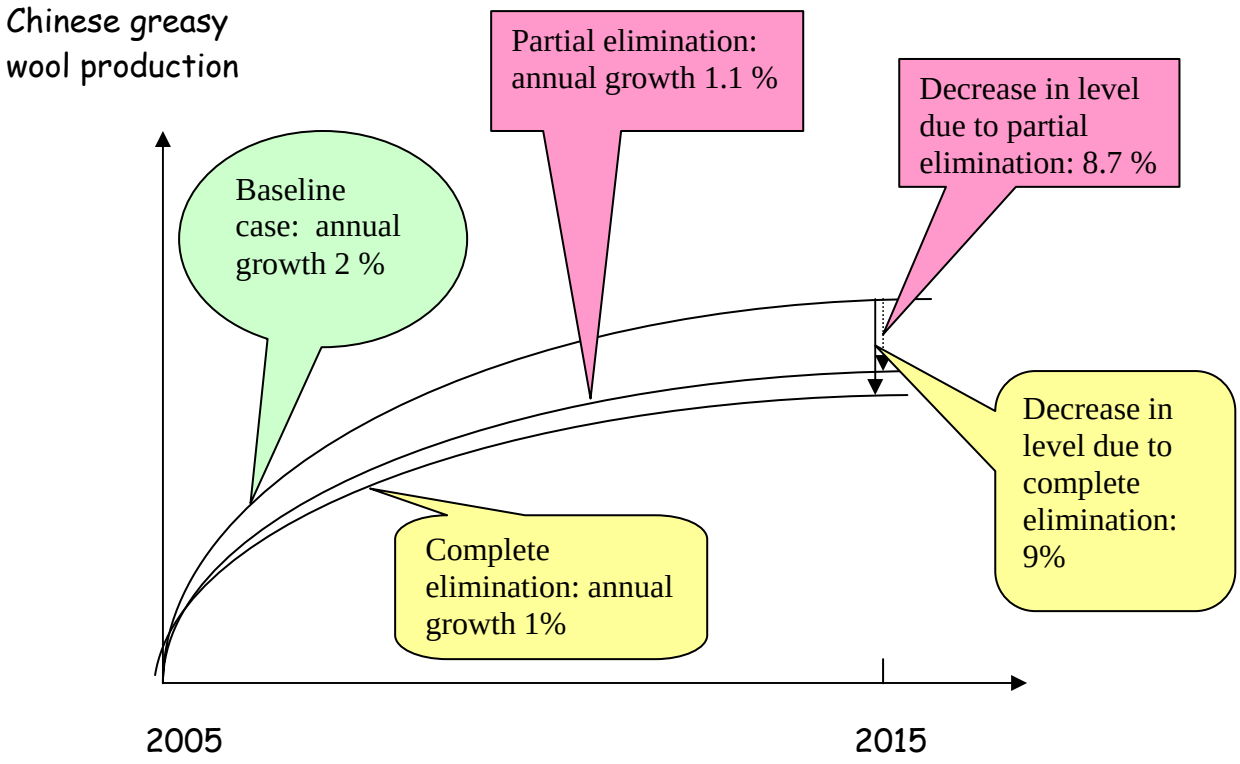

Figure 15

Potential case, Chinese greasy wool industry:

slower rate of expansion instead of contraction

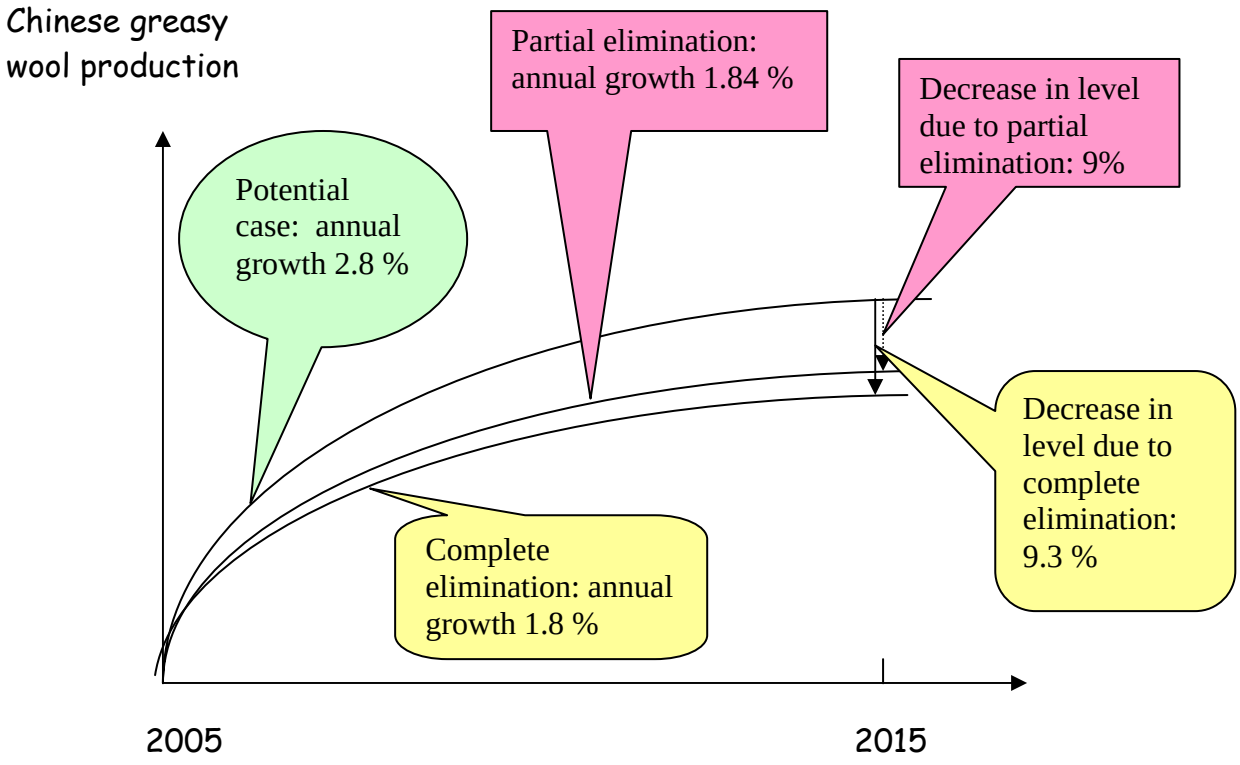

Figure 16

Partial and complete elimination:

Effects on Chinese textiles and wearing apparel production

Deviations from business-as-usual by 2015, per cent