REPORT

CENTRE FOR
INTERNATIONAL
ECONOMICS

Barriers to wool fibre products trade

Costs to US consumers and Australian woolgrowers

A joint study by the
Centre for International Economics, Canberra & Sydney, and
The Trade Partnership, Washington DC

The Centre for International Economics is a private economic research agency that provides professional, independent and timely analysis of international and domestic events and policies.

The Trade Partnership is a Washington (USA) based economic consulting firm with particular expertise in textile and apparel issues.

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About this study

THIS STUDY WAS INITIATED by Wool Council of Australia and was funded by Australian wool growers.

THE STUDY WAS CONDUCTED jointly by the Centre for International Economics (CIE) and the Trade Partnership.

The Trade Partnership, a Washington based economic consulting firm with particular expertise in textile and apparel issues, undertook the analysis of the effects of the agreed schedule of liberalisation of multifibre arrangements on the barriers to US imports of yarns, fabrics and apparel. The results of this analysis are reported in chapter 2 and appendixes A and B.

The CIE undertook the modelling analysis of the implications of these changes in barriers for US production and imports of fibre specific yarns, fabrics and apparel, US consumer expenditure on textiles and clothing, and Australian wool production and income. The results of this analysis are reported in chapters 3 and 4, and appendixes C, D and E.

The Trade Partnership provided assistance with the data and parameter requirements of the model.

Summary

- Under the Multifibre Arrangement (MFA) the US has for many years imposed fibre specific quotas on imports of textiles and clothing. As a result, US consumers are denied cheaper access to textiles and clothing and fibre producers in the US and elsewhere are disadvantaged.

- Under the WTO Agreement on Textiles and Clothing (ATC) – signed in the Uruguay Round – the US and other parties to the MFA agreed to phase out their MFA quotas over a ten year period from January 1995.

- The ATC has wider product coverage than the MFA and other (non–MFA) import restrictions. Products previously not subject to MFA–style restrictions are now included in the ATC phase out. The broader product coverage allows importing restraining countries to defer liberalisation of MFA restrictions until the end of the phaseout period.

- Because of the broader coverage, the US and the EU managed to meet their ATC obligations in Stages 1 and 2 of the phase out without actually liberalising (or integrating) many restrained products. Research by the International Textiles and Clothing Bureau shows that in Stages 1 and 2 the trade accounted for by products freed of quota restrictions represented only about 6 per cent (US) and less than 5 per cent (EU) of total restrained imports.

- If the ATC is implemented to schedule the influence of quotas will wane during the transition period. By 1 January 2005 the only protective barrier will be the tariff. Of particular interest is how the barriers will change under the ATC phase out and the implications of the phase out and faster liberalisation for US textile and clothing consumers and Australian wool producers.

- For yarns import quotas to the US are not projected to restrict trade over the ten year ATC phase out period. The total barrier to imports is the tariff which will fall slightly from 8 to 7 per cent (cotton yarn), 8 to 6 per cent (wool and wool blend yarn) and 9 to 7 per cent (other fibre yarn) between 1996 and 2006.

- Import quotas to the US for fabrics are also unlikely to be restrictive over the ATC phase out. Tariffs will fall from 9 to 8 per cent (cotton fabric), 25 to 18 per cent (wool and wool blend fabric) and 11 to 8 per cent (other fibre fabric).

- Quotas on imports to the US for cotton apparel, wool and wool blend apparel and other fibre apparel are likely to stay restrictive over the ten year ATC phase out. The total protective barrier (tariff plus tariff equivalent of quota) is projected to fall from 47 to 15 per cent (cotton apparel), 33 to 15 per cent (wool and wool blend apparel) and 70 to 20 per cent (other fibre apparel) between 1996 and 2005.

- For wool and wool blend apparel the protective barrier is projected to remain virtually unchanged for the first nine years of the ATC phase out. All of the fall in import protection occurs in year ten. US consumers of wool and wool blend apparel will not have access to cheaper imports until that year.

- Elimination of tariffs and quotas on US imports of yarns, fabrics and apparel in 1999 delivers major gains to US consumers. Consumers are able to increase their consumption of textiles and clothing by switching to cheaper imports and still have US$20 billion left over to spend on other goods and services. US production of apparel falls substantially and imports increase. Australia's wool production is projected to increase by about 0.3 per cent and Australian wool producer income improves by A$17 million per year. The percentage increase in Australia's cotton production is nearly three times that for wool. Cotton producer income increases by A$15 million per year.

- US import quota liberalisation now with tariffs remaining in place delivers gains to US consumers of about 60 per cent of the gains from elimination of both quotas and tariffs. The gain in Australian wool industry income is about half the gain achievable liberalisation by the US of both quotas and tariffs.

- Step by step quota liberalisation in the first nine years of the ten year phase out slightly worsens the position of wool apparel relative to cotton and other fibre apparel in the US market because of a faster rate of decline in the tariff equivalent of quotas on cotton and other fibre apparel relative to wool apparel. This leads to a very small decline (less than 1 per cent) in Australian wool industry income over this period.

- All of the gains to the Australian wool industry from step by step quota liberalisation occur in the last year — to January 2005. This result highlights the importance to the Australian wool industry of achieving

complete removal of US import quotas as soon as possible and certainly by the end of the ATC.

1 *Introduction*

SINCE ITS INCEPTION IN 1974, the Multi–Fibre Arrangement (MFA) has allowed developing countries to negotiate discriminatory quotas on imports of textiles and clothing from participating exporting countries and to unilaterally impose country specific restrictions where agreement with supplying countries could not be reached. The United States, the European Union (EU), Canada, Norway, Japan and Switzerland are the developed country participants in the MFA, though Switzerland and Japan have not, for some time, imposed restrictions under the Arrangement. On average, around 30 exporting countries have been signatories to the arrangement though many more countries have had restrictions imposed on their exports under the Arrangement.

The product and country coverage, and trade restrictiveness of the MFA have increased over time. All clothing and textiles of wool, cotton and synthetic fibres have been included since 1974. Each importing country used its own product classification for specification of restrictions and the set of products for which restrictions were specified varied between exporting countries. Under the MFA the US imposed fibre–specific textile and clothing quotas.

These restrictions have resulted in higher prices of textiles and clothing to consumers in developed countries, reduced textiles production in both exporting and importing countries and reduced prices and incomes of raw fibre producers.

The MFA has also changed the composition of textiles and clothing, and fibre demand and production. Consumer demand has shifted toward less restricted (and hence cheaper) categories of textiles and clothing. Depending on the fibre composition of these categories, the restrictions, while disadvantaging all fibre producers, disadvantaged some categories of fibres relative to others.

Replacement of the MFA with the ATC

The WTO Agreement on Textiles and Clothing (ATC) was negotiated during the GATT Uruguay Round of multilateral trade negotiations. Under the ATC, members of the WTO, which includes all developed countries imposing MFA sanctioned restrictions against textile and clothing imports from developing countries, agreed to progressively bring the textiles and clothing trade under WTO disciplines, and in particular to phase out their MFA restrictions over a ten year period from 1 January 1995. That is, all textiles and clothing products will be progressively integrated into the GATT 1994 (which forbids the imposition of quotas) and quota growth rates for products not yet integrated will be increased.

Under the ATC all MFA quotas and other restrictions in force on 31 December 1994 had to be notified to the WTO. Notified restrictions are regarded as the only restrictions being maintained by WTO members against other WTO members (i.e. if the restrictions were not notified they became WTO–illegal). WTO importing restraining members (the US, the EU, Canada and Norway) were further required to accelerate MFA quota growth rates by an agreed annual percentage during each stage of the ATC phase out program.

Both the percentage of total 1990 import volume of products to be integrated at each stage of the phase out, and the quota growth rate acceleration factor are minimum requirements. That is, importing restraining countries are required by the ATC to increase the percentage of products integrated and the quota growth rates at each stage by not less than the agreed percentage. There are specific provisions in the ATC which encourage faster integration and unilateral liberalisation.

The phase out program is in four stages, during which the coverage of products for which import quotas are eliminated will be progressively expanded. Importing countries are free to determine which products will be included in each stage of the integration process as long as they include products from each of the four groupings: tops and yarns; fabrics; made up textile products; and clothing. At the conclusion of the transition period, all quotas on textiles and clothing will be eliminated between WTO members.

Operating within the rules of the ATC, the US has chosen not to integrate products with the highest barriers to imports until toward the end of the transition period. These products are dominated by clothing. With clothing left until last in this sequencing and with imported inputs to clothing manufacture (yarns, fabrics, etc.) becoming cheaper through earlier liberalisation, incentives to expand domestic clothing production will

increase. US manufacturers of textiles and clothing face the prospect of significant disruption to their business in the last year of the adjustment period — which could be avoided with a smoother transition path. And by delaying and compressing the adjustment there is a real danger that political pressures, driven by protectionist forces within the US, will lead to abandonment of the textile and clothing import liberalisation program with adverse consequences for US consumers and retailers of clothing and textiles, developing country exporters and fibre producers.

This study

The focus of this study is on the impact of the ATC phase out on wool, cotton and other fibre textile and clothing production, consumption and imports in the US and the implications for wool, cotton and other fibre producers. The US is the largest importer of wool apparel. US policies toward wool apparel imports are therefore likely to be important in shaping prospects for wool producers and processors, and retailers of wool based clothing and textiles in the US and throughout the world.

Our study is concerned with:

- the costs to US consumers of a continuation of barriers to imports of clothing and textiles;
- the effects of these barriers on the global wool market;
- the impact of the US phase out program under the ATC on sales of wool based clothing in the US;
- the extent to which the US phase out program discriminates between wool and other fibres; and
- the benefits to US consumers and retailers – and Australian wool and cotton growers – from a faster rate of liberalisation than that currently proposed by the US Government.

2 How barriers to US imports of textiles and clothing will change as the ATC is implemented

THE ATC'S FOUR STAGE PHASE OUT requires that a specified share of total 1990 imports covered (but not necessarily restricted) by the ATC are to be integrated into GATT 1994 (i.e. have their import quotas and other restrictions removed) at each stage (table 2.1). However, importing restraining countries can include on the list for integration imports which have never been subject to MFA import quotas. Canada, the EU and the US all watered down the first stage of adjustment on 1 January 1995 by employing this tactic. In the case of the US, imports previously unrestricted by quota which have been included on the list represent about 37 per cent of 1990 textile and clothing imports (estimate by Bagchi 1994). In stage 1, the US did not integrate any apparel products that were subject to quota and in stage 2 only 4 per cent were integrated. A further 7 per cent will be integrated in stage 3. The remaining 89 per cent will not be integrated until 1 January 2005.

2.1 The ATC phase out program

Stage	*Integration: minimum share of total 1990 import volume of products covered by the ATC*		*Minimum rate of expansion of residual quotas relative to base quota expansion rate agreed under last MFA*
	Share	*Cumulative*	
	%	%	%
Stage I (1 January 1995)	16	16	16 per cent faster (for example, a 5 per cent annual expansion becomes 5.8 per cent)
Stage II (1 January 1998)	17	33	25 per cent faster than in stage I (5.8 per cent becomes 7.25 per cent)
Stage III (1 January 2002)	18	51	27 per cent fast than in stage II (7.25 per cent becomes 9.21 per cent)
Completion (1 January 2005)	49	100	

Source: Francois, McDonald and Nordström (1995).

It was assumed that China and Taiwan become members of the WTO in 2000 and that they enter the stages and phase out terms of the ATC at the same point as other suppliers in that year.

It is clear from table 2.1 that many US textile and clothing imports will be subject to import quotas for most of the transition period. In order to calculate the likely cost of these quotas to US consumers and retailers of textiles and clothing, we first need to establish the degree to which the quotas will continue to restrict each category of imports over the life of the ATC. The degree to which the quota restricts imports can be measured by its tariff equivalent — the extent to which the quota causes the domestic price of imports to increase above the cif import price. This in turn will depend on the size of the import quota relative to the demand for imports at the start of the period and the rate at which the import quota is expanding relative to the rate of increase in consumer demand for the product.

For example, if the import quota for a particular product is expanding more rapidly than the growth in demand by US consumers for that imported product, then the restrictive effect of the quota will decline. This will be reflected in a falling gap between the domestic price of imports and the cif import price, as the imported product becomes less scarce. If, by contrast, the growth in demand for the product exceeds the rate of expansion in quota, then the restrictive effect of the quota will increase. This will be reflected in a rising local price of imports relative to the price at the border in order to ration sales to consumers.

Measuring the size of the barriers

A key issue for our analysis is how the size of the barrier to imports of different types of clothing and textiles into the US will change as the ATC phase out proceeds. The size of the barrier to imports represents the tariff equivalent of the quota plus the tariff. The influence of quotas will wane during the transition period as products are integrated into GATT 1994. By 1 January 2005 the only protective barrier will be the tariff.

We have estimated for yarns, fabrics and apparel, on a fibre specific basis, the size of the barrier to imports in each year of the transition period. Details of the methodology are set out in appendix A. In brief, it involves the following steps.

- Determine whether the quotas restrict trade in the base year 1996. If quotas are not restrictive (that is, the import quota exceeds the desired volume of imports), then the quota is having no effect on the price of

imports — the only barrier is the tariff. (This involved analysis of data on import quotas and imports for each of 147 three digit textile and apparel commodity classifications.)

- Compare the rate of growth of import quota over the transition period relative to the projected rate of growth in demand for the imported product into the US. A formal economic model is used to determine import demand growth. This model takes into account production conditions in the US and exporting countries (which determine how relative prices between goods sourced overseas and goods produced in the US are likely to change over the period) and the extent to which US consumers will switch their purchases between US produced and imported textiles and clothing as the relative prices between them change. The demand growth projections for each type of yarn, fabric and apparel are shown in appendix B.

We consider in turn the US barriers for yarns (table 2.2), fabrics (table 2.3) and apparel (table 2.4). Each table contains four columns of tariff equivalent estimates for each commodity and year as follows.

- Tariff equivalent of quota on target imports — the protection provided by the quantitative restrictions on target countries (those assigned an import quota) only.
- Tariff equivalent of quota across all imports — the protection provided by the quantitative restrictions across all countries, that is the weighted sum across quota and non-quota countries (say, a).
- Trade weighted average tariff — the weighted sum of the ad valorem equivalent of duty payable across all countries (say, b).
- Total barrier to imports. This is calculated by multiplying the power of the tariff equivalent of the quota by the power of the tariff $(1+a/100)(1+b/100)$.

The barriers for yarns

For the three categories of yarns distinguished — cotton yarn, wool yarn, other yarn — quotas were not restrictive. In all cases, quota volumes greatly exceeded desired imports. And, in all cases, quota is expected to grow at a faster pace than demand for these products. For quotas to become restrictive, imports would have to surge by several multiples of their current levels. The barrier to imports of yarns into the US over the term of the ATC is therefore the projected tariff rate. This is shown in table 2.2.

The total barrier facing imports is similar for each type of yarn. Small reductions in tariffs on yarns, fabrics and apparel were agreed to in the Uruguay Round of trade negotiations. The tariff for cotton yarn is projected to move from 7.6 to 6.8 per cent over the period. For wool and wool blend yarn the movement is from 8.2 per cent to 5.8 per cent compared with 8.7 to 7.3 per cent for the other yarn category.

2.2 Projected barriers for yarns

Year	*Tariff equivalent of quota on target imports*	*Tariff equivalent of quota across all imports*	*Trade weighted average tariff*	*Total barrier to imports*
	%	%	%	%
Cotton yarn				
1996	0	0	7.6	7.6
1997	0	0	7.5	7.5
1998	0	0	7.4	7.4
1999	0	0	7.3	7.3
2000	0	0	7.2	7.2
2001	0	0	7.1	7.1
2002	0	0	7.0	7.0
2003	0	0	6.9	6.9
2004	0	0	6.8	6.8
2005	0	0	6.8	6.8
2006	0	0	6.8	6.8
Wool and wool blend yarn				
1996	0	0	8.2	8.2
1997	0	0	7.9	7.9
1998	0	0	7.6	7.6
1999	0	0	7.3	7.3
2000	0	0	7.0	7.0
2001	0	0	6.7	6.7
2002	0	0	6.4	6.4
2003	0	0	6.1	6.1
2004	0	0	5.8	5.8
2005	0	0	5.8	5.8
2006	0	0	5.8	5.8
Other fibre yarn				
1996	0	0	8.7	8.7
1997	0	0	8.6	8.6
1998	0	0	8.4	8.4
1999	0	0	8.2	8.2
2000	0	0	8.0	8.0
2001	0	0	7.8	7.8
2002	0	0	7.7	7.7
2003	0	0	7.5	7.5
2004	0	0	7.3	7.3
2005	0	0	7.3	7.3
2006	0	0	7.3	7.3

Source: The Trade Partnership.

The barriers for fabrics

The story for fabrics is similar to that for yarns. Import quotas are underfilled on each category as a whole and quota volumes are expected to grow faster than demand for imports. This results in the tariff barriers shown in table 2.3.

The barrier to imports of wool and wool blend fabric (the tariff) is more than double the barrier to imports of cotton fabric and other fibre fabric.

2.3 Projected barriers for fabrics

Year	*Tariff equivalent of quota on target imports*	*Tariff equivalent of quota across all imports*	*Trade weighted average tariff*	*Total barrier to imports*
	%	%	%	%
Cotton fabric				
1996	0	0	8.9	8.9
1997	0	0	8.8	8.8
1998	0	0	8.7	8.7
1999	0	0	8.6	8.6
2000	0	0	8.5	8.5
2001	0	0	8.4	8.4
2002	0	0	8.3	8.3
2003	0	0	8.2	8.2
2004	0	0	8.1	8.1
2005	0	0	8.1	8.1
2006	0	0	8.1	8.1
Wool and wool blend fabric				
1996	0	0	25.0	25.0
1997	0	0	24.1	24.1
1998	0	0	23.2	23.2
1999	0	0	22.4	22.4
2000	0	0	21.5	21.5
2001	0	0	20.6	20.6
2002	0	0	19.7	19.7
2003	0	0	18.8	18.8
2004	0	0	17.9	17.9
2005	0	0	17.9	17.9
2006	0	0	17.9	17.9
Other fibre fabric				
1996	0	0	11.1	11.1
1997	0	0	10.7	10.7
1998	0	0	10.3	10.3
1999	0	0	10.0	10.0
2000	0	0	9.6	9.6
2001	0	0	9.2	9.2
2002	0	0	8.8	8.8
2003	0	0	8.4	8.4
2004	0	0	8.0	8.0
2005	0	0	8.0	8.0
2006	0	0	8.0	8.0

Source: The Trade Partnership.

The barriers for apparel

Cotton, wool, wool blend and other fibre apparel quotas were all restrictive in 1996 and are likely to remain so over the term of the ATC. The estimated tariff equivalent of these quotas in 1996 across all imports is 26.4 per cent (cotton apparel), 12.8 per cent (wool apparel) and 40.1 per cent (other apparel). The tariff equivalent for all apparel imports into the US is estimated at 30.4 per cent.

2.4 Projected barriers for apparel

Year	*Tariff equivalent of quota on target imports*	*Tariff equivalent of quota across all imports*	*Trade weighted average tariff*	*Total barrier to imports*
	%	%	%	%
Cotton apparel				
1996	41.7	26.4	16.3	47.0
1997	40.9	25.9	16.1	46.2
1998	39.3	24.9	16.0	44.9
1999	37.7	23.9	15.8	43.5
2000	35.8	22.7	15.6	41.8
2001	33.8	21.4	15.5	40.2
2002	30.5	19.3	15.3	37.6
2003	27.0	17.1	15.2	34.9
2004	23.8	15.1	15.0	32.4
2005	0.0	0.0	15.0	15.0
2006	0.0	0.0	15.0	15.0
Wool and wool blend apparel				
1996	35.9	12.8	17.8	32.9
1997	37.0	13.3	17.5	33.1
1998	38.2	13.7	17.2	33.3
1999	39.4	14.1	16.9	33.4
2000	40.5	14.5	16.6	33.5
2001	41.5	14.9	16.3	33.6
2002	42.3	15.2	16.0	33.6
2003	43.1	15.5	15.7	33.6
2004	43.9	15.8	15.4	33.6
2005	0.0	0.0	15.4	15.4
2006	0.0	0.0	15.4	15.4
Other fibre apparel				
1996	59.7	40.1	21.2	69.8
1997	57.7	38.7	21.0	67.8
1998	54.9	36.8	20.8	65.3
1999	52.3	35.1	20.7	63.1
2000	49.3	33.1	20.5	60.4
2001	46.3	31.1	20.3	57.7
2002	42.1	28.3	20.1	54.1
2003	37.8	25.4	20.0	50.5
2004	33.8	22.7	19.8	47.0
2005	0.0	0.0	19.8	19.8
2006	0.0	0.0	19.8	19.8

Source: The Trade Partnership.

These results are consistent with estimates made by others. For example, Hufbauer and Elliott (1994) estimated the tariff equivalent of US apparel quotas in 1990 to be 29 per cent. Cline (1987) calculated a tariff equivalent of US apparel quotas in 1986 of 30 per cent. The tariff equivalents reported above for 1996 reflect just one year of ATC liberalisation — no integration benefits because the US integrated no products subject to quota in stage 1 and just one year of accelerated growth rates. It is not surprising that the overall tariff equivalent for 1996 — 30.4 per cent — is so similar to tariff equivalents estimated by others for earlier years in which no quota liberalisation occurred. It is likely that demand growth was strong enough in 1996 to outweigh any liberalisation of apparel quotas that came from the accelerated growth rates of the quotas in that year.

Table 2.4 shows how the barriers to imports of apparel to the US are likely to change during the period of ATC liberalisation.

The ATC starting point import barriers are highest for other fibre apparel, followed by wool apparel then cotton apparel. Over the ATC liberalisation period those barriers are projected to fall from 47 to 15 per cent for cotton apparel, from 33 to 15 per cent for wool and wool blend apparel and from 70 to 20 per cent for other fibre apparel. For cotton and other fibre apparel, there is some progress on reducing barriers to 2004. But for wool apparel, the protective barrier increases slightly until 2004.

3 *Effects of US liberalisation options*

THE NEXT STEP IS TO ANALYSE the effects of removing barriers to US imports of textiles and clothing on US consumers and on Australian wool producers. To do this requires a framework that tracks the fibre content of apparel back to fibre producers and recognises that the United States is linked to other regions by trade. Box 3.1 summarises the features of the MFA model especially developed for this analysis.

Our approach

We have taken a two step modelling approach involving:

- using a framework developed by the Trade Partnership to forecast the tariff equivalents of current and future barriers to US textile and clothing imports over the ATC phase out period — as detailed in chapter 2 and appendixes A and B; and
- simulating with the MFA model the effects of removing these tariff equivalents — which is the focus of this chapter.

The strength of our two step modelling approach is that it permits the maximum detail to be incorporated into the forecasts of tariff equivalents for the US. These are important information in their own right as well as key inputs into our second step MFA model used to analyse effects. The potential weakness of a two step approach is that the two models may not be entirely consistent.

A theoretically more appealing approach would involve conducting the forecasting of future tariff equivalents and the effects of their removal within an internally consistent framework. This approach is, however, impractical. It would involve the development of an extremely detailed forecasting model together with a scenario describing the dynamics of demographic changes, income changes, changes in fashion and tastes, and changes in production technologies and input requirements for each level of activity throughout the textile and clothing chain in each of the three regions distinguished.

3.1 The MFA model

The MFA model is an Armington style input–output model of production, consumption and trade in fibres, textiles and apparel. The model covers:

- Australia, the US and the rest of the world
- apparel wool fibre and cotton fibre
- wool, cotton and other yarns
- wool, cotton and other fabrics
- wool, cotton and other apparel.

The 'other' activity includes both synthetic fibres and other natural fibres such as silk, jute and flax.

The model is based on an integrated set of input–output accounts, which shows how fibre producers are linked to final users of apparel through each stage of the value added chain.

Other features of the model are:

- its comparative–static nature —it analyses the effects of a policy change while holding constant all other factors;
- its partial equilibrium nature — focusing only on each fibre specific yarn, fabric and apparel chain; and
- its differentiated product nature — goods from different regions are recognised as imperfect substitutes for each other so that farm or factory prices can move independently between regions.

The structure of the model is detailed in full in appendix A. The model is non-linear and solved using GEMPACK software.

We took a number of steps to minimise inconsistency between the two models — by using the same base data for 1996 and using similar elasticity estimates for the US region of the MFA model as the Trade Partnership. However, some differences remain between the two models. In particular, in its forecasting framework the Trade Partnership distinguishes quota and non-quota suppliers into the US, whereas the MFA model aggregates these suppliers into the rest of the world region — which in turn supplies the US.

Simulations

We have undertaken four groups of simulations with the MFA model as follows.

- Simulation A: complete liberalisation now — the US removes in 1999 all quotas and tariffs on its imports of yarns, fabrics and apparel.

- Simulation B: US quota liberalisation now — all quotas on US imports of yarns, fabrics and apparel are removed in 1999, but tariffs on imports of these items remain.
- Simulation C: US quota liberalisation according to the agreed phase out schedule in each of the years 1999-2000, 2000-01, 2001-02, 2002-03 and 2003-04.
- Simulation D: US quota liberalisation after 2003-04 — the US removes all remaining quotas on imports of yarns, fabrics and apparel according to the ATC schedule.

Simulations C and D together encompass the ATC whereby the US phases out its quotas on textile and clothing imports to achieve their complete removal by January 2005.

The MFA model has a variable depicting the total barrier to imports — which includes both the duty component and the tariff equivalent of the quota restriction. This variable is represented in the model as the power of the total barrier. That is, if the tariff plus tariff equivalent of the quota is 30 per cent, then the starting value for this variable is 1+30/100=1.3. Each simulation involves a change in the value of this variable to include one or both components of the total barrier as appropriate.

Understanding the results

Results of model simulations are shown in table 3.2 (percentage change from base) and table 3.3 (change in values from base). They represent annual changes in model variables as a result of the changes in barriers to imports. The results concentrate on the effects on:

- US consumption of fibres, yarns, fabrics and apparel by type of fibre;
- US imports of fibres, yarns, fabrics and apparel by type of fibre;
- US production of fibres, yarns, fabrics and apparel by type of fibre;
- US expenditure on textiles and clothing; and
- Australia's wool and cotton production, wool exports to the US and Australian wool and cotton industry income.

3.2 Key results for some US textile and clothing liberalisation scenarios (Percentage change from base)

Variable	*Units*	*Base value 1996*	*Simulation A: complete liberalisation (quotas and tariffs) in 1999*[b]	*Simulation B: quota liberalisation in 1999*[a]	*Simulation C: Phase out of quotas year by year*[a]					*Simulation D: quota liberalisation in 2004*[a]
					1999–2000	*2000–01*	*2001–02*	*2002–03*	*2003–04*	
Use of domestic commodities by US apparel chain										
Fibres										
▪ Wool	kt	13.9	-6.4	-1.5	0.0	0.0	-0.1	-0.1	-0.1	-1.2
▪ Cotton	kt	2051.2	-2.2	-0.9	0.0	0.0	-0.1	-0.1	-0.1	-0.7
Yarns										
▪ Wool	kt fibre eq.	32.7	-18.6	-5.3	0.0	0.0	-0.1	-0.1	-0.1	-4.6
▪ Cotton	kt fibre eq.	960.1	-7.0	-3.3	-0.1	-0.1	-0.2	-0.2	-0.2	-2.3
▪ Other	kt fibre eq.	2218.5	-4.6	-1.8	-0.1	-0.1	-0.1	-0.1	-0.1	-1.3
Fabrics										
▪ Wool	kt fibre eq.	26.8	-21.1	-10.4	-0.1	-0.1	-0.2	-0.2	-0.2	-9.1
▪ Cotton	kt fibre eq.	391.3	-20.3	-11.3	-0.4	-0.4	-0.7	-0.8	-0.7	-7.8
▪ Other	kt fibre eq.	432.8	-20.9	-12.3	-0.4	-0.4	-0.7	-0.8	-0.7	-8.4
Final consumption of apparel										
▪ Wool	kt fibre eq.	31.2	-21.1	-11.9	-0.1	-0.1	-0.2	-0.3	-0.2	-10.5
▪ Cotton	kt fibre eq.	434.7	-24.3	-14.7	-0.5	-0.6	-0.9	-1.0	-0.9	-10.0
▪ Other	kt fibre eq.	427.5	-27.3	-16.5	-0.6	-0.6	-0.9	-1.0	-1.0	-11.3
Use of imports by US apparel chain										
Fibres										
▪ Wool	kt	34.2	-9.5	-2.4	0.0	0.0	-0.1	-0.1	-0.1	-2.1
▪ Cotton	kt	176.1	-4.2	-1.9	-0.1	-0.1	-0.1	-0.1	-0.1	-1.3
Yarns										
▪ Wool	kt fibre eq.	7.2	-4.4	-5.7	0.0	0.0	-0.1	-0.1	-0.1	-5.1
▪ Cotton	kt fibre eq.	53.7	8.3	-4.3	-0.2	-0.2	-0.3	-0.3	-0.3	-2.9
▪ Other	kt fibre eq.	204.9	12.1	-3.0	-0.1	-0.1	-0.2	-0.2	-0.2	-2.0
Fabrics										
▪ Wool	kt fibre eq.	10.9	16.1	-10.8	0.0	0.0	-0.2	-0.2	-0.2	-9.6
▪ Cotton	kt fibre eq.	241.5	-0.2	-9.5	-0.4	-0.4	-0.6	-0.7	-0.6	-6.5
▪ Other	kt fibre eq.	315.7	10.3	-6.4	-0.2	-0.2	-0.4	-0.4	-0.4	-4.3
Final consumption of apparel										
▪ Wool	kt fibre eq.	58.9	20.6	6.4	-0.9	-0.9	-1.0	-1.0	-1.0	11.8
▪ Cotton	kt fibre eq.	613.6	40.4	22.9	0.8	1.0	1.5	1.8	1.6	15.3
▪ Other	kt fibre eq.	612.7	80.6	46.0	1.5	1.5	2.2	2.3	2.4	29.6

(Continued on next page)

3.2 **Key results for some US textile and clothing liberalisation scenarios (Percentage change from base)** (continued)

Variable	*Units*	*Base value 1996*	*Simulation A: complete liberalisation (quotas and tariffs) in 1999*[b]	*Simulation B: quota liberalisation in 1999*[a]	*Simulation C: Phase out of quotas year by year*[a]					*Simulation D: quota liberalisation in 2004*[a]
					1999–2000	*2000–01*	*2001–02*	*2002–03*	*2003–04*	
Reduction in US expenditure	$US million	315120	-6.4	-3.8	-0.1	-0.1	-0.2	-0.2	-0.2	-2.7
US production										
Fibres										
▪ Wool	kt	13.6	-1.5	-0.3	0.0	0.0	0.0	0.0	0.0	-0.2
▪ Cotton	kt	4124.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Yarns										
▪ Wool	kt fibre eq.	51.4	-9.3	-2.3	0.0	0.0	-0.1	-0.1	-0.1	-2.0
▪ Cotton	kt fibre eq.	1969.6	-2.6	-1.1	0.0	0.0	-0.1	-0.1	-0.1	-0.8
▪ Other	kt fibre eq.	3298.3	-1.6	-0.6	0.0	0.0	0.0	0.0	0.0	-0.4
Fabrics										
▪ Wool	kt fibre eq.	37.4	-14.5	-4.8	0.0	0.0	-0.1	-0.1	-0.1	-4.2
▪ Cotton	kt fibre eq.	986.9	-5.7	-2.8	-0.1	-0.1	-0.2	-0.2	-0.2	-1.9
▪ Other	kt fibre eq.	2378.3	-3.2	-1.6	-0.1	-0.1	-0.1	-0.1	-0.1	-1.1
Apparel										
▪ Wool	kt fibre eq.	35.1	-14.8	-8.8	0.0	0.0	-0.2	-0.2	-0.2	-7.7
▪ Cotton	kt fibre eq.	496.0	-17.6	-10.7	-0.4	-0.4	-0.6	-0.7	-0.7	-7.3
▪ Other	kt fibre eq.	492.2	-19.3	-11.8	-0.4	-0.4	-0.7	-0.7	-0.7	-8.1
Australian production										
▪ Wool	kt	447.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.2
▪ Cotton	kt	429.0	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.2
Australian wool industry income										
Total	A$m	1749.1	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.6
Farm price	$/kg clean	4.9	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2
Australian cotton industry income										
Total	A$m	674.8	2.2	1.1	0.0	0.0	0.1	0.1	0.1	0.7
Australia's wool exports to the US										
▪ As wool	kt	24.0	-9.3	-2.4	0.0	0.0	-0.1	-0.1	-0.1	-2.1
▪ In wool yarns, fabrics and apparel	kt	0.2	16.6	-5.3	0.0	0.0	0.0	-0.1	0.0	-6.2

[a] Remove tariff equivalent of the quota arrangements. [b] Remove tariff equivalent of the quota arrangements and duty payable.

Source: MFA model.

3.3 Key results for some US textile and clothing liberalisation scenarios (change in values from base)

Variable	*Units*	*Base value 1996*	*Simulation A: complete liberalisation (quotas and tariffs) in 1999*[b]	*Simulation B: quota liberalisation in 1999*[a]	*Simulation C: Phase out of quotas year by year*[a]					*Simulation D: quota liberalisation in 2004*[a]
					1999–2000	*2000–01*	*2001–02*	*2002–03*	*2003–04*	
Use of domestic commodities by US apparel chain										
Fibres										
▪ Wool	kt	13.9	-0.9	-0.2	0.0	0.0	0.0	0.0	0.0	-0.2
▪ Cotton	kt	2051.2	-45.4	-19.3	-0.7	-0.7	-1.1	-1.2	-1.2	-13.6
Yarns										
▪ Wool	kt fibre eq.	32.7	-6.1	-1.7	0.0	0.0	0.0	0.0	0.0	-1.5
▪ Cotton	kt fibre eq.	960.1	-67.6	-31.4	-1.1	-1.2	-1.9	-2.1	-2.0	-21.7
▪ Other	kt fibre eq.	2218.5	-102.1	-39.7	-1.4	-1.5	-2.3	-2.6	-2.5	-27.8
Fabrics										
▪ Wool	kt fibre eq.	26.8	-5.7	-2.8	0.0	0.0	-0.1	-0.1	-0.1	-2.4
▪ Cotton	kt fibre eq.	391.3	-79.6	-44.2	-1.6	-1.7	-2.7	-3.0	-2.9	-30.4
▪ Other	kt fibre eq.	432.8	-90.5	-53.0	-1.9	-1.9	-3.0	-3.3	-3.2	-36.5
Final consumption of apparel										
▪ Wool	kt fibre eq.	31.2	-6.6	-3.7	0.0	0.0	-0.1	-0.1	-0.1	-3.3
▪ Cotton	kt fibre eq.	434.7	-105.8	-63.9	-2.3	-2.5	-3.9	-4.3	-4.1	-43.6
▪ Other	kt fibre eq.	427.5	-116.6	-70.7	-2.5	-2.5	-4.0	-4.3	-4.2	-48.4
Use of imports by US apparel chain										
Fibres										
▪ Wool	kt	34.2	-3.3	-0.8	0.0	0.0	0.0	0.0	0.0	-0.7
▪ Cotton	kt	176.1	-7.4	-3.3	-0.1	-0.1	-0.2	-0.2	-0.2	-2.3
Yarns										
▪ Wool	kt fibre eq.	7.2	-0.3	-0.4	0.0	0.0	0.0	0.0	0.0	-0.4
▪ Cotton	kt fibre eq.	53.7	4.4	-2.3	-0.1	-0.1	-0.1	-0.2	-0.2	-1.6
▪ Other	kt fibre eq.	204.9	24.8	-6.1	-0.2	-0.2	-0.3	-0.4	-0.4	-4.1
Fabrics										
▪ Wool	kt fibre eq.	10.9	1.8	-1.2	0.0	0.0	0.0	0.0	0.0	-1.1
▪ Cotton	kt fibre eq.	241.5	-0.6	-23.0	-0.9	-0.9	-1.5	-1.7	-1.6	-15.8
▪ Other	kt fibre eq.	315.7	32.6	-20.2	-0.7	-0.7	-1.1	-1.2	-1.2	-13.6
Final consumption of apparel										
▪ Wool	kt fibre eq.	58.9	12.2	3.8	-0.5	-0.5	-0.6	-0.6	-0.6	7.0
▪ Cotton	kt fibre eq.	613.6	247.8	140.3	5.1	6.0	9.4	11.0	10.1	93.7
▪ Other	kt fibre eq.	612.7	493.7	281.9	9.2	8.9	13.7	14.2	14.5	181.6

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3.3 Key results for some US textile and clothing liberalisation scenarios (change in values from base) (continued)

Variable	*Units*	*Base value 1996*	*Simulation A: complete liberalisation (quotas and tariffs) in 1999*[b]	*Simulation B: quota liberalisation in 1999*[a]	*Simulation C: Phase out of quotas year by year*[a]					*Simulation D: quota liberalisation in 2004*[a]
					1999–2000	*2000–01*	*2001–02*	*2002–03*	*2003–04*	
Reduction in US expenditure	$US million	315120	-20164.8	-11959.1	-423.8	-447.9	-705.1	-775.7	-751.5	-8358.0
US production										
Fibres										
▪ Wool	kt	13.6	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
▪ Cotton	kt	4124.1	10.4	5.6	0.2	0.3	0.4	0.5	0.5	3.3
Yarns										
▪ Wool	kt fibre eq.	51.4	-4.8	-1.2	0.0	0.0	0.0	0.0	0.0	-1.0
▪ Cotton	kt fibre eq.	1969.6	-51.4	-22.6	-0.8	-0.9	-1.3	-1.5	-1.4	-15.6
▪ Other	kt fibre eq.	3298.3	-53.5	-19.0	-0.7	-0.8	-1.2	-1.3	-1.3	-13.6
Fabrics										
▪ Wool	kt fibre eq.	37.4	-5.4	-1.8	0.0	0.0	0.0	0.0	0.0	-1.6
▪ Cotton	kt fibre eq.	986.9	-56.3	-27.9	-1.0	-1.1	-1.7	-1.8	-1.8	-19.2
▪ Other	kt fibre eq.	2378.3	-75.6	-37.8	-1.3	-1.4	-2.2	-2.4	-2.3	-26.2
Apparel										
▪ Wool	kt fibre eq.	35.1	-5.2	-3.1	0.0	0.0	-0.1	-0.1	-0.1	-2.7
▪ Cotton	kt fibre eq.	496.0	-87.1	-53.2	-1.9	-2.1	-3.2	-3.6	-3.4	-36.4
▪ Other	kt fibre eq.	492.2	-95.1	-58.3	-2.0	-2.1	-3.3	-3.6	-3.5	-40.0
Australian production										
▪ Wool	kt	447.4	1.4	0.7	-0.1	-0.1	-0.1	-0.1	-0.1	0.9
▪ Cotton	kt	429.0	3.5	1.7	0.1	0.1	0.1	0.2	0.1	1.1
Australian wool industry income										
Total	A$m	1749.1	17.3	8.2	-0.6	-0.7	-0.7	-0.7	-0.8	11.0
Farm price	$/kg clean	4.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Australian cotton industry income										
Total	A$m	674.8	15.0	7.1	0.2	0.3	0.5	0.6	0.5	4.6
Australia's wool exports to the US										
▪ As wool	kt	24.0	-2.2	-0.6	0.0	0.0	0.0	0.0	0.0	-0.5
▪ In wool yarns, fabrics and apparel	kt	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] Remove tariff equivalent of the quota arrangements. [b] Remove tariff equivalent of the quota arrangements and duty payable.

Source: MFA model.

Key factors shaping the results in tables 3.2 and 3.3 are:

- the changes in import prices into the US of yarns, fabrics and apparel under quota phase out and removal, and removal of quotas and tariffs — in particular, the import price relativities between each fibre category of yarns, fabrics and apparel (see table 3.4);
- the importance of US consumption of each fibre category in world fibre markets (see table 3.5); and

3.4 Changes in import prices under various US liberalisation scenarios

	Trade weighted average tariff	*Tariff equivalent target imports*	*Tariff equivalent total imports*	*Total tariff equivalent*	*Change in power of tariff[a] (import price)*		*Year on year changes*
					ATC liberalisation (quotas only)	*Complete liberalisation (tariffs and quotas)*	
	%	%	%	%	%	%	%
Cotton apparel							
1996	16.3	41.7	26.4	47.0	-20.9	-32.0	0
1997	16.1	40.9	25.9	46.2	-20.6	-31.6	0
1998	16.0	39.3	24.9	44.9	-19.9	-31.0	0
1999	15.8	37.7	23.9	43.5	-19.3	-30.3	0
2000	15.6	35.8	22.7	41.8	-18.5	-29.5	-0.8
2001	15.5	33.8	21.4	40.2	-17.6	-28.7	-0.9
2002	15.3	30.5	19.3	37.6	-16.2	-27.3	-1.4
2003	15.2	27.0	17.1	34.9	-14.6	-25.9	-1.6
2004	15.0	23.8	15.1	32.4	-13.1	-24.5	-1.5
2005	15.0	0.0	0.0	15.0	0.0	-13.0	-13.1
2006	15.0	0.0	0.0	15.0	0.0	-13.0	
Wool and wool blend apparel							
1996	17.8	35.9	12.8	32.9	-11.3	-24.7	0
1997	17.5	37.0	13.3	33.1	-11.7	-24.9	0
1998	17.2	38.2	13.7	33.3	-12.0	-25.0	0
1999	16.9	39.4	14.1	33.4	-12.4	-25.0	0
2000	16.6	40.5	14.5	33.5	-12.7	-25.1	0.3
2001	16.3	41.5	14.9	33.6	-13.0	-25.2	0.3
2002	16.0	42.3	15.2	33.6	-13.2	-25.2	0.2
2003	15.7	43.1	15.5	33.6	-13.4	-25.2	0.2
2004	15.4	43.9	15.8	33.6	-13.6	-25.2	0.2
2005	15.4	0.0	0.0	15.4	0.0	-13.3	-13.6
2006	15.4	0.0	0.0	15.4	0.0	-13.3	
Other fibre apparel							
1996	21.2	59.7	40.1	69.8	-28.6	-41.1	0
1997	21.0	57.7	38.7	67.8	-27.9	-40.4	0
1998	20.8	54.9	36.8	65.3	-26.9	-39.5	0
1999	20.7	52.3	35.1	63.1	-26.0	-38.7	0
2000	20.5	49.3	33.1	60.4	-24.9	-37.7	-1.1
2001	20.3	46.3	31.1	57.7	-23.7	-36.6	-1.1
2002	20.1	42.1	28.3	54.1	-22.1	-35.1	-1.7
2003	20.0	37.8	25.4	50.5	-20.3	-33.5	-1.8
2004	19.8	33.8	22.7	47.0	-18.5	-32.0	-1.8
2005	19.8	0.0	0.0	19.8	0.0	-16.5	-18.5
2006	19.8	0.0	0.0	19.8	0.0	-16.5	

[a] Power of the tariff is defined as one plus the tariff rate *t*, that is, 1+(*t*/100).

Source: The Trade Partnership.

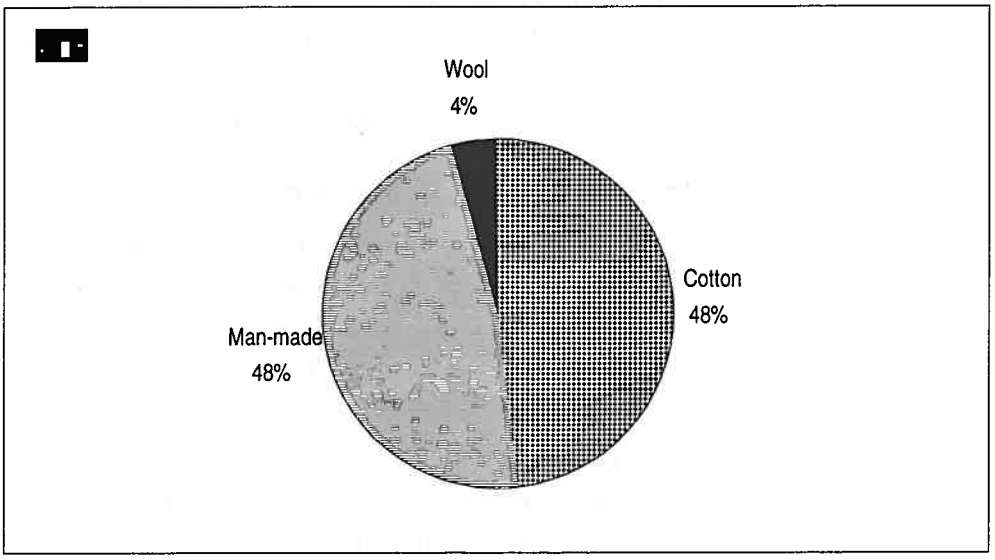
- how US total fabric and apparel consumption is shared between consumption of wool fabrics and apparel, cotton fabrics and apparel, and other (mainly man-made) fabrics and apparel (see chart 3.6).

3.5 Importance of the US market in the world fibre market

Fibre type	*World consumption*	*US consumption*	*US share*
	kt fibre equivalent	kt fibre equivalent	%
Wool and wool blend	1 009.0	121.7	12.1
Cotton	17 280.1	2 740.6	15.9
Other	21 308.0	3 834.4	18.0

Source: CIE estimates.

3.6 Fibre composition of US apparel consumption Fibre equivalent weight basis



Source: CIE estimates.

Consider, for example, simulation A (complete liberalisation in 1999). Table 3.4 shows that this will result in reductions in US import prices of apparel of 30.3 per cent for cotton apparel, 25 per cent for wool and wool blend apparel and 38.7 per cent for other fibre apparel. Thus, while all imported apparel into the US will be substantially cheaper, cotton and man-made fibre apparel will be cheaper still relative to wool apparel. This is because, although tariffs on woollen apparel in 1999 are slightly higher than on cotton and other fibre apparel, the tariff equivalent of the quota on wool based apparel imports is lower.

Table 3.5 shows that US final consumption of wool fibre in fabrics and apparel accounts for 12 per cent of world consumption. In the case of cotton and man-made fibres, US consumption by fibre is significantly higher (16 per cent for cotton and 18 per cent for other). Changes in the demand for

apparel in the US are therefore likely to have a greater influence on world apparel demand in the case of cotton than in the case of wool.

Chart 3.6 shows that, on a fibre equivalent basis, US apparel consumption is dominated by cotton (48 per cent) and man-made fibres (47.7 per cent). Wool accounts for only 4.3 per cent of US apparel consumption. Hence, increases in US apparel consumption through cheaper imports will lead to much bigger increases in the demand for cotton and man-made fibres by the US than is the case for wool.

Simulation A: complete liberalisation now

The results show how much current US barriers to imports of yarns, fabrics and apparel penalise US textile and clothing consumers, and raw fibre producers. They provide a measure of the maximum gains achievable for US consumers and for Australian wool producers from US liberalisation.

Key points to note are as follows.

- US consumers increase their apparel consumption significantly but switch strongly from domestically produced to imported apparel — imports of wool based apparel increase by 21 per cent, imports of cotton apparel increase by 40 per cent and imports of other apparel increase by 81 per cent.
- Expenditure by US consumers on textiles and clothing falls by US$20 billion. This provides a guide to how much better off US consumers would be if current restrictions on US imports of textiles and clothing were to be removed. Import liberalisation would allow US consumers to consume more of the now much cheaper textiles and clothing and still have US$20 billion left over to spend on other goods and services.
- US production of apparel falls substantially — by 15 per cent (wool), 18 per cent (cotton) and 19 per cent (other).
- As a result of the switch from domestic apparel production to apparel imports US imports of yarns and fabrics decrease substantially. Imports of woollen yarns and woollen fabrics are projected to fall by 19 and 22 per cent respectively.
- Australia's raw apparel wool exports to the US are projected to fall by 9 per cent because of the contraction in US production of wool–based yarns, fabrics and apparel. The US obtains its increased requirements for Australian wool through its imports of wool fabrics and apparel. Australia's wool production is projected to increase by about 0.3 per cent (an additional 1.4 kilotonnes) and Australian wool industry

income improves by A$17 million per year. Both in absolute and percentage terms, the increase in Australia's cotton production is nearly three times that for wool.

Simulation B: US quota liberalisation now

Relative to simulation A, the reductions in US import prices are considerably lower. Consider, for example, imports of apparel. The import price of cotton apparel is projected to fall by 19 per cent (compared with 30 per cent in A). For wool apparel the import price is projected to fall by 12 per cent (compared with 25 per cent in A) while the price fall for other fibre apparel is 26 per cent (compared with 39 per cent in A). The increase in US consumption of apparel and the degree of switching from domestically produced to imported apparel are also smaller, though still substantial.

The savings for US consumers are less — US expenditure on textiles and clothing falls by about US$12 billion, which is about 60 per cent of the expenditure reduction in simulation A. The gain in Australian wool industry income is about half of the gain from complete import liberalisation now.

Simulations C and D: Step by step quota liberalisation with all quotas eliminated by the end of 2004

The phase out between 1999-2000 and 2003-04 slightly worsens the position of wool apparel relative to cotton and other fibre apparel in the US market because of a faster rate of decline in the tariff equivalent of quotas on cotton and other fibre apparel relative to wool apparel. Imports of cotton and other apparel increase slightly each year between 1999-2000 and 2003-04, while imports of wool apparel decline slightly. As a consequence, there is a very small decline in Australian wool industry income over this period.

US consumers make steady gains over this period through being able to satisfy their clothing and textile demands with less expenditure. US production of apparel declines by small amounts each year.

But the phase out from 1999-2000 to 2003-04 comes only a fraction of the way to complete liberalisation of quotas at the end of 2005. Most of the action is in the final year (simulation D). About 70 per cent of the total reduction in US expenditure on textiles and clothing from quota liberalisation occurs through liberalisation planned for 2004-05.

All of the gains to the Australian wool industry occur from quota liberalisation during 2004-05. This result highlights the importance to the Australian wool industry of achieving complete removal of US import quotas by the end of the ATC.

4 Sensitivity analysis

THE MFA MODEL INCORPORATES considerable detail about economic behaviour in fibre specific textile and clothing chains and the trade flows between each region at each level in the chain. This calls for a large number of behavioural parameters and elasticities. A complete list of parameters and elasticities required by the model is documented in appendix C along with sources. Values for these parameters and elasticities are not known with certainty. In this chapter we look at the sensitivity of results to changes in values assigned to a selection of parameters.

Parameters tested

We use as our base reference point simulation A, complete liberalisation of US import barriers (removal of tariffs and the tariff equivalent of the quantitative restriction). Changes in parameters and elasticities investigated include:

- setting the domestic-import substitution parameter for all commodities in the US to zero (base value of parameter was 2.5);
- setting the domestic-import substitution parameter for all commodities in the US to 5.0 (base value of parameter was 2.5);
- doubling substitution possibilities between apparel of different fibre types in the US (base values were own price elasticities of around 1.0);
- doubling supply elasticities in the US textiles and apparel industries (base elasticities of 1.0);
- doubling supply elasticities of wool and cotton in Australia (base elasticities of 0.8 and 1.0).

Results

Selected results are shown in table 4.7. They show that the gains to US consumers (measured in terms of reduction in expenditure on textiles and

4.1 Selected results of the sensitivity analysis (percentage changes from base)

	Units	*Reference simulation A (standard parameter set) Complete US liberalisation from 1999*	*US domestic import parameter equals 0.0*	*US domestic-import parameter equals 5.0*	*Double cross-price elasticities in US apparel consumption*	*Double US textiles and apparel supply elasticities*	*Double Australian wool and cotton supply elasticities*
United States							
Final consumption of domestic apparel							
▪ Wool	kt fibre eq.	-21.1	7.9	-32.2	-22.3	-24.6	-21.0
▪ Cotton	kt fibre eq.	-24.3	4.5	-39.8	-26.5	-26.9	-24.2
▪ Other	kt fibre eq.	-27.3	8.4	-49.5	-24.8	-29.9	-27.1
Final consumption of imported apparel							
▪ Wool	kt fibre eq.	20.6	7.9	23.8	17.4	22.5	20.6
▪ Cotton	kt fibre eq.	40.4	4.5	57.1	34.7	42.6	40.1
▪ Other	kt fibre eq.	80.6	8.4	115.5	86.7	82.4	79.1
Reduction in US expenditure	$US billion	-6.4	-4.0	-7.3	-6.4	-6.0	-6.4
Australia							
Wool production	kt	0.3	0.6	0.3	0.3	0.2	0.4
Wool industry income	$A million	1.0	1.9	1.1	0.8	0.7	0.8

Source: MFA model.

clothing), the adjustment burden on US apparel producers (measured in terms of the degree of switching from domestically produced to imported apparel) and the gains to Australian wool producers are most sensitive to changes in the domestic-import substitution parameter for yarns, fabric and apparel.

Under the assumption of no substitution between domestic and imported yarns, fabrics and apparel in the US, the US textile and clothing industry benefits from liberalisation as consumers increase their total apparel consumption in response to cheaper imports. Because consumers cannot switch between sources, consumption of domestically produced apparel increases by the same percentage as consumption of imported apparel. Whereas in the reference simulation US consumption of domestically produced apparel declines by 15 to 19 per cent as consumers switch to cheaper imports, with no substitution possible US consumption of domestically produced apparel expands by between 5 and 8 per cent. Increased US production of wool apparel also leads to bigger demands by the US for Australian raw wool. However, a zero value for domestic-import substitution is extreme. It implies that quota restrictions would not be binding.

Increasing the import-domestic substitution elasticity from 2.5 to 5.0 results in a greater reduction in US consumption of US produced apparel and a bigger increase in US consumption of imported apparel. The gains to US consumers in terms of reduced expenditure on textiles and clothing are a little higher than in the reference simulation. The gains to Australian wool growers remain unchanged.

Doubling cross-price elasticities in US apparel consumption has a small effect on US production, imports, expenditure, and Australian wool production. Doubling US textile and apparel supply elasticities also has only a small effect on these outcomes, as does doubling Australian wool and cotton supply elasticities.