Australian Government

Productivity Commission

Modelling Economy-wide Effects of Future TCF Assistance

Productivity Commission
Research Report

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The Productivity Commission

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Foreword

This is the second of two studies requested by the Australian Government to complement existing reviews of future industry assistance arrangements. A study released last month dealt with the automotive sector; this one deals with the textiles, clothing and footwear (TCF) sector, in parallel with a review headed by Professor Roy Green. In both cases, the Commission was requested to model the economy-wide effects of assistance options that had been identified, and to release its reports publicly.

In the present exercise, the Commission was asked to model various combinations of tariffs and subsidies applying to TCF and to undertake specific sensitivity tests. The modelling suggests that there would be net gains to the Australian community from the current program of assistance reductions, even under quite pessimistic assumptions about employment and price effects. The projected gains come almost entirely from the scheduled tariff reductions and would be smaller for lesser reductions. While the net gains are relatively small in economy-wide terms, in line with the small size of the TCF sector itself, the projected total benefits to consumers from lower priced clothing and footwear are substantial.

In preparing its study, the Commission had early meetings with Professor Green and the TCF Review Secretariat. Three modelling experts refereed the modelling, with work-in-progress discussed at a technical workshop attended by them, as well as by the Secretariat, consultants to the review and other officials. The Commission is grateful to all for their cooperation and input.

Gary Banks AO
Chairman

30 June 2008

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Abbreviations

ABS	Australian Bureau of Statistics
ANZSIC	Australian and New Zealand Standard Industrial Classification
ASEAN	Association of Southeast Asian Nations
CGE	Computable general equilibrium
cif	Cost, insurance and freight
COAG	Council of Australian Governments
CoPS	Centre of Policy Studies
CPI	Consumer Price Index
EOAP	Expanded Overseas Assembly Provision
ERA	Effective rate of assistance
fob	Free on board
FBT	Fringe Benefits Tax
GDP	Gross Domestic Product
GNE	Gross National Expenditure
GSP	Gross State Product
IAC	Industries Assistance Commission
IC	Industry Commission
MFN	Most-Favoured-Nation
MMRF	Monash Multi-Regional Forecasting
PC	Productivity Commission
PDS	Product Diversification Scheme
PTA	Preferential Trade Agreements

R&D	Research and Development
SAP	Structural Adjustment Program
SBP	Small Business Program
SIP	Strategic Investment Program
SOP	Supply chain Opportunities Program
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement
TCF	Textiles, clothing and footwear
WITS	World Integrated Trade Solutions
WTO	World Trade Organization

OVERVIEW

Key points

- The textiles, clothing and footwear (TCF) sector currently receives assistance amounting to more than $0.5 billion a year in *net* terms.
  - This equates to an effective rate of assistance of 12 per cent, nearly three times the average for Australian manufacturing. Clothing producers receive a much higher rate than textiles and footwear producers.

- Modelling projects net gains to the community from the current program of phased reductions in assistance.
  - The projected annual gains are relatively small from an economy-wide perspective, given the small size of the TCF sector itself.
  - Nearly all of the benefits come from the legislated reductions in tariffs rather than removal of financial support (which is much smaller in magnitude and does not increase prices).
  - Options involving smaller reductions in assistance generate smaller gains.

- Reductions in assistance place further pressure on TCF production and employment.
  - But they reduce total burdens on consumers and taxpayers amounting to nearly $1.5 billion annually.
  - They also ease the export 'tax' effect of industry assistance and enable internationally competitive industries to attract the resources they need to expand.

- The modelling projects net gains from scheduled assistance reductions even when, as requested, applying such restrictive assumptions as tariff cuts not being fully passed on in lower consumer prices, or a related permanent increase in national unemployment.

- A simulated increase in the real exchange rate has more than double the impact of scheduled assistance reductions on TCF production and jobs.
  - Seeking to resist such pressures through assistance to TCF would come at a cost to the economy.

- Any policy-induced improvements to productivity would moderate pressures on the TCF sector and enhance economy-wide gains.
  - But whereas reducing tariffs would likely spur innovation and productivity growth, budgetary support for innovation would only bring net benefits if it generated additional spillovers worth more than the additional costs.

Overview

This report responds to a request from the Australian Government to model the economy-wide impacts of various assistance options and scenarios raised by the current review of the textiles, clothing and footwear (TCF) industries. The assistance options involve different levels of tariffs and budgetary support, as well as different assumptions about the effects on industry productivity and the market in which firms operate.

While recognising significant differences between the two sectors, the study has obvious synergies with the Commission's recent modelling of assistance for the automotive industry. In particular, the Commission, in consultation with modelling experts, has used a similar model (adapted for the TCF sector) and broad analytical approach. An important common theme is that assessing economy-wide impacts of policy changes requires that all the costs and benefits be brought to account to identify the policy approach most likely to deliver the largest *net* benefits to the community.

Modelling can bring important insights

As for the automotive report, the Commission has used a 'computable general equilibrium' (CGE) model to analyse the economy-wide effects of the assistance options. By capturing relative price changes and resource movements across industries and the economy as a whole, such models are the best tool available for projecting the wider implications of a policy change in one industry or sector.

CGE models can yield important insights because they capture key economic relationships while paring away extraneous factors. But modelling requires a range of assumptions to be made about behaviour and other parameters, the validity and significance of which always need to be tested. Moreover, the influence of assumptions on model results can increase disproportionately as the policy changes modelled become smaller.

Nor do CGE models directly estimate all the potential effects of policies — such as induced technological change, spillover effects and adjustment costs. To provide a complete assessment of the economy-wide effects of assistance options, these impacts must also be analysed and estimated.

The modelling in context

As in various other countries, TCF industries in Australia have long received comparatively high levels of assistance (mainly in the form of tariffs, but also 'voluntary' export restraints and quotas in the 1970s and 1980s). While assistance to the sector has fallen greatly since the 1980s, in *net* terms it amounted to some $500 million in 2006-07, with an effective rate of assistance of 12 per cent, nearly three times the average for manufacturing. (Tariffs and budgetary support combined currently cost consumers of TCF products and taxpayers almost $1.5 billion a year.)

Tariffs remain the dominant form of assistance, providing around four times the level of support of budgetary programs. Currently, imports of textiles and footwear attract tariffs of 7.5 or 10 per cent, while tariffs on all clothing imports are 17.5 per cent. Except for clothing, all rates are legislated to be reduced in 2010 to 5 per cent (the general rate applying to other manufacturing industries, except for the automotive sector). The tariff on clothing is scheduled to fall to 10 per cent in 2010 and to 5 per cent in 2015.

These scheduled, phased reductions followed recommendations contained in the Commission's 2003 review of the sector. Also broadly in line with Commission recommendations, the Government put in place a package of special budgetary support for the industries (and any displaced workers) to facilitate adjustment to lower tariffs. As the package of measures would bring to an end special assistance for the sector, no further reviews were foreshadowed.

Box 1 **The TCF industries at a glance**

- The TCF sector accounts for less than 0.3 per cent of GDP and 3 per cent of Australian manufacturing. The textiles industry accounts for about half of the sector; clothing about 40 per cent and footwear the remaining 10 per cent.

- The sector is focused on producing for the domestic market — exports account for less than 10 per cent of the output of the textiles and clothing industries and around 30 per cent of footwear industry output. In 2006-07, imports represented 36 per cent of output of the textiles industry, 44 per cent of footwear production and 56 per cent of clothing industry output.

- Taken as a whole, TCF production is labour intensive, though some segments (some textiles, for example) are relatively capital intensive.

- Just under 50 000 people were employed full-time or part-time in the TCF sector in 2007-08 according to the ABS (around 55 per cent being women). But official estimates exclude a significant number of 'outworkers'.

Although TCF tariffs have not changed since 2005, and under existing legislation are not scheduled for further reduction until 2010, competitive pressures on the industry have continued to mount. In part this reflects reforms within developing and emerging economies, which are enabling them to realise their comparative advantage in labour-intensive production. These competitive pressures have been intensified for the sector (and, indeed, for many other trade-exposed industries) by the strong appreciation of the Australian dollar in recent years.

Against this background, the Australian Government commissioned a further review to 'develop strategies to ensure the sector's competitiveness, based on its strengths and capabilities'. Headed by Professor Roy Green, the review is nested within a concurrent, wider review of industry innovation policy led by Dr Terry Cutler.

Modelling the options

The Commission has been asked to model policy options covering a mix of tariff rates and levels of budgetary support. Reflecting particular concerns of the review, the Commission was also asked to carry out sensitivity simulations involving different assumptions about the degree of 'pass through' of tariff reductions in retail prices for consumers and about the ability of displaced workers to find re-employment. A further request was to model small productivity improvements in the industry posited to result from subsidies.

In line with the automotive study, there was also a request to model the effects of the Australian dollar achieving parity with the US dollar. (A subset of the large number of possible combinations of policy options and sensitivity scenarios was selected for modelling, to highlight their different implications, as shown in table 1.)

Customising the model

The MMRF model (developed by the Centre of Policy Studies at Monash University) was used for this study, as for the companion automotive study, and broadly for the same reasons:

- it is well-documented with a proven track record
- it allows analysis of the effects of policy at the national, State, Territory and industry levels, which is particularly important for analysing the geographically-concentrated TCF industries.

Table 1   **Combinations of policies and sensitivity scenarios**

	Tariffs remain at 2005 levels	**Tariffs to 5% by 2015 as scheduled**	Clothing & finished textiles tariffs 10%; others 7%
Budgetary support remains at 2005 levels	**O3b**	**O1** **S1a** & **S1b** (1.5% and 0.5% productivity improvements)	**O2**
Budgetary support discontinued in 2010	**O3a**	Not modelled	Not modelled
Budgetary support discontinued in 2015 as scheduled	Not modelled	**'Reference' case R** **S2a** & **S2b** (10% and 50% pass though of tariff cuts) **S3a** & **S3b** (30% and 10% of displaced TCF workers unemployed) **S4** (10% price increase for mineral exports)	Not modelled

Again, a 'comparative-static' version of the model was used, which avoided the need to formulate long-range (and often contentious) forecasts about the economy and the industry for a 'base case' scenario. Although particular adjustment paths therefore cannot be inferred, a comparative-static model provides a snapshot of the 'fully-adjusted', long-term implications of different industry policies, which is the main policy interest. The simulation results relate to the economy as depicted in its 2005-06 database. Accordingly, they involve projections, not forecasts of what the economy, or TCF industry, will look like in future.

To ensure that the scenarios were as realistic as possible, the model database was updated to 2005-06, and the textiles, clothing and footwear sector disaggregated into its three constituent industries, using the most recent ABS sources.

Trade-weighted tariff rates were adjusted to reflect the likelihood that Australia's current preferential trade agreements have not generated a large net increase in imports of TCF products. This means that the actual protective effect of the tariff is likely to be somewhat higher than indicated by trade-weighted average tariff rates. But it also means that, to the extent preferential tariff agreements have generated additional TCF imports, the modelled effects of lower tariffs would be slightly overestimated (as some of the impacts would already have been felt).

There are economy-wide gains from modelled assistance reductions

Reducing assistance for the TCF industries, particularly tariff assistance, is projected to generate small net economy-wide gains. Following through with the existing regime of scheduled reductions in tariffs (to 5 per cent) and removal of budgetary support by 2015 (the modelled reference case 'R' — column 1 in table 2) is projected to increase real economic activity (GDP) and wider community economic well being (as measured by adjusted GNE) by around $70 million and $60 million respectively each year. (Results for some key scenarios are presented in table 2.)

Table 2 **Assistance reductions deliver economy-wide gains, even with restrictive assumptions**

Column/(scenario)	*1 (R)*	*2 (O1)*	*3 (S2a)*	*4 (S3a)*	*5 (S1a)*	*6 (S4)*
Tariff	*To 5%*	*To 5%*	*To 5%*	*To 5%*	*To 5%*	*To 5%*
Budgetary assistance	*To 0*	*No change*	*To 0*	*To 0*	*No change*	*To 0*
Sensitivity scenario			*10% pass through*	*30% remain un-employed*	*Productivity increase*	*Minerals boom*
National aggregates ($m)						
Real adjusted GNE	63	63	50	18	114	12 331
Real GDP	71	71	58	23	121	13 458
Export volumes	385	324	362	378	309	-6 935
Import volumes	344	336	238	334	332	4 650
Sectoral output (% change)						
Agriculture	0.02	0.01	0.02	0.02	0.01	-1.56
Mining	0.08	0.05	0.08	0.07	0.04	14.03
Food processing	0.05	0.04	0.05	0.05	0.03	-3.21
Manufacturing	-0.07	-0.06	-0.04	-0.08	-0.04	-4.12
Services	0.00	0.01	0.00	0.00	0.01	0.80
Textiles (% change)						
Output	-2.76	-2.27	-2.43	-2.77	-1.72	-5.30
Employment	-3.09	-2.53	-2.72	-3.10	-3.54	-6.19
Clothing (% change)						
Output	-5.12	-4.55	-3.05	-5.12	-3.91	-11.81
Employment	-5.73	-5.10	-3.42	-5.73	-5.98	-13.46
Footwear (% change)						
Output	-2.06	-0.60	-1.75	-2.07	1.41	-13.79
Employment	-2.48	-0.85	-2.08	-2.49	-0.24	-16.25

That the projected annual gains are relatively small simply reflects the impact of changing assistance for a small sector of the economy. Nonetheless, the model's 'cost–benefit' assessment is that the benefits of assistance reductions to consumers and other industries outweigh the costs incurred by the TCF sector itself. The results demonstrate the adverse consequences for the economy as a whole of policies that draw resources away from internationally-competitive domestic industries (such as mining, agriculture and food processing and, indeed, other manufacturing industries) to less competitive ones.

The results also indicate that virtually all of the projected economy-wide gains from implementing scheduled reductions in assistance come from reducing TCF tariffs to 5 per cent (column 2, scenario O1). There are two reasons for this: budgetary support for the sector provides a fraction of the assistance delivered by tariffs, and direct assistance generally avoids the distorting, price-raising effect of tariffs (revenue needed to fund budget support can be raised more efficiently from general taxation than from a tariff). However, it is likely that the model, by underestimating the distorting impacts of the tax system as it operates in practice, underestimates somewhat the economy-wide benefits of removing current budgetary support programs.

The economy's gain from reducing TCF assistance inevitably comes at some cost to the protected sector — output and employment are projected to be lower than otherwise for the three industries. The impact is greater for the clothing industry, because the scenarios involve a larger reduction in the higher tariff on clothing.

As for any modelling exercise, the results are sensitive to assumptions embedded in the model. The modelling request expressly identified several alternative scenarios, which are discussed below. The Commission also undertook other sensitivity analysis involving different elasticities, including the price sensitivity of demand for Australia's exports.

Australian exporters are more likely to be price takers than price makers

The export demand elasticities used in GE models can make a significant difference to the economy-wide results. This is because reductions in across-the-board export prices that are induced by increased exports can, in the model, outweigh the gains from improved resource use which result from assistance reductions. Yet sensitivity analysis which halved the export demand elasticities in the model from 10 to 5 (thus doubling the induced reduction in all export prices), still showed aggregate gains from implementing scheduled reductions in TCF assistance.

That said, the Commission does not consider the lower elasticities credible, particularly when assessing the long-term impacts of policy changes. (Elasticities in the long term normally are higher than in the short term because of supply-side responses to higher prices.) There is little evidence that Australian exporters have the ability to influence prices significantly in world markets over time, even for major commodity exports such as coal, iron ore, wheat and wool.

Arguments for continued tariff assistance that rely on modelling results suggesting the opposite should be treated with some care, especially where assumed elasticities do not reflect a considered assessment of the actual degree of price influence in world markets. In any case, even if it were demonstrated that restraining some of Australia's exports could bring higher prices and increased national income, the best policy approach would be to tax or otherwise control those exports directly, not maintain tariffs on TCF imports.

The model shows net gains even with restrictive assumptions

The model still projects economy-wide gains from assistance reductions even when it is assumed, as the Commission has been requested to do, that 30 per cent of displaced TCF workers become permanently unemployed, translating to an increase in national unemployment (column 4, scenario S3a), or that just 10 per cent of the tariff reductions are passed on via lower prices to consumers (column 3, scenario 2a). Small gains result even if both sensitivity scenarios are modelled simultaneously, because of remaining limited scope for export-oriented industries to attract additional resources for expansion.

In the Commission's assessment, however, such assumptions are implausible.

While some TCF workers could be expected to lose their jobs if assistance were further reduced (in the 'reference' case scenario, about 4 per cent of TCF workers are projected to be displaced in the long term), it is unlikely that this would increase the *national* unemployment rate. This is because reducing TCF assistance over time helps generate new jobs in industries previously 'taxed' by tariffs, opening up employment opportunities for former TCF workers, as well as for others.

Of greater relevance is the likelihood of former TCF workers being able to fill the new jobs created, or fill vacancies created when others move to these jobs. There are reasons for greater optimism about their re-employment opportunities in the future than in the past, including projected ongoing national shortages of skilled *and* unskilled workers, as well as the concentration of TCF jobs in the large employment markets of Melbourne and Sydney (box 2). Re-employment prospects for some individuals undoubtedly would be enhanced by retraining or other adjustment

assistance. But the costs of well-targeted adjustment assistance for displaced workers would be far less than the ongoing cost to the community of repealing the legislated program of assistance reductions. On the Commission's reckoning, around $150 000 of assistance is required each year to retain an additional job in the industry.

Box 2   TCF jobs are concentrated in Melbourne and Sydney

TCF firms (a quarter of which have fewer than 5 employees) in Melbourne and Sydney employ more than 25 000 people, more than half of the industry's total employees.

The main regional centres for TCF enterprises include Wodonga, Wangaratta and Geelong. For these regions, TCF employment is about 1.5 per cent of total employment. For all other regions, it is less than 1 per cent of the total.

There is little evidence that retailers of TCF products have significant market power: there are many retail establishments reflecting low barriers to new entrants selling these products (box 3). Even with considerable market power, they would maximise profits by passing on *at the very least* one-half of any tariff reduction to consumers. (With lower costs, even a monopolist can earn more from reducing prices and increasing sales).

Box 3   Retailing of clothing and footwear appears competitive

The Commission was asked to model two 'sensitivity' scenarios in which only 10 per cent and 50 per cent of any tariff cut was passed through to consumers in lower retail prices, apparently reflecting a view that retailers of TCF products in Australia possess substantial market power. Yet even with these restrictive assumptions, the model projects gains for the economy overall from better resource use, though consumers of TCF products do not benefit as much from lower prices.

More fundamentally, at issue is whether such assumptions are realistic. In the Commission's assessment, the weight of the evidence suggests the contrary.

- There are around 19 000 retail clothing establishments, as well as many independent wholesalers and importers.

- Major department stores are estimated to account for about 40 per cent of the market, speciality clothing stores another 40 per cent, and small independents the remaining 20 per cent. Market concentration may be higher for some products, such as children's wear.

- But barriers to entry (broadly speaking, costs which must be incurred and which cannot be recovered) appear low. New entrants do not need to provide the full range of products and services of major retailers to generate effective competition — through 'cherry picking', they can constrain prices to competitive levels.

Although the Commission has not been able in this study to undertake a comprehensive assessment of the determinants of TCF product prices, there is strong evidence of a decline in real prices of clothing and footwear dating from the removal of quotas and the progressive opening of the market since the late 1980s (figure 1). The lower cost of clothing and footwear items will have brought significant benefits to consumers, especially lower income households.

Figure 1   **Cuts in protection have preceded lower prices**
Clothing and footwear and CPI (indexes, September 1972 = 100)
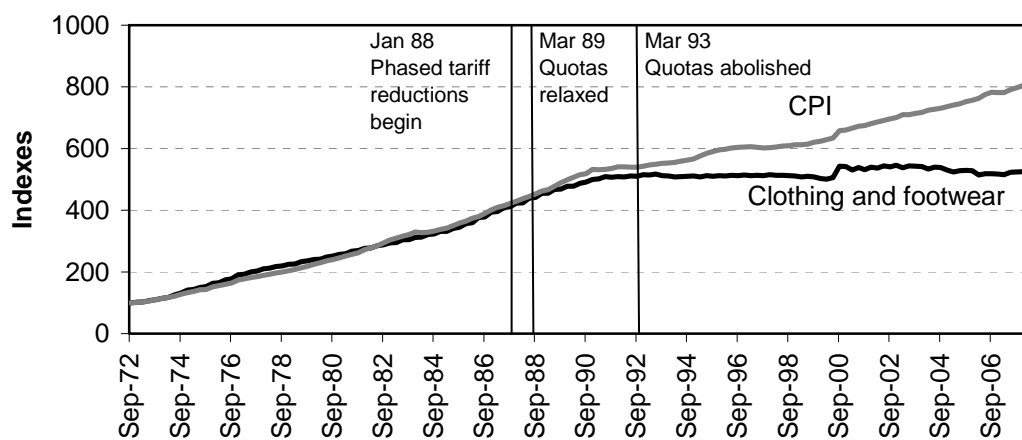
Linking policy to industry innovation and productivity growth

The Commission also was asked to model two small productivity improvements (of 0.5 per cent and 1.5 per cent) in the TCF sector, linked to a scenario combining tariff cuts and retention of current levels of budgetary assistance. The apparent rationale for the request is that budgetary support is, or if modified could be, targeted to enhance the sector's productivity performance by promoting innovation.

Not surprisingly, combining tariff cuts with no change in budgetary assistance and a productivity gain of 1.5 per cent (column 5, scenario S1a) produces greater economy-wide gains (a difference of about $50 million) than tariff cuts alone (column 2, scenario O1).

The TCF sector fares a little better too, though its expansion resulting from the assumed productivity gain is not large enough to offset the adverse impact of tariff reductions. But not all in the sector benefit from a productivity improvement. TCF employment is projected to be lower than if tariffs were reduced without a productivity gain. This is because TCF output does not increase enough (largely reflecting the industry's reliance on the small domestic market) to compensate for

the labour-saving effect of the productivity improvement. (The productivity improvements were assumed to be 'neutral' — that is, both labour and capital productivity increase by the same amount.) Of course, productivity improvements might not 'save' inputs required for producing given output, but instead result from innovations that lead to better quality or new products for which consumers are willing to pay more.

Evidence suggests that reducing tariffs spurs innovation and productivity growth through increased competitive pressure. Whether maintaining assistance through subsidies would also be beneficial would depend on whether it is targeted at overcoming identified impediments to innovation, and the value of any additional innovation activity and 'spillovers' that result (relative to the extra costs). Given the existence of generally-available programs to support firm R&D, the net benefits to the community from extra support targeted at the TCF sector would need to be demonstrated.

Significant exchange rate appreciation dominates all other scenarios

Modelling a nominal exchange rate appreciation can only be proxied in models of the 'real' economy. The Commission modelled a 10 per cent increase in the prices paid for Australian mineral exports to drive a real exchange rate appreciation which would also be consistent with appreciation of the $A against the $US. The economy-wide effects of this assumed improvement in the terms of trade — which essentially capture what has occurred in the Australian economy over the past few years — are orders of magnitude greater than for any of the TCF-specific scenarios modelled (column 6, scenario S4).

The gains in GDP and economic welfare are substantial, as are the structural effects on the economy. Apart from the services sector, which for the most part is not exposed to international competition, all sectors of the economy contract to allow the mining sector to expand. For the TCF sector itself, the resulting real appreciation involves roughly double the competitive pressure from implementing scheduled assistance reductions.

However, as the Commission observed in its recent automotive modelling report (in which a similar scenario was modelled), trying to counter the forces pulling resources to other parts of the economy by protecting one sector can only place a greater adjustment burden on other sectors and constrain the community benefits to be had from higher commodity prices.

Summarising the results

The modelling indicates small net benefits for the Australian economy from implementing the current assistance reduction program. The gains come predominantly from the legislated program of reductions in the sector's relatively high tariff rates. (Options involving lesser tariff reductions deliver commensurately smaller economy-wide benefits.)

Given the size of the sector in the economy, the projected gains suggest a reasonable benefit–cost ratio from the policy change. Moreover, economy-wide gains are projected even with quite pessimistic and, in the Commission's assessment, implausible assumptions about re-employment prospects for TCF workers or price benefits for consumers.

Unsurprisingly, the net economy-wide gains are greater when policy-induced productivity improvements are assumed. Policies may complement tariff reductions in promoting additional innovation activity, but proponents need to be able to demonstrate the likelihood of net benefits to the economy additional to those from general R&D support.

Finally, as in the case of the Commission's automotive modelling, it emerges that exchange rate changes of the magnitude experienced in recent times have much greater impacts on the TCF sector than scheduled tariff changes. However, the modelling also demonstrates that seeking to resist such adjustment pressures through continued TCF assistance would come at a cost to the economy.

1 Background and approach to the study

1.1 Introduction

The textiles, clothing and footwear (TCF) manufacturing sector covers a diverse range of products and incorporates all stages of production from the processing of raw materials to the supply of finished products.

Box 1.1   **TCF manufacturing activity**

TCF manufacturing in Australia covers a spectrum of activities:

- early stage processing — the preparation or production of leather and textile fibres:
  - leather production including activities such as salting, wet blueing (the first stage of tanning), finishing and fur dressing
  - natural fibres — mainly cotton and wool, but also niche materials such as cashmere and alpaca
  - man-made fibres: including cellulosics such as viscose; synthetics such as polyester, nylon, acrylic and polypropylene (all derived from petrochemicals); and fibres made from inorganic materials such as glass, metal or ceramics
- production of textiles which involves the conversion of fibres into yarns and fabrics (through spinning, weaving, knitting, tufting etc)
- finishing activities — aimed at giving fabrics visual, physical and aesthetic properties (through bleaching, printing, dyeing, impregnating, coating, plasticising etc)
- transformation of yarns, fabrics and leather into products such as:
  - clothing and footwear (involving design, pattern making, fabric cutting and assembly)
  - carpets (woven, knitted, tufted and flocked) and other textile floor coverings
  - home and commercial textiles (including towels, bed linen, curtains)
  - technical textiles which encompass performance or functional characteristics (including shade cloth, medical products, insulation materials, geotextiles).

Source: PC (2003).

The TCF sector represents a small part of the economy, with sales and services income (excluding subsidies) of $9.2 billion in 2005-06 and value added of $2.8 billion in 2007. The sector accounted for 2.6 per cent of the total manufacturing activity in Australia (under either measure), or just under 0.3 per cent of gross domestic product.

Box 1.2   Australia's TCF sector – some facts and figures

- Value added in the TCF manufacturing sector was around $2.8 billion in 2007. Exports were valued at $1.7 billion. Both are about one-half of levels a decade ago. Over half of all TCF manufacturers produce solely for the domestic market and only 10 per cent of businesses export more than 50 per cent of production. Imports increased in real terms by 21 per cent (to $9.1 billion) in the 10 years to 2007.

- Based on ABS labour force survey data, approximately 48 500 people were employed in the TCF sector in 2007-08. The sector also has a significant 'outworker' component. In 2003, the Commission estimated that the number of outworkers was equal to around 40 per cent of factory-based employment. If this share remained constant, there would have been around 19 400 TCF outworkers in 2007-08. If some of the decline in sectoral employment since 2003 reflected outsourcing of garment assembly to outworkers, however, this could be an underestimate. Around 55 per cent of TCF sector employees are women compared with a national average of 45 per cent. Over 80 per cent of TCF workers are located in either New South Wales, Victoria and Queensland.

- Textile manufacturing is the largest industry in the sector (50 per cent of value added), followed by clothing (38 per cent) and footwear (12 per cent).

- The sector contains many small businesses, with around a quarter of employees in businesses with fewer than 5 employees. From 2001-02 to 2005-06, medium sized businesses (10-49 employees) increased their share of industry employment, to around 30 per cent.

The Australian TCF sector historically has been provided with high levels of industry assistance, typically through tariffs and quotas. As in the case of the automotive industry, protection levels have been significantly reduced since the 1980s. However, the sector continues to receive relatively high assistance compared to other industries. In particular, tariffs on imported clothing and finished textiles are around three and a half times higher than tariffs applying to most other imports. The sector also obtains substantial budgetary assistance.

The TCF sector has faced increasing levels of import competition in recent years. In addition to the effects of the most recent tariff reductions in 2005, a major source of competitive pressures is the recent appreciation of the Australian dollar, which has made imports much cheaper for Australian consumers. In addition, competition from nations with much lower labour costs has intensified, with many closing

previous productivity gaps that, together with higher tariffs, enabled Australian TCF producers to be competitive in the past.

In response to these pressures, many producers have left the sector. Those remaining have rationalised their operations, merged, moved manufacturing operations offshore or increased their reliance on imports. For example, Pacific Dunlop, formerly Australia's largest clothing producer, has been transformed into Pacific Brands, maintaining some manufacturing operations (including within Australia) but becoming predominantly a clothing wholesaler and brand manager (Weller 2007, Pacific Brands 2007). Unlike the automotive industry, there has been no offsetting increase in TCF exports. This process has seen the sector contract significantly (figure 1.1).

Figure 1.1   **Trends in the TCF sector since 1988**

Four quarter moving averages[a, b]
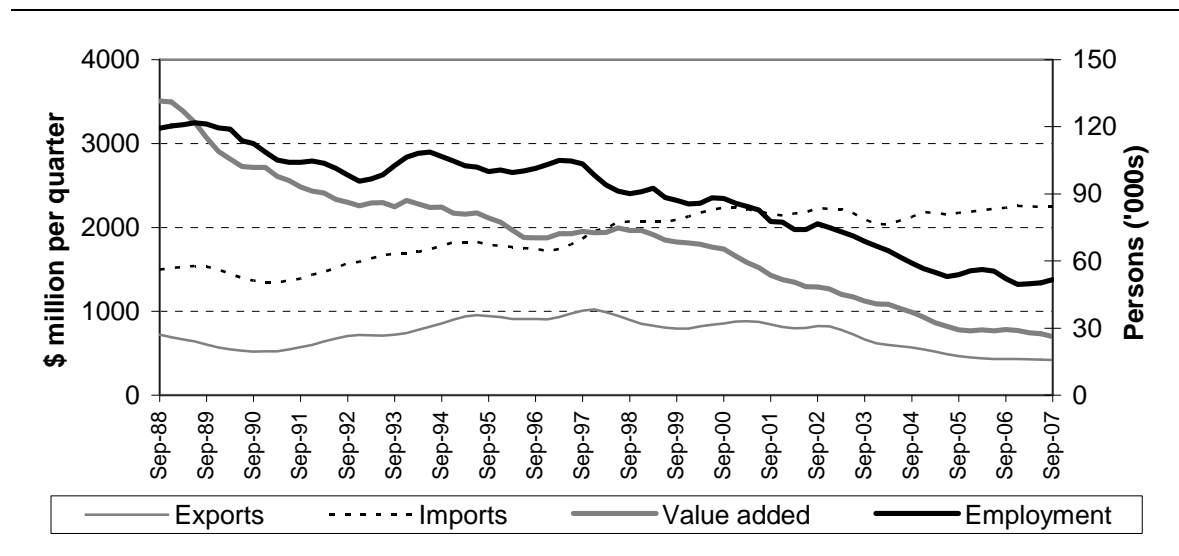
a Values in September 2007 dollars. **b** The series should not be used to infer market share changes between local producers and imports.

Sources: ABS (various).

1.2   The Green Review and the Commission's study

The Australian Government commissioned a review of the TCF sector on 8 March 2008. The reviewer is Professor Roy Green, Dean of the Macquarie Graduate School of Management. He is assisted by an appointed advisory panel comprising members with extensive TCF sector experience. Its task is to 'develop practical and effective strategies to ensure Australia's TCF industries will be vibrant, innovative and competitive well into the future' (Carr 2008). The review is

being conducted within the context of a concurrent review of Australia's innovation system, chaired by Dr Terry Cutler.

In announcing the review, the Minister for Innovation, Industry, Science and Research foreshadowed that:

> The Government will separately request that the Productivity Commission undertake modelling on economy-wide effects of future assistance options. The Commission's modelling will be released publicly to inform Professor Green's examination of the industry, public debate, and the Government's deliberations in this area. (Carr 2008)

Following the release of the Green Review's background paper, the Commission received a letter from the Assistant Treasurer, on 22 May 2008, asking it to model policy scenarios suggested in previous correspondence from Professor Green (appendix A).

The Terms of Reference for the TCF review require Professor Green 'to take account of the Australian Government's desire to:

(a) ensure there are no impediments to the TCF industries benefiting from new technologies and innovation

(b) foster globally competitive industries based on Australia's strengths and capabilities

(c) optimise the overall economic performance of the Australian economy.'

The Commission's modelling is of particular relevance to the second and third objectives. In providing an 'economy-wide' perspective on assistance options for the TCF industry, the modelling considers not only the impacts of assistance reductions on the TCF sector, but also the benefits to consumers, taxpayers and other industries that currently bear the costs of that assistance.

In undertaking the modelling requested, the Commission has incorporated TCF sector tariffs and budgetary assistance, but has not modelled the impacts on the TCF sector of more generally available assistance programs.

1.3　Background to the current assistance regime

Australia's TCF sector essentially came into being through import protection (IC 1997). This was intended to promote the development and ongoing viability of firms at all points of the production process.

By the 1980s, there was growing concern about the sector's continuing reliance on government assistance. In particular, a 1986 report by the Industries Assistance

Commission (IAC) found assistance imposed costs in the form of higher prices and reduced choices for consumers and user industries, and contributed to an industry structure in Australia that was not reflective of the nation's comparative strengths (IAC 1986).

As a consequence, industry assistance has been significantly reduced over the past 20 years, beginning with the 'Button Plan' in 1987. For example, effective rates of assistance for the TCF sector have fallen from more than 150 per cent in 1984-85, to around 12 per cent in 2006-07. The sector is still, however, one of the two most heavily protected manufacturing industry groupings (together with the automotive industry) (PC 2008b).

The Commission's 2003 inquiry

When the Commission last reported on the TCF industries in 2003, it found that, while major structural change had already occurred, further adjustment was inevitable given global competitive pressures, regardless of future assistance arrangements.

It was noted that labour cost differentials placed Australian producers at a major competitive disadvantage, particularly as productivity differences with China and other developing nations were diminishing. Production volumes were low by world standards and the legacies of high protection — fragmented production, dispersed location of facilities and separation of supply chains — were a continuing handicap for the sector.

Even so, some TCF producers were found to be internationally competitive, with others having the potential to be so if impediments and weaknesses were addressed. Those firms doing best were seen to have exploited competitive strengths in supplying differentiated products based on leading edge technology, superior design and marketing attributes, high levels of productivity and a focus on customer service. Such firms increasingly looked to overseas markets to maintain and expand their businesses.

Policy considerations in the 2003 inquiry

While the Commission found that assistance to the TCF sector still imposed significant costs on consumers, taxpayers and other industries, the benefits of reducing protection, and associated industry adjustment, were smaller than in previous years when assistance to the industry was higher.

The high levels of assistance afforded the TCF sector in earlier years meant reductions offered the prospect of significant gains to the community, which typically greatly outweighed the accompanying adjustment costs. Thus, the net benefits of reducing protection to the TCF sector were clear. This was reflected in quantitative modelling undertaken at the time.

By 2003, assistance rates to the TCF sector were much lower and the Commission found that further reductions would provide comparatively small allocative gains. Indeed, the quantitative modelling undertaken for that inquiry suggested the gains would be largely offset by small adverse shifts in the terms of trade. In previous years, such terms of trade effects had been outweighed by large allocative gains. 'Exogenous' considerations, not directly encapsulated in quantitative modelling, including considerations of equity, assumed greater significance in assessing the direction of assistance policy.

'Exogenous' factors

In particular, the Commission considered that assistance reductions would be likely to stimulate further cost reductions and productivity improvements within the TCF sector:

> Assistance reductions encourage firms to become more productive and internationally competitive. Undoubtedly, adjusting to increased international competition is often hard, requiring that firms and their employees make significant changes. But the experience in many industries that have been through this process shows that the benefits can be substantial. In being forced to deal with the removal of their protective cushion, many firms have identified opportunities — previously considered unlikely or impossible — where they can compete with the best in the world. (PC 2003, p. 97)

While adjustment costs for parts of the TCF workforce were considered integral to the policy calculus, they were not seen as a sufficient reason to forgo the benefits to the community as a whole of reducing assistance further. However, it was noted that, were assistance levels reduced too quickly, production and jobs that could remain viable under a more gradual transition process could be put at risk. It would also make adjustment potentially more disruptive, and consequently involve higher costs.

Other issues raised in 2003

Participants in the Commission's 2003 TCF inquiry raised a number of issues and arguments regarding future assistance to the sector, which were carefully considered.

One was whether reductions in assistance should be made contingent on similar reductions by our trading partners. In considering these matters, the Commission noted that producers might legitimately consider it 'unfair' that they could not gain adequate access to foreign markets at a time when assistance was being reduced in Australia. That said, Australia's TCF tariffs could also be seen as unfair to domestic consumers forced to pay higher prices. Furthermore, other industries might consider it unfair that they do not receive similar, or at least offsetting, levels of assistance.

The Commission saw little potential for Australia's TCF arrangements to be used as 'bargaining coin' in trade negotiations. It was noted that Australia's market represented less than one per cent of global TCF sales, and that imports already made up one-half of the domestic market.

Several participants in the public inquiry argued that cost savings from lower TCF tariffs would increase the profit margins of distributors, retailers and shopping centres, rather than being passed on to consumers. The Commission considered this argument to be inconsistent with market realities. Over time, the competitive nature of importing, wholesaling and retailing would invariably see tariff reductions passed on to consumers. (This is considered further in chapter 5.)

A stronger case for assistance could be made if it led to additional 'spillover' benefits to other sectors of the economy. However, it was noted that the TCF sector typically had lower expenditure on research and development (R&D) than most other industries. The sector also already had access to general assistance programs designed to promote R&D.

The Commission's 2003 recommendations and the Government's response

In order to provide greater policy certainty to the TCF sector, as in the case of its earlier 2002 automotive assistance inquiry, the Commission's recommendations covered a ten year period from 2005 to 2015.

- The Commission's preferred tariff option was to maintain all TCF tariffs at the legislated 2005 levels until 2010, then reduce most of them to 5 per cent. However, tariffs on apparel and certain finished textiles, being significantly higher than those on other TCF products, would not reach 5 per cent until 2015.

- To facilitate adjustment to these tariff reductions, it was proposed that transitional budgetary support be extended for a further eight years from 2005, but with funding levels reducing over time. Such support should be delivered using a modified version of the [pre-2005] Strategic Investment Program (SIP).

As further firm closures were seen as inevitable, and in view of some characteristics of the workforce, the state of the wider labour market and the importance at that time of TCF sector activity to some regions, the Commission considered that special labour adjustment support was warranted during the transition period.

The Australian Government's response was announced in November 2003 and subsequently put into legislation. The Government accepted the Commission's preferred tariff option and endorsed its approach to post-2005 assistance. The quantum of assistance in the Government's package was in line with the Commission's recommendations, although the duration of the assistance and some types of expenditure differed. The Government endorsed the view that there should be no further review of TCF industry assistance ahead of the scheduled tariff cuts.

1.4   The Commission's approach to this study

In the present exercise, the Commission has been given the more limited task of modelling the economy-wide effects of assistance scenarios suggested by the Green Review. The stated purpose of the Commission's study is 'to inform Professor Green's examination of the industry, public debate, and the Government's deliberations in this area' (Carr 2008).

The eleven scenarios to be modelled include changes to tariff rates and budgetary assistance, as well as sensitivity analysis relating to further appreciation of the Australian dollar, the partial passing on of tariff reductions by retailers, and a proportion of TCF workers displaced by tariff cuts being unable to obtain re-employment. The list of scenarios modelled is set out in chapter 3.

To help assess the long-term economy-wide effects of the various assistance options, the Commission has used a version of the Monash Multi-Regional Forecasting (MMRF) model, with the database disaggregated into separate textiles, clothing and footwear industries.

As with the 2003 inquiry — and consistent with the recent automotive study — the Commission has examined the sensitivity of parameters or features of the model used, and has endeavoured to integrate into its analysis of the modelling the key exogenous factors that influence the economy-wide effects of assistance policies.

Referees and workshop

The Commission's modelling approach — together with some preliminary results — was reviewed by a panel of modelling experts at a technical workshop on

28 May 2008. Participants included three expert referees, in addition to representatives of the TCF Review, the Australian Treasury, and the Department of Innovation, Industry, Science and Research. A detailed account of the referees' comments, and how these have influenced the modelling, is contained in appendix B.

In undertaking this study, the Commission has also drawn on findings from its earlier reviews and modelling exercises related to the TCF sector, together with publicly available information associated with the Green Review.

2 Current assistance to the TCF sector

This chapter describes and quantifies the assistance currently provided to the TCF sector. The focus is on the assistance measures that the Commission was explicitly asked to model, namely:

- tariffs (section 2.1)
- budget-funded assistance programs provided under the TCF Post-2005 Assistance Package (section 2.2).

Although not modelled in this study, the TCF sector also receives assistance from general policies and programs (for example, general research and development concessions). These are discussed briefly in section 2.3. The estimated value of total assistance the TCF sector receives, using different measures, is provided in section 2.4.

2.1 Tariff assistance

Most-Favoured-Nation (MFN) tariff rates apply to imports of TCF products from all WTO member countries for which no preferential agreement exists. Since 1 January 2005, these tariff rates are:

- 17.5 per cent for clothing and finished textiles
- 10 per cent for cotton sheeting, fabrics, carpets and footwear
- 7.5 per cent for sleeping bags, table linen and footwear parts
- 5 per cent for other products, such as textile yarns and leather.

Under the current program of reductions, from 1 January 2010, items that have a tariff of 17.5 per cent will be reduced to 10 per cent. Tariffs for all other items will be reduced to 5 per cent (with those already at 5 per cent unchanged). From 2015, the maximum tariff rate for all TCF items will be 5 per cent (figure 2.1), bringing them into line with the general rate that has applied to most manufactured imports since 1996.

Figure 2.1 **Tariffs are scheduled to fall to 5 per cent by 2015**
TCF tariff rates, effective from 1 January 2005, 2010 and 2015
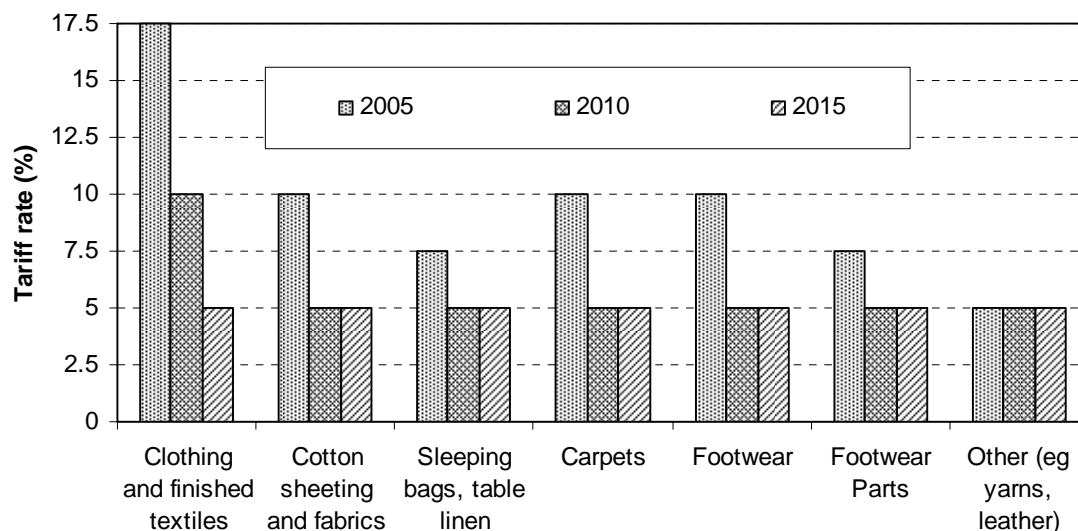
Source: TCF Review (2008).

Tariffs are lower than the MFN rate for imports from some countries with which Australia has a preferential trade agreement (PTA) — including New Zealand, Singapore, the United States and Thailand. Because tariffs applying to these countries are typically lower than the MFN rate, Australia's average *trade-weighted* tariff rate is lower than the MFN rate applying to each TCF commodity (box 2.1).

However, for the reasons discussed in chapter 5, for the purposes of the modelling, it is assumed that the MFN rate approximates the actual 'price wedge' for PTA member countries. Under this assumption, the duty-paid price for imported TCF products from PTA member countries remains (largely) unchanged, and there is little change in assistance to the industry. However, there will be a loss of tariff revenue to the government, as indicated by the lower average trade-weighted tariff.

In practice, the effect is small, as not all preferential tariff rates are zero, and imports from PTA member countries are small in value. For example, clothing imports from New Zealand, the United States and Thailand together represented 4.5 per cent of total clothing imports, by f.o.b. value, in 2005-06.

Box 2.1   Calculating trade-weighted tariffs

Trade-weighted average tariffs take into account different tariff rates applying to:

- different goods produced by an industry

- goods imported from different countries.

They are calculated as the weighted sum of each import from each country, that is:

$$\sum_{i=1}^{i}\sum_{j=1}^{j}(M_{ij}\times\frac{t_{ij}}{100})\bigg/\sum_{i=1}^{i}\sum_{j=1}^{j}M_{ij}=t_w$$

where M_{ij} represents the f.o.b. value of imports M of product j from partner country i, and t_{ij} is the tariff rate applied to those imports. Thus, for example, a low tariff rate receives a high weight if the value of its imports are high.

Because some products are imported from countries with tariffs below the MFN rate (including from those countries with PTAs), trade-weighted tariffs for each TCF commodity are lower than the MFN rates.

For the entire TCF sector, the trade-weighted average tariff was 11.1 per cent in 2005-06.

Trade-weighted, MFN and selected preferential tariff rates, 2005-06

Country		Textiles	Clothing	Footwear
Number of tariff lines		***721***	***259***	***110***
Canada	Min (%)	0	0	0
	Max (%)	17.5	17.5	10.0
MFN	Min (%)	0	0	0
	Max (%)	17.5	17.5	10.0
New Zealand, Singapore, Papua New Guinea	Min (%)	0	0	0
	Max (%)	0	0	0
Thailand	Min (%)	0	0	0
	Max (%)	12.5	12.5	9.0
United States	Min (%)	0	0	0
	Max (%)	15.5	15.5	9.0
Trade-weighted average	**(%)**	**9.0**	**14.9**	**7.6**

2.2   Budgetary assistance

The TCF Post-2005 Assistance Package provides funding for the following six programs, worth $747 million over 10 years.

1. Strategic Investment Program (SIP) Scheme ($575 million).

2. Small Business Program (SBP) ($25 million).

3. Structural Adjustment Program (SAP) ($50 million).

4. Product Diversification Scheme (PDS) ($50 million).

5. Expanded Overseas Assembly Provision (EOAP) Scheme ($27 million).

6. Supply chain Opportunities Program (SOP) ($20 million).

Each program is described briefly below.

Strategic Investment Program (SIP) Scheme

The SIP runs for 10 years, from 2005-06 to 2014-15, with total funding over this period of $575 million. Annual payments are capped at $97.5 million until 2009-10, reducing to $17.5 million from 2010-11 to 2014-15. Payments are made annually, in arrears, and are subject to income tax.

To be eligible for the Scheme, a firm must show that it undertakes eligible manufacturing or design activities in Australia. A minimum of $200 000 must be spent, which can be accumulated over the duration of the program. Two types of grants are available under the SIP:

- Type 1 grants: for *capital investment* expenditure, including new TCF plant and buildings; brand support; and, for clothing and finished textiles entities, investment in non-production related information technology.

- Type 2 grants: for *research and development* expenditure; and product development activities consisting of innovative product design, innovative process improvement, market research and obtaining industrial property rights.

Type 1 grants are capped at 40 per cent of eligible expenditure undertaken by an entity, and type 2 grants can fund up to 80 per cent of eligible expenditure. For example, if a firm incurred $200 000 of type 1 expenditure, the grant entitlement is capped at $80 000.

Actual grants paid to firms are usually less than the capped amounts, for two reasons:

- eligible expenditure is capped at 5 per cent of a firm's annual sales. This is because, at the time the SIP was developed, WTO rules specified that subsidies greater than 5 per cent caused 'serious prejudice' to competing activities in other countries (PC 2003)

- a 'modulation factor' is used, to ensure that total grants provided to the sector do not exceed their budgetary allocation (currently $97.5 million per year). A

modulation factor of 0.7367 was applied for the 2005-06 program year, meaning that a firm entitled to $100 000 in funding would be paid $73 670.

In the first five years of the program, all TCF entities are eligible to receive the grant. From 2010-11, only textiles and clothing businesses will be able to access the SIP. The extension of SIP funding was restricted to these industries because they face the largest tariff adjustment in future years. The distribution of grants paid for the 2005-06 program year is presented in table 2.1.

Table 2.1   **SIP grants paid to TCF industries in 2005-06**

Industry	Value ($ million)	Share (%)
Textiles	**52.9**	**55**
Textiles	32.7	(34)
Technical textiles	2.9	(3)
Carpet	17.3	(18)
Clothing	**33.7**	**35**
Footwear	**9.6**	**10**
Footwear	4.8	(5)
Leather	4.8	(5)
TCF	**96.1**	**100**

Source: TCF Review (2008).

Small Business Program

The Small Business Program (SBP) makes available $25 million in funding over the ten-year period from 2006-07 to 2015-16. This program is designed to assist smaller businesses that do not qualify for assistance under the SIP Scheme. To be eligible, an entity must not have received a SIP grant and have fewer than 20 employees.

The SBP is a competitive grants program, with an annual selection round to determine successful applicants. To date, three rounds have occurred, with 203 projects receiving funding of $7.5 million in total. Up to $50 000 is provided for a successful project, with applicants also required to make their own cash contribution to the project. SBP grants have mainly been allocated to small businesses in New South Wales and Victoria (49 and 32 per cent of total funds, respectively).

Unlike the SIP, which provides funding for expenditure on capital or R&D, funding is to enhance the 'business enterprise culture' of TCF small businesses and is provided for a wide variety of projects. According to the SBP customer information guide (AusIndustry 2007), projects 'involving mentoring, enterprise management

systems, marketing and branding strategies, business process re-engineering and e-commerce initiatives have been funded in previous rounds'.

Structural Adjustment Program

The Structural Adjustment Program (SAP) provides $50 million over 10 years and aims to support industry consolidation and labour market adjustment. It consists of three parts:

- Part 1 increases awareness of existing programs and services available to retrenched TCF employees to help them secure alternative employment (such as the Job Network Program). To date, a total of $2.4 million has been provided. As at 18 January 2008, 822 ex-TCF workers had registered for the program and 607 (about three-quarters) had been successful in finding employment.

- Part 2 is a Restructuring Initiative Grants Scheme provided to firms. Grants, which are subject to income tax, are for expenses on ancillary activities and capital expenditure on second-hand TCF plant or equipment. Four grants totalling $6.1 million have been paid as at 18 February 2008. A restructuring initiative must involve (by way of merger or takeover) the reconfiguration of two or more TCF entities. At least one of those entities must not be financially viable currently (or unlikely to be viable in the foreseeable future). After the reconfiguration, at least one entity must be more financially viable than it would have been if the restructure had not taken place. Only this entity can carry on TCF activities after the restructure.

- Part 3 provides support in regionally sensitive areas through the Regional Partnerships Program. No funding has yet been provided.

Product Diversification Scheme

Under the Product Diversification Scheme (PDS), $50 million in assistance is provided from 2006-07 to 2015-16. Clothing and finished textile manufacturers can receive duty credits which can be used to offset duty payable on imported finished clothing or textile articles. Only entities eligible for the SIP can receive duty credits. Entities can make a claim for credits at the time of applying for the SIP. Duty credits are not tradeable and expire at the end of the financial year in which they are provided if the business does not use them.

Expanded Overseas Assembly Provision Scheme

The Expanded Overseas Assembly Provision (EOAP) Scheme provides assistance through duty concessions to firms which assemble garments and footwear overseas

from predominantly Australian fabric and/or leather and then re-import them into Australia. The Scheme is scheduled to finish on 30 June 2010, with an estimated value in duty forgone of $27 million. Duty forgone in 2006-07 was $3.2 million.

Supply chain Opportunities Program

The Supply chain Opportunities Program (SOP) is a $20 million competitive grants program that supports major capital investments to strengthen the local supply chain for the clothing and finished textiles sector. It will commence on 1 July 2010 and finish in 2015.

2.3 Other programs and policies

In addition to the TCF Post-2005 Assistance Package, there is a range of generally-available assistance measures that directly benefit the TCF sector. Some of them afford substantial levels of additional assistance (box 2.2).

Other programs may indirectly provide assistance to the TCF sector. The Corporate Wear Scheme provides employers and employees with tax exemptions or concessions when a non-compulsory uniform is registered. These benefits are likely to encourage greater expenditure on domestically-manufactured clothing by firms and workers than if the Scheme did not exist. The Scheme does not exclude imported clothing, so it is difficult to quantify the benefit to the domestic industry.

Administering the various budget-funded programs involves a further burden. The Commission has previously estimated that $1.6 million in administration costs had been spent on the SIP between 2000 and 2003 (PC 2003).

Some industry-specific and more general policy measures may interact or overlap with each other:

- As SIP funding is reduced in future years, firms may increase their use of general R&D concessions. (Although the extent to which this can occur will be limited by the different provisions for R&D expenditure in the SIP and for general R&D concessions.)

- The Product Diversification Scheme provides credits to offset duty on imported TCF products. Similarly, TRADEX provides duty credits to firms, albeit for goods directly intended for export.

| Box 2.2 | **TCF assistance provided by other measures** |

Although not specific to the TCF sector, there are a number of general policies that provide it with assistance. In 2006-07, the value of these measures was estimated at around $29 million. The largest measures, by value, are described below.

R&D grants and tax concessions

R&D grants and tax concessions for the TCF sector totalled $19.8 million in 2006-07:

- $18.5 million was provided to the CSIRO Textile & Fibre Technology Division for research that is of benefit to the TCF industry (for example, research into wool, cotton, advanced fibrous materials, technical textiles and nonwovens).

- $0.9 million for the R&D tax offset (which is available to companies with an annual turnover of less than $5 million); $0.4 million for other R&D tax concessions.

TRADEX

TRADEX provides upfront exemptions from customs duty and GST on imported goods that are intended for direct export or are used in the manufacture of exported goods. In 2006-07, $7.2 million of assistance was provided to the TCF sector.

Other measures

There a number of smaller programs and assistance measures, by value, that benefit the TCF sector (and other industries), including the:

- Export Market Development Grants Scheme, which provides taxable grants to reimburse up to 50 per cent of designated export promotion expenses (focusing on small and medium enterprises).

- Tasmanian Freight Equalisation Scheme, which reduces freight costs for shippers of eligible goods, transported by sea between Tasmania and mainland Australia.

In total, the TCF sector directly received net assistance of around $1.8 million from other measures in 2006-07.

Sources: Appendix G; PC (2008b).

2.4 Adding up TCF assistance

The value of assistance the TCF sector receives can be measured in various ways (box 2.3). In sum, the TCF sector received assistance equivalent to almost $700 million in gross terms, and $550 million in net terms, in 2006-07 (table 2.2). Tariffs accounted for three-quarters of net assistance. The effective rate of assistance the sector received in 2006-07 was 12 per cent — nearly three times the manufacturing average.

Box 2.3   Measuring assistance to the TCF sector

There are a number of ways to measure the value of assistance provided to the TCF sector, which highlight different aspects of assistance and its effect on the economy.

Gross assistance

Gross assistance is a measure of the total value of assistance to the industry. It is the estimated equivalent value of assistance to an industry's outputs and value added.

Net assistance

A preferred measure of total assistance is the value of *net* assistance to an industry's value added. It equals the estimated value of assistance on outputs and value added (that is, gross assistance), less the 'tax equivalent on materials' used in production.

For example, a firm may use imported TCF products as inputs into final production. Tariffs enable the firm to increase the price at which it sells its output. However, tariffs also impose a penalty on the producer, because they 'tax' the price of inputs into production. This tax equivalent on materials is deducted to obtain net assistance.

Effective rate of assistance

Effective rates of assistance are calculated as the value of net assistance divided by the industry's unassisted value added. They provide an indication of the extent to which assistance allows an industry to attract and hold economic resources.

Sources: Appendix G; PC (2008b).

Table 2.2   **Value of assistance for the TCF sector, 2006-07**

	Textiles	Clothing	Footwear	TCF
Subsidy equivalents	$m	$m	$m	$m
Tariff output assistance	235.9	270.0	39.1	545.0
Post-2005 Assistance Package	59.9	39.0	10.7	109.6
Other budgetary assistance	13.2	11.8	3.9	28.9
Total gross assistance	**308.9**	**320.9**	**53.7**	**683.5**
Tariff input assistance	-42.7	-72.9	-18.5	-134.1
Total net assistance [a]	**264.7**	**246.8**	**34.8**	**546.2**
Effective rate of assistance (ERA)	%	%	%	%
Tariffs	8.3	15.9	2.2	9.1
Post-2005 Assistance Package	2.6	3.1	1.1	2.4
Other budgetary assistance	0.6	1.0	0.4	0.6
Total ERA	**11.4**	**19.9**	**3.7**	**12.1**

a The total net assistance estimates have been adjusted to reflect that the TCF Expanded Overseas Assembly Provision Scheme is included in the estimates of both tariff and budgetary assistance.

Source: Appendix G.

3 The modelling framework

Modelling is a tool that can assist policy analysts assess various economy-wide ramifications of policy changes. By formally laying out a framework for analysis in a systematic and transparent way, insights can be gained into many of the direct and indirect impacts of the policy under consideration. That said, modelling provides an abstraction of the real world and its complex interactions, and cannot be expected to replicate reality except in simple exercises. It is therefore best used in conjunction with other analysis and, ultimately, judgement will still be required by the policy maker.

In this chapter, the choice of the particular model and how it is applied are outlined. Section 3.1 explains the choice of model. Section 3.2 then describes the structure of the model, its underlying assumptions, and modifications to it and its database for this study. The set of scenarios modelled (simulations) are set out in section 3.3, including how they have been implemented in the model. The chapter ends with an outline of key indicators used to report on the economy-wide, jurisdictional, and sectoral impacts of the scenarios modelled. (The simulation results for policy scenarios are reported in chapter 4.)

3.1 Why use the MMRF model?

A good economic model should focus on the variables that dominate the impacts arising from the matter under study, thereby capturing to a large extent the key influences on the outcome. This study is focused on estimating the economy-wide implications of changing assistance policies that affect the textiles, clothing and footwear industries. Therefore, an appropriate model for the task is one that takes into account:

- the direct impacts of future assistance scenarios on the textiles, clothing and footwear industries
- the linkages between the TCF sector and the other sectors of the economy
- the nature of Australia's international trade (imports and exports)
- differences in the economic structure of jurisdictions
- the economy-wide impacts of changes in assistance to the TCF sector.

Two important aspects that influence how well a model achieves the objectives of the analysis are:

- the assumptions about the economic behaviour underlying the model. These include assumptions about the behaviour of TCF and other sectors, as well as investors, households, the government sector and the foreign sector. These are reflected in the equations and parameter values that collectively determine the manner in which the economy adjusts to the specified changes in assistance. Included in this is the model 'closure', which describes those variables that are endogenous and allowed to adjust in response to the policy scenario being evaluated, and those variables that are assumed to be predetermined or fixed.

- the database, which is calibrated to industry data, so that it realistically represents the key input–output linkages and other economic relationships embedded in the model.

For this study the Commission chose to use the comparative static version of the MMRF model, a multi-regional applied computable general equilibrium (CGE) model developed by the Centre of Policy Studies at Monash University. The MMRF model, like the MONASH model, is well-documented with a proven track record. The Commission previously used the MMRF model in its study for COAG of the *Potential Benefits of the National Reform Agenda* (PC 2006) and in the Commission's recent report, *Modelling Economy-wide Effects of Future Automotive Assistance* (PC 2008a).

Pros and cons of a comparative static MMRF model

Using the comparative-static version of MMRF means that its simulation results relate to the economy as depicted in its 2005-06 database. As the model does not give projected impacts on the economy over time (year by year), no adjustment paths can be inferred. The economy-wide impacts must be interpreted as the difference between two situations: 'with' and 'without' the policy change.

The economy-wide impacts are the simulated *projections* of the effect of the specific scenario modelled. They are not *forecasts* of what the economy will look like at a future point in time.

The obvious disadvantage of a comparative static approach is that it cannot be used to simulate the timing of policy changes and how their economy-wide impacts unfold over time. A comparative static model was, however, preferred for this study for several reasons.

- First, the economy-wide impacts are likely to be relatively small in the long run. In these circumstances, focussing on evaluating the long-term implications of

changing assistance policy, after the economy has fully adapted to the changes, is likely to be more useful to policy makers. Changes from year to year would be unlikely to provide extra insights material to the policy assessment.

- Second, in light of the time available to undertake the modelling, the choice of a comparative static version of MMRF enabled the Commission to avoid the issues associated with calibrating and projecting a base case for the economy as a whole, and for the TCF sector in particular.

- Third, the complexity of setting up the policy scenarios in the model, as well as the time taken to run the model and extract the results, is considerably less for a comparative static model. This enabled the Commission to concentrate on understanding the different impacts at the jurisdictional and industry level of the large number of scenarios that are required to be simulated for this study.

At the technical workshop, modelling referees noted the pros and cons of the comparative static and dynamic models. It was agreed that a comparative static model was appropriate for this study.

3.2 Key features of the MMRF model

Unlike other economic models, the MMRF model is designed to capture the economy-wide impacts of policy changes by representing the Australian economy as a combination of the economies (and industries) of all jurisdictions. This is important for this study because the TCF sector is more heavily concentrated in some jurisdictions than others (table 3.1). The sector is largest in Victoria but also has a significant presence in New South Wales (by size) and Tasmania (by concentration). This model allows for differences in the industrial structure of jurisdictional economies, enhancing the analysis. (It does not, however, comprise independent economies at the regional level.)

In the MMRF model, as in all CGE models, there are three main aspects that determine the economy-wide impacts of the policy scenarios modelled:

- the behavioural assumptions reflected in the equation structure, parameter settings, and closure

- its database

- how the exogenous policy scenarios are incorporated in the model.

Table 3.1   **The TCF sector is concentrated in the eastern states**

TCF value added and employment, by State, 2005-06

State	Value added[a]	Value added as a share of GSP	Employment	Employment as a share of state total
	$m	Per cent	Persons	Per cent
New South Wales	794	0.31	16 780	0.51
Victoria	1127	0.67	22 580	0.91
Queensland	329	0.19	8250	0.41
South Australia	137	0.24	3530	0.47
Western Australia	219	0.18	3430	0.32
Tasmania	61	0.41	1380	0.62

a Value added data were not available for the Northern Territory and the Australian Capital Territory. There were fewer than 200 people employed in the TCF sector in the Northern Territory and the Australian Capital Territory.

Sources: ABS 2007, *Australian National Accounts: State Accounts*, Cat. no. 5220.0; ABS 2007, *Manufacturing Industry, Australia*, 2005-06, Cat. no. 8221.0; ABS 2008, *Labour Force, Australia*, Cat. no. 6291.055.003.

Structure and parameters

The MMRF model includes a representation of the behaviour of:

- 60 domestic industries that supply commodities, services and investment, classified by eight domestic jurisdictions (six states and two territories)

- domestic consumers and suppliers of labour and capital, provided by eight jurisdictional-specific household sectors

- labour supply classified by eight occupations

- aggregate foreign demand for Australia's exports, aggregate foreign supplies of imports, and access to foreign capital

- financial accounts of the Australian Government and eight State and Territory Governments.

The assumptions underlying the behaviour of these participants in the MMRF model include:

- industries are subject to constant returns to scale technology and respond to changes in input and output prices by changing their output and their use of labour, capital, land and intermediate inputs

- households vary their consumption of commodities in response to changes in their disposable (after-tax) income from labour and capital, and the relative prices of goods consumed

- labour responds to jurisdictional employment opportunities as signalled by changes in relative wages (that is, labour moves to jurisdictions in response to opportunities to earn higher wages)

- domestic and foreign investors respond to changes in industry-specific opportunities to earn returns on investment

- the price received for Australian exports responds to changes in the Australian supply to the world market

- the domestic demand for imports responds to changes in the relative price of imported and domestically-produced commodities.

These assumptions are widely applied in economy-wide CGE models and generally accepted as reasonable representations of observed behaviour in an economy at the industry level. (For example, most are present in Econtech's MM 600+ model (EconTech 2003)). The model's equations and parameters, outlined briefly below, reflect these assumptions.

Equations

The equations in the MMRF model specify the determinants of demand and supply (documented in Adams et al. 2002). Three additional sets of equations were incorporated in the model for this study.

1. A set of equations was required to handle the inter-jurisdictional mobility of labour by occupation (as in the version of MMRF used in the Automotive Assistance study (PC 2008a) and the National Reform Agenda study (PC 2006)) and the 'single national labour market' by occupation closure.

2. Equations were incorporated to model the requested sensitivity scenarios of less than full pass through by retailers of tariff reductions (discussed in section 3.3).

3. Variables were added so that the trade diversion effects under preferential trade agreements could be incorporated (discussed in section 3.3).

Parameter settings

Numerous parameters, mostly elasticities of substitution and price elasticities of demand — combined with the values in the database — determine the degree to which changes in particular variables, such as prices, lead to changes in quantities demanded and supplied.

A number of these parameters are particularly important.

- Export price elasticities of demand, which determine the responsiveness of the prices received for Australia's exports to changes in Australia's supply of these commodities. These have been set to 10 (and at 5 in a sensitivity analysis, see appendix E) across all commodities (box 3.1).

Box 3.1   Export price elasticities and terms of trade effects

Export price elasticities of demand indicate the responsiveness of the price received for exports to a change in the quantity supplied. These elasticities can have an important influence on overall results.

A large elasticity value implies that Australian producers are 'price takers' with increases in the level of Australia's exports having little effect on the prices received (the world price). Alternatively, small elasticity values imply that an increase in Australia's exports would necessitate a reduction in the price received by exporters. When it is assumed that there is a very high price elasticity of supply for imports, in combination with a low price elasticity of demand for exports, there is inevitably a decline in the terms of trade. That is, export prices fall as the volume of exports rise, but import prices remain unchanged along with the volume of imports.

Economic models do not account for some of the factors that might limit the expansion of an economy. Price elasticities of demand for exports are one way of reducing the scope for a model of the economy, based on constant returns to scale, to overshoot (through exports), in response to an improvement in its international competiveness (for example, lower costs of production arising from a policy change such as lower tariffs). This is the so-called 'flip-flop' problem described by Dixon et al. (1997).

Consequently, the almost small economy assumption (Tyers 2004) is often applied in CGE models of the Australian economy (such as MONASH and MMRF), whereby the world prices of imports are assumed to be fixed, and world prices of exports are assumed to be somewhat sensitive to the volume of Australian exports.

There is a range of views about the appropriate export elasticity value. CoPS has traditionally used 5 in the MMRF model, which was informed by the results of econometric studies undertaken in the 1970s during the IMPACT Project (Parmenter 1982), as well as experience with the ORANI and MONASH models.

The Commission has previously argued that an elasticity value of 5 is too low (PC 2000, 2002, 2006) for two reasons. First, the basis of the original econometric estimates differs from the definition of the parameters used in MMRF. Second, although low values might be appropriate for short-run, year-to-year modelling purposes, they are likely to overstate the extent to which Australian commodities remain differentiated from those of foreign competitors in the longer term.

The Commission used export price elasticities as high as 20 for some commodities in the National Reform Agenda modelling (PC 2006). In a similar model used by Econtech to model the TCF sector in 2003, an elasticity of 12 was used.

- Elasticities of substitution between domestically-produced and imported commodities, which determine the sensitivity of imports to changes in the duty-paid prices of imports. These vary between 0 and 10 across commodities, and are set in the range of 1.95 to 5.0 for the TCF sector (appendix H).

- Elasticities of substitution between labour and capital, which determine the degree to which these factors can be substituted for each other in production in response to relative changes in wages and returns to capital. These are set to 0.5.

'Closure' of the model

The model closure describes the variables that are determined within the model, as well as those variables that are fixed and determined outside the model. It is this combination of variables that allows a specific scenario to be evaluated, by defining the economic environment in which the policy changes are imposed.

The closure settings adopted for modelling the policy simulations are broadly consistent with those applied in the Commission's recent Automotive Assistance study (PC 2008a), as well as the report on the National Reform Agenda (PC 2006) and earlier studies of industry assistance policies (for example, IC 1997 and PC 2002 and 2003).

The settings for labour and capital reflect what is often referred to as a 'long-run closure'. A consequence of this closure is that the relative size of the jurisdictional economies is likely to change in response to changes in assistance, as resources are reallocated from the TCF sector to other sectors, and from TCF-intensive jurisdictions to other jurisdictions. Further, if the economy expands, the capital stock increases the capital intensity of the economy, because the national workforce is taken as fixed.

Economy-wide aggregates

Labour supply by occupation is fixed nationally (being determined at a level independent of the policies under investigation), so all adjustments in the national labour market translate into changes in real wages for each occupation.

The after-tax rate of return on capital is fixed nationally and the capital stock adjusts to keep the national rate of return constant. The capital stock of the economy is funded through Australian savings and foreign inflows of capital.

Private savings and consumption by households move in line with disposable (after-tax) income.

The trade balance (value of exports less imports) is endogenous and adjusts to keep additional investment fully funded through inflows of foreign capital.

The level of real government current expenditure moves in proportion with the level of real aggregate private consumption expenditure. The Australian Government operating surplus (taxation revenue less expenditure) is a fixed proportion of GDP. This is consistent with the assumption that budgetary policy is independent of TCF industry policy. To achieve this outcome, a tax on factor incomes (labour and capital) adjusts to maintain this ratio.

Mobility of labour and capital

Labour is mobile across jurisdictions by each occupation, such that changes in occupational wages equate across jurisdictions. In a similar way, capital is reallocated across jurisdictions, so that the rate of return on capital at the national level is maintained.

Industry production and structure

Policy changes are assumed not to alter the technology applied by industries to produce goods and services, except where it is an explicit assumption as part of a policy scenario. However, industries change the capital–labour ratio of their production processes in response to changes in relative prices of labour and capital. Industries can substitute between occupations in response to changes in relative occupational wage rates.

Capital and labour are reallocated across industries, in response to changes in their respective output levels (size of the industrial sector). The ratio of investment to the capital stock of each industry in each jurisdiction is fixed.

Updating and modifying the database

The current economic and policy environment provides a starting point from which future policy options can be assessed. Thus, having laid out the structure of the model, the next step is to set up the database to reflect the latest available information. The database is similar to that used for the National Reform Agenda study (PC 2006) and the Automotive Assistance study (PC 2008a). Relative to the National Reform Agenda study, this database was modified in three ways:

- the base year was updated from 2001-02 to 2005-06

- the TCF sector was disaggregated into textiles, clothing and footwear/leather industries

- the data for the TCF sector, relating to costs, imports and tariff revenue were modified to be consistent with ABS data.

Updating the database to 2005-06

Given the substantial changes that have occurred in the Australian economy in recent years, it was important for the model's database to be as up-to-date as possible. The database was updated to 2005-06 by CoPS, using the latest-available ABS data. Appendix D provides an outline of the process used.

Aggregation of the TCF sector

The TCF manufacturing sector covers a diverse range of products and incorporates all stages of production from the processing of raw materials to the supply of finished products (box 1.1).

Under the TCF Post-2005 Strategic Investment Program Scheme 2005 (SIP), TCF sector eligibility for assistance was based on Division C Subdivision 22 of the Australian and New Zealand Standard Industrial Classification (ANZSIC) 1993. This includes six categories defined at the three-digit level (figure 3.1). For this study, these six industries were aggregated into three higher level industries (in contrast to a single sector used in the National Reform Agenda database).

The Commission chose this level of aggregation because of the trade-off between the quality and usefulness of more disaggregated data and because of the limited time available. Aggregated data are of higher quality but may limit the insights gained from the model. For example, using aggregated industry data may mute the different directional effects of a tariff change on resource allocation within that sector, so that the effects are understated. Alternatively, more disaggregated industry data provide greater detail, but reduce reliability because of the numerous assumptions often required to disaggregate ABS data into more narrowly defined industries. In light of discussion at the technical workshop, priority was placed on having an up-to-date, and validated database, for the TCF sector.

Figure 3.1   **Definition of the TCF sector in the MMRF database**
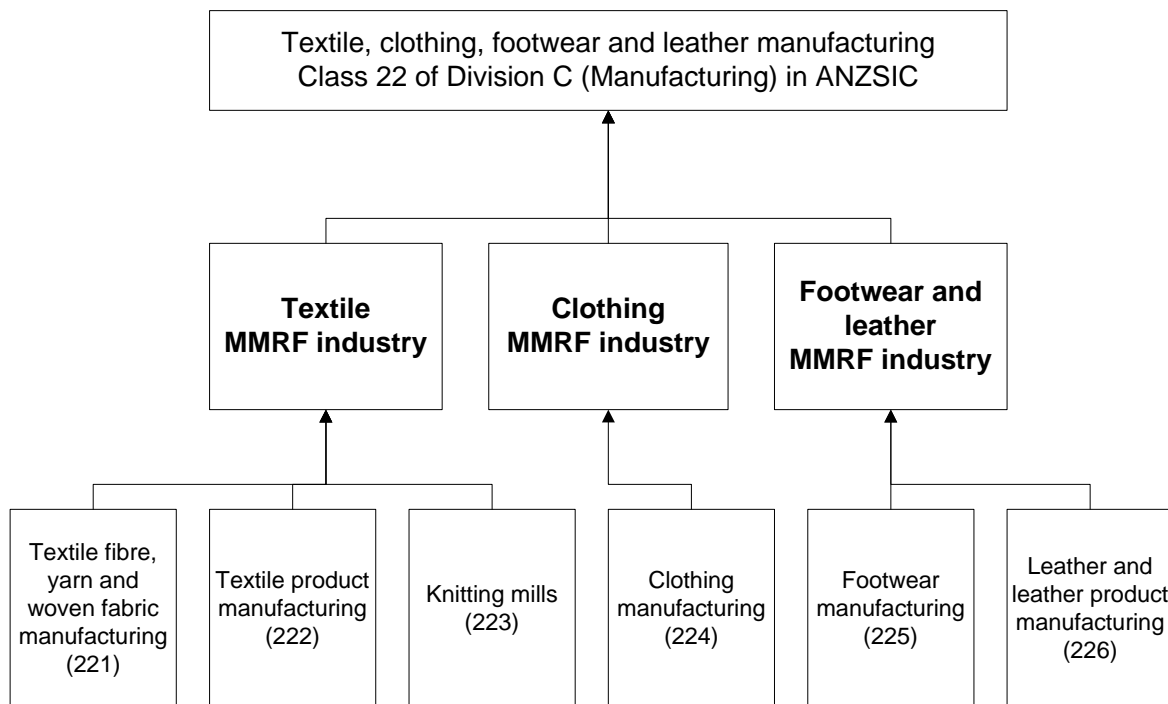
Source: ABS 1993, *Australian and New Zealand Standard Industrial Classification (ANZSIC),* Cat. no. 1292.0.

Modifying the cost structure of the TCF sector and the value of imported TCF commodities

The cost structure of the TCF sector in the database was compared with ABS data for the TCF sector in 2005-06. The total value added for the TCF sector was consistent with the industry data. However, the distribution of costs between capital and labour, and across the textiles, clothing and footwear industries, varied between the database and the industry data. The cost of intermediate goods in the database also varied significantly from that reported by the ABS.

Following discussion of the effect of these data discrepancies at the Commission's technical workshop, the cost structure of the TCF sector in the MMRF database was modified to make it consistent with the ABS data for 2005-06, as set out in table 3.2.

Table 3.2   **TCF sector's cost structures**

2005-06, $ million

	Original MMRF	Modified MMRF	ABS data
Textiles			
Intermediate goods	4110	3047	3059
Labour	922	962	962
Capital	328	340	340
Value added	1249	1302	1302
Clothing			
Intermediate goods	2178	2683	2669
Labour	574	669	669
Capital	203	295	295
Value added	777	964	964
Footwear			
Intermediate goods	1966	867	869
Labour	277	225	225
Capital	161	90	90
Value added	438	315	315
TCF			
Intermediate goods	8254	6598	6597
Labour	1772	1856	1856
Capital	692	725	725
Value added	2464	2581	2581

Sources: MMRF database; PC estimates based on ABS 2007, *Manufacturing Industry, 2005-06*, Cat. no. 8221.0.

The value of TCF imports and tariff revenue in the database were compared with equivalent data sourced from the World Integrated Trade Solutions database (WITS) and the ABS. The ABS and WITS data were comparable for both measures. The MMRF database differed from the ABS data by less than 4 per cent for the value of tariff revenue. However, the value of imported commodities differed by 18 per cent. It was concluded at the Commission's technical workshop that these differences could effect the results, and that the MMRF database should therefore be modified. As a result, the values for imported TCF commodities in the MMRF database were increased to equate with the values obtained from ABS data for 2005-06, as indicated in table 3.3.

Table 3.3 **TCF sector's import values and tariff revenues**
2005-06, $ million

	Original MMRF	Modified MMRF	ABS data
Textiles			
Import value	2897	3302	3302
Tariff revenue	236	279	279
Clothing			
Import value	3192	3702	3702
Tariff revenue	539	521	521
Footwear			
Import value	1487	1929	1929
Tariff revenue	128	138	138
TCF			
Import value	7576	8933	8933
Tariff revenue	903	939	938

Sources: MMRF database; Commission estimates based on ABS (unpublished).

3.3 Implementing the scenarios

As outlined in chapter 1, the Commission has been asked to model a number of tariff and budgetary assistance options, as well as to undertake sensitivity analyses. The number of possible combinations of these scenarios is large. But it is not necessary to model all potential combinations to highlight the impacts of different policies or assumptions. The results of the simulations are approximately linear. It is therefore possible to gain insights into a combination that is not simulated by examining differences between included simulations.

With this in mind, the Commission modelled the simulations set out in table 3.4. The simulations are grouped into three categories, the reference case assistance package[1] (R), the options for assistance (category O), and the sensitivity scenarios (category S).

One of the options specified in the modelling request was to maintain tariffs and budgetary assistance at current levels. It is not possible to *model* this as a scenario because current levels of budgetary and tariff assistance are already embedded in the database (see appendix D for a description of how this was done). The results for all modelled scenarios are relative to this 'base case'. For example, the results for the reference case are reported as either a change in absolute (dollar) terms or percentage changes in the relevant variable, relative to the economy and assistance levels in the base year, 2005-06.

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[1] This is referred to as the base case in the options identified by the Green Review.

Table 3.4 **Simulations for modelling TCF assistance options and sensitivity analyses**

Label	Simulation
R	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are discontinued in 2015.
O1	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are maintained at 2005 levels.
O2	Tariffs are reduced to 10 per cent for clothing and finished textiles and 7 per cent for the remaining tariff lines (excluding the 'other' category which is maintained at 5 per cent). Budgetary assistance programs are maintained at 2005 levels.
O3	Tariffs are maintained at 2005 levels and budgetary assistance programs are discontinued in 2010.
S1a	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are maintained at 2005 levels. There is a 1.5 per cent improvement in labour and capital productivity.
S1b	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are maintained at 2005 levels. There is a 0.5 per cent improvement in labour and capital productivity.
S2a	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are discontinued in 2015. 10 per cent of the reduction in the imported price of TCF commodities is passed on by retailers to final consumption by households.
S2b	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are discontinued in 2015. 50 per cent of the reduction in the imported price of TCF commodities is passed on by retailers to final consumption by households.
S3a	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are discontinued in 2015. 30 per cent of displaced TCF workers are permanently unemployed.
S3b	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are discontinued in 2015. 10 per cent of displaced TCF workers are permanently unemployed.
S4	Tariffs fall to scheduled 2015 levels and budgetary assistance programs are discontinued in 2015. There is a 10 per cent increase in the price of mining commodities exported.

Implementing the tariff options

The simulated tariff scenarios are set out in table 3.4. The initial tariff rate was calculated based on the trade-weighted tariff rate effective in 2005-06 (10.5 per cent for the TCF sector). This was calculated using fob trade data (the value at the border of the exporting country), and scaling it to account for the cost of insurance and freight, in order to be consistent with the model database (appendix D). The change in the tariff rate was then calculated for each tariff scenario.

As discussed in chapter 5, it is likely that TCF exports from countries with which Australia currently has a preferential agreement are not priced much below exports from countries to which the Most-Favoured-Nation (MFN) rate applies. In these

circumstances, reducing MFN rates also lowers the duty-paid price of exports from preferential trade agreement (PTA) member countries, even though the preferential rates may not fall. This effect was modelled by 'marking up' prices paid for preferential imports (box 3.2). The impact is small, however, representing less than 1 per cent of the import price (table 3.5).

Box 3.2   Tariffs and import prices for PTA and MFN countries

In the modelling, it was assumed that for a given TCF commodity, the duty-paid price of all imports is the same, regardless of their source. That is, it is assumed that exporters in countries that face preferential tariff rates set their supply price to compete with exporters in countries subject to MFN rates. This mark-up is likely to reflect part profit and part compensation for higher costs. (Either way, tariff revenue accruing to Australia will be forfeited.)

This can be expressed as:

$$P_{PTA}(1 + \text{Mark-up})(1 + t_{PTA}) = P_{MFN}(1 + t_{MFN})$$

Where P_{PTA} and t_{PTA} are the price and tariff rate for an exporting country subject to PTA tariff rates and P_{MFN} and t_{MFN} are the price and tariff rate for an exporting country subject to MFN tariff rates.

If the MFN tariff rate falls, the gap between the pre-tariff price received by the foreign PTA exporter and MFN exporter narrows. This forces PTA exporters to reduce their 'rents' or to leave the market. The net effect for Australian purchasers is that $P_{PTA}(1 + \text{Mark-up})$ falls.

Therefore, as the MFN rate is reduced, in order to measure fully the economy-wide impacts on Australia, it is also appropriate to reduce the mark-up. It will reduce by the change in the difference between the (trade-weighted) MFN and PTA tariff rates.

The reduction in tariffs also has revenue implications for the Australian Government. Tariff revenue from non-PTA member countries decreases as the MFN rates are reduced. Tariff revenue from PTA member countries may not be affected unless the preferential rates fall as well. This was accounted for in the modelling by adjusting tariff revenue using the trade-weighted (fob) tariff rates accounting for PTAs.

Table 3.5   **Modelling the reductions in tariffs[a]**

	Textiles	Clothing	Footwear	TCF
Trade-weighted using PTA and MFN tariff rates (per cent)				
2005	8.5	14.1	7.2	10.5
2010 (existing policy)	5.1	8.1	4.5	6.2
2015 (existing policy)	5.7	8.1	5.5	6.7
2010 (alternative policy)	3.7	4.1	4.5	4.0
Mark-up (per cent)				
2005	0.8	0.8	0.3	0.7
2010 (existing policy)	0.4	0.4	0.2	0.4
2015 (existing policy)	0.6	0.4	0.2	0.4
2010 (alternative policy)	0.4	0.2	0.2	0.3

a These values have been scaled to include insurance and freight costs to be consistent with the database.

Source: Commission estimates.

Implementing the budgetary assistance options

The Commission was asked to model the budgetary programs under the TCF Post-2005 Assistance Package, outlined in chapter 2. These programs are available to support a broad range of projects which may affect both production and investment decisions, and therefore have characteristics in common with both a production and a capital subsidy.

A production subsidy will tend to increase production but not affect the cost structure of firms in the industry. Under this approach, the subsidy has the effect of driving a wedge between production costs and the value of sales of TCF producers, so that the price charged by producers is lower than the unit cost of manufacture.

In contrast, a capital subsidy creates a wedge between the cost of capital (for example, plant and equipment) and the revenue received for the use of the capital. This effectively reduces the price charged for the services of capital, relative to wages. In the MMRF model, this not only reduces the cost of production, but also causes substitution away from labour towards the use of capital. This substitution is likely to be pronounced because the subsidy to the TCF sector is large relative to the size of the capital stock (table 3.2) and, hence, capital costs.

By value, the largest budgetary assistance program to be modelled is the SIP, representing over three-quarters of the total budgetary assistance package. As discussed in box 3.3, available SIP funds are provided for a range of projects.

Because of its broad coverage and the criteria of other budgetary assistance programs, the Commission considered it preferable to model all programs as

general production subsidies. This approach was endorsed by two of the three referees in discussions at the workshop and has been used previously (CoPS 2003 and EconTech 2003).

Box 3.3   Modelling the effect of the SIP

There are two different types of SIP grants, and the Commission had to determine whether they should be modelled as a production subsidy, capital subsidy, or both.

Type 1 grants

Some type 1 grants are made available for capital expenditure, such as acquiring new TCF plant or equipment and new buildings or structures. However, type 1 grants are also available for more general expenses, including non-production related IT equipment and participation in trade shows and in-store promotions.

Given the variety of projects eligible for type 1 grants, they could be modelled as a production subsidy, rather than as a capital subsidy.

Type 2 grants

Type 2 grants are made available for R&D and to develop more innovative products (for example, product design or process improvements). Grants are also available for market research and obtaining industrial property rights.

Given the broad nature of activities eligible for type 2 grants under the SIP, they are unlikely to generate additional spillovers associated with R&D. Grants for innovative process improvements (for example, fabric testing) are likely to affect production costs. Overall then, type 2 grants are also likely to fund a range of expenditure broader than capital.

Other effects of the SIP

The SIP has administration costs, which are funded by the Government (chapter 2). There are also the following costs for firms:

- application costs (registering for the scheme and making a claim), with many firms using consultants

- costs associated with appeal processes.

The effect of reducing these costs (from reducing or removing SIP funding) is not modelled.

Source: AusIndustry 2008.

The total value of all budgetary assistance incorporated in the model is shown in table 3.6. The derivation of the numbers is detailed in appendix D.

Table 3.6 **Value of budgetary assistance modelled**
$ million (post-tax)[a]

Year	Textiles	Clothing	Footwear	TCF
2005-06[b]	42.9	28.0	7.7	78.7
2010-11	12.4	8.5	0.8	21.7
2015-16	0	0	0	0

[a] Values in this table are post-tax, because the budgetary assistance programs are subject to income tax.
[b] Payments for some programs did not occur until 2006-07.

Source: Appendix D.

Implementing the sensitivity scenarios

The exogenous policy changes imposed on the model in the simulations involve changes to tariffs and budgetary assistance programs outlined above. In addition, the Commission was asked to perform sensitivity analysis for scenarios involving:

- less than complete pass through of tariff reductions into domestic prices of imported TCF commodities

- increased multifactor (labour and capital) productivity

- a proportion of displaced TCF workers failing to find new employment, leading to a permanent increase in unemployment

- an appreciation in the exchange rate.

The methods used to implement these sensitivity scenarios in the modelling are discussed below.

Partial 'pass through'

The Commission was asked to model partial pass through of tariff reductions, based on a perception that there may be significant market power in the retail sector. However, the MMRF model does not explicitly provide for the modelling of market power or monopolistic behaviour, so the model was modified to enable an appropriate simulation for this scenario.

The exercise of any market power could result in retailers earning higher rates of return than would occur in competitive markets. Therefore, one approach would be to increase the rate of return on capital exogenously. However, this would be inappropriate for two reasons. First, the trade margin sector (which includes the retail sector) in the MMRF model supplies services to the consumption of all commodities, not just TCF commodities. So any increase in the rate of return to the sector would raise the costs of retail services economy-wide. Second, raising the

rate of return would increase the price of capital relative to labour, resulting in substitution towards labour.

An alternative approach was adopted, in line with comments from referees and participants at the Commission's technical workshop. This involves introducing a mark-up on the trade margin for TCF commodities sold to households. This has an effect on prices similar to a tax. However, the revenue from the mark-up (economic rent) accrues as income to the owners of capital used in trade services. This approach enables the creation of a distortion in the price without distorting input decisions, and maintains the outcomes implied by the presence of market power.

To implement this approach, the change in the import prices of TCF commodities resulting from the reference case simulation (R) was used as the indicator of the price decrease that would occur in the absence of market power. The mark-up on the trade margin was estimated so that 50 and 90 per cent of the price decrease was kept by retailers. The mark-ups varied according to the size of the trade-weighted tariff reduction (table 3.5) and the proportion of the trade margin in household expenditure on imported TCF commodities. The mark-up for each of the three industries incorporated in the model is shown in table 3.7. The final pass through to consumers will differ from the values in table 3.7, because of general equilibrium (or second-round) effects (see chapter 4).

Table 3.7 **Modelled partial pass through**
Percentage change

	Textiles	Clothing	Footwear	TCF
Full pass through[a]				
Price at the border	-5.2	-10.7	-2.8	-18.7
Final price to consumers	-3.6	-5.5	-1.3	-10.4
Partial pass through[b]				
Simulation S2a				
90 per cent mark-up by retailers	3.2	5.0	1.1	9.3
10 per cent pass through to consumers	-0.4	-0.6	-0.1	-1.0
Simulation S2b				
50 per cent mark-up by retailers	1.8	2.8	0.6	5.2
50 per cent pass through to consumers	-1.8	-2.8	-0.6	-5.2

a When a tariff reduction is fully passed on to consumers, the level change in the price at the border will equal the level change in the price to consumers. However, in percentage terms the fall in the price at the border is greater than in the price to consumers. This is because tariffs do not directly affect the costs incurred once an imported good has arrived in Australia. **b** Due to rounding, the sum of the final price to consumers (under full pass through) and the mark-up by retailers may not equal the pass through to consumers.

Source: Commission estimates.

In reality, both pass through scenarios appear implausible. Even in the event of extreme market power (a monopoly with no threat of competition) *at least*

50 per cent of tariff reductions would be passed on to consumers (box 3.4). However, there is little evidence of market power in the sector, let alone monopoly (chapter 5).

Box 3.4   **Pricing behaviour with a tariff reduction: the case of a monopolist**

The Commission was asked to model a scenario where, following a tariff reduction, the reduction in price is not fully passed on to consumers (because retailers have market power). Using the example of a monopolist — an extreme case, requiring not only control of the whole market, but also zero threat of entry — the following analysis demonstrates why even a retailer in that powerful position would not appropriate all of the cost saving from lower import prices.

To simplify, suppose a monopolist has a linear demand curve (D) and constant marginal cost curve (P_{Ct}). This cost reflects the price of imported goods plus a fixed trade margin. To maximise profits, a monopolist equates marginal revenue with marginal cost and sets the price at P_{Mt} (twice the price in a competitive market, P_{Ct}) and the quantity supplied (Q_{Mt}) is half that in a competitive market (Q_{Ct}).
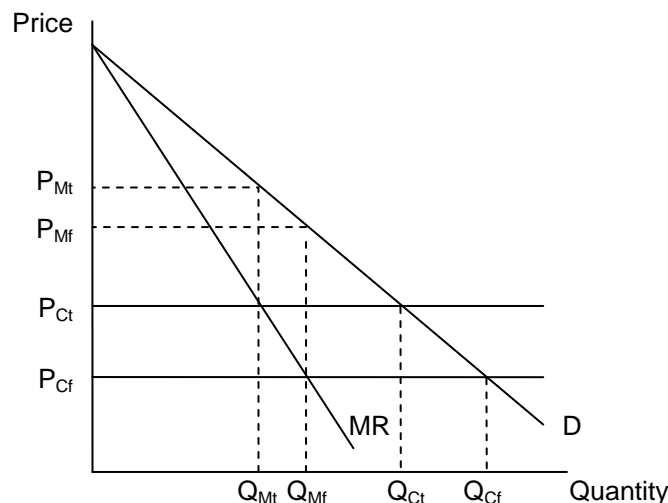
Next, assume a tariff reduction lowers the supply price from P_{Ct} to P_{Cf}. The monopolist would reduce the price to P_{Mf} — half the reduction in the supply price and half that which would occur in a competitive market.

Thus, even for a monopolist with a linear demand curve, 50 per cent of a tariff reduction would be passed on to consumers in lower prices.

The extent of pass through is determined by the ratio of the slope of the demand curve to the slope of the marginal revenue curve. For a linear demand curve, this ratio is constant and equal to 0.5. For convex demand curves, the ratio is greater than 0.5 (appendix F). In other words, the scenario of 50 per cent pass through under a monopoly outlined above, represents a *lower bound*.

Finally, it should be noted that if the trade margin is fixed in value, then the share of the trade margin in the price to the consumer will always increase as a consequence of lowering the tariff, regardless of the retailers' degree of market power.

Increased labour and capital productivity

In the options identified by the Green Review, increased productivity induced by budgetary assistance is posited relative to a 'trend' level. However, a comparative static model, by definition, does not have a 'trend' level. Rather, it has different levels of productivity for each industry, as reflected in the 2005-06 database.

To implement the productivity scenarios, a one-off increase in the productivity of labour and capital in the TCF sector was applied, such that these industries become more productive relative to all other industries in the economy. The fall in the cost of manufacturing TCF commodities is largely determined by the size of the productivity improvement and the share of labour and capital in the cost of production, outlined in table 3.2.

Permanent increase in unemployment

This sensitivity analysis examines the effects of displaced TCF workers who do not regain any employment. It was modelled by increasing the rate of national unemployment to account for the displaced workers. First, the amount of labour shed as a result of the policy change was estimated by examining the impact of the reference case (R) simulation on TCF employment. Second, the unemployment rate was increased, in each jurisdiction and for each occupation, by a proportion equivalent to the decrease in the level of employment, equal to 10 and 30 per cent of displaced TCF workers.

This approach assumes that there is a reduction in aggregate employment (above the long-run level of unemployment) induced by the policy change. However, displaced TCF workers could remain permanently unemployed without affecting the unemployment rate. For example, a TCF sector employee may be displaced, but a previously unemployed person could find employment in a job created elsewhere as a result of reducing assistance to the TCF sector. Under this interpretation, the permanent unemployment of some displaced TCF workers is consistent with the usual labour market assumption embodied in the model and reflected in the reference case (R).

Exchange rate scenario

The Commission was also asked to model the effects of the Australian dollar rising to parity with the US dollar. Based on current exchange rates, this would require an appreciation of about 10 per cent.

The MMRF model does not include nominal bilateral exchange rates. But CGE models can model changes in *real* exchange rates arising from factors such as increases in demand for export commodities, a key factor behind the recent increase in Australia's nominal exchange rate (figure 3.2). (The real exchange rate in the MMRF model is the ratio of import prices to the GDP price deflator.)

Referees at the Commission's technical workshop (and also for the Commission's recent Automotive Assistance study (PC 2008a)) supported modelling an increase in the prices of key commodities to proxy future exchange rate appreciation. The Commission adopted this suggestion by modelling a 10 per cent increase in the prices Australia receives for mineral exports, including coal, oil, gas and iron ore.

An approximation of the effect of an appreciation in the nominal exchange rate on the TCF sector (and all other sectors) can be obtained by scaling the simulation results. For example, to analyse the effect of a nominal appreciation of the Australian dollar to parity with the US dollar, the change in TCF output (from simulation S4) would be multiplied by a ratio of the change in the nominal exchange rate required to reach parity to the change in the real exchange rate (from simulation S4).

Figure 3.2   **Australia's terms of trade and the nominal exchange rate**
              1997 to 2007, quarterly
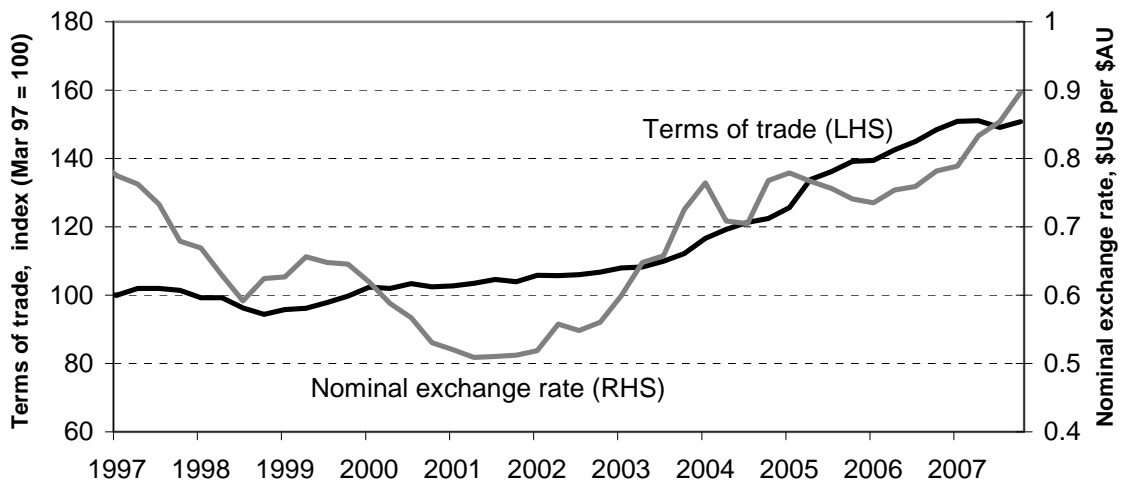
3.4 Reporting the economic impacts

The outcomes of MMRF simulations are interpreted as long-run effects — that is, changes to the economy once all adjustments in goods and factor markets have occurred. These impacts are summarised by reporting on the following variables:

- the output of national and jurisdiction economies (GDP and gross state products), as well as the output of each of the TCF industries and other sectors
- employment and wages by jurisdiction and by each of the TCF industries
- capital employed and the return on capital by jurisdiction and by each of the TCF industries
- exports and imports nationally, by jurisdiction and by each of the TCF industries
- revenues and expenditures for the jurisdictional and Australian Governments
- the exchange rate and the terms of trade.

The change in real gross national expenditure (GNE), adjusted for the share of additional investment funded by foreign sources, has been used as indicator of economic 'welfare', as outlined in box 3.5.

Box 3.5 Measuring changes in economic welfare in the MMRF model

An indicator of economic welfare attempts to assess the effect of a policy change on the wellbeing of Australians, derived through additional consumption. In this study, real gross national expenditure (GNE), adjusted for the effect of foreign investment, is used as an indicator of welfare. GNE is defined as the sum of private and public consumption and investment. Investment is included because it represents the present value of the future consumption generated by the return on investment. However, the future income generated by investment financed by foreigners is returned to the foreigners, and needs to be excluded from the estimation of domestic economic welfare. The rationale for this approach is as follows.

Private and public consumption expenditure

Traditionally, the combined changes in consumer and producer surplus, together with changes in taxes, have been used as an indicator of economic welfare. In the case of private consumption, 'equivalent variation' can be used to estimate consumer surplus. This is a measure of the amount of income a consumer would need to offset the benefits arising from a policy change. This measure can be related to the change in consumption expenditure adjusted by the change in prices (real consumption). A similar logic is applied to changes in spending on government services, which form part of the wellbeing of households through their consumption of government services.

In the MMRF model, households receive the income from all factors (so a separate calculation is not required for producer surplus). A household's disposable income is determined after adjusting for taxes. Real consumption provides, therefore, a good proxy for the traditional indicator of welfare for this part of GNE.

Private and public investment

In a comparative static model, it is difficult to account for the income and consumption implications of changes to the capital stock of the economy. In this study, investment is interpreted as claims against future consumption. The additional capital requires an increase in investment. To the extent that some of this investment is financed by foreigners, only the part of investment relevant to Australian investors should be included in calculating the part of GNE that is relevant to measuring a change in the welfare of Australian residents. In the MMRF database, 80 per cent of capital is assumed to be Australian-owned.

Source: PC (2008a).

4   Modelling results

The Commission has modelled a large number of scenarios, which encompass the effects of: reductions in tariffs, reductions in budgetary assistance, and the sensitivity scenarios specified in the request to undertake the modelling. The strategy in this chapter is first to provide a framework which describes the main mechanisms at work in the model with respect to assistance. A reference case and three other assistance options are simulated to illustrate the interactions between the reductions in tariff and budgetary assistance (section 4.2). Results for the sensitivity simulations are discussed in section 4.3.

4.1   Main mechanisms at work

Generally, lowering TCF tariffs will reduce the prices of imported TCF commodities. This can benefit household consumers of TCF commodities. TCF manufacturers can also benefit from tariff reductions through lower prices for their imported TCF inputs.

Lower import prices also encourage a switch in demand away from domestic production towards imports, putting pressure on the profits and sales of TCF manufacturers. This, in turn, puts pressure on these sectors to reduce their costs, which they can do in part by switching their input mix towards the now less costly imported inputs.

In the MMRF model, it is assumed that imported and domestic commodities are less than complete substitutes for each other. In these circumstances, reducing budgetary assistance leads to an increase in the price of domestically-manufactured TCF products. Producers are forced to pass on the full cost of production to their buyers, who switch partly to imports. Even if imports and domestically manufactured TCF products were highly substitutable, there would be no decrease in price from removal of subsidies. However, there would be a loss of sales to imports, as higher cost domestic supplies are displaced by imports.

Hence, like a reduction in tariffs, a reduction in budgetary assistance imposes pressures on firms to lower their costs of production. However, unlike a tariff reduction, it does not bring about the extra benefit of reducing prices to consumers and business. This is because, compared with a tariff, removal of a producer subsidy

does not decrease, and may even increase, consumer prices. Thus, subject to being able to source government revenues in a way that minimises deadweight losses from raising taxes — an important proviso — reducing budgetary assistance can be expected to be less beneficial than reducing equivalent assistance through tariffs, other things being equal (box 4.1).

The economy-wide effects of policy changes are conditioned by the many settings in the model, as discussed in chapter 3. Reducing tariffs affects real consumption (an indicator of welfare) through three main mechanisms in the model: allocative efficiency effects, terms of trade effects, and resource expansion effects.

- Tariffs distort the decisions of consumers and downstream industries in favour of domestic over lower-cost imported products. Reducing tariffs improves allocative efficiency across the economy, as some resources are released from the TCF sector to industries that can generate greater value from these resources.

- In the MMRF model, as in other GE models, it is assumed that Australian firms can only sell greater volumes on world markets by accepting a somewhat lower price (the *almost-small economy* assumption described in chapter 3). To the extent that policy changes raise the share of resources allocated to export-intensive industries, Australians face some reduction in the prices of their exports relative to the prices of imports. Therefore, although tariff reductions generate cost reductions and encourage increased exports, in the model this occurs at the cost of a decline in Australia's terms of trade, and therefore in income that can be allocated to consumption.

- Aggregate employment in the model is fixed by assumption. Australia's capital stock can be financed by domestic and foreign investors, giving the economy the capacity to expand. Although foreigners receive the returns on the capital they finance, Australians can still gain from greater foreign capital because of domestic taxes on repatriated profits and through higher real wages from the associated increase in labour productivity.

The allocative efficiency and resource expansion effects are referred to collectively here as resource effects. These effects contribute to an increase in economic activity (GDP) through an increase in real pre-tax wages, and income from a larger capital stock.

As noted in chapter 3 and illustrated in box 4.1, the resource effects from tariff reductions generate greater economy-wide gains in the model than from equivalent reductions in budgetary assistance.

Box 4.1   **The differing effect of tariffs and subsidies**

Differences exist in how import tariffs and production subsidies influence relative prices, and the behaviour of firms and consumers. These differences need to be taken into account in evaluating policy options.

A tariff increases the domestic price (P_d in diagram below) of a good relative to the foreign price (P_f). This higher domestic price raises domestic production above the efficient level (from Q_s to Q_{s1}), but reduces consumption from Q_d to Q_{d1}. Part of the loss in consumer surplus from higher prices is transferred to producers (producer surplus) and to the Government (tariff revenue). However, a deadweight loss is also incurred, depicted by the patterned triangles in the diagram below.

If instead, in the presence of trade (and assuming no distinction between local and imported products), the industry were assisted by a production subsidy — represented by a shift in the supply curve — the same expansion of the industry would occur as with the tariff, generating the same patterned triangle of deadweight loss on the left in the diagram. However, unlike the tariff, the consumer price would remain at the world price (P_f) and the patterned triangle on the right would not appear.

To the extent that production subsidies avoid the deadweight loss on the consumption side (right-hand triangle), they are less distortionary than import tariffs. In this sense, assuming that the government funds the subsidy through a relatively efficient tax, production subsidies are preferable to import tariffs as they are a less costly means of promoting activity in an industry.
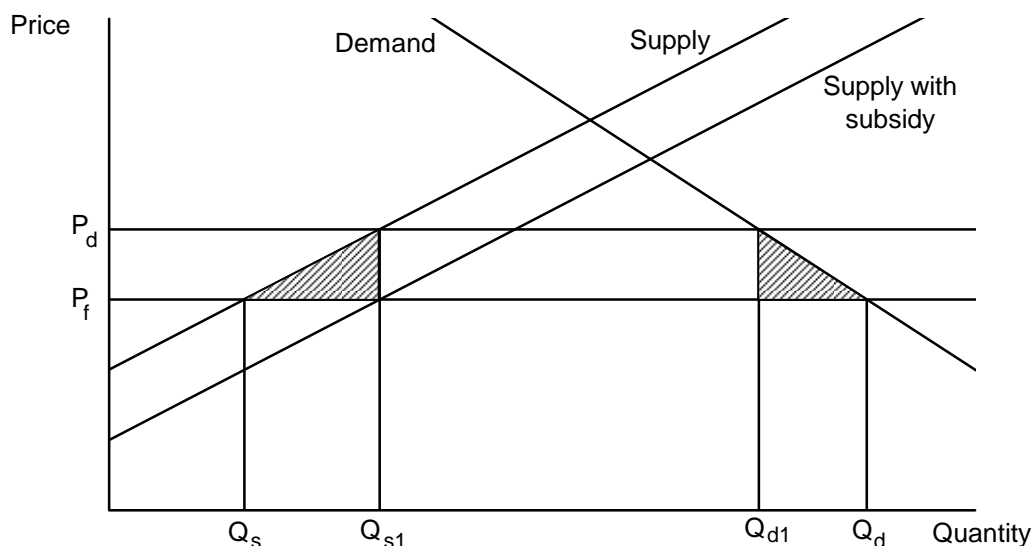
Source: PC 2008a.

4.2 Results for different scenarios

Simulations are used to illustrate and analyse the effects of the assistance options set out in the modelling request. Throughout this chapter, scenario R is used as the reference case, as it represents the current legislated program of assistance reductions for the TCF sector. TCF tariffs are reduced to 5 per cent and the transitional budgetary assistance program is concluded. This scenario can be decomposed into the effect of reducing the tariff (scenario O1) and the effect of removing the budgetary assistance (scenario O3). The Commission has also been asked to model another tariff scenario (O2), whereby tariffs on textiles, clothing and footwear are reduced to 10, 7, and 5 per cent respectively and budgetary assistance is maintained at 2005-06 levels. The results for this simulation are presented for completeness, but not discussed in any detail because they are essentially proportional to the reference case results.

Results at economy-wide, industry and jurisdictional levels are presented in tables 4.1 to 4.4. The economy-wide results in table 4.1 are expressed as changes in the reported variables compared with the base case tariff and budgetary assistance at 2005-06 levels (either as millions of dollars per year or percentage change). The dollar values are in 2005-06 prices. For tables 4.2 to 4.4, results are expressed as percentage changes in the reported variables. Once again, these are percentage changes relative to the base case values of variables in 2005-06.

Economy-wide effects

As anticipated, the modelled net effects on the economy as a whole are small, reflecting:

- the small share of the economy accounted for by the TCF sector

- the reduced levels of existing tariffs

- the relatively small reductions in the price of imported TCF products arising from the further reduction of tariffs.

In the reference case, reducing tariffs to 5 per cent and winding up the budgetary assistance program are projected to result in an increase in real GDP of $71 million per year (table 4.1). There is an improvement in the international competiveness of the Australian economy, as indicated by the decrease in the GDP deflator (about 0.09 per cent) and exports increase by $385 million per year. There is a small decline in the terms of trade, which partially offsets the positive income effects of lower tariffs. In addition, the reduction in tariffs leads to a loss of revenue to the Australian Government. Under the model closure used for this study, the taxes on

labour and capital increase, in part, to compensate, thereby reducing the gains to consumers from higher income. The measure of overall welfare increases, with real adjusted Gross National Expenditure increasing by about $63 million per year.

Table 4.1 **Main option results — economy-wide impacts**

Change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	*O1*	*O2*	*O3*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Alternative tariff rates, maintain budgetary assistance*	*Maintain tariffs, remove budgetary assistance*
Tariff level	2015	2015	10%, 7%, 5%[a]	2005
Budgetary assistance	None	2005 level	2005 level	None
Variable (real $m)				
Adjusted GNE	63	63	41	0
GNE	31	84	55	-54
GDP	71	71	45	0
Consumption	12	51	35	-40
Investment	26	25	15	0
Government expenditure	5	17	11	-12
Inventory	-12	-10	-6	-2
Exports	385	324	181	63
Imports	344	336	192	8
Variable (percentage change)				
GDP deflator	-0.087	-0.076	-0.042	-0.012
Consumer price index	-0.132	-0.123	-0.069	-0.009
Terms of trade	-0.005	-0.001	0.001	-0.004
Real exchange rate[b]	0.070	0.059	0.032	0.012
Real wage (pre-tax)	0.076	0.087	0.049	-0.011

a Tariff rates for textiles, clothing and footwear respectively. **b** A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

Effects of the tariff reduction

Reducing tariffs to 5 per cent (scenario O1) is projected to yield an increase in GDP of $71 million per year (nearly the entire increase resulting from the policy package). By reducing the cost of TCF commodities, the lower tariff encourages an expansion of production in non-TCF sectors. As labour supply is assumed to be fixed nationally, the improvement in allocative efficiency leads to a small increase in wages and a decrease in the rental price of capital. This change in a relative factor price encourages substitution of capital for labour as the economy expands, which

attracts an inflow of foreign capital. This is reflected in an increase in investment of $25 million per year.

The lower tariff also increases trade. Reduced production costs lower the cost of exports, and the real value of exports increases by $324 million per year. At the same time, users of TCF commodities partly switch from domestically-manufactured goods to the cheaper imports. As the economy expands, the real value of imports increase by $336 million per year.

Increased export volumes lead to a fall in export prices, and the terms of trade fall slightly. The corresponding fall in national income partly offsets the rise in consumption from the positive income effects from cheaper TCF products, resulting in real consumption growth of $51 million per year. Projected net benefits to the community, as measured by real adjusted GNE, are $63 million per year.

Effects of removing the budgetary assistance

As anticipated, removing budgetary assistance alone (scenario O3) is projected to result in a very much smaller increase in GDP (less than $1 million per year). The main reasons for this are that the assistance provided to the TCF sector through budgetary assistance is one-quarter that provided by tariffs (box 2.1) and, as noted, there are not the price distortions associated with tariffs.

Broadly speaking, the tariff raises the price of imports relative to the ex-factory prices of TCF manufacturers by more than the budgetary assistance enables them to reduce their prices relative to imports. Hence, for the TCF sector, reducing the tariffs to 5 per cent has a much larger impact on their relative competitiveness than removing budgetary assistance.

Furthermore, the tariff imposes a tax on buyers of TCF products (box 4.1) whereas budgetary assistance tends to lower consumer prices. A reduction in the tariffs to 5 per cent is estimated to reduce retail prices of textiles, clothing and footwear by about 1.6, 3.2 and 1.1 per cent, respectively. However, removal of budgetary assistance results in small increases in the retail prices of textiles, clothing and footwear. Although removing budgetary assistance frees up tax revenue, which all else equal allows lower taxes in the economy, the beneficial effect of this is less than the economy-wide benefits from reducing the 'consumer tax' effect of the tariffs. In other words, as modelled, the distortions imposed by the import tax on households, and businesses which use TCF products as intermediate inputs, exceed the distortions imposed by the broader-based taxes used to pay for the subsidy.

It should be noted, however, that budgetary assistance is assumed in the model to be funded through a tax on factor incomes (labour and capital). This broad-based tax is

highly *neutral* as modelled, in that it does not change the relative prices of labour and capital, and consequently generates only small deadweight losses. It is, therefore, likely that the model does not fully capture the distorting impacts of the tax system as it actually operates. For this reason, the benefits of removing budgetary assistance are likely to be underestimated.

In addition to the (small) increase in GDP, the removal of budgetary assistance leads to an increase in the real value of exports ($63 million per year), with a corresponding fall in the terms of trade (0.004 per cent). The modelled decline in the terms of trade leads in turn to a decline in real consumption of $40 million per year. The net benefits, as measured by real adjusted GNE, are negligible.

Intersectoral effects

As modelled, reducing assistance to the TCF sector results in some resources moving out of this sector into other sectors (table 4.2). This reallocation is a function of the various sectors' trade exposure and the price responsiveness of demand for their output as prices change. More exported-oriented sectors face price sensitive demands for their products and are therefore able to expand. Conversely, sectors that produce mainly for the smaller domestic market are more constrained in their ability to expand output.

Table 4.2   **Main option results — sectoral changes in output**
Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	**O1**	**O2**	**O3**
Description	**Reference case**	**5% tariffs, maintain budgetary assistance**	**Alternative tariff rates, maintain budgetary assistance**	**Maintain tariffs, remove budgetary assistance**
Tariff level	2015	2015	10%, 7%, 5%[a]	2005
Budgetary assistance	None	2005 level	2005 level	None
Agriculture	0.020	0.013	0.008	0.006
Mining	0.080	0.049	0.027	0.031
Food processing	0.052	0.037	0.021	0.015
Manufacturing	-0.072	-0.063	-0.037	-0.008
Services	0.005	0.007	0.004	-0.002

a Tariff rates for textiles, clothing and footwear respectively.

Source: Commission estimates based on MMRF simulation results.

As a result, resource allocation gains from reduced TCF assistance are concentrated in the mining sector, as well as (to a lesser extent) other non-manufacturing sectors.

The services sector grows at almost the same rate as the economy as a whole to support the expansion of other sectors. Growth of the agricultural sector is constrained by the availability of land, and the food processing sector is limited by the growth of its main input, agricultural products.

Effects on the TCF sector

The effects of reducing tariffs and removing budgetary assistance on the TCF sector are complicated by the opposing effects of each type of assistance on the prices of outputs (table 4.3).

Effects of the tariff reduction

Reducing tariffs (scenario O1) lowers the price of imported textiles, clothing and footwear by about 5.0, 10.1 and 2.7 per cent respectively. This encourages buyers of TCF products to substitute toward imports. Domestic sales of locally manufactured TCF products are projected to fall by about 2.7, 6.5 and 3.6 per cent respectively and imports increase by about 2.4, 6.7 and 1.0 per cent respectively. The TCF sector also benefits from reduced tariffs on imported TCF products and lower labour costs, which mean that the exports of textiles, clothing and footwear increase by about 5.2, 6.1 and 3.0 per cent respectively. However, the increase in exports is insufficient to offset the decrease in domestic demand for locally manufactured TCF products, and the total output of each industry decreases (2.3, 4.6 and 0.6 per cent respectively).

The increase in the capital-labour ratio (the percentage decrease in the capital employed being less than that for labour employed), means that the decrease in employment exceeds the decrease in the output for the TCF sector.

Table 4.3   **Main option results — impacts on the TCF industries**

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	*O1*	*O2*	*O3*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Alternative tariff rates, maintain budgetary assistance*	*Maintain tariffs, remove budgetary assistance*
Tariff level	2015	2015	10%, 7%, 5%**a**	2005
Budgetary assistance	None	2005 level	2005 level	None
Textiles				
Output	-2.764	-2.266	-1.285	-0.497
Employment	-3.089	-2.530	-1.435	-0.558
Nominal wages	-0.037	-0.018	-0.010	-0.019
Capital employed	-1.834	-1.497	-0.849	-0.336
Nominal rental price of capital	-2.560	-2.091	-1.182	-0.461
Domestic sales — local production	-2.998	-2.675	-1.514	-0.330
Domestic sales — total	0.000	0.003	0.002	-0.003
Export volume	1.518	5.210	2.908	-3.541
Import volume	2.542	2.382	1.321	0.160
Domestic supply price	-0.171	-0.586	-0.330	0.418
Import price duty paid	-4.952	-4.952	-2.803	0.000
Clothing				
Output	-5.115	-4.552	-2.641	-0.560
Employment	-5.728	-5.099	-2.961	-0.627
Nominal wages	-0.036	-0.016	-0.009	-0.020
Capital employed	-3.694	-3.281	-1.904	-0.410
Nominal rental price of capital	-4.200	-3.727	-2.149	-0.456
Domestic sales — local production	-6.837	-6.513	-3.757	-0.334
Domestic sales — total	0.000	0.003	0.002	-0.003
Export volume	4.226	6.085	3.412	-1.782
Import volume	6.866	6.671	3.804	0.195
Domestic supply price	-0.884	-1.285	-0.730	0.407
Import price duty paid	-10.117	-10.117	-5.851	0.000

a Tariff rates for textiles, clothing and footwear respectively.

Source: Commission estimates based on MMRF simulation results.

Continued next page

Table 4.3   Continued

| Description | Simulation | | | |
	R	O1	O2	O3
	Reference case	5% tariffs, maintain budgetary assistance	Alternative tariff rates, maintain budgetary assistance	Maintain tariffs, remove budgetary assistance
Tariff level	2015	2015	10%, 7%, 5%[a]	2005
Budgetary assistance	None	2005 level	2005 level	None
Footwear				
Output	-2.057	-0.598	-0.377	-1.454
Employment	-2.484	-0.847	-0.529	-1.632
Nominal wages	-0.028	-0.008	-0.005	-0.020
Capital employed	-1.144	-0.281	-0.180	-0.859
Nominal rental price of capital	-2.514	-0.624	-0.399	-1.879
Domestic sales — local production	-4.533	-3.629	-2.156	-0.928
Domestic sales — total	0.000	0.003	0.002	-0.003
Export volume	0.880	2.998	1.734	-2.078
Import volume	1.041	0.954	0.564	0.092
Domestic supply price	-0.114	-0.348	-0.203	0.237
Import price duty paid	-2.664	-2.664	-1.571	0.000

[a] Tariff rates for textiles, clothing and footwear respectively.

Source: Commission estimates based on MMRF simulation results.

The effect of eliminating budgetary assistance

Eliminating budgetary assistance (scenario O3) increases the price of locally manufactured TCF products (textiles by 0.4 per cent, clothing 0.4 per cent and footwear 0.2 per cent). As a result, consumers and businesses switch toward imports and exports fall, leading to a decrease in local manufacturing by the TCF sector.

Jurisdictional results

The mechanisms at work at the jurisdictional level are similar when reducing the tariff and removing budgetary assistance, and they are discussed together here, concentrating on the reference case (scenario R). As assistance is reduced, the more TCF-intensive jurisdictions (especially Victoria and New South Wales) lose a small proportion of their labour and capital to other jurisdictions, especially to those that depend on resources and exports for a large part of their activity (such as Western Australia, Queensland and the Northern Territory) (table C.1).

Table 4.4 **Main option results — jurisdictional change in GSP per worker**

Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | | |
Description	R	O1	O2	O3
	Reference case	5% tariffs, maintain budgetary assistance	Alternative tariff rates, maintain budgetary assistance	Maintain tariffs, remove budgetary assistance
Tariff level	2015	2015	10%, 7%, 5%[a]	2005
Budgetary assistance	None	2005 level	2005 level	None
New South Wales	0.004	0.005	0.004	-0.002
Victoria	0.005	0.006	0.004	-0.001
Queensland	0.006	0.007	0.004	0.000
South Australia	0.003	0.005	0.003	-0.002
Western Australia	0.016	0.014	0.008	0.002
Tasmania	0.009	0.010	0.006	-0.001
Northern Territory	0.009	0.009	0.006	-0.001
ACT	-0.003	-0.001	0.000	-0.003

a Tariff rates for textiles, clothing and footwear respectively.

Source: Commission estimates based on MMRF simulation results.

This movement of population out of the TCF-intensive jurisdictions, reduces demand for local services, in turn reducing slightly aggregate activity in these jurisdictions (New South Wales by 0.019 per cent and Victoria 0.029 per cent) (table C.1).

In all jurisdictions (except the ACT), however, GSP per worker increases, particularly in Western Australia (table 4.4).

4.3   Results for the sensitivity scenarios

Results for the sensitivity scenarios requested of the Commission are outlined and discussed in the following sections. The scenarios include:

- two levels of multi-factor productivity improvement (1.5 and 0.5 per cent), assumed to be induced by budgetary assistance (scenarios S1a and S1b)

- two levels of *pass through* (10 and 50 per cent) by retailers to household consumers of the reduction in the price of imports from lowering tariffs (scenarios S2a and S2b)

- two levels of permanent decrease in the level of national employment (30 and 10 per cent of the workers displaced from the TCF industries) arising from the reduction in assistance in the reference case (scenarios S3a and S3b)

- an increase in the real exchange rate induced by an increase in the international demand for, and prices received for, Australia's mining exports (scenario S4).

Each of these sensitivity scenarios is discussed in turn. The differences between the results for each sensitivity scenario and the reference case provide insights into their relative effects.

Improving labour and capital productivity

In this sensitivity scenario, it is assumed that innovation is induced through the provision of budgetary assistance to the TCF sector. The innovation is assumed to manifest itself as an improvement in labour and capital productivity (scenarios S1a and S1b). The economy-wide impacts are presented in table 4.5 and the TCF sector results are presented in table 4.6.

Table 4.5   **Productivity improvement — economy-wide impacts**

Change relative to the base case (assistance levels in 2005-06)

| | Simulation | | | |
| | *R* | *O1* | *S1a* | *S1b* |
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Productivity improvement (1.5 per cent)*	*Productivity improvement (0.5 per cent)*
Tariff level	2015	2015	2015	2015
Budgetary assistance	None	2005 level	2005 level	2005 level
Aggregate variable (real $m)				
Adjusted GNE	63	64	114	81
GNE	31	84	145	104
GDP	71	71	121	88
Consumption	12	51	90	64
Investment	26	25	33	28
Government expenditure	5	17	29	21
Inventory	-12	-10	-7	-9
Exports	385	324	309	319
Imports	344	336	332	335
Aggregate variable (percentage change)				
GDP deflator	-0.087	-0.076	-0.067	-0.073
Consumer price index	-0.132	-0.123	-0.116	-0.121
Terms of trade	-0.005	-0.001	0.001	0.000
Real exchange rate[a]	0.070	0.059	0.050	0.056
Real wage (pre-tax)	0.076	0.087	0.095	0.090

a A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

Table 4.6 **Productivity improvement — impacts on the TCF industries**
Percentage change relative to the base case (assistance levels in 2005-06)

		Simulation		
	R	*O1*	*S1a*	*S1b*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Productivity improvement (1.5 per cent)*	*Productivity improvement (0.5 per cent)*
Tariff level	2015	2015	2015	2015
Budgetary assistance	None	2005 level	2005 level	2005 level
Textiles				
Output	-2.764	-2.266	-1.719	-2.083
Employment	-3.089	-2.530	-3.541	-2.870
Nominal wages	-0.037	-0.018	-0.018	-0.018
Capital employed	-1.834	-1.497	-2.098	-1.699
Nominal rental price of capital	-2.560	-2.091	-2.933	-2.374
Domestic sales — local production	-2.998	-2.675	-2.321	-2.556
Domestic sales — total	0.000	0.003	0.010	0.005
Export volume	1.518	5.210	9.298	6.570
Import volume	2.542	2.382	2.221	2.328
Domestic supply price	-0.171	-0.586	-1.031	-0.736
Import price duty paid	-4.952	-4.952	-4.952	-4.952
Clothing				
Output	-5.115	-4.552	-3.913	-4.338
Employment	-5.728	-5.099	-5.979	-5.394
Nominal wages	-0.036	-0.016	-0.015	-0.016
Capital employed	-3.694	-3.281	-3.848	-3.471
Nominal rental price of capital	-4.200	-3.727	-4.382	-3.947
Domestic sales — local production	-6.837	-6.513	-6.147	-6.390
Domestic sales — total	0.000	0.003	0.010	0.005
Export volume	4.226	6.085	8.208	6.796
Import volume	6.866	6.671	6.454	6.598
Domestic supply price	-0.884	-1.285	-1.731	-1.436
Import price duty paid	-10.117	-10.117	-10.117	-10.117
Footwear				
Output	-2.057	-0.598	1.406	0.071
Employment	-2.484	-0.847	-0.244	-0.644
Nominal wages	-0.028	-0.008	-0.005	-0.007
Capital employed	-1.144	-0.281	0.007	-0.184
Nominal rental price of capital	-2.514	-0.624	0.003	-0.413
Domestic sales — local production	-4.533	-3.629	-2.359	-3.204
Domestic sales — total	0.000	0.003	0.010	0.005
Export volume	0.880	2.998	5.871	3.955
Import volume	1.041	0.954	0.824	0.911
Domestic supply price	-0.114	-0.348	-0.675	-0.458
Import price duty paid	-2.664	-2.664	-2.664	-2.664

Source: Commission estimates based on MMRF simulation results.

National results

As would be expected, an improvement in the TCF sector's labour and capital productivity is beneficial to the wider economy, because it increases its capacity to produce output from available resources. In scenario S1a, the modelled change in GDP is $121 million per year and adjusted GNE is $114 million per year.

By comparing the simulation results of scenario S1a with those for the reference case (R) and scenario O1, the improvement in TCF productivity adds about $50 million per year to the gains from reducing tariffs, both in GDP and adjusted GNE. For scenario S1b, the additional gains are $17 million per year or about one third of those for scenario S1a. This is expected, as the assumed productivity improvement (0.5 per cent) is one third that for scenario S1a.

One interpretation of the productivity scenario is that the provision of budgetary assistance costs little in terms of welfare forgone, and generates additional welfare through innovation and productivity in the TCF sector. However, it is important from a policy perspective that the mechanisms by which subsidies lead to innovation and productivity be clearly identified. Disentangling productivity induced by innovation subsidies from that induced by reductions in assistance, or which occurs as part of normal technological change, is likely to be particularly challenging. Indeed, as noted in chapter 5, a plausible alternative interpretation of these scenarios is that the productivity gains derive predominantly from the reduction in tariffs, not the maintenance of financial support.

Effects on the TCF industries

For each TCF industry, the modelled improvements in labour and capital productivity are insufficient to offset the effects of lower assistance (table 4.6). Although it enables them to reduce their prices, it does not match the decrease in the price of imports (about 6 per cent), and the level of output still decreases. However, the magnitude of the decrease is significantly less than in the reference case. For example, in the case of clothing, the 1.5 per cent improvement in productivity (S1a) reduces the decrease in output from about 5.1 per cent in the reference case (R) to about 3.9 per cent. For the TCF sector, the improvement in productivity means that, relative to the reference case:

- employment is lower because the increase in output is more than offset by the improvement in labour productivity

- wages are higher, reflecting the higher productivity of labour, although wages have still decreased overall with the reduction in assistance

- the increase in the wage and the decrease in the rental price of capital leads to a higher capital to labour ratio. Although the improvement in productivity is neutral with respect to labour and capital, labour is the fixed factor in the economy and productivity improvement raises the wage and leads to an increase in the capital to labour ratio as output increases.

- the value of exports is higher, and that of imports lower, reflecting the greater international competiveness of the TCF sectors (the larger decrease in the supply price of the domestic TCF industries for their products).

Intersectoral effects and jurisdictional results

Compared with the reference case, the productivity increase improves the TCF sector's prospects by lowering its production costs. This results in higher TCF and, therefore, higher output in the manufacturing sector (table C.3). There is also a dampening of the expansion in output of the trade-exposed sectors in the economy (relative to the reference case). The competitiveness of these sectors is eroded by higher labour and input costs induced by the productivity improvement in the TCF sector, as indicated by a smaller reduction in the GDP deflator and smaller real devaluation of the exchange rate (table 4.5).

The improvement in labour and capital productivity of the TCF sector dampens the gains to those jurisdictions benefiting from the reduction in assistance (table C.5). The smaller decline in the TCF sector arising from its productivity improvement reduces the adverse effects of tariff cuts in those States with a high concentration of TCF industries. Indeed, only GSP in NSW is projected to decline. However, all jurisdictions have an increase in GSP per worker (table C.6).

Partial pass through of tariff reductions

In this set of sensitivity scenarios, it is assumed that retailers of TCF commodities have market power. As described in the modelling request, retailers are assumed to pass on to household consumers only 10 or 50 per cent of the decrease in the price of imports from lower tariffs. The economy-wide results for the scenarios S2a and S2b are presented in table 4.7 and the TCF sector results in table 4.8.

Table 4.7 **Partial pass through — economy-wide results**

Change relative to the base case (assistance levels in 2005-06)

| | Simulation | | |
| | R | S2a | S2b |
Description	Reference case	Pass through of 10 per cent	Pass through of 50 per cent
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
Aggregate variable (real $m)			
Adjusted GNE	63	50	56
GNE	31	-66	-23
GDP	71	58	64
Consumption	12	-63	-30
Investment	26	23	24
Government expenditure	5	-19	-8
Inventory	-12	-8	-10
Exports	385	362	372
Imports	344	238	285
Aggregate variable (percentage change)			
GDP deflator	-0.087	-0.066	-0.076
Consumer price index	-0.132	-0.094	-0.111
Terms of trade	-0.005	-0.004	-0.004
Real exchange rate[a]	0.070	0.049	0.059
Real wage (pre-tax)	0.076	0.051	0.062

a A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

National results

Even if retailers did not pass on tariff reductions in lower prices to consumers, there would still be economy-wide gains from reducing tariffs. For the most extreme case (scenario S2a, with only a 10 per cent pass through), there are projected increases in GDP (about $58 million per year) and in adjusted GNE ($50 million per year). Household consumption decreases (by $63 million per year) for two main reasons:

- the prices of TCF commodities to consumers do not decrease by the full extent of the reduction in tariffs

- higher income taxes (on labour and capital) are required to offset the loss of tariff revenue, which reduces disposable income.

The prices of TCF commodities still decrease for each industry and there is more efficient allocation of resources in the economy. Exports increase, albeit by a smaller amount, and investment increases as the economy expands.

The economy-wide outcomes under scenario S2a relative to the reference case are just under twice as large as those for S2b, reflecting the fact that the mark-up by retailers (90 per cent) is slightly less than twice that for scenario S2a (50 per cent).

As outlined in chapter 5, however, the pass through scenarios (S2a and S2b) appear unlikely in practice.

Effects on the TCF industries

For the TCF sector, the less than full pass through by retailers to household consumers offsets, to some extent, the effects of lower tariffs. Compared with the reference case, the less than full pass through means that:

- the supply price of manufacturers is marginally higher, reflecting the higher demand for locally manufactured products because consumers have not been exposed to the full reduction in the price of imported TCF products

- lower levels of exports, reflecting the higher supply price for locally manufactured TCF products

- higher levels of output by manufacturers, as the decrease in exports is more than offset by the increase in domestic sales of locally manufactured products

- higher levels of employment and capital employed, reflecting the higher level of output

- a smaller decrease in wages and an increase in the labour to capital ratio, reflecting the lower level of resource reallocation taking place.

Intersectoral and jurisdictional results

A less than full pass through by retailers to household consumers of lower prices for imports advantages domestic manufacturers. However, the difference in the reduction in output of the TCF sectors between the reference case and 50 per cent and 10 per cent pass through scenarios is small. Consequently, there is little difference in the resource allocation across the sectors in the economy. There are only small differences in the changes in sectoral output between the reference case and scenarios S2a and S2b (table C.7).

Table 4.8   **Partial pass through — impacts on the TCF industries**
Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | |
	R	S2a	S2b
Description	Reference case	Pass through of 10 per cent	Pass through of 50 per cent
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
Textiles			
Output	-2.764	-2.433	-2.580
Employment	-3.089	-2.720	-2.884
Nominal wages	-0.037	-0.025	-0.030
Capital employed	-1.834	-1.611	-1.710
Nominal rental price of capital	-2.560	-2.251	-2.388
Domestic sales — local production	-2.998	-2.636	-2.797
Domestic sales — total	0.000	-0.002	-0.001
Export volume	1.518	1.272	1.381
Import volume	2.542	2.503	2.520
Domestic supply price	-0.171	-0.143	-0.155
Import price duty paid	-4.952	-4.952	-4.952
Clothing			
Output	-5.115	-3.054	-3.969
Employment	-5.728	-3.423	-4.447
Nominal wages	-0.036	-0.026	-0.030
Capital employed	-3.694	-2.205	-2.866
Nominal rental price of capital	-4.200	-2.496	-3.249
Domestic sales — local production	-6.837	-4.276	-5.413
Domestic sales — total	0.000	-0.002	-0.001
Export volume	4.226	3.578	3.864
Import volume	6.866	4.206	5.378
Domestic supply price	-0.884	-0.743	-0.805
Import price duty paid	-10.117	-10.117	-10.117
Footwear			
Output	-2.057	-1.751	-1.888
Employment	-2.484	-2.076	-2.258
Nominal wages	-0.028	-0.020	-0.024
Capital employed	-1.144	-0.989	-1.058
Nominal rental price of capital	-2.514	-2.174	-2.326
Domestic sales — local production	-4.533	-3.739	-4.093
Domestic sales — total	0.000	-0.002	-0.001
Export volume	0.880	0.606	0.728
Import volume	1.041	0.796	0.905
Domestic supply price	-0.114	-0.082	-0.096
Import price duty paid	-2.664	-2.664	-2.664

Source: Commission estimates based on MMRF simulation results.

The differences in the jurisdictional results between the reference case and the sensitivity scenarios is fairly small. Less than full pass through dampens the effects on reducing assistance on jurisdictions. However, when considered in terms of GSP per worker, this dampening effect is very small (table C.10).

Permanent decrease in employment

The sensitivity scenarios relating to employment involve an assumption that certain proportions (30 and 10 per cent) of the workers displaced from jobs in the TCF sector, as a consequence of reductions in assistance, become *permanently* unemployed. Furthermore, it is assumed that the increase in unemployment among TCF workers is not offset by the creation of employment for existing unemployed workers outside the TCF sector, resulting in a reduction in total employment in the economy. The aggregate results from this set of sensitivity scenarios are presented in table 4.9, with the results for the TCF sector presented in table 4.10.

Table 4.9 **Displaced workers — economy-wide results**
Change relative to the base case (assistance levels in 2005-06)

	Simulation		
	R	**S3a**	**S3b**
Description	**Reference case**	**Displaced workers (30 per cent)**	**Displaced workers (10 per cent)**
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
Aggregate variable (real $m)			
Adjusted GNE	63	18	48
GNE	31	-21	14
GDP	71	23	55
Consumption	12	-16	3
Investment	26	11	21
Government expenditure	5	-4	2
Inventory	-12	-12	-12
Exports	385	378	383
Imports	344	334	341
Aggregate variable (percentage change)			
GDP deflator	-0.087	-0.089	-0.088
Consumer price index	-0.132	-0.134	-0.133
Terms of trade	-0.005	-0.004	-0.005
Real exchange rate[a]	0.070	0.072	0.071
Real wage (pre-tax)	0.076	0.075	0.075

a A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

Table 4.10 **Displaced workers — impacts on the TCF industries**

Percentage change relative to the base case (assistance levels in 2005-06)

		Simulation	
	R	**S3a**	**S3b**
Description	**Reference case**	**Displaced workers (30 per cent)**	**Displaced workers (10 per cent)**
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
Textiles			
Output	-2.764	-2.770	-2.766
Employment	-3.089	-3.096	-3.091
Nominal wages	-0.037	-0.025	-0.033
Capital employed	-1.834	-1.836	-1.835
Nominal rental price of capital	-2.560	-2.558	-2.559
Domestic sales — local production	-2.998	-3.004	-3.000
Domestic sales — total	0.000	-0.005	-0.002
Export volume	1.518	1.502	1.513
Import volume	2.542	2.539	2.541
Domestic supply price	-0.171	-0.169	-0.170
Import price duty paid	-4.952	-4.952	-4.952
Clothing			
Output	-5.115	-5.119	-5.117
Employment	-5.728	-5.733	-5.730
Nominal wages	-0.036	-0.025	-0.033
Capital employed	-3.694	-3.695	-3.694
Nominal rental price of capital	-4.200	-4.196	-4.199
Domestic sales — local production	-6.837	-6.841	-6.838
Domestic sales — total	0.000	-0.005	-0.002
Export volume	4.226	4.221	4.224
Import volume	6.866	6.864	6.866
Domestic supply price	-0.884	-0.882	-0.884
Import price duty paid	-10.117	-10.117	-10.117
Footwear			
Output	-2.057	-2.066	-2.060
Employment	-2.484	-2.494	-2.487
Nominal wages	-0.028	-0.019	-0.025
Capital employed	-1.144	-1.149	-1.145
Nominal rental price of capital	-2.514	-2.515	-2.515
Domestic sales — local production	-4.533	-4.542	-4.536
Domestic sales — total	0.000	-0.005	-0.002
Export volume	0.880	0.871	0.877
Import volume	1.041	1.038	1.040
Domestic supply price	-0.114	-0.113	-0.114
Import price duty paid	-2.664	-2.664	-2.664

Source: Commission estimates based on MMRF simulation results.

National results

Even under the assumption of a permanent decrease in employment, there are positive net outcomes for the economy as a whole from reducing assistance. Under scenario S3a, which has the highest assumed decrease in employment, the projected gains from reducing assistance are $23 million per year in GDP and $18 million in adjusted GNE. The permanent decrease in employment reduces the capacity of the economy to generate output.

The unemployment scenarios lead to small decreases at a national level in the number of employed persons (about 468 persons for scenario S3a and 156 for scenario S3b).

A key issue is whether an initial decrease in employment in the TCF sector would lead to a lower level of total employment in the economy in the long run. The resource allocation effects from reducing tariffs lead to increases in output in other sectors and higher real wages. Structural change arising from the economy-wide effects of reducing assistance to the TCF sector are likely to create *churning* in the labour market — a loss of employment opportunities for some displaced TCF workers, with the creation of job opportunities for other workers and unemployed people. Therefore, a permanent increase in unemployment among TCF workers need not mean a decrease in national employment. This issue is discussed further in chapter 5.

Effects on the TCF sector

For the TCF industries, a permanent decrease in the *nation's* labour supply has only a small impact relative to the reference case. The decrease in employment is small, but does lead to a small increase in wages. Relative to the reference case, this leads to:

- lower levels of output by the TCF industries

- higher wages and lower levels of employment

- slightly lower levels of capital employed

- a higher capital to labour ratio induced by the relatively higher cost of labour.

Intersectoral and jurisdictional results

Reflecting the small decrease in the number of people employed, the output of all sectors is slightly lower than in the reference case (table C.11).

The permanent increase in unemployment scenarios also lead to a small decrease in GSP (table C.13) and GSP per worker (table C.14) for States and Territories relative to the reference case.

Real appreciation of the exchange rate

Scenario S4 is designed to simulate an appreciation in the real exchange rate arising from an increase in the international demand, and prices, for Australian mining exports. This scenario essentially captures the likely effects of a minerals and energy commodity boom (chapter 3). The exports include coal, oil, gas, iron ore and other mining products. The aggregate results for scenario S4 are presented in table 4.11 and the results for the TCF sector are presented in table 4.12.

National results

As expected, an increase in the price of Australia's mining exports is projected to have a significant impact on the economy. The effects of the commodity boom completely overwhelm the economy-wide impacts of reducing assistance to the TCF sector. The increase in international demand for minerals leads to increase in returns to the nation's fixed factors (land and labour). Wages increase significantly (real wages increase nationally by about 1.8 per cent). This leads to a general increase in the cost of production in the economy, as indicated by the increase in the GDP deflator (4.5 per cent). The real exchange rate appreciation in the MMRF model is defined as the per cent increase in the GDP deflator less the decrease in the price of imports. The increase in the GDP deflator reduces the international competitiveness of Australia's exports and sectors, such as TCF, which compete with imports.

Even though the real value of mining exports increases, the loss of competitiveness by other exports leads to an overall decrease in the real value of exports ($6.9 billion per year). The decrease in the competitiveness of import competing industries also means that the real value of imports rises significantly ($4.7 billion per year). Overall, GDP increases by just over $13 billion per year and adjusted GNE by $12.3 billion per year.

Table 4.11 **Real exchange rate appreciation — economy-wide results**
Change relative to the base case (assistance levels in 2005-06)

| | Simulation | |
| | R | S4 |
Description	Reference case	Export price increase
Tariff level	2015	2015
Budgetary assistance	None	None
Aggregate variable (real $m)		
Adjusted GNE	63	12 331
GNE	31	25 043
GDP	71	13 458
Consumption	12	12 668
Investment	26	8 017
Government expenditure	5	4 409
Inventory	-12	-51
Exports	385	-6 935
Imports	344	4 650
Aggregate variable (percentage change)		
GDP deflator	-0.087	4.548
Consumer price index	-0.132	3.673
Terms of trade	-0.005	3.519
Real exchange rate[a]	0.070	-4.387
Real wage (pre-tax)	0.076	1.806

a A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

Effects on the TCF sector

As above, the real appreciation of the exchange rate greatly outweighs the effects of assistance changes for the TCF sector. Relative to the reference case:

- wages are about 6 per cent higher

- the supply price of locally manufactured TCF products are between 1.9 and 2.6 per cent greater

- the reduction in output is twice as great for textiles and clothing, and more so for footwear

- employment in the TCF sector is further reduced

- exports of TCF products contract and imports increase, but by a much smaller proportion.

Table 4.12 Real exchange rate appreciation — impacts on the TCF industries

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation	
	R	**S4**
Description	*Reference*	*Export price increase*
Tariff level	2015	2015
Budgetary assistance	None	None
Textiles		
Output	-2.764	-5.304
Employment	-3.089	-6.188
Nominal wages	-0.037	6.207
Capital employed	-1.834	-2.785
Nominal rental price of capital	-2.560	-0.631
Domestic sales — local production	-2.998	-4.133
Domestic sales — total	0.000	1.062
Export volume	1.518	-26.691
Import volume	2.542	3.264
Domestic supply price	-0.171	2.619
Import price duty paid	-4.952	-4.952
Clothing		
Output	-5.115	-11.808
Employment	-5.728	-13.462
Nominal wages	-0.036	6.125
Capital employed	-3.694	-7.663
Nominal rental price of capital	-4.200	-6.612
Domestic sales — local production	-6.837	-8.854
Domestic sales — total	0.000	1.062
Export volume	4.226	-27.821
Import volume	6.866	9.647
Domestic supply price	-0.884	2.092
Import price duty paid	-10.117	-10.117
Footwear		
Output	-2.057	-13.787
Employment	-2.484	-16.250
Nominal wages	-0.028	5.735
Capital employed	-1.144	-7.062
Nominal rental price of capital	-2.514	-13.893
Domestic sales — local production	-4.533	-8.950
Domestic sales — total	0.000	1.062
Export volume	0.880	-19.525
Import volume	1.041	1.930
Domestic supply price	-0.114	1.934
Import price duty paid	-2.664	-2.664

Source: Commission estimates based on MMRF simulation results.

Sectoral and jurisdictional results

The consequent increase in demand, and prices, for mineral and energy exports benefits the mining sector and its output increases by over 14 per cent (table C.14). For most other sectors, particularly those that export (and whose international demand has not increased), and the import competing sectors, output decreases. The resulting increase in the GDP deflator (table 4.11) has increased their cost of production, making them less internationally competitive.

The obvious beneficiaries from the increase in demand for mineral and energy exports are Western Australia, Queensland and Northern Territory (table C.17). Although the economies in some states contract (New South Wales, Victoria and Tasmania), all jurisdictions see a small increase in GSP per worker (table C.18).

5   The modelling in perspective

The modelling undertaken in this study provides insights into how changes in assistance to Australia's TCF sector affect individual industries, including those in the TCF sector, and impact upon resource allocation within the broader economy.

As noted earlier, however, modelling exercises of this type have limitations. Outcomes are sensitive to parameter choices and aspects of the particular models used. And factors such as adjustment costs, innovation, technological change and productivity improvements are not integral features of general equilibrium models, and must be considered, where appropriate, in conjunction with modelling when drawing policy insights.

In this chapter, the Commission first discusses the broad messages to emerge from the simulations reported earlier (section 5.1), then examines how incorporating aspects of the model, and various exogenous influences, could affect these findings (sections 5.2 and 5.3). It then draws some implications of the modelling that are relevant when assessing future TCF assistance options (section 5.4).

5.1   High level messages from the simulations

The modelling demonstrates that further reductions in TCF assistance are likely to generate net benefits to the community. The greatest gains, as measured by real adjusted gross national expenditure (GNE), are produced under the reference scenario (scenario R), which is the (current) program of assistance reductions, involving the legislated reduction in tariffs to 5 per cent and removal of subsidies by 2015. The modelling indicates that this program would still yield net gains even when introducing some unusual assumptions about the effect of reducing tariffs on the prices of TCF products and on employment. In these simulations (S2 and S3), the gains in real adjusted GNE are less than those in the reference scenario, but are still positive.

As expected though, the small share of the TCF sector in the Australian economy (0.3 per cent of GDP) and the modest price effects modelled translate into small net benefits in economy-wide terms. Under the reference scenario, for example, the increases in real GDP and real adjusted GNE are $71 million and $63 million per year, respectively. That said, the gains would accrue each year in perpetuity, and are

therefore more sizeable in present value terms (approaching $900 million when calculated with an annual discount rate of 7 per cent). They are also significant in comparison to the assistance afforded the TCF sector.

Moreover, while the net benefits of reducing assistance may be small in economy-wide terms, there would still be significant gains to Australian buyers of TCF products and to taxpayers from reductions in assistance. The Commission estimates that TCF assistance currently involves an annual redistribution of more than $0.5 billion in income from TCF consumers to owners of capital and workers in the TCF sector. Although the precise number of workers in the TCF sector is uncertain, this would equate to a transfer in the order of $10 000 per TCF worker identified in the ABS Labour Force Survey data for 2006-07.[1]

As expected, reducing TCF assistance has differentiated effects at the industry level. The reference scenario involves a contraction of TCF output and employment of around 3 per cent and 4 per cent, respectively. This comprises a 5 per cent reduction in output and 6 per cent reduction in employment in the clothing industry, and contractions of about half this magnitude in the textiles and footwear industries. However, once the economy fully adjusts to reduced TCF assistance, the contraction in the TCF sector is projected to be more than offset by expansion in other industries, particularly food processing and mining.

Reflecting the disproportionate presence of the TCF sector in some States, there are differences in the effects of the simulations across jurisdictions. The reference scenario involves small long-run contractions in economic activity in New South Wales and Victoria, with small increases in activity in other jurisdictions. Importantly, long-run average real wages and State output per worker increase in all jurisdictions under the reference scenario, and in all other simulations involving reductions in TCF tariffs.

Mirroring a finding from the recent automotive study (PC 2008a), the modelling indicates that the impact of changes in assistance on the TCF sector, and indeed the broader economy, would potentially be small relative to other factors affecting the sector. This is reflected in scenario S4, where a commodity boom-induced appreciation of the Australian dollar leads to a significant contraction of activity in the TCF sector — much greater than that projected from assistance reductions —

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[1] As noted in appendix G, recorded TCF employment fluctuates significantly from quarter to quarter and different ABS survey publications contain different employment estimates for TCF. The assistance per worker estimate reported here is based on ABS Labour Force Survey data for 2006-07 — the same year for which the Commission's TCF assistance estimates have been calculated. The Labour Force Survey estimates are higher than those from other ABS surveys, although it is unclear to what extent they capture TCF outworkers. Accordingly, the estimates should be treated as indicating the order of magnitude of TCF assistance per worker, rather than as precise estimates.

and a contraction in several other industries. By extension, the model also indicates that a future exchange rate depreciation of similar size would provoke an expansion in TCF activity that would more than offset the effects of reduced TCF assistance.

The simulations also indicate that TCF subsidies currently impose significantly smaller costs on the community than TCF tariffs. For example, comparison of scenario O1 (involving a reduction in assistance via tariff cuts) and scenario O3 (involving a reduction in assistance via the removal of the SIP and other subsidies) suggests that removal of tariffs produces almost all the potential gains. However, as discussed in chapter 4, the simulations are likely to understate the costs of budgetary assistance to the extent that they do not fully reflect the tax-raising costs entailed in funding such assistance (see also PC 2008a). That means, among other things, that the benefits of scenario O3 are likely to be understated relative to the benefits of the reference scenario.

5.2 How robust are the model specifications and key parameters?

While the Monash Multi-Regional Forecasting (MMRF) model has been supported by referees as suitable for the present task, it is important in modelling exercises of this type to investigate how the results may be affected by changes to key aspects of the model specifications and parameters.

For example, in its recent related study on future automotive assistance (PC 2008a), the Commission examined how allowing for the likelihood of *increasing* returns to scale in automotive (and other) production would affect the results from the model (which is based on a simplifying assumption of *constant* returns to scale). However, while there may be some economies of scale associated particularly with textiles production, in general scale economies in the sector are not nearly as significant as they are in more capital intensive activities such as car assembly. In any case, Australian TCF production is increasingly focussing on smaller and more flexible and differentiated production runs targeting market niches, rather than the mass production of items that might facilitate the attainment of economies of scale. Accordingly, beyond observing that any effects would likely be minor, the Commission has not assessed the effects of relaxing the 'constant returns to scale' assumption in the context of this study.

There are, however, two other aspects of the model specification and parameters that have the potential to affect the simulation results in more significant ways and that warrant explicit consideration:

- export demand elasticities
- tariff preferences under bilateral trade agreements.

Export demand elasticities

As noted in chapter 3, in the MMRF model it is assumed that Australian firms can sell more on world markets only by accepting lower prices. Accordingly, to the extent that policy changes raise the share of resources allocated to export-intensive industries, Australians face a reduction in the average prices of their exports relative to the prices of their imports. These 'terms of trade' effects are reflected in the simulation results reported in chapter 4, and reduce the net benefits associated with reductions in assistance relative to what they would otherwise be.

The simulated terms of trade effects were based on export demand elasticities — which measure the responsiveness of world prices to increases in Australia's exports — set equal to 10 for all commodities.

As in its recent automotive modelling exercise (PC 2008a), the Commission undertook a sensitivity analysis (appendix E) by reducing this parameter to 5 (which is at the lower end of the range typically applied in GE models). This had a limited effect on outcomes generated by the model. As would be expected, the reductions in TCF assistance simulated in the sensitivity analysis result in greater terms of trade losses, although net gains are still derived. Of course, with sufficiently low export elasticity parameters, it should be possible to obtain estimates of net *costs* from reductions in assistance, due to terms of trade effects. (In turn, this provides the 'theoretical' basis for deriving a set of 'optimal' tariffs that exceed zero (box 5.1).)

However, it is highly unlikely that Australia would have such a degree of market power. Rather, for the reasons set out in chapter 3, the Commission considers that the export demand elasticities used in its reference case simulations are a more reasonable representation of the price–quantity trade-off that Australian exporters face in the longer run.

Preferential tariffs

As noted in chapter 3, the tariff scenarios are modelled as changes in the headline Most-Favoured-Nation (MFN) TCF tariff. The change in MFN rates is interpreted to be a measure of the change in the price 'mark-up' created by tariffs.

The calculation abstracts from the effect of preferential tariff rates and concessional arrangements, including those granted in Australia's preferential trade agreements (PTAs) with New Zealand, Singapore, Thailand and the United States, and other preferential arrangements such as those with Canada, Pacific Islands Forum nations (including Fiji), and Papua New Guinea.

These agreements provide for tariff preferences on imports from these countries, subject to meeting the requirements of 'rules of origin'. Under these arrangements most of the tariffs on the TCF products from these countries will be zero by 2015. Textiles imports from these countries currently represent around 16 per cent of total textiles imports; the equivalent percentages for clothing and footwear imports are 7 and 5, respectively.

Box 5.1   Some issues in seeking to devise an 'optimal' tariff

In its related report on modelling automotive assistance (PC 2008a), the Commission pointed out that Australia, as a relatively small part of the world economy, is generally considered to be a 'price taker' in world markets. However, our share of world trade in certain commodities, and in some instances the possibility of taking advantage of seasonal and/or regional variations in demand and supply, may in theory be sufficient to allow the exploitation of 'market power' in those markets by manipulating trade flows.

Were this the case, there would in theory be a set of 'optimal' import tariffs and/or export taxes that exceed zero. These trade taxes would be optimal in the sense that they would facilitate the extraction of 'rents' from foreign suppliers and buyers by restricting flows of imports and exports. Although these taxes would leave Australia's trading partners worse off and generate net costs globally, they could in theory generate net benefits for Australia, outweighing the efficiency costs of the tariff protection.

To exploit any market power Australia might have in commodities markets, the 'first best' policy approach would typically be to tax or otherwise directly control exports of the relevant commodities, such as iron ore, wheat and wool, taking into account developments in international markets.

As the Commission discussed in its recent report on automotive assistance, it has been suggested that tariff protection for the automotive sector could also allow Australia to benefit in this way, as holding resources in the sector would indirectly restrict the expansion of export industries, thereby limiting the terms of trade losses that would entail. In this context, if Australia were assumed to exert sufficient influence over prices received in foreign markets and an economic model was specified accordingly, it should be possible to derive the result that an increase in tariffs (holding all other tariffs constant) would generate a net benefit for Australia. The same argument has been made in relation to TCF.

However, it should also be possible to obtain the same result for an increase in tariffs on any *randomly selected* imported item. Individual tariffs devised on this basis, whether for cars, TCF or other products, are unlikely to be 'optimal'. In practice, seeking to devise optimal tariffs to generate terms of trade gains would be a complex and fraught task. To seek to capitalise on any gains Australia might be able to derive from market power in certain commodity markets through a specific tariff on TCF imports would likely be far from optimal in an economy-wide sense.

Source: PC 2008a

The effects of PTAs on import competition in Australia, and thus on the most appropriate tariff price wedge for use in modelling, depend on the extent to which the partner countries' TCF industries undercut the (tariff-inflated) price of rival imports, and on the volume and patterns of trade between Australia and the partner countries (box 5.2). While an empirical matter, the limited share of imports entering Australia under preference, and the exclusion of China and India at present from preferential agreements, suggests that the impact of existing PTAs may likewise be limited.

Box 5.2   **Effects of PTAs on domestic TCF prices**

The effects of PTAs on import competition in Australia, and thus on the most appropriate tariff price 'mark-up' for use in modelling, would depend on the extent to which the partner country's TCF industry undercuts the (tariff-inflated) price of rival imports.

To the extent that the partner country's industry does not undercut the tariff-inflated price of goods from competing domestic and foreign suppliers, the duty concessions embodied in these PTAs would effectively transfer tariff revenue from the Australian Government to TCF producers with facilities located in the partner countries (for example, Thailand, Fiji and the United States), and not significantly benefit Australian consumers through price reductions in the local market. This would imply that these agreements have little effect on assistance to the domestic TCF industry and, in turn, that little or no adjustment is needed to the modelled net benefits of reducing such assistance.

To the extent, however, that the prices of TCF products in Australia have fallen as a result of these tariff concessions, there would be a case for adjusting the modelling results to reflect these effects. But determining the appropriate adjustment to make would not be straightforward:

- On the one hand, to the extent that the price of imported TCF products in Australia has fallen as a result of these tariff concessions, the 'true' price mark-up on the industry's *outputs* would be lower than represented in the modelling. The industry adjustments to lower tariffs would be commensurately lower.

- On the other hand, lower priced materials such as yarn or fabric also imported under concessional arrangements would reduce the penalty manufacturers of final TCF products pay on their *inputs* as a result of TCF tariffs.

In these circumstances, the use of the MFN tariff rate (rather than the MFN rate deflated to reflect the concessions) to derive price mark-ups in the modelling could have caused some overstatement of assistance to the TCF inputs sector, but either some overstatement or understatement of assistance to producers of final products, depending on trade patterns with the PTA partner countries and which products have borne the price declines.

The Australian Government is currently considering or negotiating further separate preferential trade agreements with Japan, China, Malaysia, India, Indonesia, Korea, the Association of South East Asian Nations (with New Zealand) and the Gulf Cooperation Council. As alluded to above, were Australia to conclude an agreement

that provided preferential treatment for imports from China or India — major sources of TCF products under existing arrangements — this would be expected to place significant downward pressure on local TCF prices, given the competitiveness of production and the multiple manufacturers in each of these countries. On the export side, impacts would depend among other things on the extent of demand for Australian TCF products in those markets, and the margin of preference afforded by the PTA. Taking clothing as an example, Japan is the only country in the top ten export destinations where a PTA is currently being negotiated, but imposes a tariff of only 6.6 per cent on clothing (WTO 2007), suggesting limited additional impact for this product group of prospective PTAs.

5.3 Accounting for 'exogenous' considerations

As noted earlier, factors such as adjustment costs, technological change, and productivity improvements are not integral features of general equilibrium models, and where appropriate must be considered in conjunction with modelling when drawing policy insights.

In the equivalent chapter of its recent report on modelling future automotive assistance (PC 2008a), the Commission discussed the issues of technological and skills spillovers under the heading of 'exogenous factors'. However, as there is little suggestion that such spillovers arise to any significant degree in relation to TCF assistance, these issues have not been separately considered in this chapter. Moreover, as the Commission noted in the automotive assistance study, spillovers are sometimes confused with inter-industry 'linkages'. All industries have such linkages — for example, the food processing industry has linkages with agriculture, transport and wholesaling, just as does the TCF industry. Such linkages are captured in the model and the flow-on 'multiplier' effects of changes in assistance to the TCF sector on other industries are therefore reflected in the simulation results. Importantly, the fact that industries have linkages with many other industries, even 'deep' linkages, does not of itself imply any case for government assistance.

While the Commission therefore has not considered spillover or linkage issues explicitly in this chapter, there are some matters that could influence the economy-wide outcomes from changes in TCF assistance and warrant explicit consideration:

- policy-induced productivity growth

- employment levels and labour adjustment costs

- 'pass through' of tariff cuts to consumers.

As requested by the Green Review, a number of these have been dealt with in the modelling.

Policy-induced productivity growth

Changes in industry productivity are not modelled as an integral part of the MMRF framework. Exogenous 'shocks' can, however, be applied to the model to simulate effects of productivity increases, as was done in some of the sensitivity simulations.

Reductions in industry assistance typically generate pressure for productivity improvements, as firms must adjust to a more competitive environment. Indeed, the evidence suggests that tariff reductions, together with other microeconomic reforms, have spurred significant increases in innovation and productivity in many industries (Shanks and Zheng 2006). To the extent that there are productivity gains not captured in the modelling, the economy-wide benefits of reducing assistance are likely to be higher than suggested in the modelling results. Importantly, were government to reverse previously agreed (and legislated) reductions in tariffs, this could be interpreted within TCF firms as 'taking the pressure off' and result in resistance to further necessary changes to production processes or work arrangements. This could reduce the potential for future productivity increases.

In response to the request from the Green Review, the Commission has modelled scenarios in which an increase in labour and capital productivity in the TCF sector has been assumed to stem from investment induced by the SIP. Unsurprisingly, adding this assumed productivity improvement results in greater gains being obtained under scenario S1 (which involves maintaining the SIP while cutting tariffs, together with increased productivity) than were achieved under scenario O1 (the same simulation without the assumed productivity increase).

However, the Commission considers there is good reason to be cautious about assuming the SIP, at least as presently constituted, would generate such productivity gains. As noted in the 2003 TCF inquiry, it is difficult to assess whether the SIP has encouraged firms to increase investment beyond levels that would have prevailed anyway in response to normal competitive pressures. Further, even if the SIP did bring about increased investment, it does not necessarily follow that labour and capital productivity would increase. This would depend on the nature and efficacy of the investment. Indeed, as noted in 2003, subsidised investment could even result in (or exacerbate existing) overcapacity.

It would need to be demonstrated how the SIP, or any modified subsidy program, generated positive productivity benefits before assumptions of increased productivity could be made with confidence. In practice, the modelling results from productivity changes in simulation S1 could be equally, and perhaps more plausibly, attributed to the reduction in tariffs.

Labour force issues

Aggregate employment levels

As discussed in chapter 3, the size of the labour force in the economy is exogenous to the model, being assumed fixed nationally by occupation. This closure condition is commonly used in general equilibrium modelling exercises examining the long-run effects of policy changes. It reflects the point that the level of aggregate employment in the long run is determined by factors well beyond the scope of industry-specific assistance.

The Commission was also asked to model the effects of TCF assistance reductions on the assumption that:

> … 10 per cent and 30 per cent respectively of the TCF workforce that is otherwise assumed to find employment in other industries as a result of tariff reductions permanently leaves the labour force. That is, model the effect of a reduction in the quantity of employed labour on aggregate output and consumption. (appendix A)

It is important to recognise that the standard employment closure used in the Commission's model does not imply that every person who is displaced from the TCF sector necessarily finds work elsewhere, even in the long run. It is equally consistent with the common phenomenon of 'churning' in the labour market, whereby some people in an industry lose their jobs and become unemployed (or in some cases formally leave the labour force), while some formerly jobless people find work in different industries or regions (or re-enter the labour force) where employment opportunities expand. Thus, even if 30 per cent of displaced TCF workers were to permanently leave the labour force — an unlikely outcome in today's labour market — this would not necessarily result in a reduction in the number of people employed across the economy; nor, therefore, in an associated reduction in aggregate output and consumption.

The 'fixed labour supply' long-run closure condition is used in general equilibrium modelling in part to constrain the expansion in the economy following a modelled policy shock, in order to focus principally on the allocative effects of that shock. Accordingly, with overall labour supply constrained, the benefits of improved resource allocation tend to be reflected (in the labour market) principally in the form of higher real wages in the long run, rather than increases in employment. Were real wages instead held constant in the model and employment levels allowed more scope to adjust, simulations of reductions in assistance could show significant gains in long-run employment levels (and greater gains in total welfare than modelled). This would be at odds with the request to model a reduction in aggregate employment in the long run.

In practice, Australia has experienced significant increases in both real wages and aggregate employment — together with significant changes in the composition of the labour force — since the program of sustained tariff reductions and industry restructuring commenced in the mid-1980s. That said, it would not be appropriate to attribute higher employment specifically to reductions in assistance. As touched on above, long-run employment, unemployment and participation rates typically depend on people's employment preferences in conjunction with macroeconomic and wider labour market conditions and policy settings.

While this means that modelling industry-specific assistance reductions in conjunction with an assumption of long run reductions in employment is of limited relevance for devising industry assistance policies, the Commission undertook sensitivity analysis on the reference scenario with the requested modified employment closures (scenarios S3a and S3b). As expected, the net benefits of TCF assistance reduction under these scenarios are lower than under the reference case. However, even with a reduction in the total labour supply equivalent to 30 per cent of the contraction in the TCF workforce, the planned assistance reductions generate small net gains to the Australian economy in the long run.

Adjustment costs

While bringing net benefits over the longer term, structural adjustment inevitably entails costs for the producers and workers affected. For instance, in some cases retrenched workers may be unable to find new work, or may need to retrain and/or relocate to take up new positions. The modelling results indicate a total net employment reduction in the TCF sector of 4 per cent under the reference scenario. Based on ABS Labour Force Survey data for 2007-08, this percentage change is equivalent to nearly 2000 jobs.

Certain labour market adjustment costs are included in the model. For example, welfare payments, including those related to structural adjustment, are captured in the model's data base, with the modelling reflecting changes in the level of unemployment under each simulation. However, the model does not include the job search costs of affected individuals (though some of these may be partly subsidised under the TCF Structural Adjustment Program or other general labour adjustment programs), nor the earnings loss (net of unemployment benefits) of those who become unemployed, associated with greater unemployment in the short-term.

In its 2003 report, the Commission noted several workforce characteristics relevant to the adjustment process recommended (box 5.3), and potential adjustment costs were a key consideration in establishing a time path for future assistance reductions.

> **Box 5.3   The Commission's 2003 TCF report on adjustment issues**
>
> In its 2003 inquiry, the Commission assessed that certain characteristics of the TCF workforce may impede adjustment:
>
> - despite improvement in skill levels across the sector, many factory-based employees had only industry-specific skills and few formal qualifications
>
> - TCF employees tended to be somewhat older than employees in other manufacturing industries, and female employment was also higher
>
> - many employees had poor English language skills.
>
> The Commission also noted different adjustment prospects for certain groups within the TCF workforce:
>
> - Outworkers were seen as having weaker prospects, given their language skills, education levels, and cultural and family considerations.
>
> - For workers in regional firms, the long term effects of changes in TCF activity would depend on the interplay of several factors, including:
>   – the prospects of individual TCF firms
>   – the degree of dependence on TCF activity in those regions (this was still relatively high in a few regions)
>   – the strength of overall regional growth and employment
>   – job opportunities in neighbouring regions.
>
> *Source*: PC (2003).

While noting these considerations, the Commission was also of the view that much of the impending adjustment in the TCF sector would occur regardless of the assistance regime — global pressures would see some firms fail and others rationalising their production to stay viable. Many within the sector saw threats to their viability in the recent (or any further) appreciation of the Australian dollar, and some firms saw the potential for currency appreciation as a much greater threat than tariff reductions.

Around 17 000 TCF workers are recorded as having left the sector between 2003 to 2007, and a further substantial decline in employment has been recorded in 2008.[2] That is, significant adjustment in the industry has already occurred. During this period, the TCF Structural Adjustment Program, which commenced in July 2005,

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[2] Whereas the ABS Labour Force Survey indicates that TCF employment was almost unchanged in the first quarter of 2008, the most recent quarterly survey indicates that employment in the sector fell from 51 thousand to 38 thousand between February and May 2008. As discussed in appendix G, estimated TCF employment fluctuates significantly over time, with sharp falls in one period typically being followed by significant increases, albeit within a downward overall trend. There have also been recent changes to the survey methodology that might help explain the sharp reduction in TCF employment recorded in the most recent quarterly survey.

has provided support through the Job Network. Yet, as noted in chapter 2, by 18 January 2008, only 822 displaced TCF workers had registered with the network (TCF Review 2008).

The most significant recent development for the adjustment prospects of people leaving the TCF sector has been the substantially stronger labour market — indeed, it is likely that some of the recent reduction in TCF employment has been driven by workers proactively choosing to shift to more attractive jobs. Unemployment has recently been at its lowest rate since the early 1970s and labour force participation is at a post-WWII high. The Secretary of the Treasury, Dr Ken Henry, expressed the current situation in these terms:

> … what we observe in the Australian economy of today … [follows] … a period of sustained success and, as a consequence, labour is in scarce supply. It is because of the intensity of competition for scarce labour that we hear so much about 'skills shortages' these days. (Henry 2006)

Associated with these labour market changes, there is increasing evidence of labour shortages in various industries, including hospitality (AHA 2008) and the tourism sector which is seen as being affected by "economy-wide labour and skills shortages … [including] in areas considered 'unskilled' or 'low skill' as they do not require formal qualifications" (Standing Committee on Employment 2007). This suggests that employment prospects for a range of less skilled workers has strengthened in recent years.

In this environment, workers losing their jobs because of future reductions in assistance are more likely to be re-employed relatively quickly in areas of demand. At a general level, adjustment costs associated with reduced assistance are likely to be significantly lower than anticipated at the time of the 2003 inquiry.

More specifically, the Commission's 2003 inquiry gave particular attention to the adjustment prospects for those employed in regional firms and for outworkers (box 5.3).

Considering the current situation of workers in regional firms, available evidence is that the employment declines in recent years have not had a disproportionate adverse impact on regional TCF employment — indeed, there appears to have been a small redistribution of TCF employment from capital cities to the regions nationally, and specifically in the States of Victoria, Queensland, and South Australia (ABS 2008).

Over the same period, aggregate regional employment has grown strongly, indeed slightly more so than in the capital cities. Based on 2006 Census data, the net effect

is that TCF employment is less than one per cent of total employment in nearly all regions.[3]

The level of post-school qualifications of TCF workers has, in the past, been a consideration for adjustment costs. Recent developments suggest, however, that this may be less significant in the current context. While TCF workers have lower post-school qualifications than others in employment, shortages of unskilled workers in certain industries have emerged or are in prospect, suggesting greater employment opportunities for those without post school qualifications than in the past.

Assuming that future job losses in each jurisdiction due to the legislated assistance reductions (scenario R) are spread between metropolitan and regional employment on a broadly proportional basis, just over 500 jobs in regional TCF firms are estimated to be at stake (based on ABS Labour Force Survey data for 2007-08). Over a decade, this constitutes a tiny fraction of regional employment and job turnover.

Given the relatively minor potential regional job losses, and the strength of the overall economy, including in regional areas, the Commission considers that adjustment costs for this group of TCF workers are no longer a significant additional consideration in assessing the economy-wide effects of assistance reductions.

Finally, it remains unclear how future assistance reductions will affect outworkers. The Textile Clothing and Footwear Union of Australia (TCFUA) has referred to 'many thousand others' of outworkers, and suggested that 'the largest proportion of clothing manufacturing in Australia takes place in the informal sector' (TCFUA 2008, pp. 2, 33). The union explains the relationship between the formal and informal TCF workforces as follows:

> The move to offshore production [since the mid-1990s] has impacted upon the informal sector with an increased demand for a local workforce that can respond quickly to consumer demand and the needs of the local market, particularly in respect of women's wear which changes frequently in style and has a high variability in seasonal demand ... leading to a growth in the informal sector (TCFUA 2008, p. 34)

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[3] The 2006 Census of Population and Housing groups data by statistical division, each of which represents a large, general purpose, regional type geographic area. There are sixty-nine of these regions in Australia, of which only two were recorded as having TCF employment as a proportion of overall employment that is greater than 1 per cent. They are Ovens-Murray (1.6 per cent), and Barwon (1.4 per cent). Other regions where the recorded share of TCF employment is at least 0.5 per cent are Melbourne, Victoria's Central Highlands and Mersey-Lyell (0.8 per cent); Loddon (0.7 per cent) and Sydney, Murray, Goulburn, Gold Coast, Greater Hobart and Tasmania's Southern region (0.5 per cent). For all other regions, the equivalent figure is less than 0.5 per cent. (ABS 2006 Census)

Given this assessment, it is not certain that future reductions in assistance will necessitate increased adjustment by TCF outworkers, and indeed their employment outcomes may be the opposite of those for the formal TCF workforce.

In summary, while the model's estimate of the net benefits of reducing assistance would be lessened by inclusion of those adjustment costs not included in the modelling, they are not likely to materially affect the results, and are likely to be much smaller for each worker displaced than anticipated in 2003.

In comparison, the cost to the Australian community of retaining jobs in the industry is clearly significant. Based on the estimates of TCF assistance and employment in appendix G, and simulation results indicating that removal of tariffs and TCF-specific subsidies is projected to induce a contraction in TCF employment of around 6 per cent, the value of support from the other members of the community for each job thereby retained in the industry would be more than $150 000 per year.

Passing on tariff reductions to consumers

Reflecting a view about retailers with market power not passing on the benefits of tariff cuts to consumers, the Commission was asked to model scenarios where only 10 and 50 per cent respectively of tariff cuts were passed on to consumers in the retail price of TCF products. (Normally MMRF models tariff cuts as being fully passed on.)

Not surprisingly, modelling results showed the benefits of tariff reductions to be lower under this scenario, although they remained positive. However, as noted, the Commission sees such 'pass through' assumptions as an unlikely representation of market realities and therefore not a sound basis for formulating policy.

One basis for the suspicion of incomplete pass-through is that some TCF retailers have increased their margins recently. However, retail margins of TCF products are affected by a number of factors in addition to industry assistance, making it hard to draw conclusions about market power based on them (box 5.4).

More fundamentally, analysis of clothing and footwear prices provides little support for the notion that retailers effectively 'pocket' a significant proportion of the benefits of tariff reductions. In fact, data suggest there was a 'series break' beginning soon after TCF sector assistance reductions commenced in 1988. Previously, retail prices of clothing and footwear tracked the broader CPI, whereas since 1990 — the year after the commencement of the Button TCF Plan — clothing and footwear prices have remained virtually unchanged in nominal terms, while the broader CPI has risen by over 50 per cent (figure 5.1). The lower cost of clothing and

Box 5.4	**Higher retail margins do not necessarily reflect market power**

It is difficult to draw conclusions about market power from changes in retail margins, as they are prone to fluctuations for many reasons, including prevailing economic conditions, exchange rates, ability to pick fashion trends and inventory management.

Supply chain improvements are a particular reason that might allow increases in retail margins, with retailers often cutting out wholesalers and importers. Even in a highly competitive industry, where individual retailers improve their supply chains (or negotiate better terms with suppliers), it is likely that they would be able to keep some of the benefits of this productivity improvement, in the short term, in the form of higher margins. Indeed, it is only the prospect of increasing margins and market share that would encourage firms to invest in more efficient supply chains in the first place. In such circumstances, firms are able to increase margins because the reduction in costs is unique to one firm (a so called 'first mover advantage'). Over time, however, competitive pressures should drive other retailers to similarly improve their supply chains (or negotiate better terms with suppliers) with the benefits being fully passed on to consumers.

In contrast to supply chain improvements, which offer scope for first mover advantages, a tariff cut would cause imported TCF products to become cheaper for *all* retailers. Any retailer failing to pass on the tariff reduction would almost certainly have its prices undercut by competitors.

Figure 5.1   Clothing and footwear prices have fallen in real terms
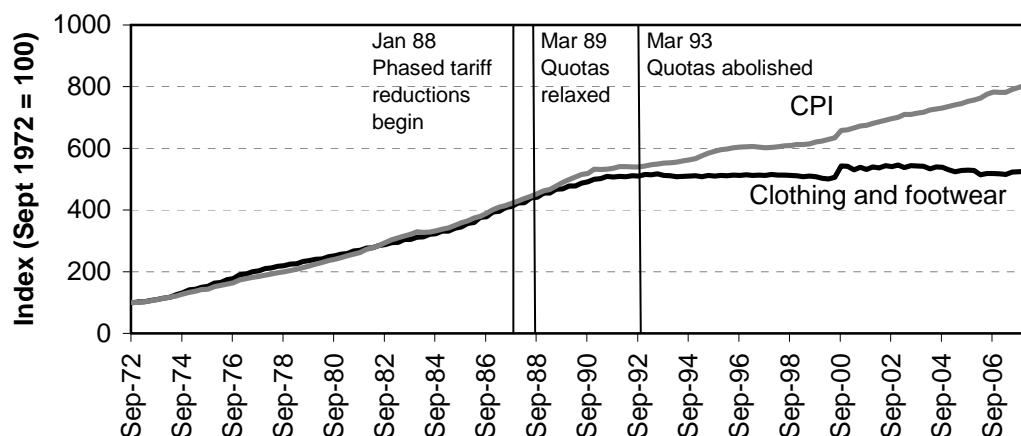
Source: ABS Cat. no. 6401.0.

footwear items will have brought significant benefits to consumers, especially lower income households (for whom expenditure on clothing, as a proportion of income, typically has less of a discretionary element).

Even in competitive markets, cost reductions generally will be shared between producers and consumers, with the eventual price fall determined by relative demand and supply elasticities. The more price sensitive is supply relative to demand, the greater the price fall and output response for a given cost reduction. If supply is highly elastic, prices will fall by the full amount of the cost reduction.

As it is likely that Australia can import more TCF products without driving up their prices (which the modelling also assumes), tariff cuts could be expected to be passed on fully in a competitive retail market. That said, if the wholesale and retail sectors can only expand sales by increasing their unit costs (for example, because of the increasing costs of attracting suitable labour), the eventual absolute price decrease would be somewhat smaller than the full amount of the tariff cut.

As noted in chapter 3, even in the extreme case of a monopoly in the retail (or wholesale) sectors, it would be expected that at least half of the price reduction that would occur under competitive conditions will be passed on to consumers. But monopoly power requires not only a sole supplier, but also one not subject to any threat of competition from a new market entrant — as such a threat would restrain the monopolist's pricing behaviour — making this outcome implausible in practice (and irrelevant to the Australian TCF wholesale or retail sectors).

In practice, the TCF retail trade has many participating firms (box 5.5), and there are few barriers to entering or exiting the business. Moreover, new entrants do not have to provide the full range of products and services of major retailers to generate effective competition. By 'cherry-picking', numerous smaller rivals can constrain prices to competitive levels.

5.4   Summing up on the economy-wide effects

The Commission's modelling suggests that there would be net gains to the Australian community from implementing the current program of reductions in assistance to the TCF sector. The bulk of the benefits would flow from the legislated tariff reductions. While it is anticipated that the TCF sector would decline further, the analysis suggests that the effects would be minor relative to other factors affecting the sector's viability and that the contraction would be more than offset by expansion of other industries. Under options involving smaller reductions in TCF assistance, the community would forgo benefits.

Box 5.5   The retail clothing industry: how competitive?

The Australian retail clothing industry is highly competitive, with few barriers to entry. It is generally suggested major department stores represent around 40 per cent of clothing sales, speciality clothing stores a further 40 per cent and markets and small independent outlets making up the remaining 20 per cent (ANZ Bank 2007). Market concentration may be higher for some TCF products, such as children's wear, than for others but the overall picture is of a highly competitive retail environment.

It is estimated the sector is made up of around 19 000 individual establishments (Lonergan Edwards 2008). One leading industry player has stated:

> The Australian, New Zealand, South African and United States specialty apparel retail markets are highly competitive with a large number of market participants and few barriers to entry. Just Group's concepts compete for both target customers and store locations with a wide range of retail formats including local, national and international specialty apparel retail chains, full service national department stores, discount department stores and single store operations. (Just Group 2008, p.47)

Many of the smaller players typically choose to operate within a particular market niche to limit price competition with major department stores. There are also differences in service levels between stores. In other words, there is some product differentiation and competition is not limited to price. Even so, there would be many close substitutes for these somewhat differentiated TCF products and, in view of competitive pressures, the Commission would still expect full or considerable passing on of tariff reductions to consumers. Only in markets for rare TCF products (without close substitutes) would the argument that tariff reductions may not be fully reflected in consumer prices seem to have any plausibility. But in markets where price competition is muted, a tariff would have little or no protective effect anyway.

The Commission is of the view that consideration of factors not directly incorporated in the modelling does not alter these conclusions. The competitive nature of the TCF sector should ensure that the benefits of tariff reductions are passed on to consumers in the form of lower prices (and modelling shows there would be benefits of tariff reductions even if they were not). Strengthened labour market prospects since 2003 should ensure that future adjustment costs are significantly lower than anticipated when the post-2005 assistance arrangements were originally announced. And, in the Commission's view, further productivity gains are more likely to occur if planned reductions in assistance proceed.

While the recent appreciation of the Australian dollar has added to competitive pressures on local TCF manufacturers, and possibly threatened the viability of some, these same pressures apply to all trade-exposed sectors. As the Commission noted in its recent report on future automotive assistance, the economy and community as a whole are best served by allowing resources to move to their most highly valued uses; not, typically, by holding resources in activities that are viable

only with assistance. Indeed, the modelling demonstrates that seeking to resist such adjustment pressures through continued TCF assistance would have costs for the economy.

A   Study request

The request for this study came in the form of a letter to the Productivity Commission's Chairman from the Assistant Treasurer, the Hon. Chris Bowen MP, agreeing to a request from Professor Roy Green that the Commission undertake modelling of specific future assistance options for the TCF industry.

This appendix includes both the letter from the Assistant Treasurer and that from Professor Green, which accompanied it, outlining the policy options to be modelled.

The Hon Chris Bowen MP
Assistant Treasurer
Minister for Competition Policy and Consumer Affairs

2 2 MAY 2008

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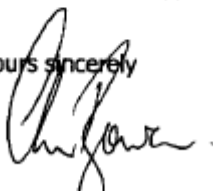
Dear Mr Banks

I am writing to convey my agreement to a request from the Head of the Review of Australia's TCF Industries (the review), Professor Roy Green, for the Productivity Commission to provide modelling assistance to the review, pursuant to Section 20 of the *Productivity Commission Act 1998*.

I ask that the Commission undertake modelling and sensitivity analysis of the economy-wide effects of future assistance options as suggested by Professor Green in his letter, a copy of which I have enclosed for your information. The Commission should feel free to consult with the review secretariat directly to discuss the details of the task and I have notified Professor Green of this accordingly.

I note that Professor Green has requested the opportunity to discuss the presentation of the modelling results with the Commission. I understand that Professor Green and representatives of his secretariat will be invited by the Commission, along with independent referees and Treasury representatives, to take part in the technical workshop on this topic. In keeping with the Commission's charter, the final content and structure of the Commission's report is entirely its responsibility.

I ask that the Commission report to the Government with its findings by the end of June 2008. The Commission's report should be made public at that time.

Yours sincerely

CHRIS BOWEN

enc.

cc: Treasurer; Minister for Innovation, Industry, Science and Research

The Hon Chris Bowen MP
Assistant Treasurer
Minister for Competition Policy and
Consumer Affairs
PO Box 6022
Parliament House
CANBERRA ACT 2600

Dear Assistant Treasurer

On 8 March 2008 the Minister for Innovation, Industry, Science and Research,
Senator the Hon Kim Carr, announced a comprehensive review of the Australian
Textile, Clothing and Footwear (TCF) industries. Senator Carr announced that I
would conduct the review.

In announcing the Review, Senator Carr noted that the Government would separately
request the Productivity Commission to undertake modelling on economy-wide
effects of future assistance options, and that this would be released publicly to help
inform the examination of the industry and the Government's deliberations in this
area.

As such, I am writing to inform you of the policy options that I would like the
Government to ask the Productivity Commission to model. The policy options cover
a number of scenarios from changes to tariff protection on TCF lines, to changing the
type and amount of Government assistance.

At the outset, I would like the base-case scenario to be the current TCF industry
support arrangements. Thus the base case for tariff reductions is:

	2005	2010	2015
Clothing and finished textiles	17.5%	10.0%	5.0%
Cotton sheeting and fabrics	10.0%	5.0%	5.0%
Sleeping bags, table linen	7.5%	5.0%	5.0%
Carpet	10.0%	5.0%	5.0%
Footwear	10.0%	5.0%	5.0%
Footwear Parts	7.5%	5.0%	5.0%
Other (eg yarns, leather)	5.0%	5.0%	5.0%

The base case scenario would also include the current tariff arrangements under Australia's negotiated Free Trade Agreements and would also include the current five programs and tariff pause announced under the TCF Post-2005 Assistance Package.

In addition to the base case outlined above, we request that the Productivity Commission model the following scenarios.

1. Maintaining the current schedule of tariff cuts and discontinuing the current TCF Post-2005 support arrangements on 1 January 2010.
2. Maintaining the current schedule of tariff cuts and introducing a new assistance package at the level of the current TCF Post-2005 support arrangements.
3. Maintaining the current tariff arrangements at 2005 levels (i.e. tariff freeze) but discontinuing the current TCF Post-2005 support arrangements on 1 January 2010 (as it is a structural adjustment measure).
4. Maintaining the current tariff arrangements at 2005 levels (i.e. tariff freeze) and introducing a new assistance package at the level of the current TCF Post-2005 support arrangements.
6. Reducing Clothing and Finished Textiles tariff lines to 10 per cent, the remaining tariff lines to 7 per cent (excluding the Other category which would remain at 5 per cent) on 1 January 2010 and introducing a new assistance package at the level of the current TCF Post-2005 support arrangements.
7. Maintaining the base-case scenario but increasing the exchange rate to $A/$US parity.

We believe it is important for the modelling to include specifications that will enable the Review to consider features of the industry and impacts of policy settings that may emerge from analysis conducted during the Review. This will enhance the value of the modelling to the Review's deliberations. In addition to your standard assumptions, we request that in modelling the scenarios above, the Productivity Commission include a sensitivity analysis which:

a) Assumes that the pass through of tariff reductions to consumers is less than 100 per cent by also modelling a 50 per cent and 10 per cent pass through of tariff reductions to consumers. That is, model the situation in which some of the gains from tariff reductions are retained by retailers rather than passed on to consumers.
b) Assumes that the impact of the provision of assistance to the TCF industries delivers increased innovation, and in turn increases in labour and capital productivity by 0.5 per cent above trend and 1.5 per cent above the economy wide trend increases.
c) Assumes that 10 per cent and 30 per cent respectively of the TCF workforce that is otherwise assumed to find employment in other industries as a result of tariff reductions permanently leaves the labour force. That is, model the effect of a reduction in the quantity of employed labour on aggregate output and consumption.

The specifications outlined above will provide the review with important additional information to that which would be provided by a modelling analysis based on the conventional assumptions of 100 per cent pass through, zero percent productivity gains from assistance and full employment. The ability to analyse the impact of these

assumptions against the conventional assumptions will significantly assist the Review.

We would appreciate the opportunity to discuss the presentation of the modelling results to ensure that the variables of most interest to the Review, including the impact of alternative policy options on different regions in Australia, are presented, and contextualised, in the manner best suited to our Review.

I have no objection to the Productivity Commission publicly releasing this letter or the letter from you tasking the PC with modelling the economic effects of the different policy options.

Thank you for the opportunity to provide input on this modelling which will help develop effective strategies to ensure Australia's TCF industries will be vibrant, innovative and competitive well into the future.

Yours sincerely

Professor Roy Green
Reviewer
Review of Australia's TCF Industries

7 May 2008

cc   Senator the Hon Kim Carr
       Minister for Innovation, Industry, Science and Research
       Parliament House
       CANBERRA ACT 2600

cc   The Hon Wayne Swan MP
       Treasurer
       PO Box 6022
       House of Representatives
       Parliament House
       CANBERRA ACT 2600

B Summary of referee comments

The modelling in this report benefited from comments by three referees at a *work-in-progress* technical workshop on 28 May 2008, and in subsequent referee reports. The referees were Philip Adams, (Director at the Centre of Policy Studies at Monash University), David Pearce (Director at the Centre for International Economics) and John Zeitsch (Concept Economics). The referee reports are available on the Commission's website (www.pc.gov.au).

Other participants at the workshop included representatives of the TCF Review and Secretariat, the Australian Government Treasury, and the Department of Innovation, Industry, Science and Research.

Set out in this appendix is a summary of comments received from workshop participants and the referees' reports, as well as the Commission's responses.

The structure of this appendix is organised thematically around the key issues discussed — appropriateness of the model (B.1), features of the model (B.2) and modelling of the requested scenarios (B.3).

B.1 Appropriateness of the model

Referees agreed that the choice of the Monash Multi-Regional Forecasting (MMRF) was appropriate for the study. As with the Commission's recent automotive study, discussion at the workshop centred on the choice of comparative static rather than dynamic modelling.

Referees agreed the choice of comparative static modelling was appropriate, particularly in view of the time constraints faced by the Commission. It was suggested, however, that the Commission needed to note the limitations of using the comparative static approach. These include not having a time dimension and, therefore, no explicit dating of policy scenarios or economy-wide outcomes, no 'satisfactory' theory of investment over time, and no explicit allowance in the base case for known events occurring now or in the near future. It was also suggested that use of comparative static modelling meant that care should be used in reporting results in the absence of a time dimension.

Response

The Commission agrees the clearest disadvantage of a comparative static approach is that it cannot be used to simulate the timing of policy changes and how their economy-wide impacts unfold over time. However, a comparative static model was seen as preferable for this study for the following reasons:

- Economy-wide impacts are likely to be relatively small in the long run. Therefore, focussing on the long-term implications of changes in assistance, after the economy has fully adapted to the changes, is likely to be of greatest benefit to policy makers.

- In view of time constraints, use of a comparative static version of MMRF enabled the Commission to avoid the issues associated with calibrating and projecting a base case for the economy as a whole, and for the TCF sector in particular. The Commission was therefore able to devote more time and effort to calibrating the model and the TCF sector to data available for 2005-06. Having an analysis based on recent data was an important priority.

- Use of comparative static modelling reduces the complexity involved in setting up the policy scenarios in the model, and the time taken to run the model and extract the results. The Commission was therefore better able to concentrate on the different impacts at the jurisdictional and industry level of the large number of scenarios that are required to be simulated for this study. The more efficient use of time also enabled the Commission to focus on addressing issues arising in the implementation of the large number of scenarios.

B.2   Features of the model

Calibration of the model database and the TCF sectors

There was some concern expressed at the workshop that the database in the model did not match closely with some ABS manufacturing data for the TCF sector in 2005-06, such as the values for labour, capital and intermediate input costs. Referees did not, however, necessarily see this as being likely to significantly affect the modelling results.

Response

The database for the TCF sector was recalibrated to the data available for 2005-06. Adjustments were made relating to labour, capital, intermediate input costs, and the imported value of TCF commodities.

Export demand elasticities

There was some discussion about the magnitudes of the price elasticities of demand used for export commodities. The Commission used an elasticity of 10 (strictly minus 10) for this study. This compares with 20 used by the Commission for the National Reform Agenda report. In modelling performed for the Commission's 2003 TCF inquiry, EconTech used an export demand elasticity of 12 and the Centre of Policy Studies used 5.

The parameter is important because it influences the magnitude of the welfare effects of tariff reductions (by determining the terms of trade changes as a consequence of export increases resulting from tariff reductions). It was agreed at the workshop that there are a range of views about the appropriate choice of this parameter. Higher elasticities (as used in this study) were considered plausible by referees because examination of data on international trade flows suggests that trade flows are more flexible than generally perceived. That said, referees saw it as important to undertake sensitivity analysis of this parameter, and to explain its significance to the results obtained.

Response

A detailed discussion of issues surrounding the Commission's choice of demand elasticities is contained in chapter 3. As in the recent automotive study, a sensitivity analysis has been performed for this study with a lower export demand elasticity and the results are reported in appendix E.

Model closure

One of the referees highlighted the importance of discussing the impact of the model closure on results. One issue discussed was the manner in which the closure impacts on indicators of welfare, such as private consumption, government consumption and gross national expenditure (GNE).

Moreover, workshop participants thought that it was important to report modelling results against an explicit welfare measure. In the absence of such a measure, there was concern readers of the report may use gross domestic product as a proxy welfare measure, which was seen as inappropriate. GNE was not considered ideal as it included foreign investment.

Response

The approach adopted in this study is consistent with that adopted in the automotive study. To address issues associated with indicators of welfare, the Commission adjusts GNE for the effect of foreign ownership of Australia's capital stock, as set out in chapter 3.

Modelling budgetary assistance programs

Production or capital subsidy?

Opinion was divided as to whether the budgetary assistance programs should be modelled as production subsidies or capital subsidies. One referee supported the Commission's approach of modelling the programs as a production subsidy, and another saw it as a 'reasonable approximation'. One referee argued that the nature of the budgetary assistance programs could cause a substitution of capital for labour. This, he argued, could result in production efficiency losses that would not be captured when budgetary assistance is modelled as a production subsidy.

The guidelines for the largest budgetary assistance program, the Strategic Investment Program (SIP), state that the subsidies are for the construction of plant and for research and development. On the other hand, type 1 SIP grants are also available for more general expenses, including non-production related IT and participation in trade shows and in-store promotions. Type 2 grants are also available for expenditure such as market research and obtaining industrial property rights.

Response

Given that budgetary assistance is available for a range of projects, not just capital expenditure, the Commission considered it preferable to model it as a general production subsidy. This approach is consistent with that used previously in similar exercises.

Other budgetary assistance issues

Workshop participants also questioned whether the Commission had missed reporting some smaller budget programs in its *work-in-progress* results, and whether modelling of grants under the SIP should take account of these grants being subject to income tax.

Response

All TCF specific budgetary measures have been incorporated into the modelling except Job Network related payments. Subsidies provided have been adjusted to after-tax amounts using the company tax rate of 30 per cent, which assumes that company profits exceed the value of the grants.

Equivalent annual values

One of the referees suggested converting SIP payments over the 10 year period to their equivalent annual value, believing the Commission's approach otherwise underestimated the value of the assistance, which is predominately provided in the earlier years of the scheme.

Response

This does not seem to be valid when using a comparative static model that is itself not an equivalent annual model. The CGE model is based on the economy in 2005-06, and is not based on what the economy will look like on average over the next 10 or 20 years.

Converting the payments to equivalent annual values would lead to scenarios that are not recognisable in terms of proposed assistance levels relevant to a comparative static model based on the economy of 2005-06. Further, were budgetary assistance payments converted to equivalent annual values, to be consistent the calculation of discount weighted average tariffs would also be required. No one suggested that tariff scenarios should be constructed in this manner.

Level of disaggregation

One referee noted the decision to disaggregate the TCF sector into only three separate industries (textiles, clothing and footwear) could understate the economy-wide effects based on a more disaggregated industry and commodity structure. Therefore the model would not fully capture the resource allocation effects of tariff reductions.

It was agreed, however, that these impacts would be small.

Response

As noted in chapter 3, the Commission chose this level of aggregation because of the trade-off between the quality and usefulness of more disaggregated data and because of the limited time available to calibrate such models. Aggregated data are of higher quality because they can be matched with available ABS data. Alternatively, more disaggregated industry data provide more detail and potentially lead to higher estimates of economy-wide impacts, but reduce reliability because of the numerous assumptions often required to apportion (top down) ABS data into more narrowly defined industries. The Commission also notes referees agreed that the negative impact of choosing higher levels of aggregation on the modelling is likely to be small.

Reporting of results

There was agreement at the workshop that the economy-wide story regarding the impact of assistance is harder to understand when modelling results are presented in percentage change form. Referees suggested it would assist readers understanding of the analysis if results were also reported in dollar amounts.

Response

The Commission has reported economy-wide results in dollar amounts, in addition to reporting percentage changes for more detailed variables at the sectoral and jurisdictional level.

B.3   Modelling the requested scenarios

Retail pass-through of reductions in tariffs

There was broad agreement that the best way to model the partial pass through of tariff reductions by retailers was to treat the proportion of the tariff reduction retained by retailers as a monopolistic rent accruing to retailers, which is paid to the owners of capital.

Some referees questioned the plausibility of the scenario, stating that they did not consider retailers would have the degree of market power needed to achieve the level of pass through set out in the modelling request.

Response

In line with the considerations at the workshop, the Commission has modelled the reduction in pass through as a monopolistic mark-up. The Commission shares the view of referees that the ability of, or even the incentive for, retailers to 'pocket' tariff reductions is very limited. The issue is discussed further in chapters 3 and 5.

Exchange rate scenario

As in the Commission's recent automotive study, the request to model an exchange rate appreciation (achieving parity between the Australian and United States dollars) was modelled using an increase in the demand for, and therefore prices of, Australian exports as a proxy. This is because the MMRF model cannot be used to simulate changes in bilateral exchange rates. It contains just one exchange rate — a real exchange rate between Australia and the 'rest of the world'.

Referees generally accepted the Commission's approach. It was suggested it was important to clearly articulate the difference between the real exchange rate modelled here and an appreciation of the nominal exchange rate.

Response

A discussion about nominal exchange rates and our simulation of the real exchange rate appreciation, driven by increasing international demand for mining commodities, has been included in chapter 3.

C   Additional results

This appendix contains additional results for the main simulations presented in chapter 4. The appendix is divided into 5 sections:

- The first contains additional results for the reference case scenario, as well as options O1, O2, O3. The tables include results for jurisdictional employment, and GSP.

- The second contains additional results for the scenarios in which labour and capital productivity was improved. The tables include sectoral results, jurisdictional employment, GSP and GSP per worker.

- The third contains additional results for the scenarios in which the pass through of prices to consumers was reduced. The tables include sectoral results, jurisdictional employment, GSP and GSP per worker.

- The fourth contains additional results for the scenarios in which displaced TCF workers increased the permanent rate of unemployment. The tables include sectoral results, jurisdictional employment, GSP and GSP per worker.

- The final section contains additional results for the scenario in which the real exchange rate appreciation was examined. The tables include sectoral results, jurisdictional employment, GSP and GSP per worker.

C.1   Main option results

Presented in tables C.1 and C.2 are additional results for the main option scenarios (R, O1, O2 and O3) in addition to those presented in chapter 4.

Table C.1   Main option results — jurisdictional change in employment

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	*O1*	*O2*	*O3*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Alternative tariff rates, maintain budgetary assistance*	*Maintain tariffs, remove budgetary assistance*
Tariff level	2015	2015	10%, 7%, 5%[a]	2005
Budgetary assistance	None	2005 level	2005 level	None
New South Wales	-0.023	-0.016	-0.009	-0.006
Victoria	-0.034	-0.013	-0.007	-0.021
Queensland	0.037	0.027	0.016	0.010
South Australia	-0.008	-0.016	-0.009	0.008
Western Australia	0.087	0.043	0.024	0.044
Tasmania	-0.005	-0.015	-0.008	0.010
Northern Territory	0.017	-0.015	-0.009	0.032
ACT	0.003	0.011	0.007	-0.008

Source: Commission estimates based on MMRF simulation results.

Table C.2   Main option results — jurisdictional change in real GSP

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	*O1*	*O2*	*O3*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Alternative tariff rates, maintain budgetary assistance*	*Maintain tariffs, remove budgetary assistance*
Tariff level	2015	2015	10%, 7%, 5%[a]	2005
Budgetary assistance	None	2005 level	2005 level	None
New South Wales	-0.019	-0.011	-0.006	-0.008
Victoria	-0.029	-0.007	-0.003	-0.022
Queensland	0.043	0.034	0.020	0.009
South Australia	-0.006	-0.011	-0.006	0.005
Western Australia	0.102	0.057	0.032	0.046
Tasmania	0.004	-0.005	-0.002	0.009
Northern Territory	0.026	-0.006	-0.003	0.032
ACT	-0.001	0.010	0.007	-0.011

Source: Commission estimates based on MMRF simulation results.

C.2 Improving labour and capital productivity

Presented in tables C.3 to C.6 are additional results for the sensitivity scenarios in which labour and capital productivity was improved relative to the reference case (R, O1, S1a and S1b).

Table C.3 Productivity improvement — sectoral changes in output
Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	*O1*	*S1a*	*S1b*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Productivity improvement (1.5 per cent)*	*Productivity improvement (0.5 per cent)*
Tariff level	2015	2015	2015	2015
Budgetary assistance	None	2005 level	2005 level	2005 level
Agriculture	0.020	0.013	0.012	0.013
Mining	0.080	0.049	0.036	0.045
Food processing	0.052	0.037	0.028	0.034
Manufacturing	-0.072	-0.063	-0.041	-0.056
Services	0.005	0.007	0.013	0.009

Source: Commission estimates based on MMRF simulation results.

Table C.4 Productivity improvement — change in employment
Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation			
	R	*O1*	*S1a*	*S1b*
Description	*Reference case*	*5% tariffs, maintain budgetary assistance*	*Productivity improvement (1.5 per cent)*	*Productivity improvement (0.5 per cent)*
Tariff level	2015	2015	2015	2015
Budgetary assistance	None	2005 level	2005 level	2005 level
New South Wales	-0.023	-0.016	-0.012	-0.015
Victoria	-0.034	-0.013	-0.009	-0.011
Queensland	0.037	0.027	0.027	0.027
South Australia	-0.008	-0.016	-0.015	-0.016
Western Australia	0.087	0.043	0.019	0.035
Tasmania	-0.005	-0.015	-0.018	-0.016
Northern Territory	0.017	-0.015	-0.026	-0.018
ACT	0.003	0.011	0.020	0.014

Source: Commission estimates based on MMRF simulation results.

Table C.5 **Productivity improvement — change in real GSP**

Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | | |
| | R | O1 | S1a | S1b |
Description	Reference case	5% tariffs, maintain budgetary assistance	Productivity improvement (1.5 per cent)	Productivity improvement (0.5 per cent)
Tariff level	2015	2015	2015	2015
Budgetary assistance	None	2005 level	2005 level	2005 level
New South Wales	-0.019	-0.011	0.000	-0.007
Victoria	-0.029	-0.007	0.007	-0.002
Queensland	0.043	0.034	0.037	0.035
South Australia	-0.006	-0.011	-0.004	-0.009
Western Australia	0.102	0.057	0.035	0.049
Tasmania	0.004	-0.005	-0.002	-0.004
Northern Territory	0.026	-0.006	-0.015	-0.009
ACT	-0.001	0.010	0.022	0.014

Source: Commission estimates based on MMRF simulation results.

Table C.6 **Productivity improvement — change in real GSP per worker**

Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | | |
| | R | O1 | S1a | S1b |
Description	Reference case	5% tariffs, maintain budgetary assistance	Productivity improvement (1.5 per cent)	Productivity improvement (0.5 per cent)
Tariff level	2015	2015	2015	2015
Budgetary assistance	None	2005 level	2005 level	2005 level
New South Wales	0.004	0.005	0.011	0.007
Victoria	0.005	0.006	0.016	0.009
Queensland	0.006	0.007	0.010	0.008
South Australia	0.003	0.005	0.011	0.007
Western Australia	0.016	0.014	0.015	0.014
Tasmania	0.009	0.010	0.016	0.012
Northern Territory	0.009	0.009	0.011	0.010
ACT	-0.003	-0.001	0.003	0.000

Source: Commission estimates based on MMRF simulation results.

C.3 Partial pass through of tariff reductions

Presented in tables C.7 to C.10 are additional results for the sensitivity scenarios in which pass through to consumers was reduced, relative to the reference case (R, S2a and S2b).

Table C.7 Partial pass through — sectoral changes in output
Percentage change relative to the base case (assistance levels in 2005-06)

| | *Simulation* | | |
| | *R* | *S2a* | *S2b* |
Description	*Reference case*	*Partial pass through of 10 per cent*	*Reduced pass through of 50 per cent*
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
Agriculture	0.020	0.018	0.018
Mining	0.080	0.075	0.077
Food processing	0.052	0.046	0.048
Manufacturing	-0.072	-0.041	-0.055
Services	0.005	0.003	0.004

Source: Commission estimates based on MMRF simulation results.

Table C.8 Partial pass through — change in employment
Percentage change relative to the base case (assistance levels in 2005-06)

| | *Simulation* | | |
| | *R* | *S2a* | *S2b* |
Description	*Reference case*	*Partial pass through of 10 per cent*	*Reduced pass through of 50 per cent*
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
New South Wales	-0.023	-0.014	-0.018
Victoria	-0.034	-0.032	-0.033
Queensland	0.037	0.018	0.026
South Australia	-0.008	-0.007	-0.007
Western Australia	0.087	0.092	0.090
Tasmania	-0.005	-0.010	-0.008
Northern Territory	0.017	0.041	0.030
ACT	0.003	-0.014	-0.007

Source: Commission estimates based on MMRF simulation results.

Table C.9 Partial pass through — change in real GSP

Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | |
| | R | S2a | S2b |
Description	Reference case	Partial pass through of 10 per cent	Reduced pass through of 50 per cent
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
New South Wales	-0.019	-0.013	-0.016
Victoria	-0.029	-0.029	-0.029
Queensland	0.043	0.024	0.032
South Australia	-0.006	-0.005	-0.005
Western Australia	0.102	0.105	0.104
Tasmania	0.004	-0.002	0.000
Northern Territory	0.026	0.044	0.036
ACT	-0.001	-0.022	-0.012

Source: Commission estimates based on MMRF simulation results.

Table C.10 Partial pass through — change in real GSP per worker

Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | |
| | R | S2a | S2b |
Description	Reference case	Partial pass through of 10 per cent	Reduced pass through of 50 per cent
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
New South Wales	0.004	0.001	0.002
Victoria	0.005	0.003	0.004
Queensland	0.006	0.006	0.006
South Australia	0.003	0.002	0.002
Western Australia	0.016	0.013	0.014
Tasmania	0.009	0.008	0.008
Northern Territory	0.009	0.003	0.006
ACT	-0.003	-0.008	-0.006

Source: Commission estimates based on MMRF simulation results.

C.4 Permanent decrease in employment

Presented in tables C.11 to C.14 are additional results for the sensitivity scenarios in which there was a decrease in permanent employment, relative to the reference case (R, S3a and S3b).

Table C.11   Displaced workers — sectoral changes in output
Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | |
| | R | S3a | S3b |
Description	Reference case	Displaced workers (30 per cent)	Displaced workers (10 per cent)
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
Agriculture	0.020	0.017	0.019
Mining	0.080	0.072	0.077
Food processing	0.052	0.048	0.050
Manufacturing	-0.072	-0.078	-0.074
Services	0.005	0.000	0.003

Source: Commission estimates based on MMRF simulation results.

Table C.12   Displaced workers — change in employment
Percentage change relative to the base case (assistance levels in 2005-06)

| | Simulation | | |
| | R | S3a | S3b |
Description	Reference case	Displaced workers (30 per cent)	Displaced workers (10 per cent)
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
New South Wales	-0.023	-0.027	-0.024
Victoria	-0.034	-0.037	-0.035
Queensland	0.037	0.030	0.034
South Australia	-0.008	-0.013	-0.010
Western Australia	0.087	0.081	0.085
Tasmania	-0.005	-0.011	-0.007
Northern Territory	0.017	0.010	0.015
ACT	0.003	-0.002	0.001

Source: Commission estimates based on MMRF simulation results.

Table C.13 **Displaced workers — change in real GSP**

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation		
	R	S3a	S3b
Description	Reference case	Displaced workers (30 per cent)	Displaced workers (10 per cent)
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
New South Wales	-0.019	-0.024	-0.021
Victoria	-0.029	-0.032	-0.030
Queensland	0.043	0.036	0.041
South Australia	-0.006	-0.010	-0.007
Western Australia	0.102	0.096	0.100
Tasmania	0.004	-0.002	0.002
Northern Territory	0.026	0.019	0.023
ACT	-0.001	-0.007	-0.003

Source: Commission estimates based on MMRF simulation results.

Table C.14 **Displaced workers — change in real GSP per worker**

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation		
	R	S3a	S3b
Description	Reference case	Displaced workers (30 per cent)	Displaced workers (10 per cent)
Tariff level	2015	2015	2015
Budgetary assistance	None	None	None
New South Wales	0.004	0.003	0.003
Victoria	0.005	0.005	0.005
Queensland	0.006	0.006	0.006
South Australia	0.003	0.003	0.003
Western Australia	0.016	0.016	0.016
Tasmania	0.009	0.009	0.009
Northern Territory	0.009	0.008	0.008
ACT	-0.003	-0.004	-0.004

Source: Commission estimates based on MMRF simulation results.

C.5 Real appreciation of the exchange rate

Presented in tables C.15 to C.18 are additional results for the sensitivity scenario in which the export price of mining commodities was increased, relative to the reference case (R and S4).

Table C.15 Real exchange rate appreciation — sectoral changes in output
Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation	
	R	S4
Description	Reference case	Export price increase
Tariff level	2015	2015
Budgetary assistance	None	None
Agriculture	0.020	-1.557
Mining	0.080	14.029
Food processing	0.052	-3.212
Manufacturing	-0.072	-4.125
Services	0.005	0.800

Source: Commission estimates based on MMRF simulation results.

Table C.16 Real exchange rate appreciation — change in employment
Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation	
	R	S4
Description	Reference case	Export price increase
Tariff level	2015	2015
Budgetary assistance	None	None
New South Wales	-0.023	-2.692
Victoria	-0.034	-5.344
Queensland	0.037	3.506
South Australia	-0.008	-4.212
Western Australia	0.087	16.297
Tasmania	-0.005	-0.681
Northern Territory	0.017	13.031
ACT	0.003	0.648

Source: Commission estimates based on MMRF simulation results.

Table C.17   Real exchange rate appreciation — change in real GSP

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation	
	---	---
	R	S4
Description	Reference case	Export price increase
Tariff level	2015	2015
Budgetary assistance	None	None
New South Wales	-0.019	-1.825
Victoria	-0.029	-4.669
Queensland	0.043	4.751
South Australia	-0.006	-3.499
Western Australia	0.102	18.761
Tasmania	0.004	-0.407
Northern Territory	0.026	14.318
ACT	-0.001	1.191

Source: Commission estimates based on MMRF simulation results.

Table C.18   Real exchange rate appreciation — change in real GSP per worker

Percentage change relative to the base case (assistance levels in 2005-06)

	Simulation	
	---	---
	R	S4
Description	Reference case	Export price increase
Tariff level	2015	2015
Budgetary assistance	None	None
New South Wales	0.004	0.867
Victoria	0.005	0.676
Queensland	0.006	1.245
South Australia	0.003	0.713
Western Australia	0.016	2.465
Tasmania	0.009	0.274
Northern Territory	0.009	1.287
ACT	-0.003	0.543

Source: Commission estimates based on MMRF simulation results.

D Modifying the database and incorporating assistance

This appendix sets out the processes involved in updating the base year of the database in the MMRF model, and incorporating the tariff options and budgetary assistance in the modelling.

D.1 Updating the database

The MMRF database used in this study was updated from 2001-02 to 2005-06 by the Centre of Policy Studies at Monash University and involved the following four steps (figure D.1):

First, the 2001-02 ABS national input–output table for 109 industries was converted to a 172-sector database to be consistent with a simple general equilibrium (GE) model of the Australian economy (ORANI). This produced a national database with a structure that is broadly consistent with that of the regional database used in the MMRF model.

Second, industry value-added and trade flows were updated to those for 2005-06, using ABS national accounts and trade data.

Third, the updated national database was disaggregated into 59 statistical divisions, using:

- 2006 Census data on employment by industry to apportion the size of the 172 industries in each statistical division

- 2002 Household Expenditure Survey and 2006 Census data to apportion household consumption in each statistical division

- trade data from 49 ports to apportion international trade flows to each jurisdiction

- a gravity model to infer inter-regional trade flows.

This updating process produced a highly disaggregated database used in TERM, a model typically used in studies requiring a detailed geographical representation of parts of Australia. To the extent that data allow, key aspects of the database — such

as household consumption, government spending and value added by industry — are calibrated to the regional accounts (further details are found in Horridge et al. (2005)).

Fourth, the regions and industries in the TERM database were then aggregated to generate the final MMRF database. For regions, this was done to the State/Territory level. For industries, it was done to the industry aggregation specified for this study — that is, 60 industries.

Figure D.1   Stages in updating an MMRF database to 2005-06

Stages	Regions	Industries
ABS 2001	1	109
⬇		manufacturing, agriculture and service industries were disaggregated
ORANI G	1	172
⬇		no change
2005-2006	1	172
⬇	statistical divisions were disaggregated	mining and services were aggregated
TERM	59	144
⬇	State and Territories were aggregated	some industries were aggregated
MMRF	8	60

Source: Glyn Wittwer, Centre of Policy Studies, Monash University, pers. comm., 8 May 2008.

D.2   Implementing tariff options

There were four tariff options examined in the modelling:

- the (current) 2005 tariff schedule

- the legislated 2010 tariff schedule

- the legislated 2015 tariff schedule

- an alternate policy specified in the options identified by the Green Review. In this option the tariff rate for clothing and finished textiles is 10 per cent, and the remaining tariff lines are 7 per cent (excluding the 'other' category which is maintained at 5 per cent).

The first tariff option is embedded in the data base and, therefore, is not modelled. The other tariff options were modelled as a change relative to the first option. This involved the following steps:

- Trade-weighted tariff rates were estimated for each option, for the textiles, clothing and footwear industries, by applying the appropriate tariff schedule to detailed (fob) trade data for 2005-06.

- To calculate the change in tariff revenue the trade-weighted tariff rates were estimated using the appropriate PTA (preferential trade agreement) and MFN (Most-Favoured-Nation) rates. For countries with no preferential agreement, the MFN tariff rates were applied. For countries with a PTA, the lower of the 2005 PTA tariff rates and the planned MFN rates (in 2010 and 2015) were used.

- To account for the trade diversion effect of PTAs (discussed in chapter 3 and chapter 5), trade-weighted tariff rates were also estimated by applying MFN tariff rates to all countries. The difference between these two sets of trade-weighted tariff rates is the mark-up that PTA countries apply.

- In the model database, the value of imports includes the cost of insurance and freight. Therefore, the estimated trade-weighted average tariff rates and mark-ups were scaled to their equivalent values after including the cost of insurance and freight.

- Each tariff rate was then converted to a 'power of the tariff' (one plus the tariff rate), which represents the impact of the tariff on the import price. The 'power of the mark-up' was calculated in a similar way.

- These were then used to derive the percentage change in the power of the tariff and the percentage change in the power of the mark-up for the three future tariff options, relative to the value in 2005-06. The percentage change in the power of the tariff is equivalent to the percentage change in the price of imports.

- The percentage changes in the power of the tariff and the percentage changes in the power of the mark-up (table D.1) were then used to simulate the policy options in the model.

Table D.1 **Trade-weighted tariff and mark-up rates**

	Textiles	Clothing	Footwear	TCF
Trade-weighted using PTA and MFN tariff rates (per cent)				
2005	9.0	14.9	7.6	11.1
2010 (existing policy)	5.5	8.6	4.7	6.6
2015 (existing policy)	3.9	4.3	4.7	4.3
2010 (alternative policy)	6.1	8.6	5.9	7.1
Trade-weighted using only MFN tariff rates (per cent)				
2005	9.9	15.7	7.9	11.9
2010 (existing policy)	5.9	9.0	4.9	7.0
2015 (existing policy)	4.4	4.6	4.9	4.6
2010 (alternative policy)	6.7	9.0	6.1	7.6
Trade-weighted using PTA and MFN tariff rates (per cent), scaled to include insurance & freight				
2005	8.5	14.1	7.2	10.5
2010 (existing policy)	5.1	8.1	4.5	6.2
2015 (existing policy)	5.7	8.1	5.5	6.7
2010 (alternative policy)	3.7	4.1	4.5	4.0
Trade-weighted using only MFN tariff rates (per cent), scaled to include insurance & freight				
2005	9.3	14.9	7.4	11.2
2010 (existing policy)	5.6	8.5	4.7	6.6
2015 (existing policy)	6.3	8.5	5.8	7.1
2010 (alternative policy)	4.1	4.3	4.7	4.3
Mark-up (for PTA countries), scaled to include insurance & freight (per cent)				
2005	0.8	0.8	0.3	0.7
2010 (existing policy)	0.4	0.4	0.2	0.4
2015 (existing policy)	0.6	0.4	0.2	0.4
2010 (alternative policy)	0.4	0.2	0.2	0.3
Percentage change in the power of the tariff (using PTA and MFN rates) from 2005				
2010 (existing policy)	-3.5	-5.9	-2.7	-4.3
2015 (existing policy)	-2.8	-5.8	-1.6	-3.8
2010 (alternative policy)	-4.9	-10.1	-2.7	-6.6
Percentage change in the power of the mark-up (for PTA countries) from 2005				
2010 (existing policy)	-0.3	-0.4	-0.1	-0.3
2015 (existing policy)	-0.2	-0.4	-0.1	-0.2
2010 (alternative policy)	-0.4	-0.6	-0.1	-0.4

Source: Commission estimates.

D.3 Incorporating budgetary assistance

The Commission was asked to model the current budgetary programs funded under the Post-2005 Assistance Package for the reference case simulation (R) and for some other simulations. The process for incorporating the budget-funded programs is described below.

Value of budgetary programs modelled

There are five programs currently in place and one additional program that is scheduled to commence in 2010:

1. Strategic Investment Program (SIP) Scheme.

2. Expanded Overseas Assembly Provision (EOAP) Scheme.

3. Structural Adjustment Program (SAP).

4. Small Business Program (SBP).

5. Product Diversification Scheme (PDS).

6. Supply chain Opportunities Program (SOP) (commencing in 2010).

The maximum amount of funds currently provided for the TCF sector, and included in the modelling, was estimated to be $112.4 million per year. Where possible, this estimate was based on annual funding amounts available for each program. An exception was for SAP funding, with the annual funding amount based on actual payments (see below).

Annual funding amounts are scheduled to phase down to coincide with the phasing down of tariffs occurring in 2010. Table D.2 shows the total amount of funding available currently, and in 2010-11, that was incorporated in the modelling.

Table D.2 **Estimated annual budgetary assistance**
$ million

Program	Current assistance	2010-11
SIP	97.5	17.5
EOAP	5.4	0
SAP (Part 2 – Restructuring Initiative Grants)	2.0	2.0
SBP	2.5	2.5
PDS	5.0	5.0
SOP	0	4.0
Total	**112.4**	**31.0**

Source: Commission estimates.

Modelling the SAP

As mentioned above, the value of funding amounts modelled for each program was generally based on annual capped amounts. However, the SAP was modelled differently:

• Part 1 of the SAP provides assistance to displaced workers and is administered through the Australian Government's Job Network. There is no specified amount

of annual funding, with funding per year likely to vary according to the number of displaced TCF employees. Expenditure on this program was not explicitly incorporated into the model. However, welfare payments to displaced TCF (and other) workers are embodied in the model's database. If unemployment increases, welfare expenditure in the model increases and, therefore, the effect of having more displaced TCF workers (including greater levels of government funding) are implicitly captured in the model simulations. (One of the sensitivity analysis scenarios specifically models a greater level of unemployment).

- Part 2 of the SAP is the Restructuring Initiative Grants Scheme. There was no available information on annual expenditure for this program. However, $6 million had been spent between July 2005 and February 2008. Assuming this cost was distributed evenly over time, approximately $2 million was spent in 2005-06. For the modelling, it was assumed that $2 million was spent for the Scheme in the database year, and for each year that it is available.

- Part 3 of the SAP is the Regional Partnerships Program. Although it commenced in July 2005, no funding has yet been provided for this program. As it would be difficult to infer any possible level of future funding for this program it was assumed, for the modelling, that there would continue to be no funding provided.

Timing of payments

Payments for the SIP are paid in arrears. That is, a firm receives a subsidy for eligible expenditure that has occurred in the previous year. This means that funding for eligible projects undertaken in 2005-06 — the database year — is different to that actually paid in 2005-06. However, even though SIP funding for 2005-06 expenditure is paid in 2006-07, it is this amount paid that influences production and investment decisions made in 2005-06. As such, the amount available in 2006-07 ($97.5 million) was used in modelling for the years 2005-06 to 2009-10.

It should be noted that two of the smaller budgetary assistance programs did not commence until 2006-07 (the SBP and PDS). As the purpose of the study is to assess the economy-wide impact of the current budgetary assistance package, it was deemed more appropriate to include all of the five programs in the model database.

A referee at the Commission's technical workshop also raised the issue of converting the payment streams of budgetary assistance over the ten-year period to produce an equivalent annual value. However, as discussed in appendix B, this did not seem valid when using a comparative static model based on the 2005-06 economy, and was not incorporated in the modelling.

Adjusting budgetary funding for the model database

To model the budgetary assistance programs for the TCF sector described above, adjustments had to be made for income tax. To be consistent with the structure of the MMRF model, shares of funding were also allocated across jurisdictions and for the textiles, clothing and footwear industries.

Income tax

Funding paid under the budgetary assistance programs is treated as income to the firm and subject to income tax, if applicable. To account for this, the total value of funding was discounted by 30 per cent before being incorporated in the model. This tax-adjusted value represents a lower bound of assistance because not all firms may have paid tax on the full amount of the grant.

Disaggregating across jurisdictions

The tax-adjusted value of budgetary assistance was allocated across jurisdictions according to the share of production costs in each jurisdiction. This process is consistent with the idea that the majority of the funding is allocated according to production values. It is also consistent with the method used in the Commission's recent Modelling Automotive Assistance study (PC 2008a).

Disaggregating by industry

For the SIP, the distribution of payments to the textiles, clothing, and footwear industries for the 2005-06 program year is publically available (TCF Review 2008). This information was used to determine SIP values of funding to each industry for the base case scenario. From 2010-11, the SIP is only available to the textiles and clothing industries. The value of scheduled funding was distributed between these two industries using a weighted value of their 2005-06 funding shares.

As funding amounts by industry were generally not available for other budgetary assistance programs, the assistance amounts from these programs was apportioned across the three industries according to industry shares of production costs in the model database. (The PDS is only available for textiles and clothing industries. Thus, weighted industry shares from the model database for textiles and clothing only were used for this program.)

How are the funding amounts simulated?

The value of budgetary assistance in 2005-06, after adjusting for income tax and allocating it by industry and jurisdiction, was then included in the model's database. As discussed in chapter 3, the Commission modelled all budgetary programs as production subsidies because of the broad range of activities that they cover. Chapter 3 discusses the economic effects of modelling budgetary assistance as a production or capital subsidy.

Table D.3 shows the value of budgetary assistance, for each of the textiles, clothing and footwear industries, that was incorporated in the model as a production subsidy. When modelling simulations in which budgetary assistance is maintained at the 2005 level (for example, O1), no adjustments (or shocks to the model) were made. When modelling simulations in which budgetary assistance is discontinued, the model was shocked so as to reduce assistance to zero. A sensitivity analysis was also modelled assuming the scheduled 2010 level of budgetary assistance (appendix E). This was done by reducing 2005-06 levels of assistance to the 2010-11 levels.

Table D.3   **Budgetary assistance modelled, by industry**

	Textiles	*Clothing*	*Footwear*	*TCF*
	$ million	$ million	$ million	$ million
2005-06				
SIP	53.6	34.1	9.8	97.5
EOAP	2.7	2.0	0.7	5.4
SAP	1.0	0.8	0.3	2.0
SBP	1.2	0.9	0.3	2.5
PDS	2.8	2.2	0	5.0
SOP	0	0	0	0
Total (pre-tax)	61.3	40.0	11.0	112.4
Total modelled (post-tax)	**42.9**	**28.0**	**7.7**	**78.7**
2010-11				
SIP	10.7	6.8	0	17.5
EOAP	0	0	0	0
SAP	1.0	0.8	0.3	2.0
SBP	1.2	0.9	0.3	2.5
PDS	2.8	2.2	0	5.0
SOP	2.0	1.5	0.5	4.0
Total (pre-tax)	17.7	12.2	1.1	31.0
Total modelled (post-tax)	**12.4**	**8.5**	**0.8**	**21.7**

Source: Commission estimates.

E   Additional simulations

In addition to the standard simulations presented in chapter 4, further simulations were completed to analyse the sensitivity of the results to two additional considerations. These are:

- a simulation of tariff reductions and budgetary assistance corresponding to that legislated for 2010-11

- a sensitivity analysis assuming export price elasticities of 5 for the reference case assistance scenario.

The results for these simulations are presented in the following sections.

E.1   Reducing assistance to 2010 legislated levels

One of the assistance scenarios to be considered in the modelling request was that legislated for 2010-11. The results for this simulation are presented here, and compared with the reference case scenario (R). The framework for implementing this scenario was the same as for the reference case, with the only points of difference being the tariff and budgetary assistance levels, as described in chapter 3 (tables 3.5 and 3.6 respectively).

The assistance levels legislated for 2010-11 are not much higher than those legislated for 2015-16 (the reference case). The budgetary assistance levels are small, so the simulation results of the reduction in budgetary assistance would be similar to that for the reference case. Similarly, a large proportion of the tariff cuts to textiles and clothing imports, and the full tariff cut to footwear imports, occur through the legislated changes for 2010. Consequently, the results of the 2010-11 simulation and the reference case would be expected to be relatively close.

The results for the 2010 and 2015 assistance scenarios are in tables E.1 and E.2.

Table E.1 **Legislated assistance reductions in 2010-11 — economy-wide impacts**

Change relative to the base case (assistance levels in 2005-06)

	Simulation	
Description	Reference case	Assistance levels legislated for 2010-11
Tariff level	2015	2010
Budgetary assistance	None	2010 levels
Aggregate variable (real $m)		
Adjusted GNE	63	48
GNE	31	32
GDP	71	54
Consumption	12	15
Investment	26	19
Government expenditure	5	6
Inventory	-12	-8
Exports	385	241
Imports	344	219
Aggregate variable (percentage change)		
GDP deflator	-0.087	-0.053
Consumer price index	-0.132	-0.081
Terms of trade	-0.005	-0.001
Real exchange rate[a]	0.070	0.040
Real wage (pre-tax)	0.076	0.050

a A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

Table E.2 Legislated assistance reductions in 2010-11 — impacts on the TCF industries

Percentage change relative to the base case (assistance levels in 2005-06)

Description	Simulation	
	Reference case	Assistance levels legislated for 2010-11
Tariff level	2015	2010
Budgetary assistance	None	2010 levels
Textiles		
Output	-2.764	-1.872
Employment	-3.089	-2.093
Nominal wages	-0.037	-0.020
Capital employed	-1.834	-1.241
Nominal rental price of capital	-2.560	-1.729
Domestic sales — local production	-2.998	-2.050
Domestic sales — total	0.000	0.001
Export volume	1.518	1.381
Import volume	2.542	1.866
Domestic supply price	-0.171	-0.158
Import price duty paid	-4.952	-3.497
Clothing		
Output	-5.115	-2.873
Employment	-5.728	-3.220
Nominal wages	-0.036	-0.019
Capital employed	-3.694	-2.074
Nominal rental price of capital	-4.200	-2.342
Domestic sales — local production	-6.837	-3.914
Domestic sales — total	0.000	0.001
Export volume	4.226	2.772
Import volume	6.866	3.896
Domestic supply price	-0.884	-0.586
Import price duty paid	-10.117	-5.887
Footwear		
Output	-2.057	-2.117
Employment	-2.484	-2.561
Nominal wages	-0.028	-0.015
Capital employed	-1.144	-1.172
Nominal rental price of capital	-2.514	-2.578
Domestic sales — local production	-4.533	-4.533
Domestic sales — total	0.000	0.001
Export volume	0.880	0.749
Import volume	1.041	1.061
Domestic supply price	-0.114	-0.099
Import price duty paid	-2.664	-2.664

Source: Commission estimates based on MMRF simulation results.

National results

Reducing assistance to 2010-11 levels generates economy-wide benefits, but these are smaller than for the reference case. As would be expected, the impacts of assistance levels legislated for 2010-11 are between about two-thirds and three-quarters of those for the reference case. The tariff reductions are about 65 per cent of those in the reference case and 80 per cent of the reduction in budgetary assistance. Of the total increase in GDP ($71 million) under the reference case, $54 million can be accounted for by the 2010 policy schedule. In terms of adjusted GNE, the implementation of the 2010 reductions will yield approximately $48 million per year, only $15 million per year less than from the full 2015 reductions.

The reductions in assistance to the 2010 levels contribute a smaller share of the total change in exports ($241 million of the total $385 million), relative to GDP and adjusted GNE. This is caused by the terms of trade effect, which is not as strong as for the reference case.

Effects on the TCF sector

The impacts vary across the TCF industries, reflecting differences in their current assistance levels and the differences in the relative reductions in industry assistance. For the textiles and clothing industries, the decrease in output for 2010 levels of assistance is about two-thirds of that for the reference case, reflecting the relative size of the tariff reduction on import prices.

The difference in output for the footwear industry is small because the tariffs have been reduced to 5 per cent by 2010 and no further reductions are made in 2015.

E.2 Changing the export demand elasticity

In order to test the robustness of the modelling results, the economy-wide impacts of the reference case were examined for a lower value of the export price elasticity of demand.[1] The default value was 10, and in the sensitivity analysis a value of 5 was applied. Tables E.3 and E.4 present the macroeconomic and TCF sector results respectively for the reference case simulation, applying both elasticity values.

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[1] Export demand elasticities are described in detail in box 3.1.

Table E.3 **Export demand elasticity sensitivity — economy-wide impacts**

Change relative to the base case (assistance levels in 2005-06)

Description	Simulation	
	Reference case with an export demand elasticity of 10	Reference case with an export demand elasticity of 5
Tariff level	2015	2015
Budgetary assistance	None	None
Aggregate variable (real $m)		
Adjusted GNE	63	47
GNE	31	-28
GDP	71	55
Consumption	12	-26
Investment	26	17
Government expenditure	5	-6
Inventory	-12	-13
Exports	385	397
Imports	344	314
Aggregate variable (percentage change)		
GDP deflator	-0.087	-0.119
Consumer price index	-0.132	-0.159
Terms of trade	-0.005	-0.025
Real exchange rate[a]	0.070	0.102
Real wage (pre-tax)	0.076	0.067

a A positive value represents a real depreciation.

Source: Commission estimates based on MMRF simulation results.

Table E.4 Export demand elasticity sensitivity — impacts on the TCF industries

Percentage change relative to the base case (assistance levels in 2005-06)

Description	Simulation	
	Reference case with an export demand elasticity of 10	Reference case with an export demand elasticity of 5
Tariff level	2015	2015
Budgetary assistance	None	None
Textiles		
Output	-2.764	-2.799
Employment	-3.089	-3.126
Nominal wages	-0.037	-0.071
Capital employed	-1.834	-1.862
Nominal rental price of capital	-2.560	-2.610
Domestic sales — local production	-2.998	-3.002
Domestic sales — total	0.000	-0.003
Export volume	1.518	0.915
Import volume	2.542	2.466
Domestic supply price	-0.171	-0.202
Import price duty paid	-4.952	-4.952
Clothing		
Output	-5.115	-5.424
Employment	-5.728	-6.070
Nominal wages	-0.036	-0.072
Capital employed	-3.694	-3.923
Nominal rental price of capital	-4.200	-4.473
Domestic sales — local production	-6.837	-6.845
Domestic sales — total	0.000	-0.003
Export volume	4.226	2.286
Import volume	6.866	6.828
Domestic supply price	-0.884	-0.928
Import price duty paid	-10.117	-10.117
Footwear		
Output	-2.057	-2.159
Employment	-2.484	-2.609
Nominal wages	-0.028	-0.064
Capital employed	-1.144	-1.203
Nominal rental price of capital	-2.514	-2.653
Domestic sales — local production	-4.533	-4.501
Domestic sales — total	0.000	-0.003
Export volume	0.880	0.619
Import volume	1.041	1.017
Domestic supply price	-0.114	-0.151
Import price duty paid	-2.664	-2.664

Source: Commission estimates based on MMRF simulation results.

National results

Even with a lower export price elasticity of demand, there are benefits from reducing assistance. Real GDP increases by $55 million, and real adjusted GNE increases by $47 million. However, the benefits are lower than under the reference case entailing the Commission's preferred value for the elasticity. When the elasticity is lower, the responsiveness of foreign demand to Australia's export price declines. The export price falls more sharply for a given increase in exports. As a result, the terms of trade fall further than in the reference case, with a corresponding impact on income.

Effects on the TCF sector

The output and employment in the TCF sector are not strongly affected by the change in the export demand elasticity. Although the economy-wide impacts are affected by the elasticity value, the TCF sector impacts are essentially dependent on the direct impact of reducing levels of assistance. As there is no difference between these, the industry level results are similar. However, exports fall significantly, as foreign demand does not respond as positively to the reduction in the supply price. The fall in the domestic supply price also causes a decline in imports of TCF products relative to the reference case, due to a substitution towards domestic production.

F   Analysis of 'pass through' under monopoly

Set out in this appendix are the principles demonstrating that, for a monopoly retailer, the pass through of reductions in tariffs to consumers would be at least 50 per cent. (A summary of the analysis is provided in chapters 3 and 5.) Section F.1 shows how the rate of pass through is derived. Sections F.2 and F.3 show what the pass through will be for a monopolist facing a linear demand curve and a convex demand curve, respectively.

F.1   Defining the rate of pass through

The rate of pass through is a measure of how the price to a *consumer* changes, relative to a change in the marginal cost of supply.

For a *monopolist,*[1] marginal revenue (MR) is set to equal marginal cost (MC). Suppose a tariff reduction lowers marginal cost for a monopolist from C_1 to C_2, as depicted below. The monopolist chooses the profit maximising quantity to supply by equating MR with the lower MC. Thus, the change in quantity supplied (Q_2–Q_1) will be determined by the slope of the marginal revenue curve.

The change in quantity supplied will lead to a change in the price to the consumer. The amount by which the consumer price changes (P_1–P_2) is determined by the slope of the demand curve.

Therefore, a tariff cut which lowers costs will lead to:

1. a movement down the MR curve

2. an increase in quantity supplied (the slope of the MR curve determining the rate at which quantity supplied changes)

3. a decrease in consumer price (the slope of the demand curve determining the rate at which prices set by the monopolist change for the given change in quantity).

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[1] This is an extreme case of market power, with no existing competitors and prohibitive barriers to potential new competitors.

Therefore, the rate of pass through equals the ratio of the slope of the demand curve to the slope of the MR curve, as expressed in figure F.1.

Figure F.1   **Measuring the rate of pass through**
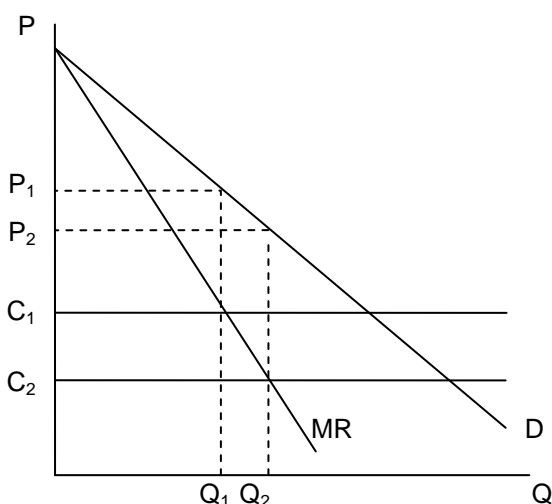
$$\text{Pass through} = \frac{\text{change in price}}{\text{change in cost}}$$

$$= \frac{(P_1 - P_2)/(Q_1 - Q_2)}{(C_1 - C_2)/(Q_1 - Q_2)}$$

$$= \frac{\text{slope of Demand curve}}{\text{slope of MR curve}}$$

$$= \frac{dP/dQ}{dMR/dQ}$$

F.2   Pass through with linear demand

In the case of linear demand (figure F.1), the inverse demand function is of the form:

$P = a - bQ$

where Q is the quantity demanded at price P, and a and b are (positive) parameters.

Thus, the slope of the demand curve is $dP/dQ = -b$

$MR = a - 2bQ$. Therefore, the slope of the marginal revenue curve is $-2b$.

This gives a pass through rate of 0.5 (50 per cent). Because the MR and demand curves have slopes that are independent of the quantity, the rate of pass through is 50 per cent at all points along the demand curve.

F.3 Pass through with convex demand curves

If a demand curve is non-linear (convex), the slope of the demand curve, and corresponding marginal revenue curve, change as quantity changes. Therefore, the rate of pass through, which is the ratio of the slopes, may also change. This is depicted in figure F.2, for the case of a quadratic inverse demand function of the form:

$$P = a - bQ + cQ^2$$

In this case, at a quantity just greater than zero, the rate of pass through is 50 per cent. As quantity increases, the rate of pass through increases. This occurs because the slope of the marginal revenue curve increases (becomes less negative) at a faster rate than the slope of the demand curve. At a quantity of Q_1, the slopes of the demand and marginal revenue curves are equal, and pass through is 100 per cent.

Figure F.2   **Pass through when the demand curve is convex**
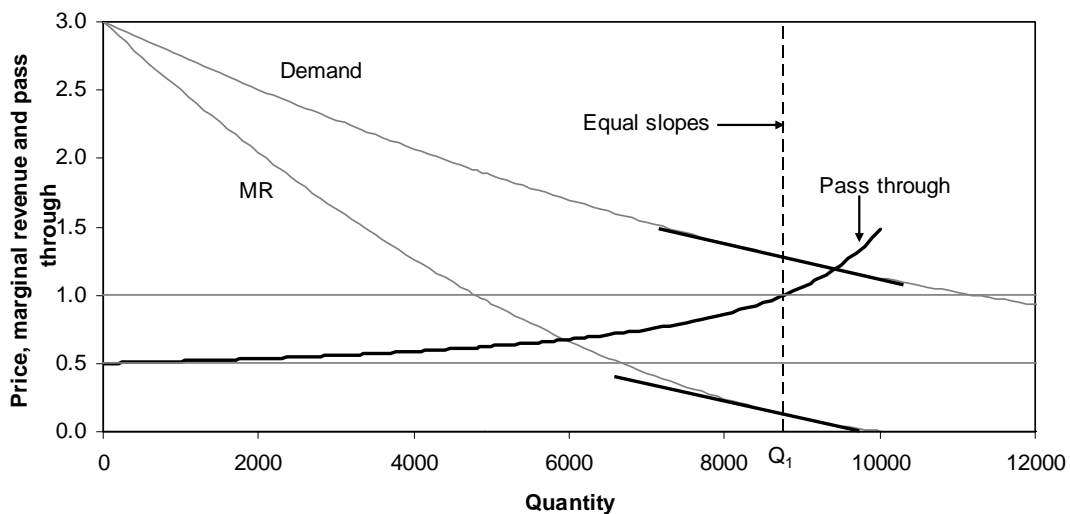
Note that if the slope of the MR curve happens to be flatter than that of the demand curve, then there is *more* than 100 per cent pass through, as illustrated in figure F.2 for quantities exceeding Q_1.

G   Estimating assistance to TCF

The Commission publishes each year assistance estimates for a range of industries, including estimates for the TCF sector (as a whole), in its *Trade & Assistance Review* publication. Such estimates help to reveal who gains and who loses from industry assistance. They can also provide a broad indication of the resource allocation effects of the assistance measures covered, and highlight some of the costs of industry support. However, care is required in interpreting assistance estimates. Among other things, the estimates are based on a range of simplifying assumptions and cover only those government measures which selectively benefit particular firms, industries or activities, and which can be quantified given practical constraints in measurement and data availability.

This appendix draws on the TCF assistance estimates for 2006-07, contained in the latest edition of the review (PC 2008b), and other data to provide disaggregated assistance estimates for the textiles, clothing and footwear industries. It also provides estimates of this assistance on a per worker basis.

G.1   Assistance measures included in the estimates

The estimates in this study cover assistance provided by:

- tariffs on TCF inputs and outputs
- the Post-2005 budgetary assistance package
- other budgetary assistance.

Tariff assistance

The estimates of tariff assistance to the TCF sector take into account not only the higher prices tariffs allow TCF producers to charge for their outputs on the domestic market, but also the penalties (or negative assistance) associated with the price-raising effects tariffs have on TCF inputs.

The estimates are derived in part by assuming that MFN rates approximate the 'mark-up' created by tariffs. The mark ups are calculated by weighting the tariff rates for various commodities by the import share of those commodities. Tariff

concessions and duty exemptions on imported goods, which reduce the penalties associated with tariffs on input goods, are also taken into account.

The tariff assistance estimates published in *Trade & Assistance Review 2006-07* are based on import data for 2001-02, which aligns with the ABS input-output data which underlies the current series of estimates. For this study, the Commission examined the sensitivity of effects of using more recent (2005-06) import data for TCF goods. The use of this data would yield higher tariff mark ups, and marginally increase measured tariff assistance to TCF. However, to maintain consistency with it general tariff assistance estimates, the Commission has chosen to retain the tariff mark ups based on the 2001-02 import data for the purposes of calculating the estimates of assistance.

The estimates abstract from the effects of tariff concessions provided under preferential trade agreements. Such agreements can, in some instances, assist local producers via preferences for exports to partner countries and lower priced imported inputs from partner countries. They can also reduce assistance to the extent that tariff preferences result in increased competition domestically leading to lower prices for local outputs (box G.1). Although an empirical matter, as noted in chapter 5 the Commission considers that current PTAs are unlikely to have a limited effect on assistance to the TCF sector.

The Post-2005 (Budgetary) Assistance Package

The estimates published in this study cover the current elements of the 'Post-2005 (Budgetary) Assistance Package', namely:

- the TCF Strategic Investment Program Scheme
- the TCF Structural Adjustment Program
- the Product Diversification Scheme
- the TCF Small Business Program
- the Expanded Overseas Assembly Provision Scheme.

The Expanded Overseas Assembly Provision Scheme operates by providing tariff concessions on imports that embody locally made inputs. As such, its effects are captured in the Commission's tariff assistance estimates. While it has also been included in 'Post-2005 (Budgetary) Assistance Package', the estimates of total assistance to TCF reported in this study have been adjusted to avoid double-counting.

The package also includes a 'Supply chain Opportunities Program', which has been allocated $20 million. However, this program is not scheduled to commence until 2010, and thus no assistance has been recorded for this program for 2006-07.

┌───┐
│ Box G.1   **Assistance effects of Preferential Trade Agreements**   │
│   │
│ As alluded to in chapter 5, the tariff concessions provided under PTAs need not result │
│ in any significant impact on prices in the domestic market and, thus, on assistance │
│ provided by the general (MFN) tariff regime. This would be the case if TCF producers │
│ in the partner country effectively 'pocketed' the tariff concession, rather than reduced │
│ their prices below the prevailing (tariff-inflated) price of rival imports. While an empirical │
│ matter, to the extent that this is so, the MFN rate would remain the most appropriate │
│ measure of the 'price wedge' created by TCF tariffs and these related concessions. │
│   │
│ However, to the extent that tariff concessions provided by PTAs result in a reduction in │
│ the prices of TCF products in the Australian market, assistance to the industry's │
│ outputs will be lower than that implied by the MFN rate. Equally though, to the extent │
│ that the price of TCF (or other) inputs is lower, the penalties (or negative assistance) │
│ on TCF producers' inputs will also be lower than implied by the MFN rate. In these │
│ circumstances, use of the MFN rate could result in some overstatement of assistance │
│ to the textiles industry, and either some overstatement or understatement of assistance │
│ to the clothing and footwear industries, depending on trade patterns with the PTA │
│ partner countries and which TCF products have been subject to price reductions (and │
│ their relative magnitudes).   │
│   │
│ On the other hand, to the extent that PTAs afford Australian TCF producers preferential │
│ market access in partner countries, assistance to the Australian TCF sector could be │
│ increased. In effect, Australian producers would obtain the benefit of assistance │
│ provided by a partner country's general TCF tariff regime for their exports to that │
│ market. The actual assistance effects would depend on the extent of trade between │
│ partner countries and the margin of preference afforded by the PTA. (For a further │
│ discussion of these effects see PC 2004).   │
└───┘

Other budgetary assistance

The estimates for the TCF sector also cover budgetary support provided through the CSIRO Textile & Fibre Technology Division, the Export Market Development Grants (EMDG) scheme and TRADEX, as well as minor amounts of assistance provided through a range of other business programs, including R&D tax concessions and offsets and the Tasmanian Freight Equalisation Scheme (TFES).

The Commission uses a range of data sources to allocate the assistance provided under general business programs to different industries. For example, the Commission allocates R&D funding across industry groupings using detailed ATO tax data, and EMDG is allocated among industries using payment information provided by Austrade. However, informational limitations sometimes hamper the precise identification of the beneficiaries of particular programs. In such cases, the Commission typically allocates the funding for a program to the industry grouping deemed likely to be the major beneficiary, or places it in an 'unallocated' category.

In the current context, funding for CSIRO's Textile & Fibre Technology Division has been allocated to the TCF sector in *Trade & Assistance Review*. In practice, it is likely that research undertaken by the division assists other industries, such as primary production, as well as firms in the TCF sector.[1] However, the amount of funding for this program — $18.5 million in 2006-07 — is relatively small compared to total TCF assistance.

The assistance estimates in *Trade & Assistance Review* also include the value of tax concessions provided via the 'TCF Corporate Wear Scheme'. Although this program clearly provides assistance and may induce some additional demand for output from the TCF sector, the Commission has excluded it from the estimates of TCF assistance in this study. The estimates also omit any assistance to firms in the TCF sector provided by state and local governments.

G.2   Disaggregation procedure

The assistance estimates for the TCF sector were disaggregated into separate estimates for the textiles industry, the clothing industry and the footwear industry as follows:

- production, materials and value added estimates for the textiles, clothing and footwear industries were sourced from the Australian Bureau of Statistics (ABS) publication *Australian National Accounts: Input-Output Tables, 2001-02*

- tariff assistance estimates, as published in *Trade & Assistance Review*, are derived according to the ABS Input-Output Industry Group (IOIG) classification. These estimates were then aggregated to the textiles, clothing and footwear industries

- for the TCF Strategic Investment Program, shares from the Green Review (2008) background paper were used to disaggregate the program between textiles, clothing and footwear

- the EMDG scheme was allocated to textiles, clothing and footwear based on payment information provided by Austrade

- for the remaining budgetary assistance programs, given limited information about the industry incidence of these programs, production shares, as derived from the modelling database, were used to provide a rough estimate of the allocation of this assistance between textiles, clothing and footwear.

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[1] CSIRO has provided to the Commission with divisional funding apportioned according to the ABS Social Economic Objective classification. This suggests that around 80 per cent of funding for this division in 2006-07 was directed to projects applying to the TCF sector.

G.3   The estimates

The resultant estimates are summarised in table G.1 and discussed below.

Table G.1   **Assistance estimates for the TCF sector, 2006-07**

	Textiles	*Clothing*	*Footwear*	*TCF*
Subsidy equivalents	$m	$m	$m	$m
Tariff output assistance	235.9	270.0	39.1	545.0
Post-2005 Assistance Package	59.9	39.0	10.7	109.6
Strategic Investment Program	52.9	33.7	9.6	96.2
Structural Adjustment Program	1.5	1.2	0.4	3.0
Product Diversification Scheme	2.8	2.2	0.0	5.0
Small Business Program	1.1	0.8	0.3	2.2
Expanded Overseas Assembly	1.6	1.2	0.4	3.2
Other budgetary assistance	13.2	11.8	3.9	28.9
CSIRO	9.1	7.0	2.4	18.5
TRADEX	3.5	2.7	0.9	7.2
Other[a]	0.5	2.1	0.6	3.1
Total gross assistance	**308.9**	**320.9**	**53.7**	**683.5**
Tariff input assistance	-42.7	-72.9	-18.5	-134.1
Total net assistance[b]	**264.7**	**246.8**	**34.8**	**546.2**
Effective Rate of Assistance	%	%	%	%
Tariffs	8.3	15.9	2.2	9.1
Post-2005 Assistance Package	2.6	3.1	1.1	2.4
Other budgetary assistance	0.6	1.0	0.4	0.6
Total[b]	**11.4**	**19.9**	**3.7**	**12.1**

a Includes the following programs: Export Market Development Grants, R&D tax concession, Premium R&D tax concession, R&D tax offset for small companies, COMET program, Small business capital gains tax exemption, Tasmanian Freight Equalisation Scheme, and Howe leather loan repayment. **b** The total net subsidy equivalent and effective rate estimates have been adjusted to reflect that the TCF Expanded Overseas Assembly Provision Scheme is included in both tariff and budgetary assistance.

Gross assistance

Gross assistance is a measure of the value of assistance to an industry's outputs and value added. Assistance to TCF in gross terms was estimated to be $684 million in 2006-07, comprising assistance provided via the price-raising effects of tariffs on TCF outputs together with the various forms of budgetary assistance.

Net assistance

Net assistance is a measure of the net transfer to the industry as a result of the assistance structure. It takes into account gross assistance and the penalty to an

industry resulting from the price-raising effects of tariffs on its inputs. The Commission estimates that net assistance for the TCF sector associated with the assistance measures covered in this study was in the order of $546 million in 2006-07, the bulk of which was shared by the textiles and clothing industries.

Effective rates of assistance (ERAs) are calculated as the net assistance provided to an industry divided by the industry's unassisted value-added. The Commission estimates that the ERA for the TCF sector associated with the assistance measures covered in this study was around 12 per cent in 2006-07. This compares to an average ERA for the manufacturing sector in 2006-07 of around 4.5 per cent (PC 2008b).

Assistance per worker

An alternative way of expressing assistance is to estimate the value of assistance for each person employed in the sector. Based on estimated TCF employment in 2006-07 of 49 800, drawn from the ABS Labour Force Survey, net assistance per worker was more than $10 000 in that year.

However, as noted in box G.2, there is some uncertainty about the precise number of workers employed in the TCF sector. Moreover, the most recent quarterly Labour Force Survey suggests that TCF employment has fallen significantly in recent months. Use of the 2006-07 Labour Force Survey estimate results in a lower estimate of assistance per worker than would be derived using other, and/or more recent, ABS employment estimates for TCF. The estimate should be interpreted as an indication of the order of magnitude of assistance per TCF worker, rather than as a precise estimate.

Box G.2   Variations in ABS employment data

The ABS publishes employment data from a range of sources. Each source has its own collection methodology and definition of what constitutes employment. This leads to a range of published values for some headline employment numbers, such as the number of people employed in the TCF sector (as defined by the 1993 ANZSIC industry classification). There are three main sources of data for TCF employment:

1. Census of Population and Housing — This is collected every five years, with the most recent data for August 2006. The scope of the Census covers all people in Australia on Census Night. The Census employment data used in this study (and included below) includes all persons over 15 years of age. The Census is intended to accurately measure the number of people in Australia on Census Night and their key characteristics.

2. Manufacturing Industry, Australia (Cat. no. 8221.0) — This is an annual publication and data are collected as part of the Economic Activity Survey. The most recent data are for the end of June 2006. Approximately 8900 manufacturing businesses were surveyed and additional information on small businesses was collected from the Australian Tax Office. It is intended to present information on the economic and financial performance of the manufacturing industry.

3. Labour Force, Australia (Cat. no. 6291.055.003) — This is a quarterly publication of data from the Labour Force Survey (LFS). The most recent data are from May 2008. Approximately 30 000 dwellings are surveyed, covering about 0.45 per cent of the population. Included in the data are all persons aged 15 years and over, excluding permanent members of the defence forces. This publication is intended to measure the civilian labour force.

Estimates of employment in the TCF sector vary across these sources. For those years for which comparisons can be made, the LFS estimates are consistently the highest while the Census estimates are the lowest (see table below). Some of the difference between these estimates may be explained by the number of outworkers captured in the data — if any. All the sources also involve scope for statistical error.

TCF employment estimates across data sources

| Data source	2001	2004	2006
Census of Population and Housing	64 600	-	43 000
Manufacturing Industry	-	56 500	48 200
Labour Force Survey (May quarter)	87 200	59 200	54 300

The Commission estimates of assistance per worker are based on an employment estimate of 49 800 sourced from the LFS for 2006-07 — which is the year for which assistance estimates have been derived.

Box G.2   (continued)

While the LFS data indicate a long term decline in TCF employment, they also reveal considerable quarterly volatility (see chart below). Most recently, from February 2008 to May 2008, employment in the TCF sector was recorded as declining by more than 25 per cent (from 51 400 to 37 800 persons). However, in the past such sharp declines have typically been followed by sharp increases, albeit within a long-term downward trend. (To provide an indication of the size of the sector, while minimising the effect of such short-term volatility, data in this study have been reported as annualised average values.)

Labour Force Survey data on TCF employment
May 1998 to May 2008, quarterly

The significant decline in TCF employment in the most recent quarter may partly result from changes to the survey methodology. The ABS reviews the LFS sample design following each Census of Population and Housing, to reflect changes in the geographic distribution of the population. The new sample design is being implemented from November 2007 to June 2008. As the Census typically estimates lower TCF employment than the LFS, this redesign may result in smaller estimates. The redesign has also involved a reduction in the smaller sample. However, the ABS states that the standard errors of the data will be maintained because of improved estimation methods.

Source: ABS 2006, Census of Population and Housing, Cat. no 2008.0, Canberra; ABS 2007, *Manufacturing Industry, Australia*, 2005-06, Cat. no. 8221.0; ABS 2008, *Labour Force, Australia*, Cat. no. 6291.055.003; ABS (2007).

H   Import substitution elasticities

Table H.1   Domestic-import substitution elasticities in MMRF

Commodity	Elasticity	Share of imports in domestic use
		Per cent
Sheep and cattle	0.9	0.0
Dairy	2.0	0.0
Other livestock	2.0	0.0
Grains	1.6	0.6
Biofuels	1.6	6.4
Other agriculture	2.0	7.2
Fisheries and services to agriculture	0.3	1.3
Forestry	2.0	4.1
Coal	0.5	0.3
Oil	10.0	79.2
Gas	10.0	0.0
Iron ore	0.5	23.5
Non-iron ore	0.6	19.8
Other mining	2.0	2.9
Meat products	0.5	2.0
Other food	1.4	10.9
Textiles	2.0	38.1
Clothing	2.8	55.0
Footwear	5.0	59.1
Wood products	2.0	11.1
Paper products	1.1	28.7
Printing	2.0	8.3
Gasoline	0.4	29.2
Diesel	0.4	24.9
Liquefied petroleum gas	0.4	31.2
Air fuel	0.4	38.1
Other fuels	0.4	40.6
Chemicals	1.9	39.2
Rubber and plastics	1.5	30.3
Non-metallic minerals	1.2	17.9
Cement	0.3	0.6
Steel	0.8	11.8
Alumina	1.0	1.7
Aluminium	1.0	15.5

Table H.1   Continued

Commodity	Elasticity	Share of imports in domestic use
		Per cent
Other metals	1.0	65.8
Metal products	1.7	19.6
Motor vehicles and parts	5.2	49.6
Other manufacturing	1.2	56.8
Electricity — coal	0.0	0.0
Electricity — gas	0.0	0.0
Electricity — oil	0.0	0.0
Electricity — nuclear	0.0	0.0
Electricity — hydro	0.0	0.0
Electricity — other	0.0	0.0
Electricity supply	0.0	0.0
Gas supply	0.0	0.0
Water supply	0.0	0.1
Construction	0.0	0.2
Trade	0.0	0.1
Accommodation and hotels	0.0	7.4
Road transport — passenger vehicles	0.0	12.9
Road transport — freight	0.0	3.0
Rail transport — passenger vehicles	0.0	17.9
Rail transport — freight	0.0	6.0
Water transport	1.8	10.4
Air transport	2.0	38.1
Communication	0.0	4.2
Financial services	0.0	1.9
Business services	0.0	2.9
Dwellings	0.0	0.4
Public services	0.0	1.1
Other services	0.0	4.0
Private transport	0.0	0.0
Private electricity	0.0	0.0
Private heating	0.0	0.0

Source: MMRF database.

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