
OVERVIEW

Overview

The Commission was asked by the Government to undertake modelling of the economy-wide effects of assistance options and scenarios identified by the current Bracks Review of Australia's automotive industry. The options cover a number of combinations of tariffs and levels of assistance provided under the Automotive Competitiveness and Investment Scheme (ACIS).

Assessing economy-wide effects of any policy intervention requires identification and summation of all the costs and benefits that flow from it. For instance, changes in industry assistance alter the economic returns from different activities. This induces changes in the pattern of resource allocation across the economy (requiring adjustments by labour and capital), as well as levels of investment and, through various mechanisms, productivity. These changes in turn affect industry output, exports and imports, prices (including the 'terms of trade') and, hence, national production and income.

Policy role of modelling

No model can replicate the economy and all its complex interactions. But economy-wide general equilibrium (GE) models can capture many of these effects in a stylised way. They trace through the impacts of changes in prices brought about by changes in assistance policies across the economy, capturing so-called 'allocative' efficiency impacts, changes in use of labour and of capital, and consequent terms of trade effects. These models can also provide a disaggregated picture of the economy, simulating potential changes in the size of particular industries (including the assisted industry) and levels of regional activity.

By giving an indication of the magnitude of resource impacts, GE models have played an important role in most previous reviews of assistance to the automotive and other industries in Australia. Particularly when assistance levels were very high, GE models exposed the substantial 'export tax' effect of industry assistance and the potential for large income gains from reducing that assistance and allowing labour and capital to move to higher-valued uses in the Australian economy. They also exposed the substantial transfers from consumers and taxpayers to assisted industries.

But GE modelling becomes less insightful the smaller the policy ‘shock’. This is because the resource impacts correspondingly diminish and can be confounded by ‘noise’ from the model’s many simplifying assumptions. While remaining valuable for understanding the impacts of policy change, in such circumstances GE models may be too blunt to rank nuanced policy options.

Moreover, many potentially important effects of changes in assistance regimes are not directly estimated by these models. For example, policy-related innovation and ‘spillover’ effects, as well as technological change and costs of adjustment, are not captured. While such effects can be incorporated (for example, as a productivity shock to the model), estimating their magnitude requires separate analysis.

This means that although modelling can make an important contribution, it must be complemented by additional analysis of ‘exogenous’ factors to enable a complete assessment of the economy-wide effects of assistance options.

The modelling task in context

The automotive industry has long received government assistance significantly above levels afforded other Australian industries (box 1). The general tariff rate for passenger motor vehicles and components, which was reduced to 10 per cent in 2005, remains at least twice the rate applying since 1996 to most other manufacturing activities (excluding the textiles, clothing and footwear sector, the subject of a parallel review). Budgetary assistance also remains substantial (primarily through the ACIS program, providing around \$0.5 billion in duty credits per year), representing about one-third of direct financial assistance to the manufacturing sector.

In its 2002 inquiry into the industry, the Commission recommended that the tariff be reduced to the norm for the manufacturing sector of 5 per cent in 2010, cushioned by an extension of the ACIS program to 2010. It was considered that further, yet still gradual, exposure to competitive pressures would encourage the industry to continue to enhance its competitiveness. Indeed, the anticipated benefits of increased competition in driving workplace and other efficiencies played a greater role than modelled resource effects in the Commission’s recommendations. The recommended program also provided the industry with the decade of policy certainty that it sought, to facilitate investment. (Reinforcing this objective, the Commission made no recommendations to modify other assistance schemes pending the phase down of tariffs and ACIS.)

While the Government of the day agreed that the tariff would be reduced to 5 per cent in 2010, ACIS funding was substantially increased and its duration

extended beyond what had been recommended. In doing this, the Government reaffirmed its primary objective of easing the industry's continued transition to a more competitive, low assistance environment. And, while endorsing the need for policy certainty domestically, a further inquiry by the Commission in 2008 was foreshadowed, to determine whether changes in legislated tariff reductions might be warranted in the light of economic conditions at that time.

Box 1 The Australian automotive industry receives a range of assistance

The Commission estimates that the automotive industry received around \$1.1 billion in support in 2006-07, from three sources:

- a tariff of 10 per cent on imported passenger vehicles and related components (except those subject to preferential tariffs under bilateral trade agreements), which is scheduled to fall to 5 per cent in 2010 and remain at that level until (at least) 2015
- a tariff of 5 per cent on light commercial and 4WD vehicles and related components
- the Automotive Competitiveness and Investment Scheme (ACIS) which provides around \$0.5 billion a year and which will provide more than \$4 billion in subsidies (provided as import credits) between 2006 and 2015.

Additional support is provided by:

- virtually prohibitive tariffs of \$12 000 per imported second-hand vehicle (other than for specialist use)
- fringe benefits tax provisions which favour fleet sales (local cars account for around three-quarters of the fleet market) and the luxury car sales tax which primarily affects imported vehicles
- government purchasing preferences for vehicles manufactured or imported by local vehicle producers.

The industry also has access to a range of support measures generally available to business, such as R&D grants and tax concessions (the automotive industry accounts for about one-third of all such assistance), TRADEX (which refunds tariff duty paid on inputs for exported products), and funding for specific 'strategic' investments via the Strategic Investment Coordination program. It also receives support from State Governments via payroll tax concessions, grants and low interest loans.

In addition, the industry has received ad hoc financial support from State Governments and the Australian Government. The latter recently announced a Green Car Innovation Fund which is to deliver support of \$500 million over the period 2011 to 2015.

The Review Panel's options

The Bracks Review has a broad remit, in part reflecting concerns about a number of pressures on the industry, including recent exchange rate appreciation, an acceleration of the longer-term shift in preferences away from larger 'family' vehicles, as well as increased imports from the United States and Thailand resulting from preferential trade agreements with those countries.

The policy options that the Commission was requested to model include various changes to the mix, nature and level of assistance provided through tariffs and ACIS, but not other forms of assistance (table 1). The Review Panel also sought modelling of a scenario in which the Australian dollar achieved parity with the US dollar.

Table 1 The policy options modelled

	<i>Tariff remains at 10%</i>	<i>Tariff 5% as scheduled</i>	<i>Tariff reduced to 0%</i>
<i>ACIS stays at Stage 2</i>	Option 5 (current assistance regime)	Options 2 & 3 (ACIS modelled as credits and grants)	Not modelled
<i>ACIS to Stage 3</i>	Option 4	Option 1	Not modelled
<i>ACIS discontinued as scheduled</i>	Option 6	Reference case 1 (policy as scheduled)	Option 7

Some technical considerations

To model these options, the Commission used the model known as MMRF (developed by the Centre of Policy Studies at Monash University). This model provides a decomposition of impacts by State and Territory (box 2). In 'comparative-static' mode, the model provides a 'snapshot' of policy impacts in the 'long run' — when the economy has fully adjusted.

The model database was updated with the most recent official data, with the automotive industry being disaggregated into car assembly and components manufacture.

Box 2 The MMRF model provides a regional perspective

The MMRF model is a well-documented model with a proven track record. It was most recently used by the Commission in its study *Potential Benefits of the National Reform Agenda* (PC 2006). The model was updated with the most recent available information about the economy (to 2005-06) and disaggregated further to identify separately car assemblers and component manufacturers.

Unlike single-industry or sectoral 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 States and Territories. Consequently, it allows analysis of the effects of policy at the jurisdiction and industry levels. This is especially useful given the concentration of the industry in Victoria and South Australia.

A comparative-static version of MMRF was used, which means that simulation results do not relate to a particular year, and particular adjustment paths cannot be inferred. While a time dimension may be insightful in some applications, a comparative-static model was preferred for this study because it captures the long-term implications of changing industry policy, while avoiding the need to formulate long-range (and often contentious) forecasts about the economy and automotive industry for a 'base case' scenario.

Also, as requested by the Review Panel, the newly-announced Green Car Innovation Fund (GCIF) was incorporated in all simulations as part of the model 'database' policy environment. This was done by treating it as an additional production subsidy to the industry, though it remains unclear whether the GCIF will generate additional vehicle production. If it simply compensated vehicle producers for replacing existing vehicle models with production of hybrid and other green vehicles or features that are less commercially viable, there would be a productivity loss and no net expansion in output.

The modelling results are broadly as anticipated

In line with the long-standing incremental approach to assistance reductions for this industry, the various options being modelled involve relatively small policy-induced price changes to an industry accounting for less than 1 per cent of GDP. Relative to the economy, the estimated net impacts appear small. For example, the 'reference case' scenario R1, which models the scheduled reduction in the tariff to 5 per cent in 2010 and removal of ACIS by 2015, yields a 0.06 per cent gain in annual national output and a 0.06 per cent increase in the community's 'economic welfare' (as measured by real adjusted GNE). Nevertheless, these small percentages equate to around \$600 million and \$500 million respectively. Furthermore, they would accrue

each year in perpetuity, and would be sizeable in present value terms. (Table 2 provides a sample of results.)

Table 2 Benefits from tariff cuts dominate ACIS cuts, but a commodity-induced appreciation dominates both

Tariff:		<i>to 5%</i>	<i>to 5%</i>	<i>10%</i>	<i>to 0</i>	<i>to 5%</i>
ACIS:		<i>to 0</i>	<i>Stage 2</i>	<i>to 0</i>	<i>to 0</i>	<i>Stage 3</i>
Other settings:						'Commodity boom'
National aggregates						
Real adjusted GNE (\$ million)		517	496	23	1458	11 677
Real GDP (\$ million)		598	568	31	1677	13 715
Exports (% change)		0.40	0.32	0.08	0.97	-2.94
Imports (% change)		0.27	0.26	0.01	0.75	2.27
Sectoral aggregates (% change)						
Agriculture		0.07	0.05	0.02	0.14	-1.56
Mining		0.36	0.26	0.10	0.81	14.47
Food processing		0.09	0.07	0.03	0.21	-3.01
Manufacturing		-0.12	-0.07	-0.05	-0.22	-3.99
Services		0.05	0.05	0.00	0.15	0.82
Automotive assembly (% change)						
Output		-4.60	-2.93	-1.68	-8.52	-11.18
Employment		-5.47	-3.50	-1.99	-10.14	-13.07
Exports		-2.86	1.14	-3.97	0.97	-28.74
Components (% change)						
Output		-1.37	-1.16	-0.22	-3.12	-3.72
Employment		-1.78	-1.53	-0.24	-4.13	-6.57
Exports		4.12	4.43	-0.30	11.77	-25.68

Indeed, the modelling consistently indicates that further reductions in automotive assistance, particularly tariffs, could be expected to yield net economy-wide benefits. The larger the reduction, the larger the gain to the wider community and economy.

- Moreover, the projected *net* benefits mask the much larger gains to Australian car buyers and taxpayers. In addition to around \$1 billion in tariffs they pay on car imports, more than \$1 billion is redistributed each year to the automotive industry (a majority of which is foreign owned).
- The automotive industry is projected to contract as a result of reductions in assistance (more so for car assembly than component manufacture), but this reduction is more than offset by expansion of activity in the services and mining sectors. As a result, there are projected (small) declines in aggregate economic activity in South Australia, and to a lesser extent in Victoria, but increases in Western Australia and Queensland. Nonetheless, output per person in all States

and Territories is estimated to increase.

- The modelling also suggests that reducing tariffs is significantly more beneficial to the community than reducing ACIS. As well as different levels of assistance currently provided by tariffs and subsidies, this reflects the additional impost tariffs place on the purchase price of cars compared with direct budgetary support (which instead places the funding burden on taxpayers, typically in a less distorting manner than tariffs). That said, the model does not capture the complexity of the tax system in Australia and likely underestimates the benefits of reducing the tax burden and, hence, the benefits from reducing ACIS.

Of course, the simulations are sensitive to the many assumptions underlying the model and, as noted earlier, must be considered in conjunction with a range of other potentially important impacts. A number of ‘sensitivity’ scenarios were modelled to test the robustness of the results. These involved different model ‘closures’ and different key parameters, but none significantly affected the estimates or the qualitative differences across simulations.

The assumed export demand elasticities are of particular relevance for the current exercise. The Commission used an export demand elasticity of 10 (that is, a 1 per cent decrease in the price of Australia’s commodity exports leads to a 10 per cent increase in the quantity demanded). Essentially, this means that additional exports can only be sold with a (small) decrease in their price, leading to a deterioration in the terms of trade. Sensitivity analysis undertaken with an export demand elasticity of 5 still showed net benefits from assistance reductions, though negligible. Of course, if sufficiently low elasticities were assumed, the projected fall in the terms of trade driven by higher export volumes following a tariff reduction could outweigh the projected gains from reallocating resources, reducing national income. However, such low elasticities are generally regarded as implausible, given that Australia’s exports comprise a small share of world trade.

Moreover, relatively low elasticities often are used in GE models to proxy the impact of frictions in the economy not captured in the model, and so do not necessarily represent a considered assessment of the actual degree of market power in trade. At any rate, even if Australian exporters of some commodities do possess market power, maintaining protection of the automotive industry would be a very blunt and relatively costly way of exploiting it (box 3).

Box 3 Export elasticities and terms of trade effects

The theoretical proposition that small tariffs may add to national income by taxing foreigners has sometimes been invoked in reviews of tariff policy. However, because of the informational requirements and risk of retaliation by trading partners, it has rarely become a practical policy rationale.

At issue is whether Australia has the degree of market power in world markets required to achieve this result (whether indirectly through protection of the automotive industry or by directly taxing or restricting key exports such as iron ore, wheat and wool). The weight of evidence is that even for these commodities, in the longer term, Australian industries are more likely 'price takers' than 'price makers'. For example, despite many in-depth reviews, there is scant evidence that the single export desk for wheat was able to capture price premiums in world markets by exploiting market power.

Even if exporters had market power in world markets, the efficient response would be to tax exports of the commodities in question directly, taking into account developments in international markets. Relying on indirect linkages between the automotive industry (or any other import-competing industry) and resources used in the export sector would be a haphazard and risky approach.

Accounting for exogenous effects

As noted at the outset, while GE modelling is the most useful tool available, it can shed light on only a subset of the economy-wide ramifications of changes in industry assistance. Other considerations must also be accounted for.

- One is adjustment costs. Some workers will lose their jobs as assistance is reduced and owners of capital may also suffer losses if the value of plant and equipment falls. (Though losses incurred by foreign owners do not diminish Australian wealth.) In the Commission's assessment, however, adjustment costs would be mitigated by the current buoyant economic conditions and the likelihood that manufacturers and their employees have already adjusted, at least in part, to the previously scheduled reductions in industry assistance. However, adjustment may be 'lumpy' rather than incremental, with job losses concentrated in locations where firms close. Even in such cases, it would make more sense to facilitate workers to adjust rather than incur the ongoing costs of supporting additional activity that would otherwise be unprofitable. On the Commission's reckoning, each job currently 'saved' in the industry requires around \$300 000 in support each year from the Australian community.
- Second, automotive assistance policies, if carefully targeted, might generate spillover benefits to the economy which could be forfeited if assistance were reduced. But tariffs and ACIS mainly cause the industry to be larger than

otherwise, and are not targeted at developing skills or supporting types of research and development that would generate significant benefits outside the industry itself.

- Assisted ‘green car’ production is unlikely to lead either to innovation spillovers or lower greenhouse emissions. The GCIF will likely encourage some buyers to switch from taxed, more efficiently produced imported hybrid and fuel-efficient vehicles to subsidised, higher cost, locally-produced ones — without markedly increasing ‘green car’ sales overall. Moreover, with an Emissions Trading Scheme in prospect, policies that directly encourage or prescribe production and use of particular emission reduction technologies are not needed and may be counterproductive.
- The model does not capture economies of scale, the presence of which could mean that a relatively small reduction in assistance triggers the closure of some firms because their unit costs rise as sales fall. On the other hand, economies of scale can assist lower-cost firms which are able to capture some of the sales from plants that close (for example, in the car fleet market). From this perspective, industry protection may encourage industry fragmentation, rather than drive efficient integration and achievement of scale economies. In addition, firms with economies of scale in other industries, by reducing their costs as output expands, could benefit more from reductions in automotive assistance than estimated by the model.
- Also not modelled are impacts on productivity that might flow from increased competitive pressures on the industry. In its 2002 inquiry, the Commission observed the potential for large efficiency gains from further workplace flexibility within enterprises, and it is probable that many of these gains remain untapped. The key is cooperation at the workplace level to facilitate operational improvements, but relaxing previously-announced assistance reductions could reduce the impetus for agreement.
 - A number of other sources of cost savings have not been modelled. Adhering to an agreed program of reductions in assistance may reduce future lobbying by industries to gain or retain assistance, and the costs that this entails. Cost savings could also come from reducing program compliance and administrative burdens on firms and government.

Related considerations

As noted earlier, the Review Panel sought modelling of a scenario in which the Australian dollar achieved parity with the US dollar. Simulating this within a GE model is problematic — instead the Commission modelled a terms of trade improvement to show possible effects of higher export commodity prices generated

by a continued ‘minerals boom’. Not surprisingly, as shown in table 2, the resultant large real appreciation swamps the effects of reductions in industry assistance, causing the automotive industry, along with other manufacturing industries, to contract relative to mining and the non-traded (services) sector.

That said, delaying scheduled assistance reductions would impede scarce resources from flowing to their highest-valued uses in the economy, reducing the scope for Australia to benefit from rising world commodity prices. Moreover, sheltering one industry from these pressures would place greater adjustment burdens on other industries.

Other market developments, such as changing consumer preferences and the negotiation of preferential trade agreements, have not been modelled, but are unlikely to overturn the projected benefits of assistance reductions either. For example, consumer preferences change in all markets and businesses that pick such trends succeed. Indeed, it is plausible that government policies (including the relatively higher tariff for passenger motor vehicles compared with SUVs and government purchasing preferences) have skewed production towards larger ‘family’ cars, blunting the incentive for the industry to respond to changes in buyer preferences. The promised inducement for the production of hybrid and other green car models and features poses similar risks.

Summing up the economy-wide effects

In the Commission’s assessment, modelling of the various assistance options, in conjunction with these broader considerations, suggests that economy-wide gains are greater under the current assistance reduction program. Reducing tariffs to 5 per cent by 2010 and removing ACIS by 2015 can be expected to have a positive pay off. By comparison, the options that would prolong higher assistance for this industry would be likely to impose costs on the community as a whole.