
5 The modelling in perspective

The economic model used in this study broadly indicates the impacts of changes in assistance on resource allocation within the economy, as well as highlighting potential impacts on particular industries, including the assisted industry.

However, as noted at the outset, modelling is not without limitations. Simulation outcomes can be sensitive to parameter choices or specific features of the model used. And some matters that influence the economy-wide effects of assistance policies — for example, drivers of innovation and technological change, and adjustment costs — are exogenous to general equilibrium (GE) models, and must be integrated with modelling assessments. This is particularly so when assessing the merits of incremental changes to assistance from a relatively low base, as is the case in the current exercise.

In this chapter, the Commission first distils some ‘high level’ messages from the simulations reported earlier in this study (section 5.1), and then examines how accounting for certain features of the model, and a range of exogenous influences, could affect these findings (sections 5.2 and 5.3). It then draws some implications from the study for the assessment of options for future assistance to the automotive industry (section 5.4).

5.1 What do the model simulations indicate?

The simulation results reported in chapter 4 consistently indicate that, in relation to the various resource effects captured in the modelling, further reductions in automotive assistance could be expected to yield economy-wide benefits, with larger reductions bringing larger gains. The largest gains through changes to automotive assistance arrangements, as measured by real adjusted gross national expenditure (GNE) (chapter 4), arise under scenario O7, in which all assistance to the automotive industry is removed. Scenario R1, which models the current plan to reduce automotive tariffs to 5 per cent in 2010 and to remove ACIS by 2015, also yields net benefits, and these are greater than in those simulations that involve lesser reductions in assistance, particularly for tariffs.

A feature of the simulation results is that, as expected, the projected net effects of all the automotive assistance options simulated are small in economy-wide terms. For

example, the increase in both real Gross Domestic Product (GDP) and real adjusted GNE in scenario R1 is just 0.06 per cent. The limited size of these net results reflects the small size of the automotive industry (0.5 per cent of GDP) and of the reductions in assistance being modelled. Nevertheless, the small percentage gains in these economic measures equate to around \$600 million and \$500 million a year, respectively. As the gains would accrue each year in perpetuity, they are sizeable in present value terms.

The *net* benefits modelled mask the much more substantial gains to Australian buyers of cars and taxpayers from reductions in tariffs and subsidies. The current programs redistribute more than \$1 billion each year in income from these groups toward owners of capital (including foreign-owned companies) and workers in the automotive industry. As noted in chapter 2, on a per worker basis, the transfer was equivalent to around \$23 500 in 2006-07 (for the assistance measures covered in the Commission's estimates).

The net benefit projections also mask differences in the impact of the modelled policy options at the industry level. The current plan (scenario R1) results in a contraction of automotive output and employment of around 3.5 per cent, although with a relatively greater contraction in vehicle assembly than in component manufacturing. The contraction in the automotive industry is the corollary of the effects of the present automotive assistance arrangements, in which consumers, taxpayers and people in other industries effectively support activity in the automotive industry. Indeed, once the economy is fully adjusted to the policy change, the contraction in the automotive industry is more than offset by expansions in the output and employment of other industries, including other manufacturing industries.

Reflecting such changes, there are also differences in the effects of the policy options between jurisdictions. Scenario R1 entails small long-run contractions in economic activity in Victoria and South Australia, with small increases in other States. Again, this is an upshot of the effects of the present automotive assistance arrangements, in which consumers, businesses and taxpayers in all jurisdictions effectively support activity in Victoria and South Australia. That said, in the long run, average incomes in all jurisdictions (as given by Gross State Product per person) are higher under all simulations involving a reduction in the tariff.

However, the modelling also shows that the impacts of changes in automotive assistance on the industry, and indeed the economy, would potentially be small relative to other influences that affect the industry's viability. This is reflected in scenario O8, where a further appreciation of the Australian dollar, induced by a commodity boom, is projected to lead to a significant contraction in the automotive industry — far greater than from reducing tariffs — as well as a contraction in

several other industries. Equally, a future *reduction* in the exchange rate of similar magnitude — resulting, for example, from a decline in commodity prices or other factors — would see an expansion that would more than offset the modelled effects of reductions in assistance.

The simulations also illustrate that, in terms of various resource effects captured in the modelling, subsidies remain preferable to tariffs for delivering industry assistance. For example, scenario R2 entails a reduction in assistance via tariff cuts; scenario R3 entails a reduction in ACIS subsidies. Scenario R2 results in much higher net benefits for Australia (even after scaling the results to make the quantum of assistance in each scenario comparable).

The modelled impacts of reducing tariffs are larger than those of removing ACIS (or reducing it, as in scenario O4) for two main reasons.

First, the assistance provided to the industry by the 10 per cent tariff is greater than assistance provided by ACIS — broadly speaking, the tariff allows automotive producers to raise their (ex factory) prices by up to 10 per cent, while ACIS reduces their production costs by less than 2 per cent. Hence, for the industry, reducing the tariff to 5 per cent has more than double the impact of removing ACIS.

Second, the tariff imposes a tax on buyers of cars. A reduction in the tariff to 5 per cent is estimated to reduce retail car prices by almost 3 per cent, whereas removing ACIS results in a small increase in the price of domestically-produced cars but virtually no reduction in the price of imported cars. While removing ACIS allows lower taxes in the economy, the beneficial impact of this as modelled is less than the economy-wide benefits from reducing the ‘consumer tax’ effect of the tariff. (In other words, the distortions imposed by the import tax on households and particularly businesses, which use automotive products as intermediate inputs, exceed the distortions imposed by the broader-based taxes used to pay for the subsidy.) It is likely, however, that the model does not fully capture the distorting impacts of the actual tax system and, for this reason, the benefits of reducing or removing ACIS are likely to be underestimated. That means, for example, that the benefits in scenario R1 are understated relative to R2.

5.2 How robust are the model specifications and key parameters?

While the simulation results suggest that reductions in automotive assistance would generate net benefits for the Australian community, and that the current plan (scenario R1) offers greater net benefits than options entailing lesser reductions in

assistance, it is important to investigate how robust such results are to changes in the model. The results from model-based simulations can only be as sound as the model itself. While the Monash Multi-Regional Forecasting (MMRF) model is widely seen as suitable for the exercise undertaken by the Commission, three aspects of the model that may affect the simulation results, and warrant explicit consideration, are its treatment of:

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

Scale economies

As noted in chapter 3, the model incorporates production functions embodying ‘constant returns to scale’. In effect, the cost of producing each additional unit — a car or a component — is modelled as being the same as the cost of producing each previous unit. In reality, some production activities show increasing or decreasing returns to scale over ranges of output.

The production of particular vehicle models is recognised as involving ‘increasing returns to scale’ up to a certain level of production. These economies of scale arise due to the large fixed costs associated with developing a product, and tooling and commissioning a plant. At the time of the Commission’s 2002 inquiry, industry sources indicated that 180 000 units was the minimum economic production volume for the sort of large vehicles produced in Australia, with 80 000 to 100 000 units seen as the minimum necessary for ‘niche’ car assembly (Spurling Report 2001, cited in PC 2002).¹ The Bracks Review indicated that ‘a minimum plant capacity of 300 000 to 400 000 units per annum is [generally accepted as] necessary to help ensure profitability, especially for small and medium car production, where margins are low’ (Bracks 2008a). By contrast, the production levels of (current) Australian assemblers in 2006 ranged from 81 000 units (Ford) to 126 000 units (Holden) (table 5.1), suggesting significant untapped scale economies.

¹ In its 2002 report, the Commission also noted that economies of scale in the industry are increasingly important due to higher product development costs requiring higher throughput for firm profitability, and at the same time are decreasing in importance at the individual model level due to developments in computer-driven machine technology and the advent of ‘platform engineering’ (PC 2002).

Table 5.1 Australian PMV production and exports^a, by producer, 2006

<i>Motor vehicle producer</i>	<i>Models</i>	<i>Engine size (cylinders)</i>	<i>Production level (units)</i>	<i>Exports (units)</i>
Toyota	Camry/Aurion	4-6	111 610	79 648
Holden	Commodore/Statesman	6-8	125 855	46 027
Ford	Falcon/Territory	6-8	81 470	7 012

^a Excludes Mitsubishi.

Source: DIISR (2007).

Economies of scale may also be important in components production. The international trend in component sourcing is for producers to purchase globally, resulting in consolidation amongst components suppliers to increase scale and a reduced number of suppliers worldwide (Victorian Government 2008). In the past, the Australian components sector has been characterised by relatively low scales of operation (PC 2002).

In these circumstances, a reduction in assistance (or any other factor that could lead to a decline in production) would be more likely to trigger the closure of one or more plants because unit costs rise as production and sales fall. Essentially, this means that adjustment may be ‘lumpy’ rather than incremental.

However, where selected closure occurs, scale economies can also help remaining firms to reduce their unit costs of production and improve their viability, as they capture some of the sales from plants that close. In relation to the car assembly sector, there are clear possibilities for substitution by domestic consumers between the current, locally produced models (although this is probably less so with respect to the Ford Territory).² This suggests that, were one of the local assemblers to cease operations at some point, the volumes achieved by the remaining assemblers would increase. From this perspective, reduced assistance may drive efficient integration and achieve scale economies. Similarly, in its 2002 report, the Commission considered that further rationalisation in the components sector could improve the industry’s competitiveness through scale economies. Further, where rationalisation within the automotive industry releases resources for use in other industries, this may allow the achievement of greater scale economies in those other industries. In sum, in such cases, the net benefits from reductions in assistance would be higher, possibly considerably so, than those projected in the simulations (box 5.1).

² The Commission’s 2002 report considered it unlikely that the export business of an exiting producer would flow to remaining Australian producers, though exports to New Zealand were a possible exception, given the high degree of substitution between Commodores and Falcons that competed in the market at that time (PC 2002).

Box 5.1 **Modelling some possible effects of economies of scale**

Modelling has been utilised in previous Commission inquiries to help illustrate some of the possible effects of reductions in assistance in the presence of economies of scale.

In the 2002 inquiry, the MONASH model was used to explore the potential impacts of the possible closure of Mitsubishi, under a variety of assumptions regarding demand leakage to imports and the effects of closure on the realisation of economies of scale by remaining vehicle producers and component producers.

Under one scenario, most of Mitsubishi's sales were assumed to be lost to foreign suppliers, and there was a resultant reduction in local component activity with an associated loss of economies of scale. As would be expected, the costs to the industry under this scenario were greater than in a second scenario in which the bulk of Mitsubishi's domestic fleet business flowed to the remaining vehicle assemblers, and the flow-on effects on component production were rescaled accordingly.

Under a third scenario, which also assumed that the bulk of Mitsubishi's domestic fleet business flowed to the remaining vehicle assemblers, allowance was made for economies of scale in assembly activity. The negative projected impacts for industry activity and employment resulting from the closure were greatly diminished, and the initial adverse short-run economy-wide impacts effectively neutralised, although regional labour reallocation impacts remained.

In the Industry Commission's 1997 automotive inquiry, simulations were run to explore the impacts, in economy-wide terms, of costs reductions that could be generated by exploiting greater economies of scale in the automotive sector. The simulation involved a reduction in tariffs from 15 per cent to 5 per cent. Among other things, the simulation assumed that the marginal producer exited the industry and the remaining producers increased their production sufficiently to meet the domestic production projected in the constant returns to scale scenario. The modelled cost reduction of 3.9 per cent increased the effects of the simulated tariff reduction on real GDP growth to four times that under the constant returns to scale scenario.

Source: IC (1997); PC (2002).

Alternatively, it may be that a future fall in output would not result in the exit of the marginal vehicle producer, or sufficient marginal components producers, but would be shared among all existing car producers and most existing component producers. If this were to occur, the unit costs for each would increase to the extent that their level of production would be less than required to minimise unit costs. As such, the net benefits from reductions in assistance would be lower than those projected in the modelling simulations.

Export demand elasticities

As noted in chapter 3, in the MMRF model it is assumed that Australian firms can sell greater volumes on world markets only by accepting a lower price. Accordingly, to the extent that policy changes raise the share of resources allocated to export-intensive industries, Australians face a reduction in the 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 be in the absence of such effects.

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.

Sensitivity analysis (scenario S2) shows that reducing this parameter to 5 (at the lower end of the range typically applied in GE models) has limited effect on outcomes generated by the model. As would be expected, the reductions in automotive assistance simulated in scenario S2 result in greater terms of trade losses. (While further reducing the export demand elasticity would increase terms of trade losses further, it is unlikely that Australia would have such a degree of market power.) However, the simulation still results in an increase in GDP, due to resource reallocation and expansion gains, and net benefits (as measured by real adjusted GNE) remains virtually unchanged. That said, real public and private consumption decline by 0.01 per cent.

Scenario S2 mirrors the main simulation reported in the Commission’s 2002 report (which also used export demand elasticities of 5, among other values), although in that case the reported result of a net consumption loss reflected the limited timeframe provided for adjustment in the simulation. Had that simulation’s time frame been extended to allow fuller adjustment, the change in net consumption would have become positive (box 5.2).

Even so, it is clear that with sufficiently low export elasticity parameters, it would 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 5.3).) However, 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.

Box 5.2 Comparison with previous modelling results

In its 2002 inquiry, the Commission used the MONASH 'dynamic' model to model several scenarios, with an array of export demand elasticities. The main scenario was the Commission's 'preferred post-2005 option', which involved:

- retention of PMV tariffs at 10 per cent from 2005, with a step reduction to 5 per cent in 2010 and no further reduction until at least 2015; and
- retention of overall ACIS funding at (then) current levels from 2005 to 2010, and retention of the uncapped production credits from 2010 to 2015.

In the 2002 inquiry report, this scenario produced the results listed in the last two columns in the table below. The comparable scenario in the present study is O1. To illustrate the effects of changing export demand elasticities, scenarios R1 and S2 are also shown.

<i>Scenario</i>	<i>O1^a</i>	<i>R1^a</i>	<i>S2^a</i>	<i>PC 2002^b</i>	<i>PC 2002^b</i>
<i>Export demand elasticity</i>	<i>10</i>	<i>10</i>	<i>5</i>	<i>4</i>	<i>10</i>
Real GDP	0.06	0.06	0.05	0.00	0.01
Terms of trade	-0.04	-0.05	-0.08	-0.08	-0.02
Real consumption	0.02	0.00	-0.01	-0.01	0.01
Real adjusted GNE	0.05	0.06	0.05	n.a	n.a

^a MMRF simulations; percentage deviation from base, once all long-term adjustments have occurred.

^b MONASH simulations; percentage deviation from baseline scenario in 2016.

Sources: Commission estimates from MMRF simulations; PC (2002).

As the table shows:

- in this study, real GDP increases about 0.06 per cent, whereas in the MONASH simulations, it increases by 0.01 per cent or less
- when comparing scenario O1 with the 2002 scenario in which export demand elasticities are set to 10 (shown in the last column), terms of trade effects in this study are larger than those in the MONASH simulations
- changes in real consumption are small in both sets of results.

The smaller increase in real GDP recorded in the 2002 MONASH simulations indicates that the capital stock had not grown as much in those simulations as in the current study's MMRF simulations. This is due in large measure to the fact that MONASH results were reported for the year 2016, only 6 years after the modelled reduction in tariffs and in ACIS. In running the MONASH simulation further, the Commission found that capital was projected to continue to be accumulated past 2016. The MONASH model took about 13 years to exhaust the adjustments required in response to the modelled policy change. In doing so, results from the MONASH simulation converged to those of the MMRF simulations in this study.

Box 5.3 **Some issues in seeking to devise an ‘optimal’ tariff**

Being a relatively small part of the world economy, Australia 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 exports of the relevant commodities, such as iron ore, wheat and wool, taking into account developments in international markets.

It has been suggested that tariff protection for the automotive industry could also allow Australia to benefit in this way, as holding resources in the automotive industry 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 automotive tariffs (holding all other tariffs constant) would generate a net benefit for Australia.

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 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 automotive imports would likely be far from optimal in an economy-wide sense.

Preferential tariffs

As noted in chapter 3, the tariff scenarios are modelled as changes in the headline Most-Favoured-Nation (MFN) automotive tariff. The change in MFN rates is interpreted to be a measure of the change in the ‘price wedge’ created by tariffs. Therefore, the calculation abstracts from the effect of preferential tariff rates, including the effect of those relating to the recent preferential trade agreements (PTAs) with Thailand and the United States. These agreements provide for tariff

concessions on imports from these countries: most imports of motor vehicles and parts meeting ‘rules of origin’ requirements from Thailand and the United States currently enter duty free, with the exception of cars from the United States, duties on which are being phased down to zero over the period to 2010.³ Imports from these countries currently represent around 14 and 10 per cent of total motor vehicles and parts imports, respectively (Bracks 2008a), although it is understood that many of these are in the ‘other’ vehicles and components category that is outside the focus of this study.

The effects of such agreements on import competition in Australia, and thus on the most appropriate tariff price wedge for use in modelling, would depend on the extent to which the partner country’s automotive industry is able to undercut the (tariff-inflated) price of rival imports. To the extent that they do 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 automotive producers with facilities located in the partner countries (for example, Thailand 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 automotive industry and, in turn, that little or no adjustment is needed to the modelled net benefits of reducing or removing such assistance (although there could be government revenue implications not picked up in the modeling).

To the extent, however, that the prices of imported cars and related components 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 straight-forward. On the one hand, to the extent that the price of imported cars and related components in Australia has fallen as a result of these tariff concessions, the ‘true’ tariff price wedge on the automotive industry’s *outputs* would be lower than represented in the modelling. On the other hand, lower priced components would reduce the penalty assemblers pay on their *inputs* as a result of automotive tariffs. In these circumstances, the use of the MFN tariff rate (rather than the MFN rate deflated to reflect the concessions) to derive price wedges in the modelling could have caused some overstatement of assistance to the components sector, but either some overstatement or understatement of assistance to assemblers, depending on trade patterns with the PTA partner countries and which automotive products have borne the price declines.

While an empirical matter, it is feasible that the net effect of these PTAs could be to reduce the net price raising effect of assistance to the domestic automotive industry

³ With the exception of the \$12 000 duty on second-hand vehicles.

provided by the tariff. In this case, the net benefits of further reducing automotive assistance would be smaller than suggested in the modelling simulations. Equally, the contraction in the automotive industry consequent upon further reductions in assistance would also be less than modelled.

Box 5.4 Some possible effects of prospective PTAs

In addition to the existing bilateral PTAs with the United States, Thailand, Singapore, New Zealand, the Australian Government is currently negotiating or considering agreements with Japan, Chile, China, Korea, Malaysia, India, Indonesia, the Association of South East Asian Nations (ASEAN) (with New Zealand), and the Gulf Cooperation Council.

The extent to which reductions in automotive assistance in particular foreign markets, that might be delivered through prospective PTAs, could benefit Australian producers would depend among other things on the nature of demand in those markets. Given that most Australian production centres around larger cars, they are likely to be of more benefit in markets where demand for such vehicles is significant. But in our key export markets for cars:

- automotive tariffs are only 5 per cent in the Gulf States
- Australia is already party to PTAs with the United States and New Zealand.

For Australian component producers, however, there may be more scope to capitalise on expanded market access, as they are not dependent to the same extent on sales in particular markets.

As noted, the effects of such agreements on import competition in Australia would depend on whether the partner country's automotive industry is able to undercut the (tariff-inflated) price of rival imports. If they do not, a PTA will simply divert trade from other sources to the partner country, with little significant impact on prices in the domestic market.

However, a PTA that provided preferential treatment for imports from Japan would have major ramifications — it would be expected to be largely trade creating, given the competitiveness of Japanese production and the multiple manufacturers located in that market. It would, therefore, effectively render remaining tariffs on imports from other countries largely ineffectual. (The prospect of such an agreement would reinforce the case for lowering all automotive tariffs, and providing whatever assistance is deemed appropriate for the automotive industry in forms such as production subsidies. More generally, as the coverage of PTAs increases, reductions in the general rate would reduce trade diversion effects.)

5.3 Accounting for ‘exogenous’ considerations

As noted above, the simulation results indicate that the net resource effects of further reductions in automotive assistance are likely to be small in economy-wide terms. This mirrors a finding of the Commission’s 2002 inquiry. As noted in chapter 1, that inquiry indicated that, given small net resource effects, other considerations not incorporated directly in the modelling exercise assumed greater relative importance for the determination of future policy.

Some key exogenous considerations that could influence the net economy-wide outcomes from changes in automotive assistance include:

- induced productivity growth
- R&D and skills spillovers
- labour adjustment costs.

Further reform-induced productivity improvements?

As noted in chapter 1, there have been substantial improvements in the productivity performance of the automotive industry over the last two decades, induced in large measure by reforms to its assistance arrangements that increased competitive pressures on the industry. Historically, the automotive industry in Australia had been protected from ‘the usual consequences of poor management, unsustainable wage outcomes and conditions and excessive disputation’ (PC 2002, p. 49). Reductions in assistance provided an imperative for employers and employees alike to improve work practices.

However, changes in industry productivity, whether tariff-induced or not, are not modelled as an integral part of the MMRF framework. (It is possible, however, to apply exogenous ‘shocks’ to the model to simulate the *effects* of productivity improvements, as the Commission has done for this study.)

The Commission’s 2002 automotive inquiry observed that assistance reductions would add pressure for further improvements. While acknowledging that much of the ‘low hanging fruit’ may have already been picked, it identified a number of potential sources of further productivity improvements, including through the reaping of further economies of scale and, importantly, more cooperative workplace relations. As the industry itself acknowledged, reductions in assistance — although not welcomed — can spur productivity improvement. In turn, this can help firms cope with the additional competitive pressures associated with lower assistance, and enhance the industry’s longer-term capacity to attract capital, and boost its

competitiveness more generally. (Indeed, such productivity improvements are one reason that previous reductions in automotive assistance typically have been followed by smaller contractions in the automotive industry than had been projected in earlier modelling exercises.)

Currently, domestic producers together with their employees face heightened incentives to maximise productivity. Among other things, as well as the 5 percentage point reduction in tariffs that occurred in 2005, the Australian dollar (as measured by the trade-weighted index) has appreciated by around one-third since 2002. Over the same period, many consumers' preferences have shifted against the larger cars that are the current focus of Australian production. These heightened pressures suggest that the additional impact of future assistance reductions on productivity in the current climate might be less than it was in the past.

However, given the history of the industry and particularly its tenuous industrial relations environment, the signal provided by any government decision to reverse pre-announced assistance reductions could result in greater resistance by worker representatives to change. This could be reflected in a slowing in the uptake of future opportunities for productivity gains, particularly via workplace efficiencies, or even the delay or reversal of previously agreed reforms.

As reflected in the relevant simulation in chapter 4, any productivity gain consequent upon further reform would add to the net benefits from such reforms. The simulation entails a 1 per cent improvement in the use of labour and capital. The results confirm the importance of productivity, with this shock leading to an increase in economy-wide net benefits of 0.01 per cent, or some \$70 million per year in real adjusted GNE. The automotive industry's output expands slightly (by around 0.5 per cent), while employment in the industry declines by around the same amount. In practice, the effects within the automotive industry itself would depend on the exact nature of the productivity gain. For instance, improved labour productivity would be expected to be reflected in higher output but could either increase or reduce employment in the industry, at least in the short term.

Technological spillovers?

Through their activities, firms often generate spillovers for rival firms in their industry. In its 2002 inquiry, the Commission supported the view that spillovers generated by firms in the automotive industry are significant and, importantly, that some of the spillovers flow through to other industries (PC 2002). The Terms of Reference for the Bracks Review state that 'innovation in the automotive industry

results in significant spillover effects across the economy, and particularly the manufacturing sector’ (Bracks 2008b).⁴

Such spillovers are typically associated with the performance of R&D — such as the development of knowledge-intensive inputs, for example advanced software tools, with applications for other industries — although they are also said to arise from non-R&D factors, such as demonstration effects from vehicle exports enhancing Australia’s reputation as a producer of complex manufactured products.

The automotive industry receives significant government support for R&D, including via ACIS (chapter 2). ACIS funding is included in the modelling exercise, principally as a production subsidy for the relevant segment of the industry. R&D undertaken by the industry is also reflected in the database.

However, the model does not account for any beyond-the-industry spillover benefits generated by the performance of R&D. Accordingly, to the extent that such spillovers are *induced* by assistance to the automotive industry, the simulation results will tend to overstate the net benefits of reducing such assistance.

Recent analysis suggests, however, that the extent of beyond-the-industry R&D spillovers generated by assistance to the automotive industry may in fact be relatively minor. In its 2007 *Science and Innovation* study, the Commission reaffirmed that the strongest case for public support of science and innovation based on spillovers occurs:

- for basic research in science
- where businesses are engaged in support-induced novel R&D activities that either spill over cheaply to others or that trigger cycles of innovation by rivals. The spillover benefits will be greatest when there are many potential beneficiaries (generic technologies, or many potential users of that technology because of industry structures) (PC 2007b).

In contrast, the type of automotive R&D that has been supported by ACIS generally involves ‘modification of existing products, processes and production systems’ (PC 2007b, p. 439). At the firm level, this may involve activities such as the design

⁴ Spillovers are sometimes confused with inter-industry ‘linkages’. All industries have such linkages — for example, the automotive industry has linkages with (among others) steel, metal fabrication, transport and wholesaling; and the food processing industry has linkages with agriculture, transport and wholesaling. Such linkages are captured in the model and the flow-on effects of changes in assistance to the automotive industry on other industries are likewise reflected in the simulation results. Importantly, the fact that industries have linkages with many other industries, even particularly ‘deep’ linkages, does not of itself imply any case for government assistance.

of parts for specific applications, or the retooling of production equipment. More broadly, the industry has been characterised as one that invests in product development rather than the development of new technology (Bracks 2008a). Further, the *Science and Innovation* study found that:

... the type of automotive 'R&D' activity that has been supported by public funding ... is likely to have been undertaken without public support as the majority of benefits from this kind of development work are captured by either individual automotive firms or the wider automotive industry. (PC 2007b, pp. 439–40)

Thus, the Commission considers that the extent of R&D spillovers supported by automotive assistance would be unlikely to warrant any significant adjustment to the simulation results.

Skill development spillovers?

The Commission's 2002 inquiry noted that 'other industries and activities have benefited from the skills development that has taken place in the automotive sector' (PC 2002, p. 71). Similarly, a 2006 inquiry into employment in the automotive component manufacturing industry considered that the industry is 'a major contributor to the wider skilled workforce through its contribution to on-the-job training.' (HoR 2006, p. 35).

As with R&D spillovers, any spillovers in skills development associated with the operation of the automotive industry are not captured in the model. Nor are any spillovers to the automotive industry that result from the relocation of skilled workers from other industries.

Importantly though, while skills acquired in one job are often of value in another, this does not necessarily mean that they represent 'spillovers' in an economic sense. Where recognised and of value, skills acquired by workers are typically reflected in the incomes paid to workers (including, when they transfer to other firms or industries). Further, the opportunity for gaining marketable skills in a particular job is one factor that may influence workers' willingness to take on a position, and the wage rate necessary to attract them to a position. Thus, the broader value of skills gained on a job will, to some extent, be 'internalised' between the employer and employee.

That said, there may be difficulties in having competencies recognised, and labour market or wage rigidities may prevent the appropriation by employers of the full value of training they provide. This is likely to cause some underinvestment by the firms in such training and by some workers in the uptake of training. (This is one reason that government assistance is provided via general programs for skills

development, which may be accessed by eligible automotive businesses and employees.)

In its 2002 report, while the Commission noted several skills and training issues for the automotive industry, it did not identify a significant market failure in the area specific to the industry. Thus, the fact that the automotive industry is a generator of skilled labour does not provide a rationale for industry-specific assistance (or continuation of current automotive industry assistance), in addition to currently available broad-based assistance for industry training. Nor is there a clear basis for adjusting the simulation results significantly to reflect the automotive industry's generation (and use) of skilled labour.

Labour market adjustment costs?

While potentially bringing 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. Equally, while reforms to automotive assistance, by improving the competitiveness and output of other industries, may increase the demand for labour in Australia in the long run, they are likely to cause a short-term reduction in employment, as the process of structural adjustment proceeds.

Jurisdiction-level employment effects are estimated in the model, but various adjustment-related costs are not. Welfare payments including those related to structural adjustment are captured in the model's database, but changes in the level of payments have not been modelled. The same applies to the costs of labour adjustment programs typically provided by the Australian and State/Territory Governments to assist with adjustment to major and rapid workforce changes, and which provide a range of assistance including with the costs of retraining or relocation. Finally, the model does not include job search costs for affected individuals (some of which may be partly subsidised under labour adjustment programs), nor their earnings loss while unemployed.

In its 2002 report, the Commission addressed the extent to which adjustment issues might arise as a consequence of further reductions in automotive assistance. Among other things, it took into account:

- the industry's demonstrated capacity to adjust successfully to significant reductions in assistance
- the significant improvements in the skills of the workforce and their effect on improving alternative employment prospects

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- the reduced regional dependence on the industry
 - certain factors limiting firm and regional adjustment capacity, including:
 - higher unemployment rates than the average for the relevant State (in some cases)
 - a significant proportion of workers without post-school qualifications
 - a relatively high-proportion of employees from non-English speaking backgrounds
 - the potentially limited value of excess plant and equipment to other industries or other automotive producers
 - reduced labour turnover rates at the time, reducing the scope to manage adjustment pressures in this way (PC 2002).

The inquiry's projections suggested a concentration of labour market adjustment costs in 2011 of 96 person-years, following step reduction in assistance in 2010,⁵ with the Commission of the view that potentially disruptive firm or regional-level adjustments in the industry could not be ruled out. In such an eventuality, governments may need to consider providing specific adjustment support (PC 2002).

Since 2002, the most significant development for future adjustment prospects is the substantially stronger employment market. In this environment, workers losing their jobs because of reduced industry assistance are likely to be more rapidly re-employed in areas of demand. This is particularly the case for skilled workers, as illustrated by events following the recent closure of the Mitsubishi assembly plant at Tonsley Park, Adelaide — at the time of the closure in March 2008, over 700 'full-time, long-term positions' were offered to highly trained personnel affected by the closure (Hassall 2008). Moreover, the automotive industry itself is already experiencing skills shortages due to competing demands in the national economy (Bracks 2008a), a point emphasised by the Victorian Government:

Australia's resource boom primarily in Western Australia and Queensland has dramatically increased demand for skilled workers and is contributing to a high attrition rate of skilled workers from the Victorian automotive industry by offering higher wages. (Victorian Government 2008, p. 21)

This suggests that while the model's estimate of net benefits of the various options to reduce assistance would be lessened by inclusion of adjustment costs, these costs are unlikely to be significant given the current strength of the labour market.

⁵ This cost was calculated using the MONASH model's Labour Input Loss Index. The Index accounts for the effects (both positive and negative) of changes in the structure of the economy on labour market adjustments (PC 2002).

Moreover, such costs are likely to be significantly lower than anticipated at the time of the 2002 inquiry, when the current assistance package for the industry was framed.

At the same time, the direct cost to the community of retaining jobs in the industry is clearly significant. Based on the estimates of automotive assistance and employment in chapter 2, and simulation O7 in which the removal of tariffs and ACIS is projected to induce a contraction in automotive industry employment of 7 per cent, the value of support from the community for each job retained in the industry could be around \$300 000 per year.

5.4 Summing up the economy-wide effects

The modelling in this study suggests that further reductions in assistance to the automotive industry would generate net benefits for the Australian community through improved usage of resources. The associated contraction in automotive activity would be more than offset in the long run by gains to other industries. The modelling also suggests that the current plan to reduce automotive tariffs to 5 per cent in 2010, and to terminate ACIS in 2015, offers greater net benefits than alternative options that entail lesser (or more prolonged) reductions in assistance. This is particularly so when allowance is made for the likely deadweight costs of raising tax revenue to make up the revenue loss associated with ACIS subsidies.

In the Commission's view, these conclusions remain intact when account is taken of the various 'exogenous' factors that influence the economy-wide effects of the options modelled. These include the potential for spillover benefits associated with the development and use of skilled labour in the automotive industry, as well as those that had been presumed to flow from automotive R&D. In the current climate, adjustment costs would be far lower than when the current assistance arrangements were framed in 2002. And the scope to achieve additional productivity gains, and to embed those already achieved, are further likely benefits from the current plan.

Nor are these conclusions materially affected by recent market developments that have increased import penetration, including currency movements, changing consumer preferences, and the effects of recently concluded PTAs. In particular, the recent exchange rate appreciation is frequently cited as a reason for providing higher levels of support to the automotive industry. Such appreciation inevitably puts pressure on the profitability and even the viability of firms in a range of trade-exposed industries, not just the automotive industry. However, this is integral to the process by which scarce resources in an economy, including skilled workers, are induced to move from lower value to higher value activities, in response to changing

economic circumstances and emerging opportunities — in this case, the higher returns available in the commodities sector. Suggestions that assistance to an industry should be maintained or increased to offset the higher dollar typically overlook this key point, and in general would prevent resources from flowing to their highest value uses, at the community's expense.

In sum, based on the Commission's economy-wide modelling and related analysis, reducing tariffs to 5 per cent by 2010 and removing ACIS by 2015 can be expected to have a positive payoff. By comparison, the options that would prolong higher assistance for this industry, or introduce new forms of assistance, would be likely to impose costs on the community as a whole.