
B Referee comments — summary

Results presented in this report have benefited from suggestions made by three independent referees — Philip Adams, Director at the Centre of Policy Studies (CoPS) at Monash University; Chris Murphy, Director at Econtech; and David Pearce, Director and Principal Policy Analyst at the Centre for International Economics.

On 28 April 2008, the Commission held a technical workshop to present some preliminary results and review the modelling undertaken for this study. Participants included the three referees, as well as representatives of the Automotive Review Secretariat, the Australian Government Treasury, and the Department of Innovation, Industry, Science and Research. Dr Larry Cook, Lecturer in the Department of Economics at Monash University, also provided insightful comments.

A summary of the feedback received and the Commission's responses to points raised is provided in this appendix. The summary is presented according to the broad topics addressed in the workshop discussion and the referee reports:

- the model chosen (section B.1)
- specific features of the model as applied in this study, including its structure and parameters, and updates to the model's database (section B.2)
- how shocks are implemented (section B.3).

The complete referee reports are available on the Commission's website (<http://www.pc.gov.au>).

B.1 The model

The Commission's choice of the Monash Multi-Regional Forecasting (MMRF) model for this exercise was seen as appropriate. The main issue discussed was the merit of using it in comparative-static rather than dynamic mode.

It was suggested that, especially in light of the time constraints for this study, the comparative-static framework was a reasonable one. It was also seen to provide 'defensible assessments' of the effects of assistance options. However, potential weaknesses of the comparative-static approach — stemming from the fact that time

is not explicit — were also recognised, namely:

- it does not explicitly allow for the precise timing of exogenous shocks or endogenous outcomes — this can make it difficult to interpret and present results, especially when timing of policy changes is a key issue
- it does not incorporate a ‘satisfactory’ theory of investment
- it requires particular care to be taken in constructing the reference database against which simulations are compared.

Response

Temporal considerations — such as whether a change occurs in 2011 or 2015 — may be important in some cases. However, the focus in this study is on evaluating the long-term implications of policy changes — that is, once firms and households have fully adapted to the changes.

Moreover, incorporating a temporal adjustment path in a model such as MMRF involves many restrictive assumptions. These relate to the estimated effects of the policy changes being modelled, as well as projections of all economic variables. A comparative-static model removes the need to make forecasting assumptions about the future economy and automotive industry, thereby avoiding issues that would arise from these assumptions.

Therefore, it is the spatial and industry dimensions of the model that are most germane, rather than the time dimension.

B.2 Features of the model

Structure and parameters

The two most discussed issues relating to the structure and parameters of the model involved the assumption of constant returns to scale and the elasticity measures used.

Constant returns to scale

One referee suggested that a brief summary of the evidence for and against the assumption of constant returns to scale be presented, with a conclusion on the reason for the final assumption simply stated.

Response

Although some evidence suggests that the automotive industry exhibits increasing returns to scale, there is some uncertainty about how much this matters to the economy-wide effects of the policy options examined in this study. For example, Horridge (1987) has found that the overall effects from changing assumptions about scale economies in modelling the economic impact of tariff reductions are unclear. If import-competing industries are assumed to exhibit external economies of scale, simulation of tariff cuts yield marginally smaller gains in welfare than under constant returns to scale. On the other hand, Harris (1984) and Dixon (1978) found that, when modelling internal economies of scale, tariff cuts can lead to markedly larger increases in GDP compared with assuming constant returns to scale. In contrast, Snape (1977) found that tariff reductions could reduce rather than increase national welfare, given increasing returns to scale.

A second issue that must be considered with respect to modelling scale economies is which other industries, apart from the automotive industry, are also subject to increasing returns to scale. The existence of scale economies in other industries implies that, although tariff reductions may have a stronger negative effect on the automotive industry, the aggregate result for all industries is largely unchanged, since tariff reductions allow other industries experiencing scale economies to lower their marginal costs of production. For example, Abayasiri-Silva and Horridge (1996) have found that, assuming scale economies operate across all industries, the effects of unilateral trade liberalisation on key aggregate variables are only slightly different from assuming constant returns to scale.

In summary, accounting explicitly for increasing returns to scale in a model such as MMRF is complex, its effects on results depend crucially on how it is modelled, and it was not possible to do it within the timeframe of this study.

Elasticity assumptions

Mention was made of the need to:

- discuss and justify parameter choices for the disaggregated automotive sectors, such as consumer demand elasticities, import substitution elasticities and capital–labour substitution elasticities
- test the effect of varying these elasticities through sensitivity analysis.

Response

Issues in estimating export demand elasticities are summarised in chapter 3. A

sensitivity analysis using a lower export demand elasticity was performed and reported in chapter 4.

Updating the database

The procedure the Commission and CoPS adopted to update the database for this study was seen as broadly appropriate. Discussion focused on specific aspects such as the base year used, checks on the industry disaggregation, and the modelling of the Automotive Competitiveness and Investment Scheme (ACIS) and the Green Car Innovation Fund (GCIF).

Updating the base year

The database was updated to 2005-06 and incorporates the latest consistent data available. It was, however, suggested that:

- this still may not be the best reference point for the simulations, given the changes in the automotive industry since then
- these more recent changes could be reflected in the database by using other data sources.

Also highlighted was the importance of comparing the automotive industry detail in the model with independent, industry-based data.

Response

The database was not updated with post-2005-06 information to reflect, for example, the closure of Mitsubishi. The direct effects of these changes over the past 18 months are uncertain but seem to have been small relative to the size of the automotive industry. Including uncertain information would introduce more uncertainty in the modelling. Excluding this information is unlikely to affect comparative-static results significantly.

Checks on the industry disaggregation

Although the definitions and sales splits were deemed ‘sensible’, one referee expressed reservations about the cost splits for intermediate inputs. It was suggested that extraneous information be used to inform the sales and costs splits and to check how well the MMRF values reflected the cost structures of the automotive sectors.

Response

The representation of the industry's cost structure in the database was compared with 2005-06 ABS data on the automotive industry (table 3.1, chapter 3). The comparison indicated that the updated MMRF database is consistent with these data. Further, the distribution of automotive industry activity across jurisdictions in the updated MMRF database is consistent with 2001-02 ABS data (table 3.2, chapter 3). The manner in which total sales were distributed across intermediate and final demand was also checked (but not reported due to space constraints).

Modelling ACIS

After some discussion, it was generally agreed that an appropriate (and the simplest) way to model ACIS was as a production subsidy, rather than as an import subsidy. This view was based on the facts that:

- the credits are tradeable (notwithstanding the discount at which they are traded) and that the supply of credits does not outstrip demand
- in practice, research and development (R&D) is defined so broadly in ACIS that any funds allocated for this purpose could be seen as a more general production subsidy.

Response

ACIS was modelled partly as a subsidy on imports and partly as an industry/production subsidy. This facilitated the modelling and allowed it to account for the possible bias that ACIS might introduce in favour of imports. This treatment assumes that firms first use credits to offset duty payable on eligible imports because of the discount incurred on trading the credits. This is consistent with evidence as to how credits seem to be used by eligible importers of eligible automotive products. To the extent that this bias does not exist, the projected impact of removing ACIS on imports could be overstated. However, whether ACIS is represented as an import or production subsidy in the database or through shocks does not affect the way in which it influences the total costs of the automotive industry, and therefore it has little effect on economy-wide results.

Given that uncapped funding depends both on the value of production and on the tariff rate, the formula used to calculate it was incorporated into the model structure to allow any changes in output to affect ACIS endogenously.

Capped funding was treated as a pure production subsidy. In line with the options outlined in the request to the Commission, total ACIS funding has also been

modelled as a pure production subsidy (in simulation O3).

Modelling the GCIF

It was observed that the lack of detailed information about how the GCIF will operate makes it difficult to simulate. Modelling it as a simple production subsidy was seen to be ‘very approximate’. Some of the difficulties raised included that it:

- requires a particular form of production
- appears designed to produce a new kind of product, which would be difficult to account for in the model.

It was also noted, however, that the assigned task did not appear to require an independent evaluation of the GCIF. It was suggested, therefore, that the GCIF not be ‘modelled in the simulations, but included in all simulations as part of the base case’.

Response

There are many potential ways to model the effect of the GCIF on the Australian economy, as discussed in chapter 3. In light of the uncertainty surrounding its nature, it was deemed most straightforward to incorporate the GCIF as a pure production subsidy in the database. As noted at the workshop, this option gives the benefit of the doubt to the GCIF, in terms of the treatment of its overall effects on costs. To the extent that the GCIF subsidises production of a model that would otherwise have been uncommercial or inefficient, it would have negative effects on productivity in the industry, and impose an economic loss on the economy overall. This effect was not considered.

The reference case

It was suggested that the report needed to explain any difference between the reference case used in the study and the ‘base case’ outlined in the request.

Response

The reference case was designed to clarify the exposition of the different impacts of tariffs and budgetary assistance. The links between the reference case and the base case are explained in chapter 4.

Closure

It was suggested that an appropriate closure would be to fix government consumption, allowing private consumption to vary to ensure the trade balance remained unchanged following a shock. It was suggested that this closure would be both justifiable and allow real consumption to be a better indicator of welfare.

Response

After experimenting with the proposed closure, further discussion with referees and eventual agreement, the initial closure was maintained as the central closure.

Eventually, changes in real gross national expenditure, adjusted for foreign ownership of capital and foreign investment were chosen as the measure of welfare. See discussion in chapter 3.

B.3 Implementing shocks

The main discussion surrounded modelling the appreciation of the Australian dollar to parity with the US dollar (as specified in the task requested of the Commission).

It was noted that the MMRF model cannot be used to simulate the effects of changes in the bilateral nominal exchange rate, as the model accounts only for changes in relative prices and there is no representation of money in MMRF.

It was argued that the factors that lead to a *real* appreciation would need to be modelled instead — for example, commodity price increases resulting from an exogenous outward shift in the export demand for minerals.

Response

The key driver of the appreciation of the exchange rate over recent years has been a rise in Australia's terms of trade, which has reflected strong increases in foreign demand for, and therefore export prices of, base metals and minerals (chapter 3). This cause of the appreciation in the exchange rate has been modelled.

An approximation of the effect of the exchange rate appreciation on the automotive industry can be obtained by scaling the simulation results. For example, to analyse the effect of an appreciation to parity with the US dollar, the change in automotive output would be multiplied by a ratio of the change in the exchange rate required to reach parity to the change in the exchange rate given by the modelling results.