

Modelling Economy-wide Effects of Future TCF Assistance

Work-in-progress technical workshop

On 28 May 2008, the Commission held a technical workshop to present some preliminary results and review the modelling undertaken for this study. Three referees attended the workshop — 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). 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.

Following the workshop, the referees provided written comments based on the preliminary simulations the Commission presented at the workshop. These comments are provided below (and a summary of these comments, and the Commission's response, is presented in appendix B of the report for this study). The Commission finalised its report on the basis of these comments and discussion at the workshop.

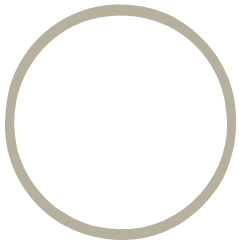


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TCF assistance modelling

Referees report



Prepared for the Productivity Commission



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May 2008

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Summary

- The overall modelling framework chosen is sound and is suitable for the simulations the Productivity Commission has been asked to undertake.
- The timeframe for the analysis has meant that some hard modelling choices have been made. It is very important to explain these choices and their potential implications for the model results. Areas of particular concern include the use of comparative statics, the limited disaggregation of the TCF sector and the inability to fully update the model database.
- The draft treatment of reduced pass through seems hard to justify and would be best modified to the alternative suggested by the Commission

This report

This report presents a referees review of the initial economywide modelling of the effects of TCF assistance options undertaken by the Productivity Commission on behalf of the current Review of Australia's TCF Industries.

This referees report is based on:

- the draft document containing background material of the key methodology and some simulations provided for a technical workshop on 28 May 2008;
- the presentations and discussions provided at the technical workshop on 28 May 2008; and
- the reviewer's working knowledge of the TCF industries and, in particular, the details of the MMRF model.

In providing this report, the reviewer has NOT:

- audited the underlying model database; or
- examined any computer (GEMPACK) input or output files.

The Commission is undertaking a series of modelling and data tasks within a short timeframe, so it is unlikely that all of the suggestion below can be practically adopted. It remains important, however to explain the implications of the modelling choices made.

Choice of model: MMRF

The choice of MMRF for the analysis is appropriate. MMRF is transparent and publicly available, and the main publisher (Centre of Policy Studies, CoPS) puts some considerable effort into disseminating understanding of the modelling framework as well of the software used to solve it.

Database updates

The procedure adopted by the Commission (in conjunction with CoPS), is appropriate and in parts is a standard procedure that has been adopted many times in previous Productivity Commission projects.

The updating procedure adopted does mean that the value added shares in total costs are different in the MMRF database to those implied by the latest ABS data (this is clearly evident in Table 2 of the initial results paper presented at the workshop). As these shares (along with the primary factor substitution elasticities) determine the supply response of the TCF industries this will have some effect on the results, but probably not large. It is probably worth illustrating the magnitude of the potential effect through a back-of-the-envelope calculation of the implied differences in supply elasticities.

Choice of disaggregation

The choice to disaggregate the TCF sector into three separate industries only (textiles, clothing and footwear) has a number of implications. First, this will not allow the model to capture the effect of the slight cascade in the current tariff structure (with more final products having higher tariffs than intermediate products). As cascading tariffs tend to generate very high levels of effective protection for intermediate sectors, this means that the model will not fully capture the resource allocation effects of tariff reductions.

Second, and related to this, greater disaggregation in general leads to greater resource allocation benefits from reform. The high level of aggregation will tend to mean that allocative effects will be understated.

Given the small tariffs, these effects clearly will not be large, however it is worth pointing out the implications of the aggregation choice when interpreting the results.

Parameter settings and sensitivity analysis

The draft simulation results use an export demand elasticity of -10. As is well known, there are a range of views about the appropriate choice of this parameter. Further, this parameter is known to influence the magnitude of the welfare effects of tariff reductions (through its effect in determining the terms of trade changes as a consequence of export increases resulting from the tariff reduction). It is crucial to undertake sensitivity analysis of this parameter.

The background material for the workshop did not present all the parameter choices for the three TCF industries. Several other sets of parameters (in particular consumer demand elasticities, import substitution elasticities and capital labour substitution

elasticities) need to be discussed and justified. The effect of the choice of these elasticities should also be tested through additional sensitivity analysis.

Import substitution elasticities, for example, partly determine the magnitude of the allocative efficiency gains from the tariff reductions, as to the capital labour substitution elasticities. Consumer demand parameters contribute to determining the magnitude of the consumer gain from tariff reductions.

Comparative statics

The Commission has chosen to run MMRF in comparative static mode. While the reasons for this within the time constraints available are sound, it is important to note that comparative statics brings its own challenges.

The timelessness of a comparative static simulation requires great care in the presentation of results, particularly when the actual time frames of policies are very much in the minds of the key stakeholders.

Some of the features of the problem are eliminated or hidden away as a consequence of this decision and approximations must be made in simulating the effect of policies that have a time dimension.

Choice of a welfare indicator and welfare decomposition

Because the results of the simulated changes are generally small (especially in percentage change terms) there is some temptation to consider that they do not matter, or that differences in alternative assistance measures do not matter. This is not a sound interpretation. While the effects are small, what matters is whether any of the assistance measures in fact make a marginal contribution to the welfare of the Australian community (regardless of how small this margin may be).

Further, it is important for policy makers to understand the tradeoffs involved in choosing levels of assistance to TCF industries. Such assistance is generally a transfer from one group of Australians to another, but with a deadweight loss associated with this transfer.

An important way to make this clear is to construct an appropriate welfare indicator within the model and to use this to explain the relative consequences of different assistance options.

It is also possible to provide a decomposition of any welfare effect into its key components (allocative efficiency and terms of trade) which assists considerably in the interpretation of the results.

Changes in real GDP *do not* provide a measure of the economic welfare effects on Australians of changes in policy. If the Commission wishes to avoid this confusion —

which unfortunately regularly emerges from model results — it is important to construct and discuss an explicit welfare measure. A number of suggestions were made in the workshop, including (by Professor Adams) using GNE adjusted for the ownership of capital.

Modelling assistance measures

In the initial simulations, most of the non-tariff assistance measures are treated as a production subsidy. While this is a reasonable approximation, it would be useful to try to more accurately capture the behavioural effects of the assistance measures. This will not make a big difference at a macroeconomic level but may change perceptions of the mechanisms underlying who ultimately pays for this assistance.

As some of the current assistance measures are paid as an R&D subsidy, it seems sensible for the Commission's MMRF modellers to draw on some of the findings of the broader Commission in its very detailed analysis of R&D measures. One issue raised there is the extent of additionality emerging from R&D measures.

Modelling exchange rate change

The Commission has been asked to model an appreciation of the exchange rate. Whether this was to be real or nominal was not specified in the request. The Commission's simulation of a real exchange rate appreciation brought about through a minerals boom is appropriate given the nature of the MMRF model.

At the workshop, there was some concern about how such a simulation would be interpreted from a policy perspective. It seems, however, that this simulation is required simply to give a sense of the difference in order of magnitude between assistance changes and exchange rate changes. Given this, the Commission's approach is certainly appropriate.

Reducing pass through

The Commission has been requested to simulate the effect of less than full pass through to final consumers of the price effect tariff reductions. In its draft report, the Commission simulated this as a productivity loss in the retail (margin) sector.

This choice is problematic, as it is hard to construct an economic rationale for such a loss of productivity. This implies that as a consequence of the tariff reduction efficiency in the retail sector declines. Without a sound economic explanation for this, simulating it as a productivity loss is likely to lead to a strong negative bias in the results.

A much better option is the second alternative suggested by the Commission, where the less than full pass through is treated as a return to capital in the retail (margin) sector. Under this treatment, a section of the retail sector is not 'lost' to the economy, rather there is a transfer from consumers to the owners of capital in the sector.

Reporting apparently small numbers

Because the TCF sector is small in the context of the whole economy, many of the changes in macroeconomic aggregates from the simulations are also small. It does not follow from this, however, that the economywide effects are small, or that the effects should be interpreted as being equal to zero. Someone in the economy must pay for the assistance given to the TCF industry (with a deadweight loss). The importance of an economywide model is to trace who pays and how big is the net loss to the economy compared with the assistance provided.

One way of making this clearer is to report results in dollars (not just percentage changes) and to use these dollar values to derive some useful summary measures of the transfers and deadweight losses involved. For example, measures such as the net (economywide) subsidy equivalent per TCF worker (or per dollar of TCF output) provide a useful ratio that is scale free. Like a cost benefit ratio, measures such as this allow a direct comparison of the effectiveness of the policy without the original scale of the values getting in the way of an appropriate interpretation.

COMMENTS ON PRODUCTIVITY COMMISSION TCF MODELLING

1. INTRODUCTION

- 1 As part of a review of the textile, clothing and footwear industries announced by the Government on 8 March 2008, the Productivity Commission was asked to model the effects of policy options covering a number of scenarios, including changes to tariff protection on TCF products and changes to the type and amount of Government assistance.
- 2 The Commission has chosen to undertake the requested analysis using a comparative-static version of the Monash Multi-Regional Forecasting (MMRF) model to assess the economy-wide impacts of changes to assistance to the TCF industries.
- 3 Preliminary results of the modelling were documented in a paper titled 'Modelling the economy-wide effects of assistance to the TCF industries' dated 28 May 2008. This paper formed the basis of a workshop held at the Commission's Melbourne office on Wednesday, 28 April 2008.
- 4 As part of the workshop 3 referees were asked to comment on the paper described in paragraph 3. Each referee was also asked to provide a short note of around 500 words detailing the main points of their review of the Commission's modelling.
- 5 This note sets out my main comments. Section 2 summarises my main comments relating to how the various assistance mechanisms have been modelled. Section 3 describes my main comments relating to the manner in which the results are reported. Section 4 sets out my comments on and certain other matters.

2. ASSISTANCE ARRANGEMENTS MODELLED

- 6 The Commission was asked to examine the effect of changes in tariffs and the assistance programs within the post-2000 assistance package.
- 7 As noted by the Commission, current tariff rates vary from 5 to 17.5 per cent. The assistance package contains the following measures:
 - 1. Strategic Investment Program (SIP) scheme (worth \$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); and
 - 6. Supply chain Opportunities Program (SOP) (\$20 million).

2.1. SIP AND SBP FUNDING

- 8 The Commission noted that it had modelled the SIP and SBP as a production subsidy. This was because, among other factors, “of the wide range of activities potentially funded under the SIP, and that labour costs were potentially funded under the program”.
- 9 The Commission noted that SIP consists of Type 1 grants and Type 2 grants and that Type 2 grants comprise the majority of SIP funding (between 60 and 80 per cent).
- 10 Type 2 grants are provided for research and development (R&D) and innovative product design. While the Commission notes that eligible Type 2 expenditure could include salary and material costs, presumably such salary and materials costs must have been incurred when the relevant firm undertook eligible R&D or innovative product design. Thus the
- 11 I would prefer to see at least Type 2 SIP funding modelled as a subsidy to capital creation. This is because, to the extent such funding caused a substitution of capital for labour, there would be some production efficiency loss associated with Type 2 SIP funding. It would be beneficial to capture such efficiency losses in the Commissions modelling. Such losses are not captured when SIP funding is modelled as a production subsidy.
- 12 To clarify, I would prefer to see:
- SIP Type 1 funding and SBP funding modelled as a production subsidy; but
 - SIP Type 2 funding modelled as a subsidy to capital creation.

2.2. SAP FUNDING

- 13 The Commission noted that SAP is not explicitly modelled because modelling the SAP is “complicated by the way funding is allocated. ...two parts are restructuring initiative grants to firms, and assistance to help displaced TCF workers find employment. Assistance to help displaced workers does not affect the TCF sector. It does, however, affect the likelihood of workers gaining employment in the future”.
- 14 While I accept that it is difficult to model the intent of SAP, not modelling it means that the change in the fiscal cost of raising the revenue to pay SAP is not included in any modelling results where SAP is implicitly altered.
- 15 I would prefer to see SAP modelled as a lump sum subsidy paid to the household sector and to the owners of capital income in the model. If modelled in this way, the Commission will at least pick up any change in the deadweight cost associated with raising revenue to pay the altered amount of SAP payments.

3. REPORTING RESULTS

- 16 In Table 7 the Commission reports the economy-wide effects associated with the 9 simulations the Commission has undertaken.
- 17 Currently, the Commission reports the results as percentage changes from the base case result. Because the changes being simulated are relatively small the reported percentage changes are also small for most variables in most simulations.



- 18 With such small changes in variables it is hard to disentangle why results are changing from one simulation to the next
- 19 The presentation of the results would be improved, in my opinion, if:
- each column in the Table was to include some measure of the change in gross assistance modelled in the particular scenario. This would help the reader understand what was driving the change in magnitude of the results from one simulation to the next;
 - as well as presenting the percentage change in relevant variables, the dollar value of the change was also reported; and
 - for each scenario modelled include in Table 7, a measure of the change in welfare was also reported (in both percentage change and dollar value terms).
- 20 It would be also beneficial for readers if the Commission were to compare its results to those obtained from previous studies of assistance reform to the TCF sector.

4. OTHER MATTERS

4.1. THE PASS THROUGH SIMULATION

- 21 The Commission was asked to undertake a simulation where only a fraction of any tariff reduction was passed through to consumers. The Commission noted that “to perform the sensitivity analysis relating to less than full pass through of tariff reductions, the Commission has assumed that the trade margin (that is, wholesale and retail margin) in household consumption of TCF commodities has increased to the point where only 50 or 10 per cent respectively of the tariff reduction has been passed on to consumers”.
- 22 As the Commission correctly points out this simulation involves a decline in productivity in the wholesale and retail sector and so we see in Simulation 3, Table 7 (where the results of this simulation are reported) Real GDP and Real GNE fall the most of any of the simulations.
- 23 It is unrealistic to assume that, in the long run, a tariff or assistance reduction could lead to a sustained decline in productivity as has been modelled.
- 24 In my view, it would be far preferable to model the requested ‘less than full’ pass through of tariff reductions as the Commission has suggested via the introduction of “a mark-up on the trade margin just for the retail of TCF commodities to consumption by households”.
- 25 As the Commission notes such a simulation would have an effect on price similar to a tax. However, the revenue from the mark-up (economic rent) would accrue as income to the owners of capital.
- 26 While the model does not contain any theory to explain why such a mark-up is sustainable in a long run situation, the simulation suggested by the Commission at least enables the effects of less than full pass through of tariff reductions on consumers to be examined.

4.2. THE REAL EXCHANGE RATE SIMULATION

- 27 The Commission was also asked to undertake a simulation of the effect on TCF industries of an increase in the exchange rate that would see the Australian dollar achieve parity with the United States dollar.
- 28 The Commissions correctly points out that “CGE models are real models of the economy and do not have the concept of exchange rates in capital markets. But CGE models can be used to model changes in real exchange rates”.
- 29 Accordingly, the Commission has modelled the exchange rate scenario as a combination of tariffs and budgetary assistance programs falling to scheduled 2015 levels and an assumed 10 per cent increase in price of global mining commodities (Simulation 9).
- 30 While I agree with the way the real exchange rate has been modelled, it would be more transparent if the real exchange rate change was modelled by itself (i.e. excluding the assistance changes) and if the change simulated was designed to achieve the same reduction in, say, TCF output that occurred in some other simulation such as a tariff reduction simulation.
- 31 Done in this way we would be able to put the tariff and assistance reductions in context. We would be able to say, for example, that the modelled assistance reductions were equivalent to x% of the real exchange rate changes Australia has incurred over the last “y” years.
- 32 I would expect “x” to be small, indicating that the recent mining boom has placed much more competitive pressure on the TCF sector than would the modelled assistance reductions.

4.3. CALCULATION OF EQUIVALENT ANNUAL VALUE FOR THE PRODUCTION SUBSIDY

- 33 In Box 3 the Commission documents how it calculated an equivalent annual value for the production subsidy that was modelled. In that Box the Commission states that “This value was \$66.35 million and calculated as the value of total assistance (\$663.5 million) divided by the length of the program (10 years)”.
- 34 Such a calculation would be appropriate if the assistance arrangements generated similar levels of assistance over the 10 years of the assistance program. However, as the Commission notes with respect to the SIP programme, which generates the lions share of budgetary assistance, “Annual payments are capped at \$97.5m until 2009-10, and at \$17.5m from 2010-11 to 2014-15. Payments are made annually, in arrears”.
- 35 Because the SIP payments are front loaded, the Commission’s approach to the estimation of the equivalent annual assistance underestimates the value of the assistance. I believe the correct approach is to calculate the annuity, at an appropriate discount rate, that gives the same present value of the assistance payments at that discount rate.
- 36 These calculations for SIP are presented below where it can be seen that the approach used by the Commission would underestimate the equivalent annual assistance provided by SIP by about 11 per cent.



Year	Actual SIP	Commission's approximation
2005-06	97.5	57.5
2006-07	97.5	57.5
2007-08	97.5	57.5
2008-09	97.5	57.5
2009-10	97.5	57.5
2010-11	17.5	57.5
2011-12	17.5	57.5
2012-13	17.5	57.5
2013-14	17.5	57.5
2014-15	17.5	57.5
Total	575	575
PV @8%	\$436.84	\$385.83
Annuity @ 8%	65.10252	57.5

Economy-wide Effects of Assistance to the TCF Industries

Comments on modelling by Philip Adams, Centre of Policy Studies.

1. **General comment on static versus dynamic policy analysis** The comparative static framework leads to defensible assessments of the effects of assistance to the TCF industries. However, by not using the dynamic facilities in MMRF the Commission leaves itself open to criticism of being “behind the times”. Note too, that with time not explicit, explicit dating of exogenous shocks and endogenous outcomes is impossible, no satisfactory theory of investment is available, and no explicit allowance in the basecase for known events now and in the near future can be allowed for.
2. **Argument for constant returns to scale on page 4.** This is weak. I would suggest that a box be allocated to this very important issue. The box should contain evidence for and against the modelling assumption, and should conclude with the final assumption simply stated.
3. **Database** Definitions and sales splits described in Section 3 look sensible. However, the cost splits for intermediate inputs, appear problematic. For example, inputs of clothing in the footwear industry should be zero not just “small”. Extraneous information should be sought and utilised as much as possible to inform both the sales and costs splits and to check the core data – import penetration for assembly in final demand, export propensities, etc.
4. **Current arrangements** Further investigation into the nature of the SIP and how this should be modelled is required. My impression from the discussion at the workshop is that it should be modelled as a simple production subsidy. However, John and David may well disagree with my view.
5. **Simulation design** A comparative-static long-run closure is adopted. In this closure, at the macro level to a good approximation:
 - a. Private consumption (C) moves with HDI;
 - b. Government consumption (G) moves with private consumption (C);
 - c. Investment (I) moves with capital available for production (K);
 - d. Employment (L) is fixed and the real wage rate (RW) is endogenous;
 - e. Capital (K) is endogenous and the rate of return on capital (ROR) is exogenous; and
 - f. Real GDP (Y) is put in place by what happens to L and K, with technology (A) held fixed.

Given a capital share in GDP of 0.5, then (d), (e) and (f) imply (using lower case letters to signify percentage changes) $y = 0.5 \times k$. If HDI moves with GDP, then (a), (b) and (c) imply that $(C + I + G)$ will typically increase (decrease) by more than Y. Thus if k is positive, then $(X - M)$ will deteriorate.

In my opinion, this is an unnecessary constraint on the simulations. An alternative treatment, which also makes real consumption a better welfare indicator, is to have G fixed, and to assume that all of the capital created or destroyed by the policy being investigated is foreign owned. In other words nominal C should respond to changes in nominal labour income, to changes in nominal income that arise from allocative efficiency effects, and to changes in income necessary to maintain government budget balances at their basecase levels.

Any discussion of the welfare effects should emphasise the role played by changes in the terms of trade.

I would suggest that government budgets be fixed at basecase levels via endogenous shifts in direct cash payments to households.

6. ***Exchange rate simulation*** As discussed in the workshop, this is not a simulation of the effects of a change in the nominal exchange rate. Instead, it is a simulation of the effects of the recent terms of trade improvement. I suggest that the description and interpretation be recast in this light.
7. ***Reducing pass through*** More thought is required. What is meant by “pass through” and why might it not be 100 per cent? Having established clear answers to both questions, then modelling can proceed to shed some light on the specific issue.
8. ***Simulation results***
 - a. More detailed interpretation is required.
 - b. Suggest that the explanation of all columns proceeds in a sequential way. First identify a key column which should be explained in detail. Then explain the next column as a deviation away from the first in response to a single change in closure and/or shock. The third column is then explained relative to the second column, etc.
 - c. Consider the comments made by David and John regarding different, and perhaps more informative, ways for reporting the results – absolute changes (\$m), for example.
 - d. In light of 5, discuss in detail the welfare implications, spelling out exactly your “proxy” for welfare.