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Using Alternative Data Bases
90 per cent across-the-board cut in production
again predictions of the short-run effects of A

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Impact Project
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The effects of changes in protection levels because, at least in the
short-run, the emphasis has been devoted to OAMI studies of
long-run welfare benefits from trade.

In protection for industrial and employment and structure rather than on the
emphasis of the analysis has been put on the short-run implications of changes
especially textiles, clothing, footwear and motor vehicles. The main
protection enjoyed by many of Australia's import-competing industries,
been the effects of changes in the high levels of tariff and/or quotas
instituted in 1974.5.6.7. These are the subject of this paper and
have been reviewed in the previous paragraphs. Among the policy questions addressed, prominent have
been the Australian economy following the tradition of Ohman and
the Austrian economy following the tradition of Ohman and
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I. INTRODUCTION

Russell J. Armstrong
and
R. B. Pomerantz
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USING ALTERNATIVE DATA BASIS
GO PER CENT ACROSS-SECTION-OAMI OUT IN PROTECTION
OAMI PRODUCTIONS OF THE SHORT-RUN EFFECTS OF A
Australian context, it is the short-run consequences which are the contentious policy issue. Even the opponents of reductions in protection have generally conceded that in the long run an industry structure more in line with the economy's comparative advantage would be beneficial. They continue to oppose reform, arguing that the adjustment costs, especially in the labour market, are not sustainable, at least in the current depressed economic climate.

Even if the long-run gains from freer trade were of more immediate policy interest, it is doubtful whether CGE's of the current generation are suitable vehicles for their quantification. Dixon (1978) has argued that economies of scale reaped via intra-industry specialization in industries exposed to increased international competition are potentially much more important than the traditional "welfare triangles". The latter when quantified in a CGE which assumes constant returns to scale and fails to model opportunities for intra-industry specialization account typically for potential gains of only one or two per cent of GDP.

Studies using ORANI have investigated the effects of changes in protection made on both across-the-board (DPSV, 1982, chapter 7) and industry-specific (Industries Assistance Commission (IAC), 1981a, 1983) bases. Those of the latter type have attempted to provide projections of the effects within the sectors subjected to the changes in their protection levels as well as of the economy-wide effects. For this, special-purpose versions of ORANI have often been constructed which treat the sector of special interest in more detail than is available in the standard version of the model which disaggregates the economy into 112 industries producing 114 commodities. For both across-the-board and

10. In fact the rates used in generating import-price changes following percentage tariff cuts refer to a later period (1980/81) than the reference date for the 1974/75 input-output data base. For a discussion of the role of these rates in ORANI see DPSV, subsection 45.2.1. For a comparison of the agricultural sections of the 1968/69 data base with an about-to-be-available data base for 1977/78, see Adams (1984).

11. The idea of giving quantitative explanations of results from large-scale economic models via relatively simple back-of-the-envelope calculations is explored more fully in Dixon, Parmenter and Powell (1983b).

12. See also DPSV, subsection 45.2.1, especially equations (45.19) - (45.22).

13 See DPSV, sections 12-14.

14. The import demand equations complementary to (3) are of the form:

\[ m_k = A_k - \alpha_k \left( 1 - S_{1k} \right) (P_k - P_i) \]

where \( m_k \) is the percentage change in the demand for imports of category \( k \).

15. The import-competing industries in ORANI are single-product industries. Consequently, in deriving (7) we can assume that \( z_{i} = x_{i} \).
grounds.

1. The issue is apparently belligerent by those who oppose such charges on these
   grounds. The nature of the opposition appears to be much smaller, however, in
   those cases reported by the regional offices. In all cases reported, the 1981 (IC) and
   1982 (IC) (in one of the 1982, 1983) (in one of the 1983, 1984) violations of
   and complaints and doxoms (1981) Study the impact on the economic situation
   of the country (1981). Thus, the impact of the suppression of the economy,

2. More than the suppression, the suppression of the economy which are considered important from the point of view of the
   community and those associated with changes in short-term development programs that to be associated with changes in
   short-term development programs or to be associated with changes in
   short-term development programs. This being of the economic environment of the model, are often referred to as models of
   economic changes. Models have also been developed, and various macroeconomic indicators. Fosters have also been developed,
   namely macroeconomic indicators, productivity, and macroeconomic studies, which are produced for a wide range of
   economic-specific studies, production and a wide range of

3. The issue of what is better is agriculturally advantageous.

NOTES
of ORANI protection-policy projections and show that these survive the data change. In section III we explain how we have decomposed the changes in the projections to highlight the impact of specific aspects of changes in the data. Section IV contains a detailed description of the decomposed results including back-of-the-envelope calculations which show how key features of the theory and data combine to determine the outcomes. Conclusions are offered in section V.


II. THE MAIN EFFECTS OF PROTECTION ON TRADE IN BANANAS

11. The main effects of protection are discussed in this paper with the short-run assumption of fixed industry-specific capital stocks.

12. The simulations to be discussed in this paper were conducted

REFERENCES

[Text continues on subsequent pages]
TABLE 1: ORANI Projections of the Macroeconomic Effects of a 50 per cent Across-the-Board Cut in Ad-Valorem Protection Rates under Different Configurations of 1968/69 and 1974/75 Data

<table>
<thead>
<tr>
<th>Simulation(a)</th>
<th>Projections(b)</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Price Index</td>
<td>-4.40</td>
<td>-5.65</td>
<td>-5.57</td>
<td>-4.67</td>
<td></td>
</tr>
<tr>
<td>Aggregate Import Bill (Foreign Currency)</td>
<td>3.05</td>
<td>2.90</td>
<td>3.39</td>
<td>3.08</td>
<td></td>
</tr>
<tr>
<td>Aggregate Export Receipts (Foreign Currency)</td>
<td>5.05</td>
<td>5.58</td>
<td>7.12</td>
<td>5.86</td>
<td></td>
</tr>
<tr>
<td>Balance of Trade (% of GDP)</td>
<td>0.23</td>
<td>0.43</td>
<td>0.60</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>Aggregate Employment</td>
<td>0.41</td>
<td>0.84</td>
<td>0.98</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>Employment by Occupation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Professional</td>
<td>0.27</td>
<td>0.47</td>
<td>0.53</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>2 Skilled white collar</td>
<td>0.12</td>
<td>0.36</td>
<td>0.43</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>3 Semi and unskilled white collar</td>
<td>0.19</td>
<td>0.42</td>
<td>0.54</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>4 Skilled blue collar (metal &amp; elect.)</td>
<td>0.00</td>
<td>0.59</td>
<td>0.87</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>5 Skilled blue collar (building)</td>
<td>-0.26</td>
<td>-0.24</td>
<td>0.04</td>
<td>-0.01</td>
<td></td>
</tr>
<tr>
<td>6 Skilled blue collar (other)</td>
<td>0.29</td>
<td>0.41</td>
<td>1.30</td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>7 Semi and unskilled blue collar</td>
<td>0.61</td>
<td>0.73</td>
<td>0.74</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td>8 Rural workers</td>
<td>4.20</td>
<td>4.99</td>
<td>6.24</td>
<td>5.21</td>
<td></td>
</tr>
<tr>
<td>9 Armed services</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

Notes
(a) A key to the different data sets used for each of the four simulations is given in Table 2.
(b) All projections are percentage changes except for the balance of trade the projected change in which is reported as a percentage of GDP.

V. CONCLUSION

The most important policy implication to be drawn from ORANI simulations of cuts in protection is that protection does not have much to do with aggregate employment in the short run. Cuts in protection will destroy jobs in the import-competing sector but will stimulate activity and employment in the export sector. The net outcome is an empirical matter which is susceptible to investigation in a multi-sectoral model such as ORANI.

The usefulness of formal models in providing information for policy makers is not in the numerical projections alone but also in the graphic demonstration which the models are capable of providing of the theoretical and empirical factors which are crucial in determining the sensitivity of different sectors of the economy to policy shocks. In this paper we have concentrated on such a demonstration for the case of ORANI protection-policy simulations. We have attempted to show what, according to the model, determines the sensitivity of key industries in the Australian import-competing and export sectors to changes in rates of protection and how the reactions of these sectors combine in the macroeconomic outcome.
International trade, which implies that costs in production would have adverse
differences in some important respects from textbook Hecksher-Ohlin models of
relatively labor-intensive activities (import competing). The model
relatively capital-intensive activities (exporting) are the opposite of
increases the aggregate demand for imported goods in the production
feature of the results in Table 1, according to Ohlin, a call in production
before proceeding to decompose further to decomposition we note one

subsequent section,

especially on results at the individual industry level. As given in the

decomposition of the changes that are observed in the results, focusing
on the contribution of the marginal productivity of labor to the change in
this time candlestick using DAX's Standard 1 day/15 min interval data. As
however, Table 1 contains results of the same simulation,

\[ \frac{x}{x} \times \frac{x}{x} = \frac{x}{x} \]

Parameter and Power (1993)^{(12)}

inter-occupation adjustment now accommodated in the market (d),
occupation-adjustment changes would be small relative to the amount of
production adjustment changes that we observe, as we did when the other
locations reveals that the extent of labor market discrimination, a
as opposed to a job occupation-based, the former clearly the derivative of the production
occupational classification is not sufficiently industry-specific to
structure of the workforce are not particularly large, the higher
movement of real workers, the projected changes in the occupational
segments of the workforce are not particularly large, the higher
mobile to increase, with the exception of the increases in the
sectors. Thus both aggregate employment and the balance of trade surplus
sector would more than outweigh the contraction in the import competing

(12) Following a pattern identical to that above, a (X)

in this category. If it
most of the export sector (depend only on the average value of the stock
matrix B which do not change between simulations III and IV.

exogenous variables. The vectors of proportionality are elements of the
effects on labour if import-competing is a relatively labour-intensive activity. Crucial differences are that in ORANI, as configured for these short-run simulations, capital is not mobile between sectors and imports are not perfect substitutes for domestic supplies in the same commodity class. In Dixon, Parmenter and Powell (1983a) we show in detail how the adverse employment effects of a cut in protection depend on the elasticities of substitution between imports and domestic supplies whilst the favourable effects depend just on the extent to which lower import prices reduce the costs of the export sector. With wages indexed to the consumer price index the latter effect depends mainly on the import weights in the price index.

The reason for the exception is that our method fails to account for the fact that the domestic sales of industry 30 collapse sharply in moving from simulation III to simulation IV because its main domestic customers are import-competing textile industries whose protection rates are higher in the 1974/75 data base than in the 1968/69 data.

The comparison between simulations III and IV differs in an important formal sense from the earlier comparisons. A solution to the linearized (percentage change) form of ORANI can be represented as:

\[ x = B y \]

(11)

where \( x \) and \( y \) are, respectively, vectors of the model's endogenous and exogenous variables and \( B \) is a matrix of elasticities (assumed constant in a Johansen-style solution, see DPSV, chapter 5). The data changes made in moving between data bases I and II or II and III alter elements of the matrix \( B \). In moving between data bases III and IV it is the values of the exogenous shocks (elements of \( y \)) which are altered. This is because the vector \( y \) contains percentage changes in the powers of the protection rates (i.e., one plus the protection rates) rather than percentage changes in the rates themselves. The base-period rates (\( T_i \) in (4)) are used only to convert the required changes in the rates into the corresponding changes in the powers in formulating \( y \) prior to solution of (11). For our simulations the only non-zero elements in \( y \) are percentage changes in the powers of protection corresponding to 50 per cent reductions in all the rates. On average the ratio of the non-zero shocks in simulation IV to those in simulation III is 0.84. As can be seen from (11) there is a proportional relationship between each of the endogenous and each of the
III. A METHOD FOR DECOMPOSING THE EFFECTS OF THE DATA CHANGE

...
domestic import-competing commodity following a change in its price relative to the corresponding import price is proportional to the share of imports in the relevant domestic market (see equation (3) in section IV). The second important development is a shift in the shares of labour and capital in value added caused by the rises in real wage rates experienced in the early seventies and the deepening recession which had set in by 1974/75. Given the CES production functions implemented in ORANI, industries' short-run supply elasticities vary directly with the shares of labour in value added (see equation (2) in section IV). Finally, there are the changes in the ad valorem equivalent rates of protection assumed between the two data bases. These rates determine the falls in the domestic-market prices of imports which are assumed to follow any given percentage reduction in the rates (see equation (4) in section IV). For the most heavily protected import competing commodities (i.e., textiles, clothing, footwear and motor vehicles) protection rates in the 1974/75 data base are much higher than in the 1968/69 data, although for the less heavily protected sectors the reverse is true.10

In order to isolate the effects of each of these developments, we conducted four simulations in each of which the shock applied to the model was a 50 per cent across-the-board cut in ad valorem equivalent rates of protection. The simulations differed with respect to the reference years for various parts of the data used. Details are given in Table 2. Given the configurations of data described in the table, it is clear that comparing simulation I with simulation II should reveal the effects on the projections of miscellaneous changes in the input-output structure of the economy between 1968/69 and 1974/75. Most important, we therefore provide the required explanation. We ignore the activity term and use the c.pi projections as an approximation to the input-cost variable (p_i). We then predict the ratio of import-competing industry outputs in the two simulations to be approximated by:

\[ \frac{x_i^{IV}}{x_i^{III}} = \frac{c.pi^{IV} - p_i^{M,IV}}{c.pi^{III} - p_i^{M,III}} \]  

with the \( p_{ik}^{M,k} (k = III \text{ or } IV \text{ indicating the relevant simulation}) \) calculated via (4), again noting that each of the \( c.i \) takes the value of -50 in all simulations. Results of the comparisons are given in the final pair of columns in Table 5. Equation (10) provides a good guide to the changes in the projections. Industry 36 (Textile products n.e.c.) is the main exception. In moving from simulation III to simulation IV the output projection for this industry changes from negative to positive (see Table 3 (i)) but our explanation fails to pick up this sign change. The problem is twofold. In the first place this industry buys a large share of its intermediate inputs from other industries in the textile sector whose protection rates are higher in the 1974/75 data than in the 1968/69 data. The change in the value of cpi therefore mis-states the change in the costs of this industry as between simulations III and IV. Once the true cost effect is taken into account, the model projects that industry 36 would suffer almost no relative price disadvantages vis-à-vis imports on account of the 50 per cent uniform protection cut when its own tariff rate is as low (0.14) as it is in our 1974/75 data. The substitution term in the demand equation (3) is therefore of no significance in explaining its output performance in simulation IV. Rather its fate is determined almost
and electricals, and a smaller blue collar (and service) industry. Reductions in the comparison of occupations 4 'skill-full blue collar' (e.g.,

<table>
<thead>
<tr>
<th>Year</th>
<th>1979/80</th>
<th>1979/81</th>
<th>1979/82</th>
<th>1979/83</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

and service) industry. Reductions in the comparison of occupations 4 'skill-full blue collar' (e.g.,
suspect, were the changes in levels of import penetration in domestic markets. Comparing simulations II and III should isolate the influence of changes in industries' supply elasticities implied (given our CES assumptions and short-run focus) by changes in the shares of labour, capital and land in value added. Finally, the role of changes in the rates of protection enjoyed by the import-competing sector should be clear from a comparison of simulations III and IV.

due mainly to the stimulation of activity in the export sector. This can be seen by noting that Rural workers and workers in occupation category 6 (Skilled blue collar (other)) experience the most dramatic improvement in their employment prospects as between simulations II and III. The first of these categories is employed predominantly in the export-oriented agricultural industries whilst a large share (0.19) of the second is employed in the export-oriented Meat products industry.

IV.3 Comparing simulations III and IV: the effects of changing nominal rates of protection

We begin by explaining the relative sizes of the effect of the cut in protection on the CPI in the two simulations. In simulation IV the fall in the CPI generated by the cut is smaller than was the case in simulation III indicating that in the 1974/75 data the appropriate average tariff rate is lower than in the 1968/69 data. We assume via (5) that the CPI effect is proportional to the direct impact of the tariff cut on the CPI, that is, to the reduction in the CPI accounted for directly by the consequent fall in import prices. Using (5) and (6) and noting that $t = -50$ in all our simulations we expect the ratio of the CPI results in columns IV and III of Table 1 to be predicted accurately by:

$$\frac{\text{CPI}_{IV}}{\text{CPI}_{III}} = \frac{\tau_{74/75}}{\left(1 + \tau_{74/75}\right)} \div \frac{\tau_{68/69}}{\left(1 + \tau_{68/69}\right)}$$

(9)

where the superscripts indicate the simulations and the corresponding protection-rate data sources. In our data bases $\tau_{68/69} = 0.2715$ and $\tau_{74/75} = 0.2189$; hence (9) indicates:

$$\frac{\text{CPI}_{IV}}{\text{CPI}_{III}} = 0.84$$
where $\chi_1$ is the percentage change in the output of industry 1, $\chi_2$ and $\chi_3$ represent the percentage changes in the output of industries 2 and 3. The second equation (1) represents the production function of the export-oriented industries, while the first equation (2) represents the production function of the import-competing industries. The substitution effect, which occurs when demand is switched away from the domestic product, reduces the output of industry 2 and increases the output of industry 1. The demand for intermediate goods from industry 2 increases the output of industry 3. The overall effect is a change in the output of industries 1, 2, and 3, which can be calculated using the equations above.


<table>
<thead>
<tr>
<th>Industry (a)</th>
<th>Simulation (b)</th>
<th>Projected changes in output (per cent) I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Import competing sector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 Man-made fibres, yarns</td>
<td>-4.62</td>
<td>-5.07</td>
<td>-6.00</td>
<td>-11.42</td>
<td></td>
</tr>
<tr>
<td>32 Cotton, silk, flax</td>
<td>-6.33</td>
<td>-5.99</td>
<td>-6.67</td>
<td>-7.63</td>
<td></td>
</tr>
<tr>
<td>33 Wool and worsted yarns</td>
<td>-1.29</td>
<td>-2.32</td>
<td>-2.47</td>
<td>-2.97</td>
<td></td>
</tr>
<tr>
<td>34 Textile finishing</td>
<td>-1.44</td>
<td>-1.54</td>
<td>-1.64</td>
<td>-2.16</td>
<td></td>
</tr>
<tr>
<td>35 Textile floors covers</td>
<td>-1.03</td>
<td>-1.64</td>
<td>-1.99</td>
<td>-2.03</td>
<td></td>
</tr>
<tr>
<td>36 Textile products n.e.c.</td>
<td>-1.50</td>
<td>-0.99</td>
<td>-0.76</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>37 Knitting mills</td>
<td>-1.30</td>
<td>-6.29</td>
<td>-6.98</td>
<td>-8.42</td>
<td></td>
</tr>
<tr>
<td>38 Clothing</td>
<td>-1.55</td>
<td>-2.55</td>
<td>-2.61</td>
<td>-3.06</td>
<td></td>
</tr>
<tr>
<td>39 Footwear</td>
<td>-5.22</td>
<td>-11.83</td>
<td>-12.05</td>
<td>-14.54</td>
<td></td>
</tr>
<tr>
<td>50 Industrial chemicals</td>
<td>-2.02</td>
<td>-1.70</td>
<td>-2.00</td>
<td>-1.06</td>
<td></td>
</tr>
<tr>
<td>67 Metal products n.e.c.</td>
<td>-3.10</td>
<td>-3.04</td>
<td>-3.24</td>
<td>-2.04</td>
<td></td>
</tr>
<tr>
<td>68 Motor vehicles &amp; parts</td>
<td>-5.24</td>
<td>-5.49</td>
<td>-7.34</td>
<td>-11.15</td>
<td></td>
</tr>
<tr>
<td>73 Electronic equipment</td>
<td>-4.82</td>
<td>-5.25</td>
<td>-5.42</td>
<td>-2.61</td>
<td></td>
</tr>
<tr>
<td>74 Household appliances</td>
<td>-1.86</td>
<td>-2.95</td>
<td>-3.06</td>
<td>-1.99</td>
<td></td>
</tr>
<tr>
<td>75 Electrical machinery</td>
<td>-1.66</td>
<td>-1.30</td>
<td>-1.32</td>
<td>-0.08</td>
<td></td>
</tr>
<tr>
<td>(ii) Export sector (c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Pastoral zone</td>
<td>1.43</td>
<td>1.97</td>
<td>6.51</td>
<td>5.37</td>
<td></td>
</tr>
<tr>
<td>2 Wheat-sheep zone</td>
<td>1.46</td>
<td>1.78</td>
<td>4.11</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>3 High rainfall zone</td>
<td>2.81</td>
<td>3.92</td>
<td>8.69</td>
<td>7.20</td>
<td></td>
</tr>
<tr>
<td>11 Fishing</td>
<td>5.01</td>
<td>1.20</td>
<td>1.69</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td>12 Iron ore</td>
<td>0.56</td>
<td>0.04</td>
<td>1.67</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td>13 Other metallic minerals</td>
<td>3.66</td>
<td>4.77</td>
<td>4.49</td>
<td>3.71</td>
<td></td>
</tr>
<tr>
<td>14 Coal</td>
<td>7.18</td>
<td>8.17</td>
<td>4.86</td>
<td>4.03</td>
<td></td>
</tr>
<tr>
<td>18 Meat products</td>
<td>2.44</td>
<td>4.58</td>
<td>7.79</td>
<td>6.49</td>
<td></td>
</tr>
<tr>
<td>22 Flour and cereal products(d)</td>
<td>0.23</td>
<td>7.68</td>
<td>8.95</td>
<td>7.31</td>
<td></td>
</tr>
<tr>
<td>25 Food products n.e.c.</td>
<td>6.66</td>
<td>8.81</td>
<td>8.63</td>
<td>7.09</td>
<td></td>
</tr>
<tr>
<td>30 Prepared fibres</td>
<td>2.04</td>
<td>2.49</td>
<td>4.11</td>
<td>2.80</td>
<td></td>
</tr>
<tr>
<td>63 Basic iron and steel</td>
<td>4.29</td>
<td>6.39</td>
<td>9.55</td>
<td>7.71</td>
<td></td>
</tr>
<tr>
<td>64 Other basic metals</td>
<td>4.44</td>
<td>5.96</td>
<td>6.75</td>
<td>5.61</td>
<td></td>
</tr>
<tr>
<td>(iii) Summary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>7.18</td>
<td>8.17</td>
<td>11.00</td>
<td>9.46</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-6.33</td>
<td>-11.93</td>
<td>-12.05</td>
<td>-14.54</td>
<td></td>
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<tr>
<td>Rank correlation coefficient against simulation</td>
<td>0.92</td>
<td>0.91</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>0.99</td>
<td>0.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
(a) Identification numbers are from the standard ORANI codes. See DPSV, chapter 7.
(b) For details of the differences in data between the simulations see Table 2.
(c) The export sector list includes all industries producing commodities for which export levels are endogenous in ORANI. It includes all industries for which exports account for at least 20 per cent of total sales.
(d) Fishing exports are endogenous in simulation I but not in simulations II - IV. The reverse is true for exports of flour and cereal products.

import-competing industries a good approximation to the ratio of output responses under simulations II and III should be given by:

\[
\frac{z_{II}^{III}}{z_{I}^{II}} = \left[ 1 + \frac{\sigma_{I}^{III} S_{I}^{III}}{\sigma_{I}^{II} S_{I}^{II}} \right] \left[ 1 + \frac{\sigma_{I}^{III} S_{I}^{III}}{\sigma_{I}^{III} S_{I}^{III}} \right],
\]

where the superscripts on the \( z_{I} \) indicate results drawn from columns II and III of Table 3(i) and those on the \( n_{I} \) indicate supply elasticities calculated with the corresponding primary-factor shares.

Details of comparisons based on (8) are given in the second pair of columns in Table 5. It is clear that the explanation is very accurate except in the case of industry 36 for which the increase in supply elasticity predicts a more severe output contraction in simulation III compared to simulation II whereas the model projects a smaller contraction. The problem is that using (8) ignores an increase in the activity variable \( \sigma_{I} \) in equations (3) and (7)) which occurs between the two simulations for this industry. About one quarter of the industry's total sales are accounted for by sales to export industries (63 and 64) and to the export-related transport sector. All of these industries are stimulated in simulation III to a significantly greater extent than in simulation II (see, for example, Table 3 (iii)). The consequent expansion in the demand for the commodity produced by industry 36 is more than sufficient to offset its increased sensitivity to the price effects of the cut in protection. Finally note that industry 36 is not an exception to our general expectation that the increase in supply elasticity will reduce the extent to which import-competing industries respond to the protection cut by reducing their selling prices. In simulation III the projected
\[\begin{align*}
\frac{1}{d} \left( \frac{1}{d} + 1 \right) \frac{1}{d} = \frac{1}{d}
\end{align*}\]
where \( t_i \) is the percentage change in the ad valorem rate of protection for good \( i \) \((t_i = -50\) for all \( i \) in each of our simulations\) and \( T_i \) is the base-period rate.

In using (1) - (4) to provide the required quantitative explanations of the changes in the industry results between successive pairs of simulations, we use the percentage change in ORANI's index of consumer prices \( (\text{cpi}) \) as an index of the percentage change in the average price of purchased inputs \( (\tilde{p}_i) \) in (1)). We explain changes in the CPI by assuming that they are proportional to the direct effect on the index of the changes in import prices which are generated by the tariff change, i.e.,

\[
\text{cpi} = \gamma \tilde{w}_M \tilde{p}_M^n, \tag{5}
\]

where \( \tilde{w}_M \) is the weight of imports in the CPI, \( \tilde{p}_M \) is the average percentage change in import prices and \( \gamma \) is the factor of proportionality. Following (4) this is given by:

\[
\tilde{p}_M = \left[ \frac{T}{(1 + T)t} \right], \tag{6}
\]

where \( t \) is the common percentage change in ad valorem protection rates and \( T \) is the average base-period rate using as weights the shares of commodities in the aggregate import component of household consumption.

The coefficients of equations (1) - (6) are sensitive to the changes in the ORANI data base which were made for the purpose of conducting our four simulations (see Table 2). Table 4 gives a summary of

IV.2 Comparing simulations II and III: the effects of changing primary factor shares

The generally depressed state of the Australian economy in the year 1974/75 is reflected in ORANI's 1974/75 input-output data base by low levels of gross operating surplus in many industries. The shares of labour in value added by industry calculated from this data base are therefore much higher than the corresponding shares calculated from the 1968/69 data. In fact the average labour shares for the economy as a whole are 66 and 73 per cent according, respectively, to the 1968/69 and 1974/75 data. For the import-competing industries identified in part (ii) of Table 3 the shares are 79 per cent and 92 per cent, and for the export industries listed in part (iii) of the Table the shares are 44 per cent and 60 per cent. The main implication for our simulations of these changes in labour shares is that, for most industries, supply elasticities (given by equation (2)) are higher in simulations III and IV which use the 1974/75 shares than in simulations I and II using the 1968/69 shares.

The impact of these increased supply elasticities can be seen for industries in the traded-goods sectors by comparing columns II and III of Table 3. Simulations II and III differ only with respect to the change in factor shares. For the export sector, equations (1) and (2) combined with the assumption that export prices are approximately fixed provide a good explanation of the output results. We take the change in the CPI as an initial indicator of the change \( (\tilde{p}_i) \) in the price of purchased inputs. From Table 1 we see that this is almost identical in simulations II and III. Using (1) and (2) it then follows that the ratios of the output
sector. 

Above, these reductions do not preclude the whole of the export-competing industries help to attenuate the employment gains but, as we have seen

net economic activity in some import-competing sectors. Large increases in the productivity growth in manufacturing in the parts of the economy that are the

to the increased activity in the export sector - a symptom of this is the

more strongly in simulation II than in simulation I. This is due primarily

aggregate employment and employment in each occupation increases.


<table>
<thead>
<tr>
<th></th>
<th>Exporting (c)</th>
<th>Import-competing (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I and II and III</td>
<td>are explained</td>
<td>are explained</td>
</tr>
<tr>
<td>III and II</td>
<td>by new formulas of the import-competing sector</td>
<td>by new formulas of the export-competing sector</td>
</tr>
<tr>
<td>I and II and III</td>
<td>co-integrations of data changes</td>
<td>co-integrations of data changes</td>
</tr>
</tbody>
</table>

TABLE 4: Relationship between Changes in the Coefficients

In the data bases for the four main simulations of the explanatory equations (i)-(6) and changes of the industry-product matrices to reflect the medium-term economic

These results, in simulation II aggregate imports are projected to expand less

than in simulation I. The increase in import shares reduces the

sensitivity of imports to the relative price changes. The small simulations of

sector.
the coefficients for which changes were important in explaining the differences in output results between each successive pair of simulations for the import-competing sector and for the export sector.

IV.1 Comparing simulations I and II: the effect of changing import penetration levels

In section III we hypothesized that most of the difference between simulations I and II could be accounted for by the increase in the shares of imports in domestic markets which occurred between 1968/69 and 1974/75. This is immediately evident for the CPI results. For a simplified explanation of the change in the CPI result we can use (5) while ignoring differences in the average change in import prices between the two simulations. This implies that the percentage changes in the CPI are proportional to the direct weights \(W^M\) of imports in the index. Although the percentage change in each commodity-specific import price does not change between the two simulations, this is still a severe simplification since it fails to account for changes in the commodity-composition of the imported household-consumption bundle and for changes in the indirect weight of imports in aggregate consumption. Recall from section III that changes in the data between simulations I and II included changes in the whole input-output core, including changes in household budget shares and in industries' input coefficients. Nevertheless, noting that the relevant import weights \(W^M\) are 0.0605 in simulation I and 0.0703 in simulation II, equation (5) gives values for \(y^M\) of -87 and -80 using the CPI projections for simulations I and II from Table 1. The closeness of these values indicates that a large part of the change in the CPI projection between the two simulations is accounted for by the increased direct import penetration of the household consumption budget (e.g., using

<table>
<thead>
<tr>
<th>Industry</th>
<th>CPI Increase</th>
<th>Pastoral Zone</th>
<th>Wheat-sheep zone</th>
<th>High-meat-mineral zone</th>
<th>Fishing</th>
<th>Iron ore</th>
<th>Other metallic minerals</th>
<th>Coal</th>
<th>Meat products</th>
<th>Flour &amp; cereal products</th>
<th>Prepared fibres</th>
<th>Basic iron &amp; steel</th>
<th>Other basic metals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.38</td>
<td>1.22</td>
<td>1.60</td>
<td>0.24</td>
<td>1.53</td>
<td>1.31</td>
<td>1.14</td>
<td>1.88</td>
<td>1.02</td>
<td>1.06</td>
<td>1.49</td>
<td>1.39</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.90</td>
<td>1.40</td>
<td>0.45</td>
<td>2.00</td>
<td>0.90</td>
<td>0.60</td>
<td>0.22</td>
<td>2.2</td>
<td>0.73</td>
<td>1.32</td>
<td>1.73</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.60</td>
<td>0.24</td>
<td>2.3</td>
<td>0.80</td>
<td>0.60</td>
<td>0.60</td>
<td>0.32</td>
<td>1.7</td>
<td>0.73</td>
<td>1.32</td>
<td>1.73</td>
<td>1.54</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.30</td>
<td>0.22</td>
<td>1.7</td>
<td>0.90</td>
<td>0.22</td>
<td>0.22</td>
<td>0.12</td>
<td>1.2</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
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</tr>
<tr>
<td>5</td>
<td>0.00</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Notes: (a) Exports from this industry were endogenous in simulation 1 but exogenous in simulations II, III and IV. (b) Exports from this industry were exogenous in simulation 1 but endogenous in simulations II, III and IV.
the domestic percentage of the export sector and domestic industries on the domestic share of the export sector. This is because the exports are modeled differently in the two simulations. The impact of the export sector on domestic industries is modeled as a constant factor, whereas the impact of domestic industries on the export sector is modeled as a function of the domestic share of the export sector. The coefficients for these relationships are given in Table 1.

We use equation (3) to calculate the export sector's output change in the two simulations. The coefficients are given in Table 1 (from simulation II) and the coefficients from simulation I are used to calculate the export sector's output change in the two simulations. The coefficients for the export sector's output change in the two simulations are given in Table 1 (from simulation II).

The results of the export sector's output change are given in Table 1 (from simulation II). The coefficients for the export sector's output change in the two simulations are given in Table 1 (from simulation II).

To calculate the export sector's output change in the two simulations, we use equation (3). The coefficients for the export sector's output change in the two simulations are given in Table 1 (from simulation II).
activity terms in the demand equations, i.e., the first term on the RHS of (3). For example, the spectacular failure is for industry 35 (Textile floor covers). This reflects a change in data classification made by the ABS between the production of the 1968/69 and the 1974/75 input-output tables. In the 1968/69 tables all inter-industry sales of the commodity were treated as intermediate sales; in the 1974/75 tables a significant proportion of these were treated as sales to capital formation. In short-run simulations industries’ investment levels are more volatile than their output levels. A large share of the investment goods produced by industry 35 were sold in the 1974/75 tables to industries 89 (Wholesale trade), 90 (Retail trade), 96 (Air transport), 97 (Communication) and 99 (Finance and life insurance), all industries which experience investment declines in the simulations. Hence the activity variable in the equation describing the demand for the output of industry 35 is smaller in simulation II than in I. In this case the change in the activity term more than outweighs the fall in the import share. Industry 31 (Nan-made fibres, yarns) is a similar, but less extreme case. Via equation (3) the fall in its import share between simulations I and II should have made its output less sensitive to the tariff cut. But as can be seen in Table 3, in the simulations industry 31 actually fares worse in simulation II. This is accounted for by the fact that its main customers (industries 37 and 38) both do much worse in simulation II than in simulation I because of increases of their own import shares (see Table 5).

For industries in the export sector, differences in output projections between simulations I and II can be explained using equation (1) together with the approximation that export prices are fixed in both simulations (i.e., \( p_1 = 0 \)). On the basis of this we should expect the