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LONG-RUN CLOSURE OF ORANI:

FIRST IMPLEMENTATION

by

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IMPACT Research Centre

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The views expressed in this paper do not necessarily reflect the opinions of the participating agencies, nor of the Commonwealth government

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LONGRUN CLOSURE OF ORANI:

FIRST IMPLEMENTATION

by

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1. INTRODUCTION

ORANI, a multisectoral, comparative-static, computable general equilibrium (CGE) model of the Australian economy (Dixon, Parmenter, Sutton and Vincent — hereafter, DPSV), has been used to generate many policy simulations since it was developed. Most of these applications make use of a shortrun environment where capital stocks are exogenous, and industry rates of return vary endogenously. The real wage is exogenous, whilst employment adjusts to satisfy industry demands for labour. At the same time, absorption - in real terms - is exogenously held constant. The rationale is that investment, household consumption, and government spending are determined in the short run by monetary and fiscal policy. ORANI does not endogenize government behaviour and so these three aggregates are assumed constant with respect to the policy change under examination - such as a change in tariff rates. Alternatively, the effect of a change in any of the three components of absorption can easily be determined by shocking them exogenously.

Longrun applications of ORANI reverse the roles played by the factors in the short run. Instead of the real wage, it is aggregate employment that is held exogenous. Capital is mobile between industries and its distribution is governed by exogenous rates of return. The idea is that capital is available on the world market in infinitely elastic supply. This seems to provide a sensible longrun microeconomic scenario. In contrast, the erection of a plausible macroeconomic environment for longrun experiments has hitherto not been possible with the standard ORANI computer programs. Earlier longrun ORANI simulations made use of two fairly **ad hoc** assumptions. Consumption and investment were assumed to be proportional to one another and the balance of trade was held exogenously constant.

These earlier longrun experiments (e.g., Vincent (1980)) successfully transposed ORANI's chief strength - its modelling of industrial structure and interdependence - to a longrun environment. Because of the arbitrary macroeconomic assumptions mentioned above, these experiments were unsatisfactory to those who sought from the results some measure of aggregate welfare. The key idea was that any rise in GDP - ORANI's nearest approach to a measure of national prosperity - must, since employment was exogenous, imply an increase in the national capital stock. It was unclear how this was to be financed, but if, as seemed likely, an inflow of foreign capital was required, the rentals on this foreign-owned capital would accrue to foreigners. Thus the increase in GDP would be likely to overstate the advantage accruing to Australians from , say, a tariff reform.

To resolve this difficulty, ORANI development focussed on the distinction between income generated in Australia - GDP - and income accruing to Australians - GNP. Members of the IMPACT team sought to model the extent of foreign ownership through an account of the disposition of GNP between consumption and national savings.

Dixon, Parmenter and Rimmer (1984) - hereafter DPR - developed a miniature two-sector version of ORANI which successfully addressed these issues. This two-sector version was further explored by Horridge and Powell (1983) - hereafter, HP. The latter also proposed a detailed scheme for implementing the new 'longrun closure' in the framework of ORANI

proper, which models 112 industries and 114 commodities.

This paper describes that new longrun version of ORANI. It is divided into five sections. The first section describes the new equations and variables introduced into the model, and the theory underlying them. The second briefly describes how, in conjunction with the existing ORANI software, a series of new computer programs generate projections compatible with the additional equations. The third section shows how a sample series of experiments was set up, paying particular attention to the data requirements. In the fourth section the results of these simulations are described and explained. A short conclusion underlines the salient features of the preceding four sections, and suggests in which areas a given quantum of research effort might yield greatest benefit.

A computer manual by Horridge (1985, forthcoming) sets out instructions on how to use the new programs. Although a cookbook style has been adopted there, some readers, who do not intend to use these programs, may find that the directions shed a useful new light on the material incorporated in the current text.

2. THEORETICAL BASIS FOR LONGRUN CLOSURE OF ORANI

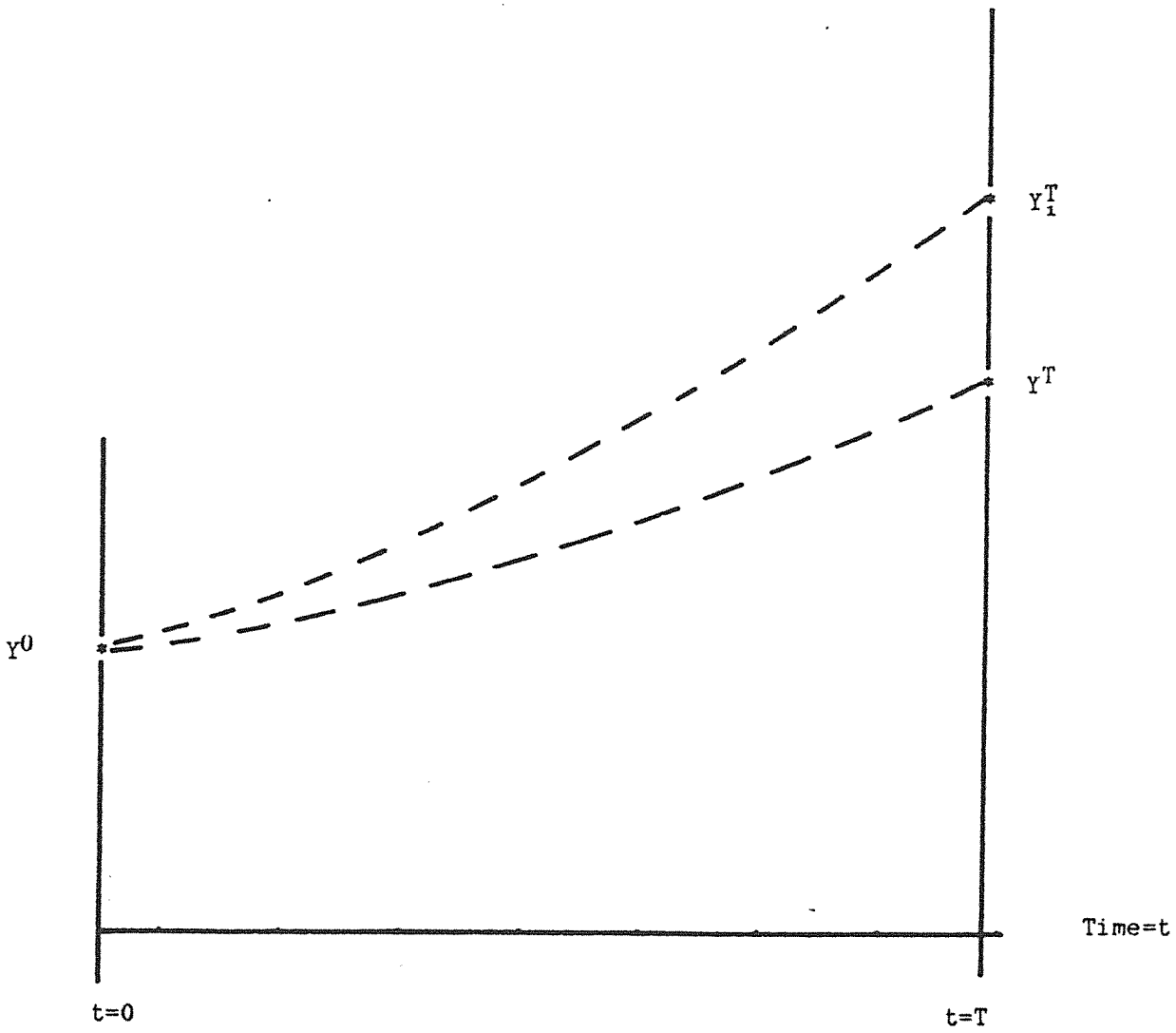
This section presents the additional equations which were added to ORANI for the longrun closure. Discussion has been kept fairly brief, especially where material has been covered in DPR and/or HP.

Like the standard shortrun version of ORANI, a comparative static methodology is employed. The ideas are illustrated in Figure 1. The diagram plots against time the value of some representative endogenous variable, Y. An undisturbed equilibrium state, Y^T, T years into the future, is hypothesized together with the transition path leading from the present state of the economy, Y^0, up to T, the 'snapshot' year. We investigate the effect on the system at time T, of a shock introduced in the present, at t=0, and maintained until T. Crucially, T must be at least large enough to allow the adjustment process implied by our choice of endogenous variables. Since capital stocks are assumed to adjust to match exogenous rates of return, this implies that sufficient time must have elapsed for new capital stocks to be installed, or for the old to depreciate by the required amount. Unless the effects of the shock are very large, this condition would normally be satisfied if $T \geq 10$.

The simulation consists in finding some new value of Y^T, Y_1^T, which satisfies longrun equilibrium conditions compatible with the new (i.e., shocked) time path of the exogenous variable between 0 and T. This new equilibrium is largely independent of any state of the system prior to T. Moreover, the values taken by most of the variables between 0 and T are not explicitly modelled. In a few instances, however, we have posited some connection between the value of variables in the intermediate period 0 - T, and the system equilibrium at T. In particular, national wealth at T is related to the flow of national saving throughout the intermediate period. However, we purposely choose a method which minimises the need for assumptions about the time paths of variables during this period, or for data on the unshocked scenario leading up to T.

As noted above, the standard version of ORANI is quite capable of simulating a suitable **micro** environment for longrun experiments. Industry rates of return may be held exogenously constant, and the capital stock of

FIGURE 1 NATURE OF AN ORANI SOLUTION



Explanation of Figure 1

A sustained shock is introduced at t=0 into the time path(s) of one or more exogenous variables. At time T the endogenous variable Y would have taken the value Y^T if the shock had not been injected; under the influence of the shock it assumes instead the value Y_1^T. The difference, $(Y_1^T - Y^T)$, is attributed to the shock. Notice that Y_1^T and Y^T at t=T are equilibria; the values on the path connecting them with Y^0 are not necessarily so.

each industry allowed to adjust accordingly. As with shortrun experiments, ORANI's agnosticism regarding labour supply allows several plausible closures. In the longrun simulations detailed below, we chose to exogenize the aggregate employment of labour, allowing the general wage and industry labour forces to adjust, whilst holding occupational and industry wage relativities constant. Other assumptions are also possible.

The chief problem in applying the standard programs to longrun simulations lies in the restricted choice of macro environments which these programs make available. Reasoning that government monetary and fiscal policy are the primary shortrun determinants of aggregate real consumption, investment, and government demands, most users of shortrun ORANI have elected to hold these exogenously constant. An alternative, of growing popularity, has been to hold the balance of trade constant whilst allowing real consumption to adjust to maintain external balance. Aggregate investment is still held constant, but government demands move in line with real household consumption.

Hitherto most longrun ORANI simulations have used some variation of this second closure. In the Vincent (1980) closure the balance of trade is held constant, but investment, instead of being absolutely fixed, is constrained to move in line with aggregate consumption. If trade is nearly balanced in the preshock equilibrium, this amounts to ensuring that consumption, investment, and government demands are all proportional to GDP.

Such a specification may seem fairly plausible in an economy open to trade in commodities, but closed to international capital flows. Since all value-added would accrue to Australians, the above modelling of consumption would approximate a proportional Keynesian consumption function. Investment would equal national saving and the aggregate capital stock could be equated with national wealth. The rates of return on all types of investment would be endogenous in such a model. But this approach raises two problems:

1. It is unsatisfactory to divorce the level of investment in the snapshot year T from any endogenous increase in the size of the aggregate capital stock. In some circumstances this could imply that an

increase in the size of the capital stock was associated with a decrease in its rate of growth. Therefore investment in the snapshot year could move in an opposite direction to the changes needed to accumulate the increased capital stock, during the intermediate period [0,T].

2. It seems unrealistic to connect consumption to GDP. By implication, either consumption is not determined primarily by income accruing to Australians, or else the possibility of rentals accruing to foreigners is excluded. Yet foreign ownership is an important feature of the Australian economy, particularly in certain sectors. It seems to be growing in extent; certainly it would be unwise to ignore the issue of ownership altogether.

These criticisms of the Vincent approach point to the main requirements of a more satisfactory longrun closure. Consumption and national saving should depend on the income accruing **to Australians**, rather than on income generated **in Australia**. National income should depend not only on GDP but also on the extent of foreign ownership of Australian factors of production. Australian equity in the snapshot year should depend on national saving over the intermediate period [0,T]. The relation of investment to the level of capital stocks should be more explicit.

Pursuing these aims, we have found it convenient to extend ORANI's treatment of macro variables generally, and to make explicit what before was determined by the ORANI model equations, but not actually calculated by the computer programs. This yields benefits not only in longrun experiments, but in shortrun closures as well.

A NATIONAL ACCOUNTING FRAMEWORK FOR ORANI

Gross Domestic Product from the expenditure side may be defined as:

$$\text{GDP} = \text{Consumption} + \text{Investment} + \text{Government Purchases} + \text{Exports} - \text{Imports}. \quad (2.1)$$

All quantities are valued at purchasers' prices. Imports are valued at the price paid by Australia - that is, excluding tariffs - whilst exports are valued at the price paid by the rest of the world, which includes any export taxes, or subsidies.

GDP from the income side, which is identically equal to the above, can also be written as:

$$\text{GDP} = \text{All Factor Payments} + \text{Indirect Taxes}. \quad (2.2)$$

The GDP identity does not appear in any list of ORANI equations. It is deducible from the Zero Pure Profits conditions for industries, and the Goods Market Clearing equations for commodities. In the framework of ORANI, the factor payments may be split into those accruing to land, labour and capital, whilst taxes comprise those levied on consumption, intermediate usage, investment, exports and imports. The ORANI category 'Other Cost Tickets', which serves to model miscellaneous industry expenses, may be viewed partly as a factor payment to 'working capital' and partly as a production tax.

The comparable equations for GNP are, on the disposition side,

$$\text{GNP} = \text{Consumption} + \text{Goverment Purchases} + \text{National Saving} + \text{Balancing Item}, \quad (2.3)$$

and on the income side,

$$\text{GNP} = \text{GDP} + \text{Invisibles Accruing to Australians} - \text{Invisibles Accruing to Foreigners}. \quad (2.4)$$

To implement these equations we make the following simplifications. We assume that all factor payments and indirect taxes generated in Australia actually accrue to Australians, excepting rentals to fixed capital. Thus the only foreign ownership modelled is foreign ownership of fixed capital. This assumption greatly simplifies computations, without departing too far from reality. Thus the 'invisibles' accruing to foreigners are supposed to represent the rentals accruing on their portion of fixed capital stock located in Australia. Symmetrically, the 'invisibles' accruing locally are represented by rentals on fixed capital located overseas but belonging to Australians.

The 'Balancing Item' comprises many small flows such as extraordinary insurance payments, transfer payments paid overseas by either the government or private individuals, foreign aid, transnational payments to labour as well as any statistical discrepancy. Its purpose is to allow a translation between the simplified accounting scheme above, and the tables published in the Australian National Accounts. It appears arbitrarily on the disposition side of the GNP identity.

The identities for GNP and GDP may be combined to produce the national balance sheet identity:

Surplus on Current Account
= Exports - Imports - Net Rentals on Capital Accruing to Foreigners
= Net Change in Domestic Ownership of Foreign Assets
= Saving - Investment + Balancing Item. (2.5)

Note that both GDP and GNP are measured gross. Thus investment must go partly into making up depreciation on existing capital, as well as on the creation of new stocks. Note too that no mention is made of direct taxes, transfer payments between Australians, government income, or the budget deficit. ORANI models the government merely as a consumer of goods and services. Activities associated with Government in real life appear as the activities of particular industries such as the defence industry, the education industry, and the public administration industry, which sell most or all of their output to government. ORANI ignores the redistribution, by the government, of income between social groups. As only a single representative consumer is currently modelled, this redistribution has no

effect within the model framework. Any budget surplus - that is, saving by the government - is subsumed in the category 'Saving', which represents not just saving by householders or the private sector but saving by the nation as a whole. The identities above guarantee that this 'national saving' is equal to investment by Australians in fixed capital, locally or abroad.

In setting up the additional equations for the longrun version of ORANI, GNP from the income side was written as:

GNP = Payments to Land and Labour + All Indirect Taxes (2.6)
+ Rentals Accruing to Australians from Capital Located in Australia
+ Rentals Accruing to Australians from Capital Located Overseas.

It was assumed that the income accruing to capital in each industry was divided between Australians and foreigners in proportion to their share in the ownership of that stock. Thus, denoting by Q_j the proportion of the capital stock in industry j owned by Australians, the income accruing locally is simply $Q_j K_j P_j^k$, where K_j is the amount of capital employed and P_j^k its rental price. Income from overseas can be written as $K_f P_f^k E$, where K_f is the foreign capital stock belonging to Australians, E the exchange rate, and P_f^k the foreign rental price of capital - some global aggregate. Thus GNP from the income side could be written yet again as:

$$GNP = \sum_j Q_j K_j P_j^k + K_f P_f^k E + \text{Other Income} , \qquad (2.7)$$

where P_f^k is treated exogenously in ORANI and where 'Other Income' comprises the returns to land and labour and Other Cost Tickets plus the five types of indirect taxes. All these components are fully specified by the standard ORANI model; a detailed account of their calculation is left to the appendix, in order to focus attention here on the additions to standard ORANI.

MODELLING THE LOCAL SHARE OF CAPITAL STOCKS

To implement (2.7), the GNP income equation, we need to know the degree of local equity in industry capital stocks and the amount of Australian-owned capital overseas.

Within a short timeframe we could regard the amount of capital owned by Australians in any industry as fixed. As the period under consideration lengthens, Australian equity at the end of the period must depend more and more on the investments made by Australians in the capital stock of the industry throughout the period. This is particularly true if equity has been growing.

To illustrate this point, a diagram introduced in HP may be adapted: Figure 2.1 depicts graphically the relation between a stock and a flow. The path S^0–S^T shows the value of the flow rate of real investment by Australians in some industry over the period 0–T during which adjustment to some policy change is supposed to take place. The scale on the time axis is so constructed that the area underneath the curve between any two consecutive years is proportional to the contribution made by that year's investment to locally owned capital stocks in the year T. Because capital stocks acquired early in the period will have depreciated considerably by the year T, the gradations near the left are closer together. In fact, to reflect the assumption that depreciation annually erodes a constant proportion, say 10 per cent, of existing capital stocks, each unit division on the horizontal time scale is 10 per cent longer than that on its left. Underneath the time axis a rectangle has been drawn, the area of which represents the amount of the capital stock in year 0, which would survive, after depreciation, till the year T. (Only the area of this rectangle is important; its shape and position have no particular significance.) Thus the capital stock in the year T may be divided into three parts:

(1) The surviving part of the original capital stock in year zero – area OXYT.

(2) The capital stock which would have been acquired through investment,

FIGURE TWO STOCK-FLOW RELATIONS

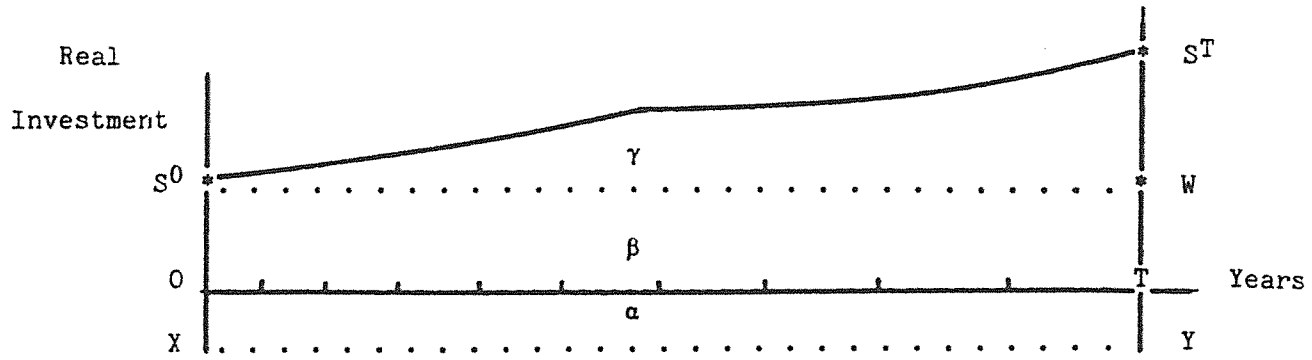


Figure 2.1 - Preshock scenario for investment and equity

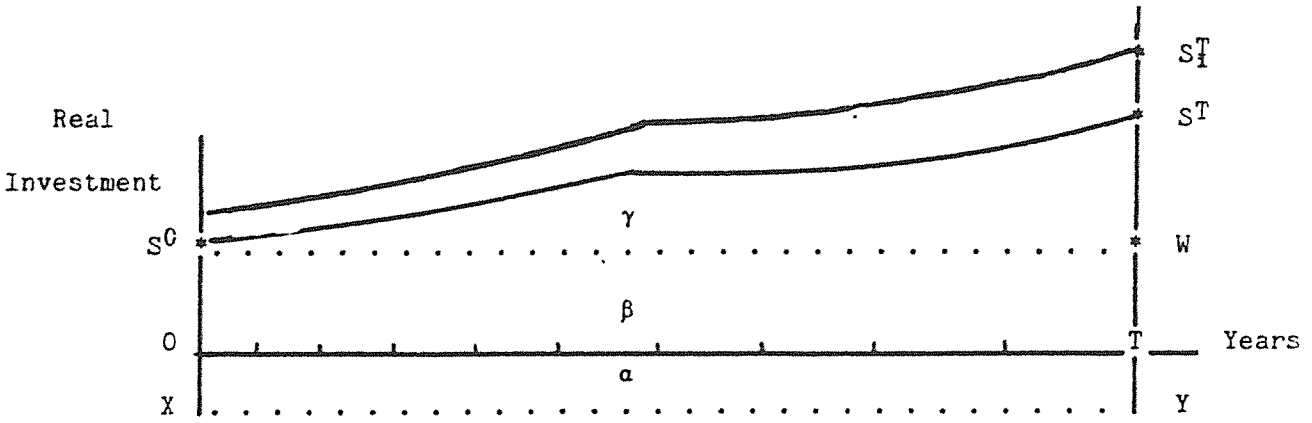


Figure 2.2 - Response path showing instantaneous jump

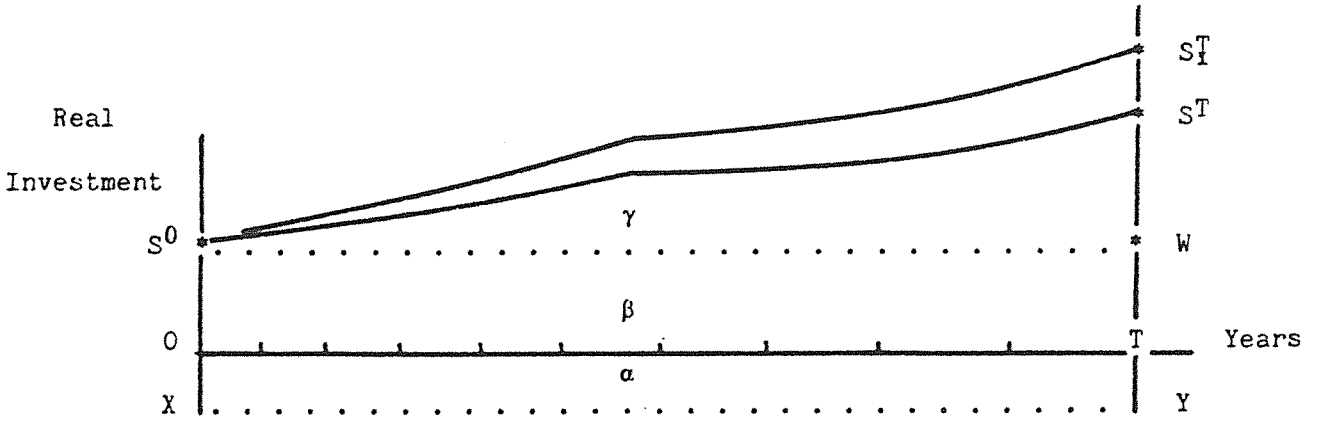


Figure 2.3 - Response path showing gradual adjustment

had the investment remained throughout the period at its original level of year 0 - area $OTWS^0$.

(3) The capital stock attributable to the growth of investment throughout the period 0-T, triangle S^0WS^T.

Let these three areas be of magnitude α, β, and γ. We could choose our units so that $\alpha + \beta + \gamma = 1$; in that case α, β and γ are the respective shares of the capital stock in the snapshot year of: surviving base year (t=0) capital; capital which would have been accummulated if the initial level of real investment had been maintained throughout the intermediate period 0-T; and of capital accumulated due to an increase during this period of the annual flows of real investment.

Suppose now that investment in the final year increases by one per cent to S_i^T without any change in the initial value of investment, S^0. By how much does the capital stock in the year T change?

The answer depends on how any adjustment to the new level of investment in year T is distributed over the period 0-T. We can distinguish two polar cases. If investment over the period remained unchanged so that adjustment took place at the moment just prior to T, the amount of capital stock installed at T would be unchanged. On the other hand, we could assume that investment increased by one per cent over the whole interval, which is to say that adjustment took place virtually instantaneously following some shock administered at time 0. In that case the amount of capital stock in year T would increase by $(1 - \alpha)$ per cent. This possibility is pictured in Figure 2.2. A third, intermediate possibility is that the adjustment might be spread evenly over the period, so that t years after the shock, investment was t/T per cent greater than in the preshock scenario. Then the capital stock in year T would change by about $(1 - \alpha)/2$ per cent. Figure 2.3 illustrates this possibility.

The value of α may be deduced from the growth rate, g, of the capital stock over the period 0-T, and the depreciation rate, d. Calling K^0 the amount of capital stock in year 0, and K^T the amount of capital stock in year T (in the unshocked scenario), then by definition $K^T = K^0(1+g)^T$. Similarly, $K^0(1-d)^T$ must be the surviving remnant of K^0 in the

TABLE 1: VALUES OF λ, THE ELASTICITY OF AUSTRALIAN EQUITY IN THE SNAPSHOT YEAR T WITH RESPECT TO SAVING IN THAT YEAR*

$$\alpha = (1-d)^T/(1+g)^T \qquad \lambda = (1-\alpha)/2$$

If T = 0 years, $\lambda = 0.0$ ($\alpha = 1.0$)

If T = ∞ years, $\lambda = 0.5$ ($\alpha = 0$)

d = rate of depreciation

g = preshock rate of growth of capital stocks

T = 2 YEARS

d =	.04	.06	.08	.10	.12
g = .01	.048	.067	.085	.103	.120
g = .02	.057	.075	.093	.111	.128
g = .03	.066	.084	.101	.118	.135
g = .04	.074	.092	.109	.126	.142
g = .05	.082	.099	.116	.133	.149

T = 5 YEARS

d =	.04	.06	.08	.10	.12
g = .01	.112	.151	.186	.219	.249
g = .02	.131	.168	.202	.233	.261
g = .03	.148	.183	.216	.245	.272
g = .04	.165	.198	.229	.257	.283
g = .05	.181	.212	.242	.269	.293

T = 10 YEARS

d =	.04	.06	.08	.10	.12
g = .01	.199	.256	.303	.342	.374
g = .02	.227	.279	.322	.357	.386
g = .03	.253	.300	.338	.370	.396
g = .04	.275	.318	.353	.382	.406
g = .05	.296	.335	.367	.393	.415

T = 20 YEARS

d =	.04	.06	.08	.10	.12
g = .01	.319	.381	.423	.450	.468
g = .02	.351	.402	.437	.459	.474
g = .03	.378	.420	.448	.466	.479
g = .04	.399	.434	.457	.472	.482
g = .05	.417	.445	.464	.477	.485

T = 50 YEARS

d =	.04	.06	.08	.10	.12
g = .01	.461	.486	.495	.498	.499
g = .02	.476	.492	.497	.499	.500
g = .03	.485	.495	.498	.499	.500
g = .04	.491	.497	.499	.500	.500
g = .05	.494	.498	.499	.500	.500

* This table shows the value of λ, for the equation

$$(q + k) = \lambda (s_d - \pi),$$

assuming a gradual adjustment of saving over the period [0,T].

year T. Taking the ratio of the two:

$$\alpha = (1-d)^T/(1+g)^T. \qquad (2.8)$$

Table 1 shows values for $\lambda = (1-\alpha)/2$, for a variety of combinations of d, g, and T. λ then represents the percentage change of the capital stock held by Australians in response to a 1 per cent increase in the real value of their investment in the year T, assuming that investment over the period adjusted gradually to its new level in the manner suggested by the third, intermediate hypothesis above.

A variety of other adjustment paths, apart from the three mentioned above, could be imagined. We shall assume merely that any endogenous change in the value of investment during the period is explicitly related to only one ORANI **variable**, namely the level of investment in year T. Then $K^T = f(S^T)$, or in percentage change form, $k = \lambda s$, where λ is a parameter deduced from various features of the whole preshock scenario. It is up to the user of the new longrun programs to set this value. A possible procedure is outlined in the section below describing the setting up of a sample experiment. Table 1 could also serve as a guide.

Following the method described above, Australian equity was related to national saving as follows. Investment by Australians may be divided into investment in local industries, and investment overseas. At any point in time the sum of these investments must equal national saving, S. Thus, let us denote by S_j the **nominal** amount of investment in industry j made by Australians in the snapshot year, by S_d the total of the S_j, and by S_f the **nominal** amount invested overseas, so that $\Sigma S_j + S_f = S_d + S_f = S$. We make two assumptions: firstly that the percentage change in all types of saving in the snapshot year is the same. Then:

$$s = s_d = s_f = s_j \quad \text{for all } j. \qquad (2.9)$$

Secondly, we assume that the adjustment parameter λ is the same for all investment by Australians in the capital stock of local industries, and for overseas investment. Hence we may write, again in percentage change form:

$$(q + k) = \lambda(s_d - \pi^L), \qquad (2.10)$$

where (q+k) is the percentage change in the aggregate amount of local capital stocks owned by Australians, and π^L is an index of the creation price of locally owned capital stocks. (k and q, respectively, are the percentage changes in the capital stock installed in Australia and in the proportion of this stock owned by Australians.) The percentage change in overseas capital owned by Australians, k^F, was modelled similarly as :

$$k^F = \lambda(s_f - e), \tag{2.11}$$

where e is the percentage change in the exchange rate.

To use (2.10) and (2.11), it is convenient to write (2.7), our expression for GNP from the income side, in percentage change form as:

$$gnp = \beta^1 (q + k + p^{KL}) + \beta^2 \text{ othinc} + \beta^3 (k^F + e), \tag{2.12}$$

where

p^{KL} = percentage change in an index of the rental price of locally owned capital,

and

othinc = percentage change in 'other income' (see above, eqn. 2.7).

ENDOGENIZING AGGREGATE INVESTMENT

To determine the amount of aggregate investment, the assumption was made that shocks alter the sizes of industries in the snapshot year, but not their rates of growth in that year or in subsequent years. In longrun equilibrium, these growth rates reflect secular trends - consequent upon technological progress and the evolution of markets - that could hardly be endogenized. Taking rates of depreciation as invariant parameters, this implies that for any industry j, $y_j = k_j$, where y_j and k_j are respectively the percentage changes in real investment and the real capital stock. This rule, since it determines the investment in each industry, also determines aggregate investment. It may be imposed, using the standard ORANI programs, by holding constant both Ω , the investment slack variable, and the

industry rates of return.

This can be seen from equations (19.8) and (19.9) from DPSV (p. 121), which may be condensed together to give:

$$y_j = k_j + A_j(r_j - \omega), \tag{2.13}$$

where A_j is an industry-specific parameter, r_j the percentage change in the rate of return, and ω the percentage change in Ω. With rates of return and Ω exogenously held constant, (2.13) reduces to:

$$y_j = k_j \tag{2.14}$$

as desired. An alternative is to assign 'exogenous investment' status to certain industries. For each of these, investment moves in line with aggregate real investment. As is common practice in shortrun ORANI simulations, we adopt this assumption, in the simulations reported below, to model investment in the government-dominated industries.

In the standard shortrun closure of ORANI, the variable Ω is left endogenous or slack. This allows the specification of behavioural rules for industry investment, whilst leaving aggregate investment exogenous. This slack is eliminated in the proposed longrun closure by holding Ω exogenously constant. Thus, unlike the usual shortrun closures of ORANI, our modelling of industry investment endogenizes aggregate investment.

ENDOGENIZING AGGREGATE CONSUMPTION

Aggregate nominal household consumption was endogenized simply by assuming it to be related to national saving by an exogenous ratio F. Thus, in percentage change form:

$$c = f + s. \tag{2.15}$$

The equation is consistent with consumer behaviour displaying locally unitary elasticity of substitution between household consumption,

government purchases, and national saving. (Within the framework outlined above, national saving is identical to investment by the nation in capital goods.)

For example, suppose the representative consumer has the Cobb-Douglas utility function:

$$U = C_r^{\alpha} S_r^{(1-\alpha)}, \tag{2.16}$$

where C_r is a measure of real consumption, and S_r real national saving. C_r is itself an aggregate of private and government components, thus:

$$C_r = C_p^{\beta} C_g^{(1-\beta)}. \tag{2.17}$$

The consumer's problem is to maximize U, subject to the national budget constraint: $GNP = C_p P_1 + C_g P_2 + S_r P_3$, where $P_1 - P_3$ are appropriate price indices; P_3, for instance, is a price index for the creation of new locally-owned capital stocks.

Only C_p and S_r, however, are subject to consumer choice. In the normal Cobb-Douglas way, it turns out that private consumption and saving will account for constant shares of national disposable income; i.e., of income remaining after goverment demands are paid for. Thus the percentage change in the nominal value of each will be the same:

$$c = s . \tag{2.18}$$

The shifter variable f in (2.15) allows us to test the effect of varying the relation of consumption to saving.

Our form of the consumption function may be contrasted with that suggested in DPR, for a miniature model with no government sector:

$$c = gnp, \tag{2.19}$$

in which c refers only to private consumption. In ORANI, which includes a government sector, such a form would imply that if government consumption autonomously increased - with national income held constant - household consumption would be unaffected. Thus not only would substitution between private and public consumption be excluded, but consumers would fail to react to the change in their income as increased government

consumption reduced the residue of national income left for household consumption and saving. Normally, ORANI users model real goverment demands as moving in line with aggregate real household consumption; in this case (2.19) and (2.18) are virtually equivalent.

Some thought was given to the possibility of replacing saving by wealth as an argument of the consumer's utility function. This would imply that a given rise in consumption would be accompanied by a larger-than-proportional rise in saving. It was felt that in a longrun context there was no compelling reason to prefer this form.

CLOSING THE LONGRUN SYSTEM

To close the additional system of longrun equations we enforce the national budget constraint by including the percentage change form of the definition of gnp from the income side:

$$gnp = \alpha^1 c + \alpha^2 g + \alpha^3 s_d + \alpha^4 s_f + \alpha^5 bi, \qquad (2.20)$$

where we specify the balancing item as:

$$bi = gnp, \qquad (2.21)$$

forcing it to be a constant fraction of GNP.

This completes the description of the main equations added to ORANI for the longrun programs. Table 2 is a summary presentation of the results. A number of other new variables were computed to facilitate the analysis of simulation results. These are listed and described in Section 3, while a precise account of their calculation is reserved for Appendix I.

TABLE 2 MAJOR ADDITIONAL EQUATIONS IN LONGRUN MODULE*

(1) $gnp = \beta^1 (q + k + p^{KL}) + \beta^2 othinc + \beta^3 (k^F + \phi)$ [Income]

(2) $gnp = \alpha^1 c + \alpha^2 g + \alpha^3 s_d + \alpha^4 s_f + \alpha^5 bi$ [Expenditure]

(3) $c = f + s$ [Consumption]

(4) $bi = gnp$ [Balancing Item]

(5) $q + k = \lambda(s_d - \pi^L)$ [Australian Equity in Local Capital]

(6) $k^F = \lambda(S_f - \phi)$ [Australian Ownership of Overseas Capital]

(7) $s_f = s$ [Investment by Australians Overseas]

(8) $s_d = s$ [Local Investment by Australians]

(9) $p^{KL} = \sum_j N_j p_j^K$ [Rental Price of Locally Owned Capital]

(10) $\pi^L = \sum_j N_j \pi_j$ [Price Index for Locally Owned Capital],

where β^1 = share locally generated capital rentals in GNP

β^2 = share other locally generated income in GNP

β^3 = share rentals from overseas in GNP

α^1 = share consumption in GNP

α^2 = share government spending in GNP

α^3 = share saving invested locally in GNP

α^4 = share saving invested overseas in GNP

α^5 = share balancing item in GNP

λ = parameter reflecting assumptions about adjustment path of saving

and N_j = share industry j, in all capital rentals accruing to Australians.

* A complete listing of the additional equations is given in Appendix I.

3. COMPUTING A LONGRUN SOLUTION

The longrun solution of ORANI, described in the previous section, is implemented by a series of computer programs, which extend and modify a solution previously produced by a standard ORANI simulation.

By this means, the risk of introducing errors into the thoroughly tested standard ORANI programs is averted. As a bonus, these programs can be useful for a variety of purposes, including shortrun simulations. There are two main additional programs, corresponding to two stages in the solution process.

Before these two programs are used, the first step in computing a longrun solution is to run a standard ORANI simulation, holding exogenous the industry rates of return, together with aggregate employment, real household consumption, and the investment slack variable, Q. Industry capital stocks, the real wage, and aggregate investment are all endogenous - otherwise the exogenous/endogenous split is the same as for most short run simulations (see the closure defined by Table 23.3, p. 143 of DPSV).

ORANI offers users the opportunity to incorporate their own estimates of some elasticities. The default files contain shortrun elasticities - these should be replaced by longrun estimates, where these are available and differ from shortrun estimates.

In concluding the standard part of the longrun simulation, an output file is produced containing the percentage responses in all the endogenous variables resulting from the policy shocks under examination, and from an autonomous increase in real consumption.

The first additional program, **EXPAND**, takes this output file of results as an input and makes a copy of it, appending to the end of this copy the responses of a number of new variables to the policy shocks and to the increase in real consumption. The most important of these new variables have been described in the previous section; they are all listed in Table 3, which briefly describes them - more exact definitions are

TABLE 3 LIST OF EXTRA VARIABLES ADDED BY PROGRAM EXPAND TO OUTPUT PIEOUT[1] FILE

POSITION		DESCRIPTION	SYMBOL IN TEXT
85	*	AGGREGATE NOMINAL OTHER DEMANDS	G
86	*	PRICE INDEX OTHER DEMANDS	
87	*	PRICE INDEX EXPORTS(AUSTRALIAN DOLLARS)	
88	*	PRICE INDEX IMPORTS(AUSTRALIAN DOLLARS)	
89	*	PRICE INDEX GDP EXPENDITURE SIDE	
90	*	NOMINAL GDP FROM EXPENDITURE SIDE	GDP
91	*	AGGREGATE NOMINAL LAND RENTALS	
92	*	AGGREGATE NOMINAL FIXED CAPITAL RENTALS	
93	*	AGGREGATE NOMINAL OTHER COST TICKETS	
94	*	AGGREGATE NOMINAL WAGE PAYMENTS	
95	*	TAX REVENUE INTERMEDIATE USAGE	
96	*	TAX REVENUE INVESTMENT INPUTS	
97	*	TAX REVENUE CONSUMPTION	
98	*	AGGREGATE EXPORT SUBSIDIES	
99	*	TARIFF REVENUE	
100	*	TOTAL NOMINAL INDIRECT TAXES	
101	*	NOMINAL GDP FROM INCOME SIDE	GDP
102	*	TOTAL NOMINAL CURRENT CAPITAL STOCK	
103		GNP - NATIONAL INCOME	GNP
104		RATIO CONSUMPTION/SAVING	F
105		OVERALL LOCAL SHARE OF LOCAL RENTALS	Q
106		TOTAL NATIONAL SAVING	S
107	*	TOTAL CAPITAL STOCK - RENTAL SHARES	K
108		AVERAGE RENTAL PRICE OF LOCALLY OWNED CAP	P^{KL}
109	*	AVERAGE RENTAL PRICE OF ALL LOCAL CAPITAL	
110		AVERAGE CREATION PRICE, LOCALLY OWNED CAP	π^{L}
111		LOCALLY OWNED CAPITAL STOCK	QK
112		NET RENTALS TO OVERSEAS	
113		NET FOREIGN INVESTMENT	
114		RENTALS TO OVERSEAS	
115		RENTALS FROM OVERSEAS	

* Variables marked by an asterisk are simply extensions of standard ORANI results. The computation of the other new variables requires information beyond that contained in the standard ORANI database. This information constitutes an additional input to program EXPAND.

[1] PIEOUT is an output file of the standard ORANI programs as implemented on CSIRONET (see Sutton (1984)).

reserved for Appendix I. Any ORANI result, shortrun or longrun, may be EXPANDed, if these new variables are of interest.

The second of the additional programs, **SWAP**, takes as input the file created by its predecessor, and transforms these results from a solution where real consumption is exogenous, and F (the ratio of consumption to saving) endogenous, into a solution in which F is exogenous and real consumption endogenous. Responses to the policy shock, and to an autonomous increase in F are computed; any selection of results may be printed or filed. The theory underlying this 'swap' of closures is laid out in DPSV pp. 246-7, and will be described here only via a brief example.

Let the experiment consist of a shock value t per cent to exogenous variable T; the results of a shock size c^s per cent to real consumption C_r are also computed. The percentage change in some variable A in this 'standard' closure, a^s, may be written as:

$$a^s = c^s.\eta_a^c + t.\eta_a^t \quad , \tag{3.1}$$

where η_a^c is the elasticity of A with respect to C_r in the standard closure and η_a^t is the corresponding elasticity of A with respect to T.
Similarly, the change in F, the ratio of consumption to saving is:

$$f^s = c^s.\eta_f^c + t.\eta_f^t \quad . \tag{3.2}$$

In the modified closure, we wish to hold F constant so that $f^s = 0$. Then:

$$c^s = - t.\eta_f^t/\eta_f^c \quad . \tag{3.3}$$

Substituting into (3.1) we obtain:

$$a^s = t \left[\eta_a^t - \eta_a^c.\eta_f^t/\eta_f^c \right] \quad , \tag{3.4}$$

which is the solution value of a in the required new closure. Program SWAP is also capable of transforming any ORANI results, whether EXPANDed or not, by exchanging any chosen exogenous scalar variable with any chosen endogenous scalar variable. Whether or not such a tranformation is required, SWAP may be used selectively to print out or add up results.

4. SETTING UP PARALLEL LONGRUN AND SHORTRUN SIMULATIONS:

THE DATA REQUIREMENTS

As a first step towards understanding the properties of the longrun closure of ORANI described above, we ran a series of experiments to compare the new closure with a standard shortrun ORANI simulation.

In this section we describe how these experiments were set up. The work may be divided into two parts. First, there is the data requirement associated with any use of the standard ORANI programs. Second, the longrun extension programs require additional data to specify the extent of foreign ownership of Australian capital stocks.

In order to make the results for shortrun and longrun as closely comparable as possible, essentially the same database was used for each simulation.

The input-output table which forms the kernel of the ORANI database was based on the 1977-8 IO tables prepared by the ABS. These tables were modified and extended by the IAC, to form the 'Canberra' ORANI database for 1977-8. A full description of the formation of this database may be found in Bruce (1984). In Melbourne we have made two complementary efforts to improve the 'Canberra' 77-8 database. Documentation of this work is still being prepared by Higgs (forthcoming, 1985) and Bruce (forthcoming, 1985), so a short account will be presented here.

Most importantly, a great deal of effort has gone toward improving the data base's treatment of the farm sector. Changeable weather and flexible world prices each cause considerable year-to-year variations in agricultural inputs, outputs and profitability. Since farm produce forms a large part of Australia's exports, and since ORANI has a 'trade' orientation, agricultural data from any single year might result in misleading results from policy simulations. Hence the project, described in a number of papers by Adams (1983, 1984a, 1984b, 1984c), Adams and Higgs (1983) and Higgs (forthcoming 1985), of averaging data from a number of

years to form a picture of the 'typical' year in Australian agriculture. At the same time the division of agricultural gross operating surplus between the various factor payments was revised. Although the resulting database is to be used for both shortrun and longrun simulations, it assumes a greater significance in the longrun context: the individual industry in a longrun environment faces costs which are fairly independent of its output level, as capital, labour, and materials are all available at an economy-wide price. Hence its expansion or contraction, relative to other industries, depends crucially on the elasticity of demand for its product. These elasticities are higher for exporting industries than for the rest of the economy. Since parts of the agricultural sector are strongly export-oriented, and also since of all the industries those in this sector alone possess a fixed factor - land - longrun results in particular may be heavily influenced by the agricultural part of the database.

The second modification made at IMPACT to the 'Canberra' database is closely related to the first. The ABS input-output tables are balanced, in the sense that the costs of each industry are equal to its sales. Thus, GDP as calculated from these tables is the same from the income or expenditure sides without recourse to any statistical discrepancy. In many tiny respects this balance was disturbed as the ABS data were rearranged and supplemented to become the 'Canberra' database. The insertion of the typical agricultural data into the 'Canberra' database, greatly exacerbated these imbalances. Thus arose the need for some means to balance the modified database while changing its essential characteristics as little as possible. This is the more desirable as we extend ORANI's treatment of macro variables. For this purpose it is important that simulated changes in GDP be the same whether measured from the income or expenditure side, which requires that the initial database be balanced.

In a forthcoming memorandum (Horridge (forthcoming 1985)) we shall describe in detail how we did this. A brief description is offered in Section 6 of Higgs (forthcoming, 1985). Suffice it now to state that a type of biproportional adjustment (i.e., RAS - see Bacharach (1970)) was used. Every element of the ORANI database was marked as comprising either a cost to industry j, or a sale of commodity i, or both, or neither. Two vectors of multipliers were computed, so that when all costs to industry j

were scaled by some factor C_j, and all sales of commodity i by factor S_i, these costs and sales added up to predetermined amounts. The coefficients of the linearized form of ORANI's equations are largely shares within rows or columns. The method of scaling each row and column by the same amount assured balance whilst altering these crucial shares as little as possible.

For both the shortrun and longrun simulations presented below, the same version of the new typical-year-with-balanced-flows input-output files was used. For the shortrun simulation, the parameter file and choice of endogenous exporters and exogenous investment industries was merely the default set used in a standard ORANI shortrun simulation. For the longrun simulation, only one change was made. The elasticity of substitution between factors was changed from 0.5, the default shortrun value, to 1.28, the accepted longrun value. (For the source of the estimate 1.28, see Caddy (1981).)

Some of the other elasticities in the parameter file could also have been changed - for instance the import substitution elasticities. It turns out that their estimated longrun elasticities are not very different from their shortrun values (see Alaouze, Marsden, and Zeitsch (1977)). The ORANI shortrun - 2 years - is a long time for consumer behaviour, but a short time for factor substitution. To avoid clouding the comparison of shortrun and longrun results with too many changes, we left these parameters at their default (shortrun) values for both simulations.

Using the above database, we ran both a standard shortrun simulation and a longrun experiment approximating the longrun closure specified in Section 2. However,in the second experiment, instead of holding exogenous F, the ratio of consumption to national saving, we exogenized real consumption. F is not a variable in the standard ORANI programs, so may not be exogenized by direct means. Instead we chose consumption as a temporary proxy for F, intending later to 'swap' the two variables. No special magic is attached to real consumption - we could also have exogenized the balance of trade or **any other** suitable ORANI variable to stand in for F at this stage. All that is necessary is that an exogenous increase in the proxy should have an appreciable effect on F, or else equation (3.3) of the previous section will be inapplicable and a subsequent attempt to transform

TABLE 4 LONGRUN AND SHORTRUN EXPERIMENTS COMPARED

SAME FOR EACH EXPERIMENT:

All parameters (bar factor substitution elasticities) set to defaults.
Endogenous Exporting Commodities: 1 3-5 14-6 20 27 32 66.*
Exogenous Investing Industries : 17 84-6 94 103-8 111 112*.

CHIEF VARIABLES HELD EXOGENOUS IN BOTH SIMULATIONS:

Computer Symbol	No. of Elements	Description
PM	114	Import Prices (Foreign Currency)
T	114	Tariff Rates
ER	1	Exchange Rate
CR	1	Aggregate Real Consumption
FO	10	Occupational Wage Relativities
FI	112	Industry Wage Relativities

CHIEF VARIABLES ENDOGENOUS IN BOTH SIMULATIONS:

Computer Symbol	No. of Elements	Description
Z	112	Industry activity levels
XA	9	Agricultural Commodity Outputs
PA	9	Agricultural Commodity Prices
Q3	7	Rental Rates on Land
N1	10	Employment by Occupation
BT	1	Balance of Trade
M	1	Aggregate Exports(Foreign Currency)
E	1	Aggregate Imports(Foreign Currency)
IP	1	Investment Price Index
CP	1	Consumer Price Index
FR	1	Ratio Real Investment to Real Consumption
U1	1	Aggregate Employment (Hours)
GN	1	Aggregate Output - imprecise measure
K	1	Aggregate Capital Stock (Asset Value Shares)
IM	1	Aggregate Nominal Investment
CM	1	Aggregate Nominal Consumption

CHIEF VARIABLES ENDOGENOUS IN SHORTRUN SIMULATION ONLY
AND EXOGENOUS IN LONGRUN SIMULATION ONLY:

Computer Symbol	No. of Elements	Description
R	112	Rates of Return by Industry
U2	1	Aggregate Employment (Persons)
LM	1	Investment Slack Variable

CHIEF VARIABLES ENDOGENOUS IN LONGRUN SIMULATION ONLY
AND EXOGENOUS IN SHORTRUN SIMULATION ONLY:

Computer Symbol	No. of Elements	Description
KO	112	Capital Stocks by Industry
IR	1	Aggregate Real Investment
FG	1	Overall Wage Rate

FACTOR SUBSTITUTION ELASTICITY = 0.5 (Shortrun) 1.28 (Longrun).

* Descriptive names corresponding to these industry and commodity numbers are listed in Sutton (1984). The industry numbers may also be found from Table R5 of Appendix II. For single product industries - all but the first eight - the corresponding commodity number is two more than the industry number.

the closure into one holding F exogenous will fail. In this respect, real consumption is obviously a good proxy.

Table 4 summarizes the main features of the 'standard' part of the experiments. In summary, excepting the difference in factor substitution elasticities, very much the same numbers were fed into both shortrun and longrun simulations. The difference between the two experiments, at this stage of the 'standard' ORANI programs, lies mainly in the choice of exogenous and endogenous variables. Before passing onto a description of the data required to determine some of the additional macro variables computed by program EXPAND, two more features of the input-output database, common to both experiments, should be noted.

The comparative-static method requires that our database be interpreted as a picture of the economy at equilibrium at some time sufficiently far into the future for adjustment to take place to a shock administered in the present. The length of this adjustment period, and the nature of the equilibrium depicted, are related to the behavioural assumptions adopted, which stem mainly from our choice of exogenous and endogenous variables. It seems worthy of comment, then, that exactly the same picture of the economy (as represented by the ORANI input-output files) has been chosen both for the shortrun simulation - which requires a scenario depicting the unshocked economy about two years hence - as for the longrun simulation - which requires a picture of the economy ten or twenty years hence. Do we not expect that the economy would have grown and changed considerably in that time ?

The effects of growth and change must be separated in this context. Because ORANI, as laid out in DPSV, is a constant-returns-to-scale model, all coefficients of the linearized form of the model equations are **ratios** of database quantities. Thus, simulation results reported in percentage change form are quite unaffected by scaling up the database by an arbitrary proportion. In adopting the same database for short and longrun simulations we assume only balanced growth in the absence of disturbance, not economic stasis.

The assumption of balanced growth is not an essential feature of the longrun methodology, but merely stems from our ignorance of the future.

Prior knowledge of economic trends, which would manifest themselves independently of the policy shock under examination, could in theory be incorporated into the longrun database. In many circumstances, the easiest way to do this would be to run a simulation of the type described here, assuming balanced growth, and to impose as a shock some technological change, a change in world prices, or whatever the envisaged change was. Updating the values of the endogenous variables to take account of the 'shock' responsible for the deviation from balanced growth would produce a new snapshot year database or control scenario, for use in a policy experiment. From this point of view, experiments using the balanced growth scenario are logically prior to those using more sophisticated scenarios. The balanced growth assumption also serves our present purpose of bringing out the main differences between longrun and shortrun closures, without introducing incidental changes in the database.

More subtly, the longrun and shortrun databases depict the economy not only at different points in time but at different types of equilibrium. Crucially, longrun equilibrium requires that industry capital stocks earn equilibrium rates of return, which should be equalized (after adjustment for various industry-specific factors). A database founded on statistics for a single year is unlikely to satisfy this requirement. In fact, annual data may reflect an 'equilibrium' too ephemeral to serve as the basis for even a shortrun simulation. Where policy analysis, rather than forecasting, is the aim, a 'typicalized' database is often preferred.

It is hard to frame a simple yet satisfactory rule for such a process of typicalization. Commonly, the rentals to industry capital stocks are imputed from the value of the stocks themselves, using some estimate of the normal rate of return for that industry. Alternatively, the size of the capital stocks could be imputed from the rental flows. The first method seems more appropriate to a shortrun simulation, using a contemporary database, where capital stocks are presumed fixed and rentals adjust. The second forces stocks to adjust so that they all earn the appropriate rate of return, given fixed rentals. It seems more appropriate in the construction of a database representing some time in the future, for use in a longrun simulation. Thus the large capital stock of an industry which today earns a low rental is shrunk to a size commensurate with what it is seen to earn. That is what we expect to observe as time goes by.

We adopted a version of the second method of imputation to process the results of our longrun simulation. For both shortrun and longrun experiments, the same database **flows** were used - based on the 1977-8 ABS Input-Output Tables, and modified as described above. However, **stocks** of capital were measured differently in the two contexts. For the shortrun experiment we used measurements of the capital stock in each industry, produced by the IAC for the standard (shortrun) ORANI database. For the additional longrun equations we assumed that the size of each industry's capital stock was just proportional to its rental. This is equivalent to ignoring variations between industries in depreciation rates or risk premiums: every industry is thus deemed to earn the same rate of return.

In practical terms this means that wherever capital stocks are aggregated, two parallel indices have been constructed. The first, for shortrun closure purposes, sums up the total stock, weighted by the IAC's individual stock measurements which reflect contemporary (1977-8) conditions. The second aggregator, for longrun purposes, weights industry stocks by the preshock rentals accruing to them.

Our method of interpreting a contemporary database as a longrun equilibrium is certainly simple, yet it is not naive. Again, it has the virtue of facilitating comparison between shortrun and longrun results. Another method would be to 'typicalize' the whole database, at the same time projecting forward established trends to some chosen date in the future. Such a project, which would also involve measuring the size of industry capital stocks over a number of years, is well beyond the scope of this study.

The chief macroeconomic aggregates of the database, used to run the 'standard' ORANI programs for the simulations reported below, are presented in Table 5, using an accounting format. The additional longrun programs require extra data describing how much rent accrues to Australians from their holdings of capital stock, here and overseas. A short program, SHARES, was constructed to process these data, and combine them with the existing ORANI database. SHARES prints out the data presented in Tables 5, 6, and 7, and prepares a file of coefficients used by program EXPAND to extend an existing ORANI solution by the addition of all the newly defined

TABLE 5 THE STANDARD ORANI DATA BASE - SUMMARY OF AGGREGATES

In units of a million Australian dollars:

GDP FROM EXPENDITURE SIDE

		SHARES
HOUSEHOLD CONSUMPTION	= 57495.76421	.60359
INVESTMENT	= 21244.77652	.22303
GOVERNMENT (OTHER DEMANDS)	= 16221.65734	.17030
EXPORTS AT FOREIGN PRICES ($A)	= 14834.05958	.15573
IMPORTS AT FOREIGN PRICES ($A)	=-14540.39411	-.15265
TOTAL GDP AT PURCHASERS' PRICES	= 95255.86354	1.00000

GDP FROM INCOME SIDE

RENTALS TO LAND	= 1661.86559	.01745
WAGES TO LABOUR	= 54647.93333	.57370
RENTALS TO CAPITAL	= 19740.95246	.20724
OTHER COST TICKET REVENUE	= 12805.19885	.13443
TOTAL INDIRECT TAX REVENUE	= 6398.94203	.06718
TOTAL	= 95254.89227	1.00000

INDIRECT TAXES BY SOURCE

TAXES ON INTERMEDIATE USAGE	= 1225.33631	.19149
TAXES ON CAPITAL CREATION USAGE	= 177.94900	.02781
TAXES ON HOUSEHOLD CONSUMPTION	= 3852.93300	.60212
NET TAXES ON EXPORTS	= 210.44671	.03289
NET TAXES ON IMPORTS	= 932.27700	.14569
TOTAL COMMODITY TAXES	= 6398.94203	1.00000

variables.

By making use of data already present in the 'standard' ORANI database, the number of additional pieces of macro data can be reduced to four. These are:

(i) rentals due to foreigners who own Australian capital stocks,
(ii) rentals due to Australians who own foreign capital stocks,
(iii) investment in local capital stocks made by Australians, and
(iv) investment in foreign capital stocks made by Australians.

All these are input into SHARES as fractions of GDP, and internally converted into absolute quantities. This means was adopted to avoid problems in meshing together the accounting frameworks of the ORANI database and the ANA. The figures fed in represented no more than an informed guess as to the extent of foreign ownership in the year 2000. Quantities (ii) to (iv) were drawn from the ABS Australian National Accounts for 1977-8 as fractions of the ANA estimate of GDP. The estimate of (i), drawn from the same source, seemed implausibly small for the year 2000 - a figure was chosen instead so as to imply that about 80 per cent of local capital stocks overall was owned by Australians. These assumptions allowed us to construct the scenario presented in Table 6.

The theoretical framework laid out in Section 2 above allows for varying degrees of foreign ownership among the different industries. Once again, our projection of this dispersion for the year 2000 was, perforce, no more than guesswork. We divided the ORANI industries into three categories:

(1) industries for which some estimate of present foreign ownership is available;

(2) industries which were deemed to be totally Australian-owned; and

(3) the rest of the industries.

Members of categories (1) and (2) are listed in Table 7. The figures presented there for category (1) are drawn from an ABS survey of the mining

TABLE 6 THE DATA BASE SUPPLEMENTED BY OWNERSHIP DATA

SUMMARY OF AGGREGATES

GNP FROM DISPOSITION SIDE

		SHARES
HOUSEHOLD CONSUMPTION	= 57495.76421	.62677
GOVERNMENT CONSUMPTION-OTHER DEMANDS	= 16221.65734	.17683
NATIONAL SAVING INVESTED LOCALLY	= 17386.10021	.18953
NATIONAL SAVING INVESTED OVERSEAS	= 313.39179	.00342
BALANCING ITEM	= 316.38816	.00345
TOTAL	= 91733.30171	1.00000

GNP FROM INCOME SIDE

LOCAL CAPITAL RENTALS ACCRUING LOCALLY	= 15931.68919	.17367
OTHER LOCAL INCOME	= 75513.93981	.82319
CAPITAL RENTALS FROM OVERSEAS	= 287.67271	.00314
TOTAL	= 91733.30171	1.00000

OTHER QUANTITIES

GROSS CAPITAL RENTALS TO OVERSEAS	= 3810.23454
NET CAPITAL RENTALS TO OVERSEAS	= 3522.56183
NET FOREIGN INVESTMENT	= 3545.28452
LOCAL SHARE OF LOCAL CAPITAL RENTALS	= .80704

FOREIGN ACCOUNT

		NATIONAL SAVING	= 17699.49200
INVESTMENT IN AUSTRALIA	= 21244.77652	NET RENTALS TO OVERSEAS	= 3522.56183
BALANCE OF TRADE	= 293.66547	BALANCING ITEM	= 316.38816
TOTAL LEFT HAND SIDE	= 21538.44200	TOTAL RIGHT HAND SIDE	= 21538.44200

TABLE 7 ESTIMATES OF LOCALLY-OWNED SHARE OF AUSTRALIAN INDUSTRIES

INDUSTRIES FOR WHICH SOME ESTIMATE OF LOCAL OWNERSHIP SHARE WAS AVAILABLE

IND. NO.	DESCRIPTION		IND. NO.	DESCRIPTION	
12	FERROUS METAL ORES	.40	15	OIL, GAS + BROWN COAL	.41
13	NON-FERROUS METAL ORES	.47	56	PETROL + COAL PRODUCTS	.43
14	BLACK COAL	.50	64	OTHER BASIC METALS	.40

INDUSTRIES WHICH WERE DEEMED TO BE WHOLLY AUSTRALIAN-OWNED

IND. NO.	DESCRIPTION	IND. NO.	DESCRIPTION
84	ELECTRICITY	103	OWNERSHIP OF DWELLINGS
85	GAS	104	PUBLIC ADMINISTRATION
86	WATER; SEWERS + DRAINS	105	DEFENCE
91	MECHANICAL REPAIRS	106	HEALTH
92	OTHER REPAIRS	107	EDUCATION, LIBRARIES
94	RAIL + OTHER TRANSPORT	108	WELFARE AND RELIGIOUS

All other industries were deemed to be 73 per cent locally owned.

(and related) industries, which describes the year 1981-2. The ABS plans to extend the range of industries covered by this type of survey in the future. The figures were deemed to be at least indicative of the future pattern of foreign ownership.

The membership of category (2) was determined intuitively. As for category (3), we assumed that Australians owned the same proportion of the capital stock of each of these industries. Since the overall share of local ownership was already determined - see Table 6 - it was possible to calculate a local-ownership share for category (3). As indicated at the bottom of Table 7, this share is 73 per cent.

The last bit of information needed for the longrun simulation was a value for the adjustment parameter λ. We adapted the formulae presented in DPR, pp. 50-51, which are essentially a discrete time version of those presented in Section 1 above. It was assumed that the real value of Australians' investment in local capital stocks followed an exponential path, in both shocked and unshocked scenarios. Assuming that, without any shock, the economy would have experienced 20 years of balanced growth at the rate of 2 per cent p.a. and assuming an economy wide depreciation rate of 7 per cent (this is drawn from the ORANI database), λ worked out at around 0.5. This is not inconsistent with the estimates presented in Table 1, which assume a gradual adjustment of saving to any shock. As the discussion in Section 1 made clear, it is not possible to assign any precise value to λ. We set it at exactly 0.5. In our analysis below of the simulation results, we investigate the sensitivity of various results to the value adopted for λ.

For the shortrun simulations we set λ to zero, since the closure presumes an adjustment period, say about 2 years, which is insufficient for the translation of changes in investment levels into changes in industry capital stocks. In the same way, setting $\lambda=0$ does not allow changes in the level of investment by Australians to affect their share of aggregate capital stocks.

5. COMMENTARY ON THE RESULTS OF SIMULATIONS

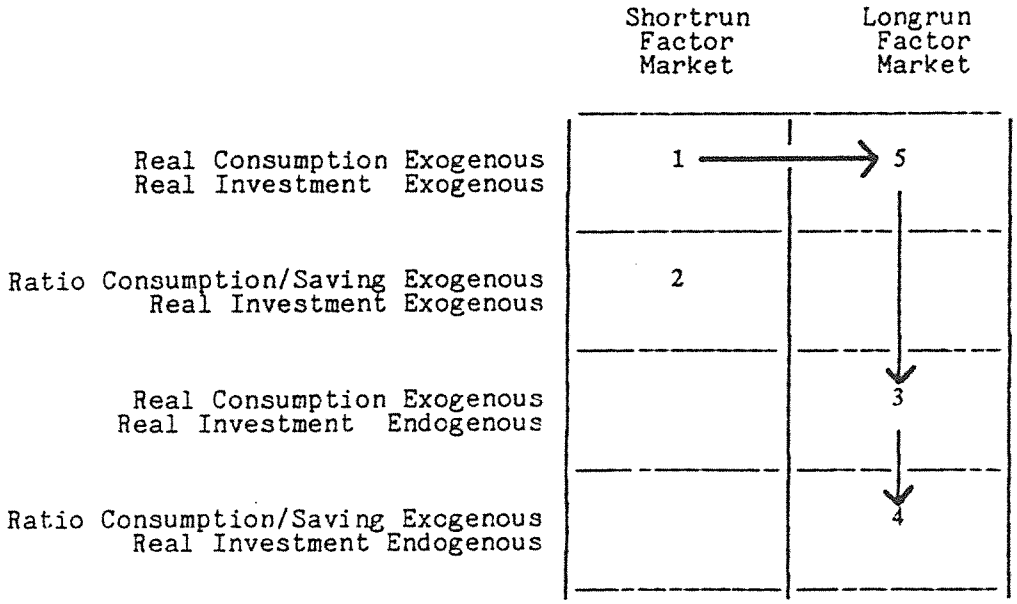
In this section we present and explain the results of the shortrun and longrun experiments described above. For both longrun and shortrun simulations a standard ORANI solution was produced, holding real consumption constant. Each of these solutions was supplemented to include results for all the new macro variables generated by program EXPAND. Then, each solution was transformed into a solution where, instead of real consumption, the ratio of consumption to saving was held exogenous. Thus, results corresponding to four environments were produced:

1. Shortrun factor market modelling, fixed consumption, fixed investment.
2. Shortrun factor modelling, endogenous consumption, fixed investment.
3. Longrun factor modelling, fixed consumption, endogenous investment.
4. Longrun factor modelling, endogenous consumption, endogenous investment.

The shortrun simulations 1 and 2 differ from the longrun simulations 3 and 4 both in their modelling of factor markets and in their treatment of aggregate investment. It seemed of interest to partition the difference in longrun and shortrun results between the effects of these two methodological changes. For this purpose, a special didactic simulation (No. 5) was prepared, combining the shortrun treatments of aggregate investment and consumption with the longrun factor market modelling. Thus the simulations can be arranged in an order reflecting the effects of successive changes in modelling leading from the standard ORANI shortrun closure to the proposed longrun closure. The order that we chose is 1, 5, 3, and 4, and shows the cumulative addition to the standard shortrun closure of longrun factor market modelling, endogenous aggregate investment, and endogenous aggregate consumption, within the context of a 25 per cent ATB tariff cut. (Simulation 2 represents the first step in a different ordering of the same set of changes.) The arrangement is portrayed in the upper half of Figure 3.

For each of these environments we computed endogenous changes with respect to a 25 per cent across-the-board (ATB) tariff cut. At the same

FIGURE 3 HOW THE CLOSURES ARE RELATED



SHOCK DESCRIPTION	CLOSURES:	1	2	3	4	5
1% increase in real consumption		*		*		*
1% increase in ratio nominal consumption/saving			*		*	
1% increase in real investment		*	*			*
1% increase in investment slack variable Ω				*	*	
1% increase in real wage economywide		*	*			
1% increase in aggregate employment				*	*	*
25% across-the-board tariff cut		*	*	*	*	*

An asterisk indicates that the shock was applied to that closure.

time results were computed with respect to three other shocks, these being a consumption-related shock, an investment-related shock, and an employment-related shock. The nature of these shocks varied between closures; they are listed in the lower half of Figure 3.

We chose the 25 per cent tariff cut to be a representative policy shock as this experiment has been extensively analysed in differing implementations of ORANI. The remaining three shocks applied in each closure serve a dual purpose. Firstly, they are of some policy interest. Secondly, they partially correspond to one of the chief differences between the closures - they are variables which are exogenous in some closures but endogenous in others. Thus results for these variables can aid in understanding how the different closures are related. For example, a tariff cut, applied to a closure where real consumption is held constant, yields the same results as the same tariff shock plus some shock to the ratio of consumption to saving, in a closure where the latter is exogenous instead.

Since 20 (5 closures x 4 shocks) results were produced for each of ORANI's 1000+ principal endogenous variables, they cannot all be reproduced here Tables R2 to R21 present a selection. For closures 1, 2, 3, and 4, results are presented for the following selection of endogenous variables: Industry outputs, employment by occupation, and selected macro variables. Additionally, closures 1 and 4, corresponding respectively to the standard ORANI shortrun environment, and to the new longrun closure were deemed to be of special interest. For these closures we give results for industry rates of return (shortrun only), industry capital stocks (longrun only), and industry employment. The didactic closure 5, by contrast, is of less significance; it figures only in a second series of comparison tables, C1 to C6, which display the main micro and macro effects of each step along the chosen route from the standard shortrun(1) to the proposed longrun closure(4). These tables are summed up by Tables C7 and C8 which compare simulations 1 and 4 directly. The comparison tables are described more fully below.

As well as giving nominal values for selected macro results, we present some of them in real form (i.e., deflated by a GDP deflator). The additional longrun and macro equations are for the most part relations

between nominal flows. For example, nominal household consumption is proportional to nominal national saving. These relations are less apparent, when written in real terms, if a different deflator is used for each nominal variable - hence the expositional convenience of some universal price index. This GDP deflator is merely a weighted sum of price indices specific to consumption, investment, and 'other'(government) demands respectively.

The industry output results are also partly duplicated in the tables of 'winners and losers'. The industries were ranked according to their response to the tariff cut and the results for the industries which contracted most, or expanded most, were printed out in ranked order. These tables also show results for the other shocks, ranked according to the effect of the tariff cut.

To minimize leafing to and fro between results and commentary, the tables of results, Tables R1-R21 and C1 to C8, are placed in Appendix II, to facilitate detachment. This compendium is preceded by its own table of contents, Table R0, (reproduced as Table 8 overleaf). Next the macro variables are listed and described. The tables of results follow.

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Table R1 Description of Macro Variables

Results for Shortrun Closure - Real Consumption Exogenous

Table R2 Macro Variables
Table R3 Employment by Occupation
Table R4 Winners and Losers - the Tariff Cut
Table R5 Industry Outputs
Table R6 Industry Rates of Return
Table R7 Employment by Industry

Results for Shortrun Closure - Ratio Consumption/Saving Exogenous

Table R8 Macro Variables
Table R9 Employment by Occupation
Table R10 Winners and Losers - the Tariff Cut
Table R11 Industry Outputs

Results for Longrun Closure - Real Consumption Exogenous

Table R12 Macro Variables
Table R13 Employment by Occupation
Table R14 Winners and Losers - the Tariff Cut
Table R15 Industry Outputs

Results for Longrun Closure - Ratio Consumption/Saving Exogenous

Table R16 Macro Variables
Table R17 Employment by Occupation
Table R18 Winners and Losers - the Tariff Cut
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Tables Showing the Main Macro and Micro Differences Between Closures

Tables C1,C2 Absorption Fixed - Comparison of Long and Shortrun Modelling of Factor Supply

Tables C3,C4 Effect of Endogenizing Aggregate Investment in Longrun Closure - Consumption Fixed

Tables C5,C6 Longrun Closures with Endogenous Investment - Effect of Endogenizing Real Consumption

Tables C7,C8 Comparison of Standard ORANI Shortrun Closure with Proposed Longrun Closure

SIMULATION 1: SHORTRUN ENVIRONMENT WITH REAL CONSUMPTION EXOGENOUS

The environment of simulation 1 is the most widely used of ORANI closures and is sometimes referred to as the 'standard closure'. The key features are: fixed absorption, fixed industry capital stocks, and an elastic supply of labour at a wage indexed to the CPI. To explain the results, we comment first on the effects on individual industries, progressing later to a discussion of aggregate or macro effects. The industry results, as in most ORANI simulations, may be broadly understood by combining two key ideas: the overall cost level of inputs to industry, and the division between traded and nontraded goods.

The overall cost level depends on the price of material inputs (domestic and imported), and the price of factor inputs. The initial cause of the cost change varies among the four shocks. Industry supply curves slope upwards, due to the assumption of a fixed capital stock in each industry. Thus, increases in demand for consumption and investment goods cause prices of these goods to rise. The wage rise may be represented by an upward shift in industry supply schedules. Conversely, the tariff cut causes the cost of imported material inputs to fall - thus industry supply schedules shift down.

The distribution of these initial cost changes among the industries varies according to the shock imposed, and depends on individual industry characteristics. The greater the share of capital in input costs, the more steeply sloping the supply schedule, and the more will an autonomous increase in demand cause an increase in output price. Again, the greater the share of imported goods in material inputs, the more will a tariff cut reduce the cost of an industry's output.

However, these first-round price changes are rapidly propagated throughout the economy, as an increase in one industry's output price is a rise in input costs for another industry. Another crucial linkage in both reported shortrun simulations is the indexation of all wages to the consumer price index. This transmits an increase in the cost of consumer goods throughout the economy. Variable 89, the GDP deflator (reported among the macro results), is an indicator of the overall cost level. Table

R2 shows that the 1 per cent increases in real aggregate investment, real aggregate household consumption and in the real wage all increase overall costs; the tariff cut has the opposite effect. We shall concentrate first on the effect of the wage rise, as this best shows the effect of a general cost increase.

The response of an industry's output to an increase in its costs depends heavily on the elasticity of demand for its product. Thus, results for the wage shock reported in column 3 of Table R5 show that industry 105 (Defence) suffered no loss of output in spite of the increase in its labour costs. This is because its sole customer - the government - is modelled as buying a fixed real amount of defence services regardless of cost. No defence services are imported (although inputs to the industry, such as equipment may be) and so the government cannot switch to a foreign product. The defence industry is able to pass on its cost increase in full.

At the other extreme, industry 25 (other food products) contracts markedly following the overall wage increase, because (see Table 4 above) it was modelled as an endogenous exporter. The elasticity of world demand for its product was assumed to be -20.0, reflecting a small share in the world market. Hence overseas demand dropped substantially in response to a price increase.

In fact, the bigger losers in column 3 tend to be those industries most exposed to world competition. Either, like the agricultural and extractive industries at the beginning of the table, exports form a large part of their market, or, like some of the manufacturing industries near the middle of the table, they face intense competition from imported substitutes. The elasticity of demand for an import-competitor may be calculated roughly by ignoring the income/expansion effects of price changes. This yields $-\sigma_{DI}S_I$, where σ_{DI} is the elasticity of substitution between the domestically-produced good and its imported eqivalent, and S_I is the share of imports in the domestic market. Thus the service industries (97-111), facing little competion from imports, suffer less from the wage increase, in spite of the high share of labour in their costs.

Especially in shortrun simulations, the slope of the supply curve plays an important role in the response of an industry to a cost increase.

We can write the shortrun elasticity of supply for an ORANI industry as:

$$\frac{\sigma_{KL} S_L}{S_V S_K} ,$$

where σ_{KL} is the elasticity of substitution between any two factors (which takes a common value for all pairs of factors in the ORANI parameter files used here), S_L is the share of the mobile factors in factor costs, S_K the complementary share of the fixed factors, and S_V the share of factor costs in all input costs. This formula assumes that the price of material inputs and of mobile factors is unaffected by a single industry's output change. In the shortrun simulation σ_{KL} was set at 0.5 for all industries so differences in supply elasticities reflect only differences in the shares of fixed and mobile factors in input costs.

The effect of a low supply elasticity may be illustrated by another extreme example. Industry 103 (Ownership of Dwellings) represents the activity, actual or imputed, of renting homes. Its factor costs accrue entirely to capital - presumed fixed in this simulation. Thus its output is also fixed, its supply curve is vertical, and a change in the costs of its material inputs leaves output unaffected.

To the extent of their impact on the overall cost level, the remaining three shocks produce a similar pattern of results to the wage rise (but note that the tariff alone reduces costs). Thus there are similarities among the columns 1 to 4 of Table R5. The differences reflect the sectoral biases of the four different shocks. The consumption increase (column 2) is the most similar to the wage increase; the increased demand for consumer goods raises the consumer price index to which the money wage is pegged. As a result costs are raised throughout the economy - the GDP deflator rises slightly more than in the case of the wage increase. Once again the traded-goods sector suffers. However, industries selling primarily to households do better, or suffer less severely than under the wage rise shock - for example industry 43 (Furniture), the service industries 97-111, and the food industries (excepting industry 25 (Other foods), an exporter). Their advantage is less marked where a substantial share of the market for an industry's product is imported (and/or high Armington elasticities apply) as is the case for industry 39 (Footwear). The cost increase in domestically produced shoes causes consumers to substitute towards imports so the home producer does not reap the full

benefit of the increase in demand.

Other gainers from the consumption rise are to be found in the government sector, industries 104-108. Demands for government services are modelled as being proportional to aggregate real consumption. Since the sector is protected from foreign competition, the real consumption rise tranlates evenly into a rise in output in these industries.

The 1 per cent increase in real investment (column 1) has a smaller effect on the overall cost level than the wage rise or consumption shock, merely because 1 per cent of aggregate investment is less in absolute terms than 1 per cent of real consumption. The main winners in this case are those industries which produce investment goods, notably industries 35 (Carpets), 40-44 (Timber Products and Furniture), 57-63 (Building Materials), and 65-78 (Capital Goods for Industry). The losers are those industries which are exposed to foreign competition without enjoying any special benefit from the investment rise.

The tariff cut (column 4) presents a rather more complex picture, as one part of the traded sector - the exporters - benefits at the expense of the other - the import competitors. The effect is most easily seen in the table of winners and losers, Table R4. Because the tariff cut is set at 25 per cent of the ad valorem rate, the biggest losers tend to be those industries which are most highly protected. These also tend to be the industries in which import penetration is already most advanced. Hence the correlation between the upper (losers) half of column 4 of table R4 and the corresponding rows in columns 1-3. These are also some of the industries most vulnerable to an increase in the cost of their inputs, which thus suffer from the cost-increasing shocks 1-3. In fact, the tariff is double-edged: Table R4 shows that many manufacturing industries actually gained from the tariff cut, particularly those supplying the exporting industries. The fall in the overall cost level (see Table R2, row 89), and the increase in demand for their products, actually outweighed the increased competition from imports. This explains the results in column 4 of Table R3 which shows changes in employment by broad occupational category. There are no heavy losers as even those categories most strongly represented in the contracting industries are sufficiently well represented in expanding industries to maintain their employment level. The small fall

in category 6 (Skilled Blue Collar: Building) reflects the redistribution of investment towards the exporting industries. Investment here is less intensive in buildings than elsewhere. The redistribution of labour between industries is shown by the results for employment by industry in Table R7.

The lower (winners) section of column 4 in Table R4, shows that the exporters and export-related industries enjoy a pure gain from the cost-reducing tariff cut. The spoils are evenly divided between the mining and agricultural sectors, followed by their suppliers. Aggregate investment, although fixed in aggregate, is modelled as being redistributed towards the industries which increase profits the most. This mechanism has a fairly sharp effect on capital goods suppliers - thus industry 76 (Agricultural Machinery) leads the gainers. This also explains the poor performance of industry 10 (Forestry), which sells a large part of its output to investment in itself. As investment is redistributed towards other industries, investment in Forestry, and demand for its product declines. Its profits decline too, so leading to a further loss in share of aggregate investment.

Among the gainers from the tariff cut, there is a strong negative correlation between the first 3 columns of Table R4 and the 4th. The industries which gain most from the tariff cut are amongst those which suffer most under cost-increasing shocks 1-3.

The aggregate effect of the tariff cut may be judged from Table R2. Imports rise, but exports rise more, yielding a positive change in the balance of trade. Absorption being fixed, the movement in the direction of trade surplus implies an increase in real GDP (row 101d); aggregate employment also rises. The gains are not evenly distributed, however: the increase in the real returns to capital (row 92d) is more than three times that of labour's wage (row 94d). This result may be traced to the fixing of capital stocks and the less-than-unitary elasticity of substitution between capital and labour. (The commentary below on the longrun simulation examines this at greater length.) Because part of the rentals to capital accrue overseas, the increased share of capital income in GDP implies that real GNP (row 103d) - the income accruing to Australians - rises by much less than GDP. Another reason for this is the concentration

of foreign ownership in the mining industries. This is a feature of the hypothetical distribution of foreign ownership set out in Table 7 above. The mining sector is an exporter and gains from the tariff cut; it is also rather capital-intensive. Thus capital belonging to foreigners enjoys a higher increase in its rental rate (below row 108d), than does the locally-owned component (row 108d).

We can calculate what the relation of GNP to GDP would have been if foreigners had owned the same proportion of each industry's capital stocks. Turning back to Table 6, we see that rentals to capital in the unshocked scenario accounted for 0.17367 of GNP. As a result of the tariff shock, the deflated value of all capital rentals increased by 1.088 per cent. This would also have been the increase in locally-accruing rentals had foreign ownership been equally distributed between the industries. With the unequal shares, deflated local rentals only increased by 0.775 per cent. So the percentage change in GNP would have been 0.17367(1.088 - 0.775) = 0.0543 per cent higher, had the foreign share in all industries been the same. These calculations assume that foreigners owned the same share of capital overall, however distributed. The difference between the percentage change results for GNP and GDP in the reported simulation is 0.122 = (0.19001-0.06811). So rather more than a third of this difference is due to the assumed dispersion of foreign ownership. The reader is reminded that the ownership scenario was hypothesized for the year 2000; one based on present conditions would show a higher local share of capital, but similar foreign shares of the mining industry. So a greater proportion of the difference between changes in GDP and GNP would be attributable to the dispersion of the foreign ownership shares. The remaining 2/3 of the difference between gnp and gdp is acccounted for by the foreign-owned component of capital stocks - assuming uniform dispersion - and by the rise in the share of capital rentals in GDP - remembering that foreigners are deemed to own only fixed capital.

The remaining macro results of the tariff cut are fairly uninteresting. They stem mainly from small discrepancies between various price indices. Consumption and government spending are fixed in real terms (when deflated by their own price indices). The government price index does not fall by as much as the consumer price index, as little of the government demands is imported, and the tariff-induced price drop is

concentrated among imported commodities. The slight increase in real GNP is mopped up by this relative increase in the cost of fixed goverment demands. Thus the residual quantity, national saving, has actually dropped slightly in GDP-deflated terms. At the same time, aggregate investment, although fixed in real terms (when deflated by its own price index) falls in nominal value more than does GDP as a whole. The net effect is that less net foreign investment (row 113d) is required to fill the gap between investment and saving.

The macro effects of the 1 per cent wage rise (Table R2, column 3) are more dramatic. Employment (row 24) falls but aggregate nominal wages (row 94) rise sharply as does the overall cost level (row 89). Thus the traded sector loses ground to overseas competition: imports rise, exports fall, and the balance of trade moves towards deficit. Real earnings of labour (row 94d) rise slightly, in marked contrast to the steep fall in real earnings of capital (row 92d). The net effect is that real GDP falls (row 101d). The damage is concentrated in rentals to capital - which is partly foreign-owned - and particulaly in the foreign-owned component (under row 108d). Therefore GNP (row 103d) - income to Australians - falls slightly less than GDP.

The drop in national income (GNP) is not matched by any drop in household consumption or government demands, since these are held constant in real terms in this closure. Thus national saving (row 106d) declines sharply, even in nominal terms. Real investment being fixed, a foreign inflow (row 113d) is required to compensate.

The zero shortrun setting for parameter λ reflects our belief that such an increase in foreign investment cannot in the shortrun affect the Australian share Q (row 105) of the aggregate capital stock. The inflow will however affect Q in the post-solution years, as the foreign-financed investment appears as installed capital stocks.

The 1 per cent rise in real consumption (column 2) causes a similar rise in overall costs (row 89) and a similar fall in the balance of trade (row 15) as the wage rise. On the other hand real GDP (105d) rises. (Part of the explanation for this is that the traded sector is the more capital-intensive, and capital stocks are presumed fixed in this simulation

- see Dixon (1979).) Capital is favoured over labour by this shock so we would expect that GNP (which is weighted more strongly towards labour) would rise less than GDP, but the opposite is seen in row 103d. The reason is the striking discrepancy between the rental rates on domestic and foreign-owned capital (row 108d and below). Table R5 (column 2) shows that the (exporting) mining group, which was assumed to be most foreign-owned, lost heavily; on the other hand the government industries, which were assumed to be wholly Australian-owned, gained. (Recall that government demands are modelled to move in line with aggregate real consumption.) Although national income is projected to increase, consumption by households and government increase more. Thus, as with the wage rise, saving drops and foreign investment increases sharply.

A 5.7 per cent wage cut coupled to a 4.6 per cent increase in household and government demands results in a 5 per cent increase in aggregate employment without any disturbance to the balance of trade. Thus this package constitutes the 'macro-fix' described in Dixon, Powell, and Parmenter (1979). The package increases the aggregate real value of returns to capital by 9.5 per cent, whilst those to labour increase by 0.6 per cent, highlighting the need for a complementary redistributive tax package.

SIMULATION 2: SHORTRUN CLOSURE WITH RATIO CONSUMPTION/SAVING EXOGENOUS

Tables R8-R11 present results for an environment very similar to that portrayed in Simulation 1. The only difference is that instead of real consumption being exogenous, the ratio of consumption to saving is held exogenous. Simulation 2 illustrates how the longrun package, composed of programs EXPAND and SWAP, may be used to extend the range of possible shortrun closures.

The results for Simulation 2 may in fact be simply deduced from those of Simulation 1. For example, the results for Simulation 1 show that a 1 per cent rise in real wages caused a 0.82513 per cent drop in aggregate employment. At the same time, F, the ratio of consumption to saving, increased by 2.27489 per cent. The 1 per cent increase in real consumption in Simulation 1 caused F to rise by 4.72345 per cent, and aggregate employment to increase slightly by 0.06929 per cent.

Under the closure of Simulation 1, we can calculate what decrease in consumption would have to be combined with the wage increase so as to leave F undisturbed. From Table R2 we can see that a drop of 0.48162 per cent (= 2.274/4.723) would suffice. This drop in consumption would itself cause a 0.0334 per cent (= 0.06929 x 0.481) drop in aggregate employment. Adding this to the direct effect of the wage rise, the total change in employment is a 0.8585 per cent (= 0.8251+ 0.0334) drop. This is precisely the result reported in Simulation 2 for the wage rise (Table R8, row 24).

Such a calculation duplicates (for one result) the operation of program SWAP which in this way calculated all the results of Simulation 2 from those of Simulation 1. It acts as a check, and also as a way of transposing our developed understanding of the environment of Simulation 1, into the new closure of Simulation 2. For instance, we can see that the results of the tariff shock must be very similar in the two closures, as the tariff cut in Simulation 1 had only a tiny effect on F, the ratio of consumption to saving. Where the differences are noticeable - compare for instance the results for industry 76 (Agricultural Machinery) in Tables R5

and R11 - it is because these results are particularly sensitive to a change in real consumption in Simulation 1 (see Table R5).

Again, Table R5 shows that a 1 per cent increase in real consumption caused a 4.72 per cent increase in F, the ratio of consumption to saving. Therefore each entry in column 2 of Tables R8-R11, showing the response to a 1 per cent increase in F, is simply the corresponding result for Simulation 1, divided by 4.72.

The effects of the wage rise in Simulation 2 (with $\bar{F}$ exogenous) are less pronounced than those reported in Simulation 1, because the fall in national income (brought about by the wage rise) induced a 0.48 per cent drop in real consumption. From the results of Simulation 1 we recall that a rise in real consumption has broadly similar macro effects to a wage rise. So the reduced drop in real consumption serves to cancel out some of the effects of the wage rise in Simulation 2, as comparison of column 3 of Tables R8 and R2 reveals.

However, wherever Simulation 1 showed the wage rise and the consumption rise to have opposite effects, the wage increase in Simulation 2 has a greater effect than in Simulation 1. Thus Table R11, corresponding to Simulation 2, shows that industry 35 (Carpets) suffered a 1 per cent decline in output when the wage rose by 1 per cent. The third column of Table R5 shows that if real consumption were held constant, only a 0.6 per cent decline would be produced. Column 2 of the same table explains why: a consumption rise has the opposite effect to a wage rise on this industry.

The above method of reasoning may be used to reconcile the changes in occupational employment following a 1 per cent increase in aggregate real investment, holding constant alternatively real consumption (Table R3) or the ratio of consumption to saving (Table R9). Table R2 reveals that, in the standard ORANI shortrun closure, the investment rise stimulates overall output without a very severe effect on exports. The induced price rises, while serving to make imported capital goods more attractive, are concentrated in the investment price index (Row 18), rather than in the consumer price index (Row 19), to which the wage is linked. So cost increases are not transmitted throughout the economy as much as when consumption is increased by 1 per cent. Real GNP rises by 0.13 per cent.

Table R3 shows that employment of labour categories 3, 5, 6 and 8 increased - these types of labour are used most heavily by the capital goods producing industries. Categories 1, 2, 4 and 10 gain less - they are linked more to government demands and household consumption (both held constant in this simulation). Categories 7 and 8 are employed in the export-related industries, and so suffer a slight decrease.

Column 2 of the same table shows the effects on occupational employment of a 1 per cent rise in real consumption and government demands. The white-collar categories gain most heavily, employment in the import-competing manufacturing categories 5 and 8 suffers, while the export-related groups 7 and 9 take a severe beating.

Turning to Table R9 we see that the investment rise in Simulation 2 produced a more even spread of employment changes than in Simulation 1, although the export-related categories 7 and 9 suffer more severely. The reason is that real consumption has also increased (to match an increase in GNP) in this experiment. Thus the contrasting pictures of columns 1 and 2 in Table R3 have been averaged together to form column 1 of Table R9.

Neither of the two closures represented by Simulations 1 and 2 is unambiguously better than the other - they are merely alternatives. Wherever GNP is affected by a policy shock they will yield diffferent results. Programs EXPAND and SWAP may be used to make clear the different implications of either macro assumption.

THE RESULTS OF LONGRUN SIMULATIONS

In this section we investigate the effects of the 25 per cent across-the-board (ATB) tariff cut in the proposed longrun closure. We wish to highlight three main differences between this closure and the standard shortrun closure:

(a) The roles of the factors have been reversed. In the short run, industry capital stocks are fixed and their rates of return are endogenous, whilst labour is available in infinitely elastic supply at a wage indexed to the CPI. In the long run, aggregate labour useage is exogenous, the wage rate endogenous, and the rates of return to capital fixed, while the stocks are endogenous.

(b) In the standard shortrun closure of ORANI, aggregate real investment is held constant. In the longrun closures represented by simulations 3 and 4, investment in each industry is proportional to the endogenous capital stock of that industry. Thus the aggregate is endogenous.

(c) In the standard shortrun closure of ORANI real consumption and government spending are fixed. In Simulation 4 - the new longrun closure - these are linked to national income. In producing the results for this closure, however, we first have to produce results for a longrun closure where real consumption by household and government is exogenous - Simulation 3.

In brief, the new longrun closure is distinguished by the reversal of the roles of the factors, and the endogenization of two components of absorption. Our mode of analysis is to investigate the effects of these changes separately. For this purpose we present results for yet another simulation - simulation 5. The environment for this experiment is the same as that for simulation 3, except that aggregate real investment is held constant, and Ω, the investment slack variable, is again slack, as in shortrun simulations. The results are indeed a transformation of those of simulation 3 where Ω is exogenous, using the method of 'closure swapping' already described several times. To effect this transformation, we read off (from the results of simulation 3) the effects of the tariff cut on

aggregate investment, asking ourselves what shock to Ω would be sufficient to neutralize the effect. The effect of this compensating shock on all the other variables was then added to the effect in Simulation 3 of the tariff shock to give the results of simulation 5.

Thus four closures are involved in our comparison of the standard shortrun and the new longrun closure:

(a) Simulation 1 - the standard shortrun closure: industry-specific capital stocks fixed, labour mobile between industries, total employment endogenous, and absorption fixed.

(b) Simulation 5 - an artificial longrun closure created for didactic purposes. Absorption is fixed, but the aggregate capital stock is endogenous and mobile between industries. Aggregate employment is fixed, although labour is mobile between industries.

(c) Simulation 3 - an intermediate stage in producing the new longrun closure. As in simulation 5, except that while consumption is still fixed, aggregate real investment is endogenous.

(d) Simulation 4 - the new longrun closure. The aggregate capital stock is endogenous and mobile between industries. Aggregate employment is fixed, although labour is mobile between industries. Both investment and consumption are endogenous.

Our analysis consists in comparing the results of closures adjacent in the above list. Thus, comparing the results of simulations 1 and 5, we investigate the effects of the reversal of the roles of the factors. Simulations 5 and 3 differ only in the treatment of investment, whilst 4 is the same as 3 except that consumption is now endogenized. In this way we can display separately the three main differences between the standard shortrun and the new longrun closures.

To illustrate these differences a series of 8 comparative tables have been prepared - Tables C1 to C8. They are grouped into four pairs, showing the effect of:

(a) changing the factor market modelling from that of the standard shortrun closure to reflect longrun assumptions (Tables C1,C2);

(b) next, endogenizing agggregate investment (Tables C3,C4);

(c) next, endogenizing agggregate consumption, thereby moving to the proposed longrun closure (Tables C5,C6).

(d) Finally the total effect of (a),(b), and (c) is shown in tables comparing directly the proposed longrun with the standard shortrun environment (Tables C7,C8).

For example, Table C1 shows the effect on macro quantities of the reversal of the roles of the factors in the tariff experiment. Results are tabulated for the standard shortrun closure, and for the didactic closure which holds absorption and the rates of return fixed. The difference between the two results is also shown. In a similar fashion, Table C2 shows the industry output results for those industries which show the greatest difference in output between the two closures. The industries are ranked in this table in a loser and winner fashion, the losers being those which gained least, or lost most, from the move to a longrun modelling of factor markets.

The effects of the three main changes in assumptions, going from the standard shortrun closure to the proposed longrun closure, are not independent of the order in which they are presented. To minimize the problems that are raised by this we have presented the largest change (longrun factor modelling) first, and the smallest (modelling of consumption) last. Although this ordering is a function of the choice of policy shock which underlies the changes, we feel that it would be reproduced by a wide range of interesting policy shocks. The perverse case would be a shock which greatly affected either national income or aggregate investment, without causing much redistribution of primary factors.

More complete results for the two endogenous-investment longrun closures are shown in Tables R12-R21. Tables R12-R15 show the results for simulation 3 of investment, employment and consumption shocks imposed in a longrun environment where real consumption is held exogenous, while for

simulation 4 Tables R16-R21 shows the corresponding results where the ratio of consumption to saving is exogenous. Simulations 3 and 4 are related, then, in just the same way as simulations 1 and 2.

COMPARISON OF SIMULATIONS 1 AND 5: THE EFFECT OF THE REVERSAL OF THE ROLES OF THE FACTORS

The chief difference between shortrun and longrun closures is the very different set of assumptions regarding factor supply. The ORANI short run is defined as a period long enough for price-induced substitution to take place but too short for capital stocks to reflect the redistribution of investment brought about by endogenous changes in industry rates of return. A constant real wage with fixed relativities roughly models the Arbitration system of wage determination as it has operated in Australia over the last decade.

In spite of some significant differences, the roles of capital and labour in the longrun closures are nearly the mirror images of those in the shortrun simulations. This time the rates of return are held constant - it is assumed that capital is available in infinitely elastic supply at these rates on the international market. Thus capital is mobile between industries and variable in aggregate as is labour in the shortrun closure. However, whereas in the short run all labour wage rates are indexed to a common price index (the CPI), in the long run, the wages of capital in each industry are individually indexed to the cost of creating a unit of capital in that industry. (This follows from the constancy of the rates of return.) The commodity composition of capital varies slightly between industries, and so too do endogenous changes in the rental rates to industry capital stocks.

Again, while in the short run capital stocks are fixed both at the industry level and in aggregate, in the long run labour is fixed, but only in aggregate. One result is that in the longrun closure costs to an industry are largely determined by mechanisms outside that industry. Crucially, expansion or contraction of output does not appreciably affect industry costs. Industry supply curves may be conceived

as being horizontal, the agricultural land-using industries aside. In the short run, by contrast, as output increases, both the marginal product of capital and its rental also increase, as increasing quantities of labour are applied to a fixed quantity of capital.

Curiously, the longrun closures are similar in this respect to a type of shortrun closure of ORANI proposed by Cowan and Wright (1980). They argued that in the very short run, if the economy were depressed, output prices could be determined by a constant markup rule. The rationale was that unutilized capital stocks could be available in many industries, and that firms tended to choose prices and let quantities adjust. Under these conditions, they observed, quantities vary more and prices less than in the case of similar experiments using a standard shortrun closure. Price changes tend to be propagated more through the economy. In both closures an increase in the costs of materials to an industry causes a rise in output costs, leading to a fall in sales and hence output. In the standard closure the fall in output results in a reduced payment to capital, which moderates both the rise in the output price, and the fall in output. Payments to capital, in short, act as a buffer which attenuates a cost shock. Where rentals to capital are fixed, this mechanism is absent. Each industry fully passes on an increase in its input costs. If it faces elastic demand for its product - as do members of the traded sector - its output will contract more sharply than under standard shortrun conditions. On the other hand, autonomous increases in absorption have a less inflationary effect, as output increases do not imply a rise in the wage to capital.

The longrun closure with fixed absorption, represented by simulation 5, differs from that described by Cowan and Wright in that the overall usage of labour is fixed, instead of its wage. Industry rentals to capital are indexed individually, rather than economywide - as in their closure. In spite of these differences their insights may usefully be applied in comparing the results of simulations 1 and 5, illustrating the effect of the changed modelling of factor supply.

To analyse the differences in longrun and shortrun results with absorption fixed we may make use of a partial equilibrium framework. Each industry has its own supply and demand curves, which, following some shock,

are translated vertically with respect to one another by an amount representing the cost advantage (relative change of input and output prices) of that industry. This vertical shift of supply relative to demand has two components. Firstly the demand curve drops by d_j per cent, as the tariff on competing imports is reduced. The extent of the drop is proportional, in our experiment, to the initial level of the tariff and to the market share of imports, and so varies between industries, although not between longrun and shortrun closures. Secondly, each industry enjoys a fall in costs, represented by a downward shift of s per cent of the supply curve. Let us suppose this shift to be approximately the same for all industries, equal to the change in the GDP deflator. Then industry j enjoys a cost advantage of $(s-d_j)$. The extent to which this is translated into an output change depends on the slopes of the supply and demand curves. In fact, the percentage change in output, z_j, is equal to :

$$z_j = \beta(s-d_j), \text{ where } \beta = \varepsilon_s\varepsilon_d/(\varepsilon_s + \varepsilon_d) \text{ and}$$

ε_s and ε_d are absolute values of the elasticities of supply and demand. Thus our comparison above of industry activity changes within the shortrun environment hinged on the distribution between the industries of values of d_j, ε_s, and ε_d. Moving from the short run to the long, the most significant change in the pattern stems from the changing industry supply elasticities, ε_s.

The coefficient β is an increasing function of ε_s - in fact a unit increase in ε_s causes β to increase by $\partial\beta/\partial\varepsilon_s = \varepsilon_d{}^2(\varepsilon_s+\varepsilon_d)^{-2}$, so that given a certain decrease in input costs, the more the supply elasticity increases, moving from the short run to the long, the greater (in absolute terms) will be the difference in the simulated output change between the two closures. For example, if two industries perform equally badly in the short run, the industry with the larger capital share or smaller supply elasticity will do worse in the longrun environment, because its supply elasticity increases most in the transition between closures. In the shortrun environment rentals to capital act as a buffer; in the long run, this shield is lost.

These output changes between shortrun and longrun closures are also

correlated with the demand elasticities, for $\partial\beta/\partial\varepsilon_s$ is an increasing function of ε_d. A unit increase in ε_d causes $\partial\beta/\partial\varepsilon_s$ to increase by $\partial^2\beta/\partial\varepsilon_s\partial\varepsilon_d = 2\varepsilon_s\varepsilon_s(\varepsilon_s+\varepsilon_d)^{-3}$. Thus, the more elastic is demand for the product, assuming both a given cost decrease and a given increase in supply elasticity, the more will output expand.

As an example we may examine Table C2 showing the changes in output of the principal losers and gainers from a 25 per cent across-the-board (ATB) tariff cut, in the standard shortrun closure, and in the longrun closure with fixed absorption. The choice of industries and their order in the table is determined by the difference between the longrun and the shortrun results. Industries at the top of the list performed worse in the longrun simulation whilst those at the bottom fared better. A striking feature of the table is that entries in columns 1 and 2 tend to be similarly signed. As in the shortrun closure, so in the longrun closure we see gains by the exporters and related industries, whilst the more heavily protected import-competitors suffer. The reasons are the same as those enumerated above in the explanation of the shortrun closure. The fundamental rules apply ... as time goes by. Industries 31 (Manmade Fibres and Yarns), 39 (Footwear), 68 (Motor Vehicles and Parts), 32 (Cotton Yarns and Fabrics), 79 (Leather Products), 33 (Worsted and Woollen Yarns), 38 (Clothing) and 37 (Knitting Mills) suffer most in both the short run and the long. The principal losers in the short run are distinguished by high demand elasticities; they also tend to have the highest tariff rates and so the uniform percentage reduction in protection hurts them more. The flattening of the supply curves means that in the longrun closure the more of the damage (in output terms) is concentrated amongst the worst losers who are unable to use rentals to capital to absorb their cost disadvantage as they do in the shortrun. This tendency will be the more pronounced the lower their shortrun supply elasticity and the higher their demand elasticity

The flat longrun supply curves also imply that that the indirect benefits to other import-competing industries of the tariff reduction are less in the long run as those domestic industries which lose the tariff shield do not adjust their prices downwards to retain market share.

Examples of losers in the longrun closure with low shortrun supply

elasticities are industries 50 (Other Basic Chemicals), 83 (Other Manufacturing), and 74 (Household Appliances). These industries have a high capital share; in the longrun environment they lost the stabilizing influence of steeply sloping supply schedules.

Whether comparison is made with the performance of the same industry in the short run, or with the longrun performance of the other industries, the chief gainers in the long run are the various mining industries. These are marked by elastic demand schedules, facing either flattish export demand curves, or, in the case of Industry 15 (Oil, Gas and Brown Coal) significant import competition combined with a very high degree of substitutability between domestic and imported equivalent. At the same time these industries have steep shortrun supply schedules, because they tend to be very capital-intensive. Thus the output increase in response to a cost reduction in the short run is not particularly large. In the longrun environment, the combination of flat demand schedules with horizontal supply schedules results in large output expansion. Conversely the small labour share of the miners protects them from the general wage rise which occurs as a result of the tariff reform. Industry 15 in fact has the flattest demand schedule and the lowest shortrun supply elasticity; it is thus the greatest gainer from the move to the longrun environment.

The comparative success of the miners in the longrun closure leads to increases in output of related industries such as 17 (Services to Mining), 84 (Electricity), 95 (Water Transport), 94 (Rail Transport) and 70 (Locomotives). Fixed aggregate investment is redistributed towards the mining industry leading to increases for industry 77 (Construction Machinery).

The reasons for the good performance of the miners in the long run can also explain the relatively poor performance of the agricultural exporters. Agriculture tends to have a high labour share and so its expansion is hampered by the economywide wage rise. Conversely the low capital share means that there is less difference between the slope of the longrun and shortrun supply schedules. The fixed stocks of land for agriculture also reduce the advantage it may reap from the the tariff stock in the long run. More importantly, while the supply curves of the agricultural industries are flattened less than those of the miners by the

transition to the long run, some of the agricultural demand curves tend to have a more pronounced downward slope than those of the other exporters. Thus the output increase which results from a drop and flattening of the supply schedule is limited. An exception is industry 2 (Wheat-Sheep Zone) which actually performs better in the longrun environment. This can be traced to the fact that this industry produces nearly all of commodities 3, 4, and 5 (Wheat, Barley and Other Grains). Of all the agricultural commodities these are in most elastic demand on the world market.

Another agricultural industry to gain from the longrun environment was industry 4 (Northern Beef) - producing Meat Cattle. This is surprising because output of the sole customer for its product - industry 18 (Meat Products) - actually declined in going from the short run to the long. The reason is that Meat Cattle are also supplied by the multiproduct industry 3 (High Rainfall Zone), which performed worse in the longrun environment. Northern Beef was able to increase its share of a declining market enough to increase its own output.

Investment is distributed away from agriculture leading to an actual decline in the output of industry 76 (Agricultural Machinery).

The relatively poor performance of agriculture in the longrun closure explains the better performance of industry 10 (Forestry and Logging). According to ORANI'S modelling of the distribution of investment between industries, investment in the agricultural industries is the most sensitive of investment in any industries to variation in the rate of return of the associated industry. Thus, the good performance of agriculture in the shortrun closure leads to a marked diversion of investment towards agriculture, and a decrease in the output of Forestry, an industry which the ORANI database shows to sell much of its output to investment in itself. In the longrun environment miners displace agriculture as the chief gainers, but they do not attract investment as strongly as did agriculture in the short run. Thus, a greater portion of aggregate investment is available for the forestry industry. Other industries which sell to investment (excluding agricultural investment) also fare better in the long run - such as industry 78 (Other Machinery and Plant).

Other comparative gainers in the move to the longrun environment are industries 99-101 (Non Bank Finance, Investment and Services, Insurance and Services). Not surprisingly, the more capital-intensive mining sector makes greater use of these industries than does agriculture, so they do better in the long run. In particular, the greatest of these gainers, industry 101 (Insurance and Services), has as its biggest customer industry 14 (Black Coal), which benefits greatly from the longrun environment.

Apart from the mining and agricultural industries, four other industries were modelled as endogenous exporters. Three of these, nos. 30 (Cotton Ginning), 25 (Other Food Products) and 18 (Meat Products) had a high shortrun supply elasticity, leading them to perform well in the shortrun simulation. In the long run, this advantage over other industries was lost and they tended to do less well. Their ordering in Table C2 is also that of their shortrun supply elasticity.

The final exporter, industry 64 (Other Basic Metals), has a low shortrun supply elasticity, and so performed better in the longrun.

MACRO EFFECTS OF THE CHANGED MODELLING OF THE FACTOR MARKET

Table C1 shows the different macro effects of experiments performed in longrun and shortrun closures with absorption fixed, again taking the 25 per cent ATB tariff cut as an example. We see that the fall in the overall price level (variable 89) was only half as much in the long run as in the short. The general flatness of industry supply curves in the longrun environment causes adjustment to take place as a quantity, rather than a price change. For this reason too, the tariff cut causes a greater increase in imports as the prices of import-competing commodities do not fall relative to imports by as much as they do in the shortrun closure. On the other hand the flatter supply schedules result in greater increases in exports leading to a greater increase in the trade surplus, and by implication in real GDP. The division of national income favours capital in both long run and short. The explanation is as follows. Compare the whole economy to a single CES two-factor producer. The percentage change forms of the factor demand equations are:

$$k = z - \sigma S_a (p_k - p_a),$$

and

$$a = z + \sigma S_k (p_k - p_a),$$

where k is the percentage change in the amount of capital used,
a " " " " " " " labour used,
z " " " " " national output,
p_k, p_a are percentage changes in the factor prices,
S_k, S_a are original factor shares in income,
and σ is the elasticity of substitution between capital and labour.
So $k + p_k$ is the percentage change in revenue accruing to capital,
and $a + p_a$ " " " " " " " " " " .

Call $AK = (k+p_k)-(a+p_a)$ 'the advantage to capital'. Then:

$$AK = \frac{1-\sigma}{\sigma}(a-k) .$$

Suppose output increases and one factor is fixed. Usage of the other must increase. In the shortrun environment where $k=0$, and σ, we may suppose, is less than unity, AK will be positive and capital will receive

the greater share of the output change.

The effect of increasing σ to more than unity, or alternatively of holding α instead of k at 0 will be to reverse the sign of AK. As we move from short run to long run, both of these changes take place. They cancel out and AK retains its sign.

The tariff cut tends to reduce the investment price index more than other price indices due to the above average imported component of capital expenditure. Since rates of return are held constant the rental price of capital in each industry is indexed to the creation cost of a unit of capital for that industry. Thus the effect of the tariff reform is to push down wages to capital, relative to other prices, as rows 108d to 109d of Table C1 show. It is interesting to note that the wages of the foreign owned component of capital are reduced by more than the locally-owned component. The reason is the lower imported component of investment in the public sector industries, where local ownership is concentrated.

The longrun division of local (as opposed to total) factor income between labour and capital displays the reverse pattern as the amount of locally owned capital is constrained by the saving capacity of Australians. Adding row 111 to row 109d we find that locally accruing capital rentals rose by 0.19684 per cent while real labour income (row 94d) rose by 0.76264 per cent. Thus labour gains - relative to existing or locally-owned capital - from the (mainly foreign-financed) increase in capital.

By subtracting row 89 from row 91 we can see that aggregate rentals to land increased by much less in the long run than in the short - in spite of land being a fixed factor. This shows the effect of the relatively poor longrun performance of agriculture.

The longrun closure with fixed absorption - devised for expository purposes - departs from realism in two major respects. Firstly, although capital stocks - row 107 - are projected to grow, total real investment has remained unchanged. Thus this closure fails to reflect the scale of the increase in foreign investment (during the period of adjustment leading up to the new equilibrium) that would have been required to allow this capital

growth. Such an inflow could only occur through an increased trade deficit. So the solution does not reflect the conditions of the preceding adjustment period, nor those of subsequent periods if the increased capital stocks are to continue to grow at their original rates. Although the growth rate of capital must have exceeded the control growth rate for the period 0-T, the constant investment budget means that the solution growth rate must actually be below control. Fixed depreciation rates imply that to maintain the control growth rate of the larger stock, more investment would be required.

Another symptom of this problem is that although real rentals paid to foreigners (row 112d) increase in the long run as foreign capital is allowed to move in, the real value of net foreign investment actually declines. The improved longrun trade surplus and the increase in national saving outweigh the increase in rentals to overseas, bringing about this fall. In the proposed longrun closure with endogenous investment there is a more natural positive correlation between foreign investment and rentals paid to overseas.

The second deficiency of the didactic longrun closure is that whilst national income (row 103d) has increased by 0.23 per cent, household and government consumption remained constant in real terms. National saving (row 106d) rose instead. Thus the effects of the tariff cut are combined with an unexplained increase in national thriftiness.

In the next sections we examine the effect of endogenizing first aggregate investment and then aggregate consumption.

THE EFFECT OF ENDOGENIZING AGGREGATE INVESTMENT

In this section we describe the effect of adding an endogenous determination of investment to the fixed absorption environment described previously, where real investment in each industry, y_j, was determined by the rule:

$$y_j = k_j + A_j\omega, \qquad j = 1,...,h$$

ω being determined by the requirement that aggregate investment remain constant. Instead, as described in Section 2, we held ω at zero to give :

$$y_j = k_j \qquad j = 1,...,h$$

allowing aggregate investment to be endogenous. Each form is a special case of the investment equations set out in DPSV, page 121. The distribution of investment is similar in each case; the modification consists mainly in the change to aggregate investment.

Tables C3 and C4 show the macro and micro effects of endogenizing aggregate investment in a longrun closure with respect to a 25 per cent ATB tariff cut. The second column in each table shows the results of the tariff cut with longrun factor market modelling and fixed absorption whilst the first column shows the equivalent result with endogenous aggregate investment determined by the rule that the solution year rate of growth of the capital stock in each industry is to remain undisturbed. Thus row 20 of Table C3 shows that aggregate investment when modelled endogenously rose by 2.2 per cent instead of being held constant - roughly following the change in the aggregate capital stock shown in row 107. Real consumption (row 21) is held constant in both closures.

The difference between the two results, shown in column 3, may be conceived of as the effect of an autonomous increase in investment spending. The increase in aggregate demand causes a rise in the price of labour - in fixed total supply. The higher wage costs (where investment is modelled endogenously) reduce the deflationary impact of the tariff cuts so

that exports rise less, and imports rise more. The balance of trade actually moves into deficit. The total effect on GDP of the increase in investment (row 101d) is negligible. The higher real wages redistribute some part of GDP towards labour - resulting in a slightly greater increase in GNP. Consumption is fixed so national saving (row 106d) is projected to grow slightly more in the environment in which investment is endogenous. This increase, however, is quite swamped by the growth in the demand for investment finance and so the inflow of foreign capital increases sharply (row 113d) bringing it into line with the increase in rentals paid overseas (row 112d). On the other hand the proportion of local ownership of capital (row 105) decreases less sharply in view of the increase in local saving.

In sum, the macro impact of endogenizing investment is fairly small except on the foreign account. Table C4 shows that the stability of total output (with respect to investment modelling) contrasts with a sharp redistribution of activity between the various industries. The first part of the table lists those industries whose activity was less in the endogenous-investment closure - the worst losers being at the top. This group is essentially the trading and trade related industries. An export market, or significant import penetration of the domestic market renders these industries most sensitive to the increase in wage or other costs brought about by the investment increase. For the same reason, these industries tend to be those which gained or lost the most in the absorption -fixed closure. The endogenization of investment is therefore rarely enough to bring about a change of sign. An exception is industry 30 (Cotton Ginning), an endogenous exporter with flattish demand and supply curves - and so having a volatile output response.

Turning to the second part of Table C4 we see that the gainers from the endogenization of investment are overwhelmingly the investment oriented industries. The overall increase in capital expenditure lifts their demand curves, stimulating outputs. The ranking of the winners is of little economic interest: it mainly reflects the transition from the extremely redistributive effects of ORANI's constraint on aggregate investment to the more balanced distribution of investment in the proposed longrun modelling. For example, industry 76 (Agricultural Machinery, column 2) performed poorly when aggregate investment was fixed, even though agriculture expanded. Mining expanded more and investment in mining by

more again - at the expense of investment in agriculture. Where investment is endogenized each industry investment grows in proportion to its capital stock. Agricultural investment (industry 76, column 1) grows with agricultural output, emerging as the principal winner, mainly because it was so badly crowded out under the fixed-investment regime. Conversely, industry 77 (Construction Machinery) performed well in the fixed investment closure as it sells to mining investment - which increased sharply at the expense of other investment. While in the endogenous investment closure the aggregate investment budget increases, Industry 77 no longer captures the investment budget of other industries. The net effect on this industry of the slackening of the investment constraint is therefore small.

Several import-competitors appear among the comparative gainers from the longrun modelling of investment. It seems possible that this may even out some of the occupational and regional disparities caused by the tariff cut in the fixed absorbtion closure.

Fuller results from the endogenous-investment, exogenous-consumption environment are shown in Tables R12 to R15, which show not only the effect of the tariff cut, but also the effects of exogenous changes to the labour force, consumption, and ω.

COMPARISON OF SIMULATIONS 3 AND 4
ENDOGENIZING AGGREGATE CONSUMPTION

Just as in the last paragraphs we described the effect of endogenizing aggregate investment, so we now describe the effect of endogenizing aggregate consumption. This final transition brings us into the proposed longrun closure environment.

As previously described, the nominal value of household consumption is modelled to change in proportion to the nominal value of national saving. Government consumption, as in other ORANI environments, is tied, in real terms, to household consumption. The small balancing item moves in proportion to national income. Finally, national income is itself comprised of household and gevernment consumption, national saving, and the

balancing item. A summary of these relations is that both types of consumption and national saving move in line with national income, although divergence of the corresponding price indices, or autonomous increases in any component of national spending, may disturb this relation.

Tables C5 and C6 compare the results of the 25 per cent ATB Tariff cut under two closures both employing the longrun factor market modelling and both endogenizing aggregate investment. The difference is that the first column shows results for the proposed longrun closure where consumption is endogenized, while the second shows results with fixed household and government consumption. Once again the third column shows the difference between the two.

Since the tariff cut raises national income, private and public consumption are raised too when consumption is endogenized. Thus, aggregate demand increases by more than in the fixed-consumption closure. This increase in aggregate demand has very similar effects to the increase in aggregate investment described in the previous sections. Wages rise, and so too do prices, putting pressure on the traded sector and leading to a further decline in the balance of trade.

The contribution to aggregate demand of the consumption rise, however, is of much smaller magnitude than that of the endogenous increase in investment. Table 5 shows that investment and private and public consumption accounted for respectively 0.223, 0.604, and 0.170 of GDP. In the proposed longrun closure illustrated by column 1 of Table C5 the percentage changes in the real values of these quantities were respectively 1.7047, 0.1031 and 0.7185 (rows 27d, 28d, 85d). Thus the contributions of the three to the increase in GDP were (taking pairwise products, 0.38 (investment), 0.062 (private consumption) and 0.122 (govt.demands). Thus the combined contribution of the consumption changes was less than half that of the investment changes.

Even this calculation greatly overstates the difference that the endogenous modelling of consumption makes. By far the greater part of the change in consumption comes from the increase in the value of government consumption which takes place even if private consumption is exogenous (see row 85d). Although government demand is fixed in quantity terms its

largely non-traded composition means that its relative price rises due to a tariff cut. The effect of the changed treatment of consumption is shown more clearly in the third column of rows 28d and 85d in Table C5; row 27d shows that the endogenous change in investment is nearly unaffected by the changed modelling of consumption. Taking the trio of changes then as (1.7, 0.101, 0.113) and applying the same base level weights, we find that the changed modelling of investment directly accounts for 4.7 times as much of the change in aggregate demand as does the changed modelling of consumption.

The effect of the consumption rise on those macro variables incorporated in the standard ORANI programs is qualitatively similar to the effect of increased investment, although the consumption rise and its effects are much smaller than the endogenous investment increase. The effect on the newly defined macro variables of increasing these two components of absorption is rather different. Unlike the investment rise, the consumption increase comes about at the expense of national saving, which declines as a result of the new modelling of consumption (row 106d, column 3, Table C5). Thus Australian wealth (row 111, column 3) also declines by half the change in saving (λ was set to 0.5). The reduced wealth cuts the share of capital rentals accruing locally and so national income (row 103d, column 3) also declines. The total amount of investment is virtually unchanged, but Australian saving can now finance less of it. Since the balance of trade has also declined, an increased inflow of foreign investment is also implied (row 113d).

The micro effects of endogenizing consumption are shown in Table C6. The upper part of the table is occupied by the losers - essentially the same group which appeared in the upper part of Table C4. They are the industries most exposed to foreign competition. The winners on the other hand are those industries most strongly oriented towards consumption whether public or private. The greatest gainers combine a high share of output going to household consumption with a high expenditure elasticity, or sell largely to the government. (Government demands move in line with real household consumption.)

A fuller selection of results in the proposed longrun environment, showing the effect of the tariff cut and also of exogenous changes in the

labour force, the ratio of consumption to saving, and ω, are shown in Tables R16 to R21.

DIRECT COMPARISON OF THE STANDARD SHORTRUN AND PROPOSED LONGRUN RESULTS

Tables C7 and C8 compare the macro and micro results of a 25 per cent ATB tariff cut in the standard ORANI shortrun, and in the proposed longrun closure. The difference between them shows the joint effect of the three major changes in modelling between the two environments, which are displayed separately in Tables C1 to C6. They may form the basis for a qualitative judgement as to which of the three changes is most important. For example, comparing Table C8(showing the main changes in results at the industry output level) with the corresponding Tables C2, C4 and C6, we can see that C8 closely resembles C2. This bears out the original hypothesis (which governs the order of presentation of the separate effects of the three changes) that it is the longrun factor market modelling which is largely responsible for the observed dispersion of industry results in the longrun closure. On the other hand we may observe that the relative performance of agriculture is poorer in Table C8 than Table C2. In fact the agricultural industries appear as relative losers in the longrun environment, while in Table C2 no particular trend is evident. The reason may be found in the upper half of Table C4. The endogenization of aggregate investment affected industries 4 (Northern Beef) and 2 (the Wheat-Sheep Zone) the worst out of the agricultural sector. Therefore these two industries move from being relative gainers in Table C2 to relative losers in Table C8. As mentioned above, these two industries have elastic export or export-related markets; the inflationary consequence of the endogenous increase in investment affected them more severely than the other agricultural industries.

The influence of the endogenous modelling of consumption is too slight to be seen in the industry results, particularly as the pattern it generates is similar to the changes brought about by the endogenous modelling of investment.

Table 9 relates to a 25 per cent ATB tariff cut. It is intended to show, for each macro variable, the relative importance of the changes to factor market modelling, investment modelling and consumption modelling, in the total difference in result between the standard shortrun and the proposed longrun environment. The table is a digest of the final columns

TABLE 9: COMPARATIVE IMPORTANCE OF THREE ASSUMPTIONS IN MACRO DIFFERENCES BETWEEN STANDARD SHORTRUN AND PROPOSED LONGRUN CLOSURES: 25% ATB TARIFF CUT

NO.	ORANI VARIABLE	FACTOR MARKETS	INVESTMENT	CONSUMPTION	TOTAL
			SHARES		
15	BALANCE OF TRADE ($FOREIGN)	-1.530 2	2.268 1	0.262 3	-0.214
16	AGGREGATE IMPORTS ($FOREIGN)	0.123 2	0.801 1	0.076 3	1.248 *
17	AGGREGATE EXPORTS ($FOREIGN)	-10.798 1	10.492 2	1.305 3	-0.218
18	INVESTMENT PRICE INDEX	0.713 1	0.256 2	0.031 3	1.472 *
19	CONSUMER PRICE INDEX	0.701 1	0.266 2	0.033 3	1.549 *
20	AGGREGATE REAL INVESTMENT	0.000 3	1.018 1	-0.018 2	2.187
21	AGGREGATE REAL CONSUMPTION	0.000 3	0.000 3	1.000 1	0.102
24	U2 - AGGREGATE EMPLOYMENT	1.000 1	0.000 3	0.000 3	-0.223
27	AGGREGATE NOMINAL INVESTMENT	0.287 2	0.712 1	0.002 3	3.659 *
28	AGGREGATE NOMINAL CONSUMPTION	0.658 1	0.250 2	0.093 3	1.652 *
30	INVESTMENT SLACK VARIABLE Ω	0.334 2	0.666 1	0.000 3	-8.122
34	AVERAGE REAL WAGE RATE	0.803 1	0.176 2	0.021 3	0.934 *
85	AGGREGATE NOMINAL OTHER DEMANDS	0.697 1	0.229 2	0.074 3	2.218 *
87	PRICE INDEX EXPORTS ($A)	-1.375 2	2.117 1	0.259 3	0.118
89	GDP DEFLATOR	0.710 1	0.258 2	0.032 3	1.624 *
91	TOTAL NOMINAL LAND RENTALS	0.857 1	0.132 2	0.012 3	-2.876 *
92	TOTAL NOMINAL CAPITAL RENTALS	0.853 1	0.110 2	0.037 3	1.913 *
94	TOTAL NOMINAL WAGE PAYMENTS	0.714 1	0.253 2	0.032 3	2.276 *
101	NOMINAL GDP FROM INCOME SIDE	0.757 1	0.211 2	0.033 3	1.931 *
103	GNP: NATIONAL INCOME	0.740 1	0.263 2	-0.003 3	1.768
104	F: RATIO CONSUMPTION/SAVING	8.768 2	2.283 3	-10.051 1	-0.082
105	Q: OVERALL AUSTRALIAN SHARE	0.935 1	-0.196 3	0.261 2	-1.465
106	TOTAL NOMINAL NATIONAL SAVING	1.043 1	0.346 3	-0.389 2	1.734
107	TOTAL REAL CAPITAL STOCK	1.105 1	-0.118 2	0.013 3	1.617
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	0.298 2	0.625 1	0.077 3	0.648 *
	AVE.RENTAL,FOREIGNER'S CAPITAL	1.385 1	-0.343 2	-0.042 3	-1.126
109	AVE.RENTAL,ALL LOCAL CAPITAL	-0.521 2	1.355 1	0.166 3	0.296
110	AVE.CREATION PRICE OF CAPITAL	0.708 1	0.261 2	0.032 3	1.556 *
111	AMOUNT,LOCALLY OWNED CAPITAL	2.747 1	0.642 3	-2.389 2	0.152
112	NET NOMINAL RENTALS TO OVERSEAS	0.899 1	-0.156 3	0.257 2	7.126
113	NET NOMINAL FOREIGN INVESTMENT	-0.207 3	0.950 1	0.256 2	13.270
114	NOMINAL RENTALS TO OVERSEAS	0.899 1	-0.154 3	0.254 2	6.567
115	NOMINAL RENTALS FROM OVERSEAS	0.905 1	-0.765 3	0.860 2	-0.392
18d	INVESTMENT PRICE INDEX	0.685 1	0.279 2	0.036 3	-0.152 *
19d	CONSUMER PRICE INDEX	0.894 1	0.096 2	0.011 3	-0.074 *
27d	AGGREGATE NOMINAL INVESTMENT	-0.051 2	1.074 1	-0.022 3	2.035
28d	AGGREGATE NOMINAL CONSUMPTION	-2.388 2	-0.255 3	3.644 1	0.028
85d	AGGREGATE NOMINAL OTHER DEMANDS	0.661 1	0.149 3	0.190 2	0.594 *
92d	TOTAL NOMINAL CAPITAL RENTALS	1.654 1	-0.719 2	0.065 3	0.289
94d	TOTAL NOMINAL WAGE PAYMENTS	0.726 1	0.241 2	0.033 3	0.652 *
101d	NOMINAL GDP FROM INCOME SIDE	1.003 1	-0.040 2	0.036 3	0.307
103d	GNP: NATIONAL INCOME	1.074 1	0.320 3	-0.394 2	0.144
106d	TOTAL NOMINAL NATIONAL SAVING	5.952 2	1.641 3	-6.593 1	0.110
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	0.984 1	0.014 2	0.002 3	-0.975 *
d	AVE.RENTAL,FOREIGNER'S CAPITAL	0.986 1	0.012 2	0.002 3	-2.750 *
109d	AVE.RENTAL,ALL LOCAL CAPITAL	0.985 1	0.013 2	0.002 3	-1.327 *
110d	AVE.CREATION PRICE OF CAPITAL	0.768 1	0.204 2	0.028 3	-0.068 *
112d	NET NOMINAL RENTALS TO OVERSEAS	0.955 1	-0.279 3	0.324 2	5.503
113d	NET NOMINAL FOREIGN INVESTMENT	-0.335 2	1.047 1	0.288 3	11.646
114d	NOMINAL RENTALS TO OVERSEAS	0.961 1	-0.289 3	0.327 2	4.944
115d	NOMINAL RENTALS FROM OVERSEAS	0.733 1	0.063 3	0.205 2	-1.900 *
	number of times rated first:	37	11	4	
	number of times rated second:	12	24	14	
	number of times rated third:	6	20	37	

* All three effects have same sign.

of Tables C1, C3, C5 and C7; its use can be illustrated by an example. Looking at row 34 we see that the proposed longrun environment gives a percentage change result for the average real wage which exceeds the standard shortrun result by 0.934 per cent. Of this difference, the changed modelling of the factor markets accounted for 80.3 per cent while the changed modelling of investment and consumption accounted for only 17.6 per cent and 2.1 per cent respectively. Hence the three changes may be ranked 1-2-3, as indicated.

The tally at the bottom of Table 9 shows that, like the micro results, the macro results are dominated by the factor market modelling, followed by the change to an endogenous determination of aggregate investment. The ranking is marked enough to outweigh any doubts about the admittedly arbitrary way of assessing the relative importance of the three differences in modelling, although it must be stressed that the order also depends on the choice of experiment.

EFFECTS OF A 1 PER CENT EMPLOYMENT INCREASE IN THE PROPOSED LONGRUN CLOSURE

An exogenous increase in employment in a longrun environment has no precise shortrun counterpart, as, in the short run, employment is endogenous and the real wage exogenous - the reverse of the longrun configuration. However, we may still use a shortrun closure result as a reference point to evaluate the longrun closure response to a 1 per cent increase in employment. The comparable shortrun experiment is a wage cut just large enough to bring about the 1 per cent employment increase.

From this point of view, an employment increase under longrun closure conditions appears as an even more unambiguous blessing than in the standard ORANI shortrun environment. The reason is that in the longrun closure a mere 0.1 per cent drop in the real wage brings about a 1 per cent increase in employment (Row 34, Table R16), while in the shortrun closure a 1.2 per cent real wage cut is needed to bring about the same result (row 34, Table R2, reciprocal of column 3). Thus in the longrun environment, all the advantages of an increase in the supply of the principal factor are

enjoyed whilst the disadvantages - such as marked income redistribution - are minimized. Real GNP increased by 0.86 per cent; of this, about 70 per cent was contributed by the increase in labour earnings, with the increase in locally-accruing capital rentals making up less than eight per cent. Thus as with the tariff cut, the increase in local saving (row 106d), which is approximately equal to the GNP increase, was not enough to pay for the increased capital employed. The local ownership share (row 105) drops sharply whilst the real value of foreign investment (row 113d) increases.

Rows 108d to 109d of Table R16 show a small divergence between the rental rates on foreign and locally-owned capital. This may be traced to the greater locally-produced component of capital in those industries where local ownership is concentrated. Since, in the longrun closure, capital rentals are indexed to the cost of creation of a unit of capital in the appropriate industry, the fall in the domestic price level (while imported prices are stable) causes rental rates on locally-owned capital to decline relative to those on capital owned by foreigners.

The reduced wage necessary to employ 1 per cent more labour benefits every industry in the longrun environment, although some gain far more than others. The left hand part of Table 10 presents a list of the 25 industries which gained least (top half) and most (bottom). For comparison, the right hand side consists of a similar list, showing the chief losers and winners from a 1 per cent real wage cut in the standard ORANI shortrun environment. The latter produces a 0.8 per cent increase in employment. The two rankings are only weakly correlated, pointing to the differences between the two closures. Three of the most important are:

(a) The longrun environment assigns a flat supply curve to each industry, while part of the ranking in the shortrun case derives from the dispersion of shortrun industry supply elasticities. As stressed above, this explains the better longrun performance of the mining industries relative to the agricultural exporters. Industry 15 (Oil, Gas and Brown Coal) a relative loser in the shortrun environment - due to a high capital share - is in fact the principal winner in the long run, as the demand for its product is extremely elastic (an Armington elasticity of 50 applied to this commodity). Import competitors which

TABLE 10: WINNERS AND LOSERS FROM A LABOUR SHOCK: SHORT RUN AND LONG RUN COMPARED

1% RISE IN TOTAL EMPLOYMENT LONGRUN ENVIRONMENT			1% GENERAL WAGE CUT SHORTRUN ENVIRONMENT		
IND. NO.	INDUSTRY NAME	INDUSTRY ACTIVITY	IND. NO.	INDUSTRY NAME	INDUSTRY ACTIVITY
19	MILK PRODUCTS	.09045	10	FORESTRY AND LOGGING	-.33343
23	BREAD CAKES + BISCUITS	.18533	69	SHIPS AND BOATS	-.16235
22	FLOUR + CEREAL PRODS.	.25444	90	RETAIL TRADE	-.01653
11	FISHING AND HUNTING	.32385	103	OWNERSHIP OF DWELLINGS	.00000
5	MILK CATTLE AND PIGS	.32723	87	RESIDENTIAL BUILDING	.00000
38	CLOTHING	.33932	105	DEFENCE	.00000
24	CONFECTIONERY + COCOA	.36132	60	READY MIXED CONCRETE	.01900
37	KNITTING MILLS	.37336	61	CONCRETE PRODUCTS	.02111
20	FRUIT AND VEGETABLES	.37948	88	OTHER CONSTRUCTION	.02246
1	PASTORAL ZONE	.43446	107	EDUCATION, LIBRARIES	.04515
8	POULTRY	.45082	23	BREAD CAKES + BISCUITS	.08167
54	COSMETICS + TOILETRIES	.45301	112	NON-COMPETING IMPORTS	.08345
3	HIGH RAINFALL ZONE	.45555	19	MILK PRODUCTS	.08736
26	SOFT DRINKS + CORDIALS	.48805	104	PUBLIC ADMINISTRATION	.09662
21	MARGARINE, OILS + FATS	.49523	59	CEMENT	.09857
29	TOBACCO PRODUCTS	.49649	27	BEER AND MALT	.10274
34	TEXTILE FINISHING	.52720	29	TOBACCO PRODUCTS	.14793
2	WHEAT-SHEEP ZONE	.53125	42	JOINERY + WOOD NEC	.17307
53	SOAP AND DETERGENTS	.54453	20	FRUIT AND VEGETABLES	.17439
7	OTHER FARMING - IMPORT	.59760	100	INVESTMENT + SERVICES	.19769
79	LEATHER PRODUCTS	.60203	26	SOFT DRINKS + CORDIALS	.20010
27	BEER AND MALT	.60339	108	WELFARE AND RELIGIOUS	.21210
95	WATER TRANSPORT	.60830	54	COSMETICS + TOILETRIES	.21350
90	RETAIL TRADE	.61896	15	OIL, GAS + BROWN COAL	.21690
33	WORSTED + WOOLLEN YARN	.64220	109	ENTERTAINMENT, LEISURE	.22222
74	HOUSEHOLD APPLIANCES	1.13479	81	PLASTIC PRODUCTS, ETC.	1.15444
51	PAINTS, VARNISHES	1.13481	80	RUBBER PRODUCTS	1.20041
75	OTHER ELECTRICAL GOODS	1.14913	44	PULP PAPER PAPERBOARD	1.24307
58	CLAY PRODS, REFRACT'S	1.15056	2	WHEAT-SHEEP ZONE	1.29255
68	MOTOR VEHICLES + PARTS	1.15340	9	AGRICULTURAL SERVICES	1.37418
111	PERSONAL SERVICES	1.16910	8	POULTRY	1.40432
86	WATER, SEWERS + DRAINS	1.17516	79	LEATHER PRODUCTS	1.53769
101	INSURANCE + SERVICES	1.17762	1	PASTORAL ZONE	1.60130
99	NON BANK FINANCE	1.18095	12	FERROUS METAL ORES	1.61638
43	FURNITURE + MATRESSES	1.18935	49	CHEMICAL FERTILISERS	1.62186
73	ELECTRONIC EQUIPMENT	1.19160	50	OTHER BASIC CHEMICALS	1.66896
10	FORESTRY AND LOGGING	1.19593	3	HIGH RAINFALL ZONE	1.88390
70	LOCOMOTIVES	1.19853	68	MOTOR VEHICLES + PARTS	2.16255
35	TEXTILE FLOOR OVERLAYS	1.19894	13	NON-FERROUS METAL ORES	2.22566
94	RAIL + OTHER TRANSPORT	1.23211	39	FOOTWEAR	2.38184
25	OTHER FOOD PRODUCTS	1.45162	64	OTHER BASIC METALS	2.64963
103	OWNERSHIP OF DWELLINGS	1.47364	14	BLACK COAL	2.74925
77	CONSTRUCTION MACHINERY	1.53805	30	COTTON GINNING ETC.	2.75058
4	NORTHERN BEEF	1.60915	32	COTTON YARNS + FABRICS	2.77258
64	OTHER BASIC METALS	1.96456	18	MEAT PRODUCTS	2.78109
13	NON-FERROUS METAL ORES	1.97758	6	OTHER FARMING - EXPORT	2.84774
12	FERROUS METAL ORES	2.32889	4	NORTHERN BEEF	2.99094
17	SERVICES TO MINING	3.19093	31	MAN-MADE FIBRES, YARNS	3.69650
14	BLACK COAL	4.04647	25	OTHER FOOD PRODUCTS	5.03743
15	OIL, GAS + BROWN COAL	4.30035	76	AGRICULTURAL MACHINERY	7.04802

gain (relatively) in the shortrun environment are those which combine a high supply elasticity with a high demand elasticity. In the longrun environment, the effect of the varying capital share disappears, reducing the dispersion of their activity changes. Thus they tend to be more in the middle of the ranked industries and appear neither as principal losers nor as principal gainers in the left-hand side of Table 10.

(b) In the longrun environment aggregate household and government demands rise in line with GNP, whereas in the shortrun they are fixed. Thus the top right of Table 10, showing the industries to gain least from a shortrun wage cut, is dominated by industries which sell largely to households or the goverment. Some of these industries become gainers in the longrun environment, particularly where a high household expenditure elasticity applies to their product. Hence the good longrun performance of industry 103 (Ownership of Dwellings) and, riding on its coat-tails, industries 86 (Water, Sewers, and Drains) and 51(Paints and Varnishes). Other examples are industries 111 (Personal Services), 73 (Electronic Equipment) and 68 (Motor Vehicles and Parts).

Conversely, commodities with a low expenditure elasticity are demanded relatively less as a result of the income rise generated by the wage cut. Thus the food and clothing industries figure prominently in the top left of the table. Certain import competitors which are strong gainers in the short run - such as industry 39 (Footwear) fail to gain so strongly in the long run because of this stagnant domestic demand. Industry 79 (Leather Products), leading its partners 80 (Rubber Products) and 81 (Plastic Products) among the shortrun winners, gains less than the other two in the long run, again because of a low expenditure elasticity for leather. The agricultural industries, a source of staple foods, are also hindered by this effect, although the fixed stocks of land, and the low elasticity of demand for wool, are other reasons for their low ranking in the longrun simulation.

Similarly, significant shares of some commodities are exported at an exogenous level. For different reasons, commodities 2 (Sheep, 43 per cent exported), 13 (Fishing and Hunting, 51 per cent) and 24 (Flour

and Cereal Products, 18 per cent) all have exogenously-set constant export levels, dampening their percentage increases in output.

(c) The longrun modelling of investment allows it to increase in aggregate; so that the capital goods industries as a whole fare better in the long run than in the short. On the other hand, redistribution of the total is much less sharp than in the shortrun environment. This redistribution lies behind the shortrun placing of outliers 10 (Forestry and Logging) and 69 (Ships and Boats), victims of the very successful 76 (Agricultural Machinery). In the long run, investment increases are spread more evenly across the industries, and so industries producing capital goods are less likely to lie at either end of the ranking of output changes.

The low longrun ranking of agriculture is perhaps the most striking feature of Table 10; some particular reasons for this are mentioned above. A more general way to understand the result is to see that the agricultural industries rank lower in the long run, because in the long run there are more reasons (than in the short) for other industries to perform better. In the shortrun environment with fixed absorption, the only industries which can react are the traded goods sector. Even of these a proportion are immobilized by a high capital share in factor costs. The active residue constitutes the bottom right of Table 10 - agriculture and certain import competitors. In the longrun environment, not only are supply constraints removed (except for agriculture), but the entire nontraded sector, selling to an endogenous absorption, claims its share of the increased factor supply. The relative advantage of agriculture has disappeared.

EFFECTS OF A 1 PER CENT INCREASE IN THE RATIO OF CONSUMPTION TO SAVING

The effects of a 1 per cent increase in the ratio of consumption to saving in the proposed longrun closure are reported in the first column of Tables R16 to R21. Only the main features of the results will be described here. They are qualitatively similar to the effect of moving from a closure where household consumption is fixed to a closure where it is endogenous, in the context of an income-increasing shock. Thus, column one of Table R16 is simply a multiple of column three of Table C5 (commented on above).

The rise in consumption stimulates the nontraded sector at the expense of the traded sector, through a rise in the domestic price level. Real GDP increases, although the balance of trade moves toward deficit. Real GNP, on the other hand, actually falls. The fall in saving reduces Australians' holdings of capital stock; capital rentals accruing to Australians also fall. This decline in capital rentals outweighs the increase in labour income - leading to a fall in GNP. The total capital stock increases; to maintain the exogenous growth rate of this stock, more investment is required. The decrease in saving by Australians means that more foreign investment must flow in to make up the difference.

The industry results in Table R19 show that industries selling to the government (whose demands are modelled to move in line with household consumption), or to household consumption, are the main beneficiaries of the consumption increase. Exporting and import-competing industries become less competitive as they find their input costs - particularly wages - increasing.

Work on a miniature longrun version of ORANI (see HP) suggested that the response of most endogenous variables to a shock would be relatively insensitive to the assumed value of λ in equation (2.10) above,

$$q + k = \lambda(s_d - \pi^L),$$

unless the shock were to the ratio of consumption to saving. Where saving and consumption grow in line with GNP, there is only limited feedback from

an increased setting of the parameter λ, through a greater value of $q+k$ (the amount of capital owned by Australians), to an increased value of gnp, and so to an increased change in real saving and real consumption. λ is always less than one and the database share of capital income in GNP fairly small. Further, it is only through a change in real consumption that the majority of ORANI variables are affected by the additional longrun macro equations. Thus, apart from q and (q+k), which are approximately linear in λ, the other ORANI variables are hardly altered by a change in λ, especially if the change in GNP (and hence saving) is small.

Where the ratio of consumption to saving has changed, the change in saving will often be larger than the change in GNP, or in consumption. Thus the setting of parameter λ assumes a greater importance. We now describe a back-of-the-envelope calculation, which may be used to assess the sensitivity of results to λ.

Imagine that λ had been set at 1.0 instead of 0.5, and assume, for the moment, that $(s_d-\pi^L)$ is not affected by this change. Then (q+k) - the amount of capital owned by Australians - would have declined by an additional 0.4376 per cent (row 111, Table R16). These rentals account for 17.37 per cent of GNP in the database (see Table 6 above). So the increase in λ would directly result in an extra decline of 0.06557 per cent in GNP. Assuming this decline is spread evenly over the expenditure components of GNP (so that the exogenous ratio of consumption to saving is undisturbed), consumption (whether private and government) and saving would also each decrease by 0.06557 per cent from about 0.19 per cent. That is, the change in consumption from which all the other ORANI results derive, in this instance, would be about one third less than if λ were set at 0.5. All the results then - with the exception of those relating to q - would be reduced by about a third.

We can extend these calculations by taking into account the second round effect of the reduced percentage change in saving. This would cause another ninth (one third squared) to be deducted from the endogenous change in consumption and saving. Continuing on with the series, the change in λ from 0.5 to 1.0 would cause a reduction by half (= 1/3 + 1/9 + 1/27 ...) in the simulated changes in all variables except q and (q+k).

In summary, where the change in real saving is small the value of λ is immaterial. When this change is significant, results do depend on the chosen value of λ, especially if the policy shock consists solely of a change to the ratio of consumption to saving.

THE LONGRUN CLOSURE AND THE BALANCE OF TRADE

Table R16 shows only small responses of the balance of trade to increased labour usage or to a tariff cut. The ORANI implementation of the longrun closure shares this feature with its miniature precursors, suggesting that the model is little different from a fixed-balance-of-trade environment. Here we issue a caveat against this interpretation.

Consider the foreign account identity:

$$BT = (S - R_a) - (I - R_t),$$

where BT is the balance of trade, R_a the capital rentals accruing to Australians, R_t total capital rentals, S the value of savings and I that of investment. Neglecting the tiny balancing item, this equation is merely another form of equation 2.5 above. The longrun closure equations imply that the aggregate capital stock moves roughly in line with aggregate real investment. The constancy of rates of return means that the rental prices of capital are linked to the industry investment price indices - this will be roughly true for the aggregate indices too. Since price and quantity components of I and R_t move together, their proportional nominal changes will also be equal. Thus the second bracketed term cannot contribute much to an endogenous change in the balance of trade, assuming that I and R_t are nearly equal in the unshocked equilibrium. We can apply identical reasoning to the first bracketed term, if λ is close to unity. In that case, just as real investment moved with the total capital stock, so the real value of Australian saving moves with Australian equity . This follows from equation (2.10) above:

$$q + k = \lambda(s_d - \pi^L).$$

Whatever value is adopted for λ, the price components of local equity and local saving will change by the same proportion. Thus the first bracketed term will not contribute much either to a change in BT, assuming that S and R_a are similar in the unshocked eqilibrium, and that the parameter λ is near to unity. Even if λ is not set near to unity, it is often the case that simulated changes in real saving are small. In this case the value of λ will not affect the simulated change in the balance of trade.

The provisos above are satisfied by our simulation of the effects of the tariff cut, and, to some extent, by that of the labour increase. However, the formal specification of the longrun closure of ORANI is more general in two major respects. Firstly, the percentage change in saving is not necessarily equal to the change in R_a - they are related by the user-chosen parameter λ. However, in many simulations the change in saving is small, so this difference may be of small account.

More importantly, there is no requirement that the database portray an equilibrium where investment is equal to capital revenue, and saving equals the rentals accruing locally. In simple growth models these equalities define a steady and optimal rate of growth with constant domestic share of capital stocks. In fact, of the three properties:

(a) Trade balance: $BT = 0$,

(b) Investment = Capital Revenue: $I = R_t$

(c) Stable Domestic Share of Capital: $S/I = R_a/R_t = Q$,

any two imply the third, and also that $S = R_a$. Our hypothetical miniature databases have these features built in, while the circumstance that the 77-8 ORANI database roughly satisfies these conditions makes more plausible the construction of a future base equilibrium by 'photographic enlargement' of contemporary data. In general, we neither require nor expect that a database will display these properties.

If conditions (a), (b) and (c) are not satisifed by our database, we cannot interpret the proposed longrun closure as a close relative of the balance-of-trade-fixed closures. This is also true when there is a large endogenous change in saving and the parameter λ is not set close to unity.

CONCLUSION

To implement the longrun closure of ORANI required a great deal of painstaking work. In one sense the result is anti-climactical. The longrun version more closely resembles 'standard' general equilibrium models than its shortrun parent. The comparison of the longrun factor market modelling (allowing only economy-wide changes in the cost of labour and capital) with that of the shortrun version tended to highlight the pronounced dependence of shortrun results on database industry factor shares, rather than any novel feature of the longrun closure. In a similar way, the second main departure from the shortrun version - the different modelling of investment - is bland and predictable; it does not yield the interesting results generated by the shortrun ORANI treatment of investment. Thirdly, the endogenization of consumption, although it raised interesting theoretical problems, turned out to be of minor quantitative significance over a range of likely experiments.

Nevertheless, we hope that the effort will prove worthwhile. One spinoff has been a number of advances in, and consolidations of technique. The production of a balanced database, the extension of shortrun ORANI results by greater macro detail, and the availability of computer programs to turn results from one closure into another cheaply, all emerged from the implementation of the longrun closure.

The longrun extension to ORANI also has direct practical applications. It may be used for the same wide range of policy experiments as the standard version. When used for policy analysis, attention must be focussed on the sensitivity of results to the data inputs. Like any ORANI result, a longrun simulation result depends in principle on the totality of data used to calculate the coefficients of the linearized equation system. The effects of varying individual data elements are not additive and so an impossibly large number of parallel experiments would need to be run in order to fully explore the sensitivity of model results to data inputs. Even were such an exercise performed, the results could not be digested. Hence the need to identify key elements in the data files.

As pointed out above, flat industry supply schedules are

characteristic of the longrun version of ORANI. We saw that industry results tend to depend heavily on the slopes of commodity demand curves. Thus the Armington elasticities, import shares, and export demand elasticities assume a greater importance than in shortrun ORANI applications. In the reported simulations, several of the endogenously exported commodities faced export demand elasticities set at the default level of -20.0. Their performance, relative to other exporters, depends heavily on this value, although the total value of exports is not so sensitive.

The consumer expenditure elasticities also play a greater role than in the shortrun version of ORANI where real consumption is fixed, especially if a policy shock has a significant effect on national income.

Conversely, the share of capital in each industry's factor costs does not have the crucial role assigned to it in the shortrun closure, where it is inversely related to the supply elasticity. This lends support to our assumption (described in Section 3), that a contemporary database could be used as though it reflected an economy at longrun equilibrium with all industry rates of return at equilibrium levels.

The data relating to the ownership of capital by Australians may be divided into two parts - the overall share of capital revenue imputed to Australians, and the distribution of this share across the industries. The latter does not seem to be particularly important, as long as the cost of creating a unit of capital changes by the same amount in all industries. Experience shows that this is a good approximation to many actual model results; hence the exogenous rates of return imply that the percentage changes in unit capital rental costs are also roughly the same across industries. This means that any changes in real income from capital derive from a change in the amount of capital held, rather than from a change in real unit rentals or in the changed distribution between industries of the total capital stock. Nor is the income change much influenced by the initial distribution of capital holdings. According to the view embodied in our methodology, any gains by foreigners which result from the good performance of an industry which is largely foreign-owned are transitory - rentals in that industry will return to their longrun level. The windfall gains which accrue in the adjustment period do not figure in the

comparative-static picture we draw of longrun equilibria. The distribution of foreign ownership is most pertinent to a shortrun simulation, where industry rental rates may diverge. In spite of their name, the longrun computer programs are equally adapted to such a shortrun purpose, as Simulations 1 and 2 show. However, shortrun applications are more reliant on the presumed dispersion of foreign ownership.

Although the overall extent of local capital ownership in the database does influence a simulated change in national income, the effect tends to be slight as the major part of GNP is noncapital revenue. Further, since the real unit rentals to capital are effectively fixed, any changes in capital income accruing to Australians originate from changes in locally-owned capital stocks. Saving behaviour, rather than the initial level of asset holding, is the chief determinant of these changes.

To sum up, use of the longrun closure defines fresh pricrities in the continuing effort to update and improve the ORANI database. Yet it is implicit in the longrun comparative-static methodology that our database be hypothetical, as it purports to show the economy as it would be, years hence, in the absence of any policy shock. Contemporary data, no matter how carefully it is gathered, can only be indicative of the future; the simulated results, therefore, must always be seen in the context of their control scenario. Nevertheless, the main features of the results described above seem unlikely to be highly dependent on the details of the control scenario.

Some elaborations of the longrun closure have already been planned. We modelled no limits on the rate of ore extraction in the mining industries - this allowed large simulated changes in their output. The possibility of imposing some supply constraints in these industries is being examined. We have also experimented with a longrun version of ORANI incorporating locally increasing returns to scale. Currently, we are attempting to marry the theory of industrial organisation with an endogenous modelling of the extent of scale economies.

REFERENCES

N.B. Details of forthcoming publications may be inexact.

Alaouze, C.M., J.S. Marsden, and J. Zeitsch (1977) "Estimates of the Elasticity of Substitution between Imported and Domestically-Produced Commodities at the Four-Digit ASIC Level", IMPACT Working Paper, No. O-11, mimeo, 66pp.

Adams, Philip D.(1983) "The Short-Run Behaviour of Agricultural Industries in ORANI 78 - Methodological Overview and Base Year Data", IMPACT Preliminary Working Paper, No. OP-42, pp. 49.

Adams, Philip D.(1984) "How Responsive are Agricultural Industries in ORANI to Price Changes?", IMPACT Preliminary Working Paper, No. OP-44, pp. 28.

Adams, Philip D. (1984) "The Typical Year Data Base for the Agricultural Sector of ORANI 78", IMPACT Preliminary Working Paper, No. OP-45, pp. 113.

Adams, Philip D. (1985,forthcoming) "A User's Guide for Computing Detailed Agricultural Sector Results with the Melbourne Version of ORANI 78", IMPACT Computing Document, No. C6-01, pp. 13.

Adams, Philip D. and Peter J. Higgs(1983) "The Disaggregation of Gross Operating Surplus for the Agricultural Sector of ORANI", IMPACT Preliminary Working Paper, No. OP-40, pp. 33.

Australian Bureau of Statistics, Australian National Accounts - National Income and Expenditure 1978-79, ABS Catalogue No. 5204.0, Australian Bureau of Statistics, Canberra.

Australian Bureau of Statistics (1983) "Foreign Ownership and Control of the Mining Industry and Selected Mineral Processing Industries, Australia 1981-82", ABS Catalogue No. 5317.0, Australian Bureau of Statistics, Canberra.

Bacharach, M.O.L (1970) Biproportional Matrices and Input/Output Changes, Cambridge University Press.

Bruce, I. (1984) "Options for Future Updates of the ORANI 78 Database at IMPACT", Research Memorandum, IMPACT Project, Melbourne.

Bruce, I. (1984) "The Industries Assistance Commission's ORANI 78 Input-Output and Parameter Files for 1977-78", Research Memorandum, IMPACT Project, Melbourne.

Bruce,I. (1985) "The ORANI 78 Input-Output and Parameter Files for 1977-78", IMPACT Preliminary Working Paper, No. OP-51.

Caddy, V. (1981) "Empirical Estimation of the Elasticity of Substitution: A Review", IMPACT Preliminary Working Paper, No. OP-09, pp. 43.

Cowan, P. and J. Wright(1980) "Comparative Shortrun Behaviour of ORANI 77 in Neo-Classical and Neo-Keynesian Modes", IMPACT Working Paper No. O-29, pp. 42.

Dixon, P.B. (1979) "Why Does ORANI Produce an Increase in Employment Under a General Demand Stimulation", Research Memorandum, IMPACT Project, Melbourne, mimeo.

Dixon, P.B., B.R. Parmenter and Russell J. Rimmer(1984) "Extending the ORANI Model of the Australian Economy : Adding Foreign Investment to a Miniature Version", in H.E. Scarf and J.B. Shoven, (eds) Applied General Equilibrium Analysis, Cambridge University Press, New York, pp. 485-533.

Dixon, P.B., B.R. Parmenter, J. Sutton and D.P. Vincent (1982) ORANI : A Multisectoral Model of the Australian Economy, North-Holland Publishing Company, Amsterdam, pp. xvii+372.

Dixon, P.B., A.A. Powell and B.R. Parmenter (1979) Structural Adaptation In an Ailing Macroeconomy, Melbourne University Press, Melbourne.

Higgs P.J. (1985) "A Balanced ORANI Database for 1977-8 with a Typicalised Agricultural Sector", IMPACT Preliminary Working Paper, OP-49.

Horridge, J.M. (1985, forthcoming) "Computer Manual for the Longrun Extension to ORANI 78", Research Memorandum, IMAPACT Project, Melbourne.

Sutton, John (1982) "Updating, Average and Balancing the ORANI78 Large Change Database", Research Memorandum, Industries Assistance Commission, Canberra.

Sutton, John (1984) "ORANI 78 Large Change Computing Manual", Industries Assistance Commission, Canberra.

Appendix I

Consolidated List of Equations which Appear in the Longrun Version of ORANI but not in the Standard Version

As set out in Section 3, the longrun macro extension to ORANI consists of the addition of equal numbers of equations and variables. By means of the method of closure swapping, one of these new variables - the ratio of consumption to saving - is exogenized, whilst a standard ORANI variable - real consumption is endogenized.

It follows that a sufficient description of the additional equations can be couched in terms of a set of definitions of the new variables listed in Table 3 above, and reproduced overleaf. To code program EXPAND it was necessary to define each new variable in terms of original ORANI variables or in terms of new variables already defined. This imposed a particular order on the work which is followed in the presentation below. By and large, the first new variables to be defined are logically dependent only on the variables computed in the standard ORANI computer programs. They do not depend on any additional data (such as data on foreign ownership) required for the macro extension. Such variables are annotated, on their heading lines, with a (1).

The method of computation of some new variables is not completely general. It is assumed, in some cases, that certain technological change and taste variables are exogenously constant. Therefore, the computed changes in these variables will be invalid if technical change has been imposed. Variables which are defined in terms of these variables will also be invalid. The limitations are set out in the description of each variable below, but for quicker reference the annotation (2) has been attached to the heading line of each variable in this category.

Lastly, only certain variables are used in the chain of definitions leading to the formula for calculating f - the ratio of consumption to saving. The longrun closure described in the text actually requires only these definitions. To assist the reader, such core variables are marked with the annotation (3) in the heading line. Variables not so marked yield useful information, but their value does not affect the values of the standard ORANI variables, after closure swapping. Therefore deficiencies in the computation of these noncore variables may have only limited

significance.

Notation follows the conventions of DPSV, as far as possible. As usual, variables in percentage change form appear in lower case. Note, however, that the symbol S_i is used to indicate the share of the ith component in a total, where the context determines both the relevant total and the nature of the ith component. Thus symbols such as S_1, S_2, and S_3 are constantly redefined as necessary. This seemed preferable to cluttering the notation with further affixes.

TABLE 3 (replicated) LIST OF EXTRA VARIABLES ADDED BY PROGRAM EXPAND TO OUTPUT PIEOUT[1] FILE

POSITION		DESCRIPTION	SYMBOL IN TEXT
85	*	AGGREGATE NOMINAL OTHER DEMANDS	g
86	*	PRICE INDEX OTHER DEMANDS	$\pi^{(5)}$
87	*	PRICE INDEX EXPORTS(AUSTRALIAN DOLLARS)	π^{e}
88	*	PRICE INDEX IMPORTS(AUSTRALIAN DOLLARS)	π^{m}
89	*	PRICE INDEX GDP EXPENDITURE SIDE	π^{gdp}
90	*	NOMINAL GDP FROM EXPENDITURE SIDE	gdp
91	*	AGGREGATE NOMINAL LAND RENTALS	
92	*	AGGREGATE NOMINAL FIXED CAPITAL RENTALS	
93	*	AGGREGATE NOMINAL OTHER COST TICKETS	
94	*	AGGREGATE NOMINAL WAGE PAYMENTS	
95	*	TAX REVENUE INTERMEDIATE USAGE	
96	*	TAX REVENUE INVESTMENT INPUTS	
97	*	TAX REVENUE CONSUMPTION	
98	*	AGGREGATE EXPORT SUBSIDIES	
99	*	TARIFF REVENUE	
100	*	TOTAL NOMINAL INDIRECT TAXES	u
101	*	NOMINAL GDP FROM INCOME SIDE	gdp
102	*	TOTAL NOMINAL CURRENT CAPITAL STOCK	
103		GNP - NATIONAL INCOME	gnp
104		RATIO CONSUMPTION/SAVING	f
105		OVERALL LOCAL SHARE OF LOCAL RENTALS	q
106		TOTAL NATIONAL SAVING	s
107	*	TOTAL CAPITAL STOCK - RENTAL SHARES	k
108		AVERAGE RENTAL PRICE OF LOCALLY OWNED CAP	p^{KL}
109	*	AVERAGE RENTAL PRICE OF ALL LOCAL CAPITAL	p^{K}
110		AVERAGE CREATION PRICE, LOCALLY OWNED CAP	π^{L}
111		LOCALLY OWNED CAPITAL STOCK	$q+k$
112		NET RENTALS TO OVERSEAS	r_x
113		NET FOREIGN INVESTMENT	r_i
114		RENTALS TO OVERSEAS	r_t
115		RENTALS FROM OVERSEAS	r_f

* Variables marked by an asterisk are simply extensions of standard ORANI results. The computation of the other new variables requires information beyond that contained in the standard ORANI database. This information constitutes an additional input to program EXPAND.

1 PIEOUT is an output file of the standard ORANI programs as implemented on CSIRONET (see Sutton (1984)).

Variable 85: Aggregate Nominal Other Demands (1),(3)

Following DPSV (eqn. 16.1, p. 105) the demand for commodity i, source s, by the government is taken to be:

$$x^{(5)}_{(is)} = c_r h^{(5)}_{(is)} + f^{(5)}_{(is)} \cdot \qquad i = 1,\ldots,g \quad s = 1,2$$

Advantage is taken of the circumstance that in the ORANI database there are no margins on other demands. The government sector therefore always pays the basic price for its consumption:

$$p^{(5)}_{(is)} = p^{(0)}_{(is)} \cdot \qquad i = 1,\ldots,g \quad s = 1,2$$

The aggregate nominal expenditure is then computed as:

$$g = \sum_{i,s} S_{(is)} [x^{(5)}_{(is)} + p^{(0)}_{(is)}] \ , \qquad i = 1,\ldots,g \quad s = 1,2$$

where $S_{(is)}$ is the database share of good i from source s in total 'other' expenditure.

Variable 86: Price Index Other Demands (1)

$$\pi^{(5)} = \sum_{i,s} S_{(is)} p^{(0)}_{(is)}, \qquad i = 1,\ldots,g \quad s = 1,2$$

where the shares $S_{(is)}$ are as defined in the description of variable 85.

Variable 87: Price Index Exports (1)

The foreign price of Australian exports is found from:

$$p^{e}_{(i1)} = -\gamma_i x^{(4)}_{(i1)} + f^{e}_{(i1)} \cdot \qquad i = 1,\ldots,g \quad \text{(DPSV 15.2, p. 104)}$$

The price index for exports is a weighted combination of these prices - which include subsidies - converted to Australian currency:

$$\pi^{e} = \phi + \sum_{i} S_i p^{e}_{(i1)}, \qquad i = 1,\ldots,g$$

where ϕ is the percentage change in the exchange rate and the S_i are the database shares of each commodity in total exports.

Variable 88: Price Index Imports (1)

The price index for imports is a weighted combination of c.i.f. import prices in Australian dollars. It is computed, in percentage change form, as:

$$\pi^m = \phi + \sum_i S_i p^m_{(i2)}, \qquad i = 1,\ldots,g$$

where ϕ is the percentage change in the exchange rate and the S_i are the database shares of each commodity in total imports.

Variable 89 GDP Deflator (1)

The gdp deflator is defined as:

$$\pi^{gdp} = S_1\pi^{(3)} + S_2\pi^{(2)} + S_3\pi^{(5)},$$

i.e., a weighted average of the price indices for household consumption, investment and other demands. $\pi^{(3)}$ and $\pi^{(2)}$ are standard ORANI variables; $\pi^{(5)}$ is defined above; S_1, S_2 and S_3 are the component shares in absorption. Note that export and import prices are <u>not</u> included in this deflator.

Variable 90 Nominal GDP from Expenditure Side (1),(3)

A standard definition of GDP is used:

$$GDP_{exp} = C + I + G + E - M .$$

All components except G are standard ORANI variables (although X and M need to be converted to Australian dollars). G is simply variable 85 described above - the nominal value of other demands. The percentage change form is then:

$$gdp_{exp} = S_1c + S_2i + S_3g + S_4(e+\phi) + S_5(m+\phi).$$

This computation of gdp (rather than that from income side) is that used in the longrun closure equations.

Variable 91 Aggregate Nominal Land Rentals (1),(2)

In percentage change form this variable is defined as:

$$\text{total rentals to land} = \sum_j S_j \, x^{(1)}_{(g+1,3)j} + p^{(1)}_{(g+1,3)j}, \qquad j = 1,\ldots,h$$

where $x^{(1)}_{(g+1,3)j}$ and $p^{(1)}_{(g+1,3)j}$ are respectively the percentage change in the quantity and the price of land used by industry j and the S_j are the shares of each industry in total rentals to land.

Variable 92 Aggregate Nominal Fixed Capital Rentals (1),(2)

In percentage change form this variable is defined as:

$$\text{total rentals to fixed capital} = \sum_j S_j \, x^{(1)}_{(g+1,2)j} + p^{(1)}_{(g+1,2)j}, \qquad j = 1,\ldots,h$$

where $x^{(1)}_{(g+1,2)j}$ and $p^{(1)}_{(g+1,2)j}$ are respectively the percentage change in the quantity and in the price of capital used by industry j and the S_j are the shares of each industry in total rentals to fixed capital.

Variable 93 Aggregate Nominal Other Cost Tickets (1),(2)

ORANI's 'other cost tickets' reflect the value of taxes and levies paid by firms plus the cost of working capital. EXPAND assumes that the quantity of tickets used by each industry is proportional to industry activity:

$$x^{(1)}_{g+2,j} = z_j. \qquad j = 1,\ldots,h$$

Thus the technical change terms $a_{g+2,j}$ mentioned in DPSV 12.25 are assumed to be zero. The price of tickets is indexed to the consumer price index, via parameters $h_{g+2,j}$ (normally unity), and shifters $f_{g+2,j}$ (normally zero):

$$p^{(1)}_{g+2,j} = h^{(1)}_{g+2,j} \pi^{(3)} + f^{(1)}_{g+2,j}.$$

Thus the percentage change in aggregate ticket revenue may be expressed:

$$\text{ticket revenue} = \sum_j S_j (p^{(1)}_{g+2,j} + x^{(1)}_{g+2,j}), \qquad j = 1,\ldots,h$$

where the S_j are the database shares of each industry in total ticket revenue.

Variable 94: Aggregate Nominal Wage Payments (1),(2)

In percentage change form this variable is defined as:

$$\text{total wages to labour} = \sum_j S_j \, x^{(1)}_{(g+1,1)j} + p^{(1)}_{(g+1,1)j}, \quad j = 1,\ldots,h$$

where $x^{(1)}_{(g+1,1)j}$ and $p^{(1)}_{(g+1,1)j}$ are respectively the percentage changes in the quantity and the price of labour used by industry j and the S_j are the shares of each industry in the total wage bill.

The $p^{(1)}_{(g+1,1)j}$ are themselves shareweighted sums of the prices of the m occupational labour grades. Building on DPSV (eqn. 22.6, p. 128):

$$p^{(1)}_{(g+1,1)j} = f^{(1)}_{(g+1,1)} + f^{(1)}_{(g+1,1)j} + \sum_m S_{mj}[cpi.h^{(1)}_{(g+1,1,m)j} + f^{(1)}_{(g+1,1,m)} + f^{(1)}_{(g+1,1,m)j}],$$

where:

$f^{(1)}_{(g+1,1)}$ = overage wage shifter

$f^{(1)}_{(g+1,1)j}$ = industry-specific wage shifter

$f^{(1)}_{(g+1,1,m)}$ = occupation-specific wage shifter

$f^{(1)}_{(g+1,1,m)j}$ = (industry/occupation)-specific wage shifter

$h^{(1)}_{(g+1,1,m)j}$ = (industry/occupation)-specific indexation parameter

S_{mj} = share of occupation m in wage bill industry j .

The $f^{(1)}_{(g+1,1,m)j}$ are not implemented by the standard ORANI programs, and were assumed to be exogenously zero. Technological augmentation of the component grades of labour has also been excluded.

Variable 95: Tax Revenue Intermediate Usage (1),(2)

To calculate this flow, we assume that the tax is specific, fully indexed to the CPI , and is levied equally on domestic and imported equivalents. We also assume that the demand by an industry for any material input (disregarding source) is proportional to its activity level. Thus technical change terms appearing in equation 12.23 (DPSV, p. 81) are assumed to be zero. The total tax revenue is then:

$$\text{Intermediate Tax Revenue} = \pi^{(3)} + \sum_j S_j z_j , \qquad j = 1,\ldots,h$$

where $\pi^{(3)}$ is the consumer price index, z_j the activity level of industry j, and the S_j are the database shares, by industry, of the tax revenue.

Variable 96: Tax Revenue on Inputs to Capital Creation (1),(2)

To calculate this flow, we assume that the tax is specific, fully indexed to the CPI , and is levied equally on domestic and imported equivalents. We also assume that the demand by an industry for any material input to its capital creation (disregarding source) is proportional to its investment level. Thus technical change terms appearing in equation 13.4 (DPSV, p. 96) are assumed to be zero. The total tax revenue is then:

$$\text{Investment Tax Revenue} = \pi^{(3)} + \sum_j S_j z_j , \qquad j = 1,\ldots,h$$

where $\pi^{(3)}$ is the consumer price index, y_j the investment level of industry j, and the S_j are the database shares, by industry, of the tax revenue.

Variable 97: Tax Revenue on Household Consumption (1)

To calculate this flow, we assume that the tax is specific, fully indexed to the CPI, and is levied equally on domestic and imported equivalents (see DPSV, p. 114, eqn. 18.5). The total tax revenue is then:

$$\text{Consumption Tax Revenue} = \pi^{(3)} + \sum_i S_i x_i^{(3)} , \qquad i = 1,\ldots,g$$

where $\pi^{(3)}$ is the consumer price index, $x_i^{(3)}$ the consumption of good i (regardless of source) and the S_i are the database shares, by commodity, of the tax revenue. The $x_i^{(3)}$ are calculated as Divisia aggregates of household consumption of domestic and imported equivalents:

$$x_i^{(3)} = \sum_s S_{is} x_{is}^{(3)} , \qquad s = 1,2 \quad i = 1,\ldots,g$$

where the s subscript differentiates imported from locally produced good i, and S_{is} is the database share of source s in the value of consumption of good i.

Variable 98: Aggregate Export Tax Revenue (1)

In calculating the revenue from export tax, we recognized that according to the ORANI database, the taxes were sometimes negative - actually subsidies. The tax rates are often endogenous, so that a subsidy may become a tax, or vice versa. Thus a special method of computation was designed. Contributions from tax on each commodity, ΔY_i, to the total change in export tax revenue, ΔY were calculated as follows.

For each commodity, the export tax revenue Y_i is equal to the difference between the value of exports at world prices, and the value at Australian prices (including margins). Call these F_i (foreign flow) and D_i (domestic flow). Then $Y_i = F_i - D_i$. Further, the power of the export subsidy, P_i is defined as the ratio D_i/F_i, so that $D_i = P_i F_i$. Hence:

$$Y_i = F_i - P_i F_i, \text{ and}$$

$$\Delta Y_i = F_i f_i - P_i F_i (p_i + f_i) ,$$

where the lower case letter denote **proportional** changes. Summing:

$$\Delta Y = \sum_i \Delta Y_i \text{ , and so}$$

$\Delta Y/Y$ is the proportional change in export tax revenue.

Both Y, the original revenue, F_i, the original 'foreign flows' and P_i, the original powers of the subsidies are calculated from the database. The f_i are derived via equation 15.2 of DPSV from the export prices and the world export demand shifters. The p_i are computed by the standard ORANI programs.

Variable 99: Aggregate Import Tax Revenue (1)

A similar method to that employed in calculating export tax was used, for the same reasons. Skipping the derivation:

$\Delta Y/Y$ is the proportional change in import tax revenue, where

$$\Delta Y = \sum_i \Delta Y_i \text{ and}$$

$$\Delta Y_i = - F_i f_i + T_i F_i (t_i + f_i),$$

where the lower case letters denote proportional changes. T_i is the power of the tariff, whereas P_i, in the previous (export tax) derivation was the power of a subsidy; hence the sign differences.

Both Y, the original revenue, F_i, the original 'foreign flows' and T_i, the original powers of the tariffs are calculated from the database. Note that the T_i are not the IAC-generated equivalent rates used to compute the size of exogenous tariff shocks. The f_i are derived from the standard ORANI variables PM (import prices) and XL (import volumes).

Variable 100: Total Indirect Tax Revenue (1),(2)

Total indirect taxes are made up of the five components just described, namely, taxes on intermediate usage, investment inputs, household consumption, exports, and imports. The percentage change in U, their sum, is simply:

$$u = \sum_w S_w u_w , \qquad w = 1,..,5$$

where the u_w are the percentage changes of the components, and the S_w are their database shares in indirect tax revenue.

Variable 101: Nominal GDP from Income Side (1),(2)

This is defined as the sum of payments to land, labour, capital, and other cost tickets, plus indirect taxes. The calculation of all these quantities is described above. The percentage change in GDP is then found as a weighted sum of the changes in its components, the weights being the component database shares in GDP.

The result should be equal to that obtained from the expenditure side - see above (Variable 90). In practice, small discrepancies arise. The reason for this is unknown. Additionally, results for Variable 101 are invalidated if any of several vectors of technical change or taste shocks are nonzero. Hence the longrun core equations use the calculated value of Variable 90 - GDP from the expenditure side.

Variable 102: Total Nominal Current Capital Stock (1)

This variable is simply defined as the change in the nominal value of the aggregate capital stock as computed by the standard ORANI programs (variable 26 - K0). In percentage change form:

$$\pi^{(2)} + k(0) = \sum_j (k_j(0) + \pi_j)\phi_{2j} \quad . \qquad j = 1,\ldots,h$$

(Refer eqn. 22.4, DPSV, p. 127). The $k_j(0)$ are the percentage changes in the quantity of capital employed in each industry, while the π_j are the changes in the price of creating a unit of such capital. The ϕ_{2j} are the value shares of capital in each industry as utilized by the standard ORANI programs. That is, they are the normalized column sums of the capital stocks matrix. As detailed in Section 4, these weights were deemed inappropriate for longrun applications. Thus this variable is computed for shortrun purposes only.

Variable 107: Total Capital Stock - Rental Shares (1),(3)

This variable is calculated in a similar manner to the variable k(0) - aggregate capital stock - computed by the standard ORANI programs, and described in DPSV, eqn. 22.4, p. 127. The difference lies in the weights attached to the changes in individual industries' capital stocks. For the reasons set out in Section 4 above, we preferred, for longrun purposes, to use weights based on the industry shares of total rentals to fixed capital. Thus:

$$k = \sum_j S_j k_j(0) \quad , \qquad j = 1,\ldots,h$$

where the S_j are database industry shares of total rentals to fixed capital, and $k_j(0)$ is the percentage change in the capital stock in industry j.

Variable 108: Average Rental Price of Locally-Owned Capital (3)

This variable represents the overall rental price of all fixed capital owned by Australians. It is computed as:

$$p^{KL} = \sum_j S_j p_{(g+1,2)j} \quad , \qquad j = 1,\ldots,h$$

where the S_j are the shares accounted for by each industry in total revenue to fixed capital, accruing to Australians.

Variable 109: Average Rental Price of Capital (1)

This variable represents the overall rental price of all fixed capital located in Australia. It is computed as:

$$p^K = \sum_j S_j p_{(g+1,2)j} \quad , \qquad j = 1,\ldots,h$$

where the S_j are the shares accounted for by each industry in total revenue to fixed capital. It is the appropriate price index for Variable 107.

Variable 110: Average Creation Price of Locally-Owned Capital (1)

This variable represents the overall creation price of all fixed capital owned by Australians. It is computed as:

$$\pi^L = \sum_j S_j \pi_j \quad , \qquad j = 1,\ldots,h$$

where the S_j are the shares of each industry in total investment in Australia by Australians. According to the methodology set out in Section 4 above, the distribution of this investment is the same as the distribution of Australians' capital assets between the industries, and the same too as the distribution, between the industries, of capital rentals accruing to Australians. This simplifying feature, however, is neither essential to the implementation of the longrun closure, nor particularly crucial to the results, in most instances. The exception would be a shock which caused a marked dispersion in the π_j.

Variables 103,104,105,106, and 111: Core Variables

Condensed Derivation of Core of Longrun Module

The following 8 equations (excerpted from Table 2 above) form the core of the longrun system. They are fully explained in Section 2 above.

(1) $gnp = \beta^1 (q + k + p^{KL}) + \beta^2 othinc + \beta^3 (k^F + \phi)$ [Income]

(2) $gnp = \alpha^1 c + \alpha^2 g + \alpha^3 s_d + \alpha^4 s_f + \alpha^5 bi$ [Expenditure]

(3) $c = f + s$ [Consumption]

(4) $bi = gnp$ [Balancing Item]

(5) $q + k = \lambda(s_d - \pi^L)$ [Australian Equity in Local Capital]

(6) $k^F = \lambda(S_f - \phi)$ [Australian Ownership of Overseas Capital]

(7) $s_f = s$ [Investment by Australians Overseas]

(8) $s_d = s$ [Local Investment by Australians].

Where β^1 = share locally generated capital rentals in GNP,
β^2 = share other locally generated income in GNP,
β^3 = share rentals from overseas in GNP,
α^1 = share consumption in GNP,
α^2 = share government spending in GNP,
α^3 = share saving invested locally in GNP,
α^4 = share saving invested overseas in GNP,
α^5 = share balancing item in GNP, and
λ = parameter reflecting assumed adjustment path of saving.

The equations above implicitly determine the variables:

gnp	national income	103*
q	Australian share of capital stock	105
q+k	Australian capital assets	111
k^F	overseas capital stock owned by Australians	
s_d	Australian saving used to purchase capital stock in Australia	106*
s_f	Australian saving used to purchase capital stock overseas	106*
s	Australian saving	106*
bi	residual component of national expenditure remitted overseas (not included in rentals to/from overseas or in investment flows)	103*
f	ratio of consumption to saving.	104

(* Some distinct variables share the same computer number, taking advantage of the fact that they always have the same percentage change.)

All other variables mentioned in the group of equations may be computed fairly directly from standard ORANI variables. In this section the condensed form of the 8 equations is presented and derived. The method used is to calculate f as an explicit function of the standard ORANI variables. Then the remaining new variables are successively computed as functions of f and the standard ORANI variables. In other words, the system is triangularised algebraically.

As a preliminary, we remind the reader that the variable othinc appearing in the first equation is only a shorthand for the percentage change in all 'other income' - apart from capital rentals - making up GDP. By assumption, all this other income accrues to Australians. Thus, in levels:

GDP = OTHINC + (AGGREGATE NOMINAL FIXED CAPITAL RENTALS),

or in percentage change form:

$$gdp = B_1 othinc + B_2 r \ ,$$

where B_1 and B_2 are database shares and where r is the percentage change in capital rentals - variable 92 - and gdp is calculated from the expenditure side. (Refer to the descriptions of variables 90 and 101.) Rearrangement gives:

$$othinc = C_1 gdp + C_2 r \ ,$$

where $C_1 = 1/B_1$ and $C_2 = -B_2/B_1$. (C_1 and C_2 are printed out by program EXPAND under the names SHRNC1 and SHRNC2. Although EXPAND computes othinc it is not printed out.)

Using the equations:

$$q + k = \lambda(s_d - \pi^L) \qquad (5)$$

$$k^F = \lambda(s_f - \phi) \qquad (6)$$

$$s_f = s_d = s \qquad (7),(8)$$

we may rewrite eqation (1) as:

$$gnp = S_1 c + S_2 f + S_3 \pi^L + S_4 p^{KL} + S_5 othinc + S_6 \phi,$$

where c and ϕ are standard ORANI variables - nominal household consumption and the exchange rate. p^{KL} and π^L are new variables 108 and 110 described above. The coefficients S_1 to S_6 are printed out by program EXPAND having been computed as:

$$S_1 = \lambda(\beta_1 + \beta_2)$$

$$S_2 = - S_1$$

$S_3 = -\beta_1\lambda$

$S_4 = \beta_1$

$S_5 = \beta_2$

$S_6 = \beta_3(1 - \lambda)$.

Values of β_1 to β_6 are printed out under the names SHRGNI (1-6).

A similar transformation is applied to equation 2 of Table 2, making use of equation 4 :

bi = gnp, so that (4) becomes

$gnp = T_1c + T_2g + T_3f$.

Coefficients T_1 to T_3 are printed out and equal:

$T_1 = (\alpha_1 + \alpha_2 + \alpha_3)/(1 - \alpha_5)$

$T_2 = \alpha_2/(1 - \alpha_5)$

$T_3 = -(\alpha_3 + \alpha_4)/(1 - \alpha_5)$.

Values α_1 to α_5 are printed out as SHRGNE(1-6).

Combining these two rearrangements we have:

$$T_1c + T_2g + T_3f = gnp = S_1c + S_2f + S_3\pi^L + S_4p^{KL} + S_5\text{othinc} + S_6\phi.$$

Thus f may be expressed in terms of the already computed variables:

$$f = ((S_1 - T_1)c + S_3\pi^L + S_4p^{KL} + S_5\text{othinc} + S_6\phi - T_2g)/(T_3 - S_2)$$

Having performed these manipulations the going becomes easy:

$gnp = T_1c + T_2g + T_3f = bi$ defining variable 103

$s_d = s_f = s = c - f$ defining variable 106

$(q+k) = \lambda(s_d - \pi^L)$ defining variable 111

$(q+k+p^{KL}) = (q+k) + p^{KL} = r_a$,

= revenue from local capital accruing to Australians.

$q = (q+k) - (r - p^K)$ defining variable 105

where $k = r - p^K$ = variable 107. Thus all eight variables are computed.

Variable 112: Net Rentals to Overseas

This is computed merely as the difference between rentals to and rentals from overseas. In percentage change form:

$r_x = Q_1^2 r_t + Q_2^2 r_f$, where Q_1^2 and Q_2^2 are computed from the database, and r_t and r_f are variables 114 and 115.

Variable 113: Net Foreign Investment

This is defined as the difference between national saving and aggregate investment. In percentage change form:

$r_i = Q_1^3 i + Q_2^3 s$, where Q_1^3 and Q_2^3 are computed from the database, and i and s are variables 27 and 106.

Variable 114: Rentals Paid to Overseas

This variable represents the capital income earned in Australia, yet accruing to foreigners. It is merely the difference between total capital income, R(variable 92), and that accruing to Australians, R_a. So in percentage change form:

$$r_t = Q_1^1 r + Q_2^1 r_a,$$

where Q_1^1 and Q_2^1 are computed from database shares. r_a is found by adding the results for variable 111 (q+k) and variable 108 (p^{KL}), which represent respectively the quantity and rental price of local capital.

Variable 115: Rentals from Overseas

These rentals represent the earnings of capital located overseas, yet owned by Australians. The unit rental price is deemed to be constant in overseas currency so the Australian value of the rentals is simply the product of the exchange rate, ϕ, and the amount of such capital, K^F. In percentage change terms:

$$r_f = k^F + \phi$$

From equations (6) and (7) of Table 2 we deduce:

$$r_f = \lambda(s - \phi) + \phi,$$

where s and ϕ are variables 106 and 9.

APPENDIX II

COMPENDIUM OF TABULAR RESULTS OF

SHORTRUN AND LONGRUN SIMULATIONS

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Table R1	Descriptions of Macro Variables	AII/3

Results for Shortrun Closure - Real Consumption Exogenous

Table R2	Macro Variables	AII/4
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Results for Shortrun Closure - Ratio Consumption/Saving Exogenous

Table R8	Macro Variables	AII/13
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Results for Longrun Closure - Real Consumption Exogenous

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Results for Longrun Closure - Ratio Consumption/Saving Exogenous

Table R16	Macro Variables	AII/23
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Table R18	Winners and Losers - the Tariff Cut	AII/25
Table R19	Industry Outputs	AII/26
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Tables Showing the Main Macro and Micro Differences Between Closures

Tables C1,C2	Absorption Fixed - Comparison of Long and Shortrun Modelling of Factor Supply	AII/32
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Tables C5,C6	Longrun Closures with Endogenous Investment - Effect of Endogenizing Real Consumption	AII/36
Tables C7,C8	Comparison of Standard ORANI Shortrun Closure with Proposed Longrun Closure	AII/38

TABLE R1: SELECTED MACRO RESULTS: EXPLANATION OF TERMS

NO.*	ORANI VARIABLE	EXPLANATORY NOTE
15	BALANCE OF TRADE ($FOREIGN)	Measured in foreign equivalents of 1977-8 A$ billion
16	AGGREGATE IMPORTS ($FOREIGN)	At at-port prices
17	AGGREGATE EXPORTS ($FOREIGN)	At at-port prices
18	INVESTMENT PRICE INDEX	Expenditure-weighted mean of prices,investment goods
19	CONSUMER PRICE INDEX	Expenditure-weighted mean of prices,consumption goods
20	AGGREGATE REAL INVESTMENT	Nominal investment deflated by (18)
21	AGGREGATE REAL CONSUMPTION	Nominal consumption deflated by (19)
22	IR/CR	Ratio (20) to (21)
24	U2 - AGGREGATE EMPLOYMENT	Measured in wage units
27	AGGREGATE NOMINAL INVESTMENT	
28	AGGREGATE NOMINAL CONSUMPTION	
30	INVESTMENT SLACK VARIABLE Ω	Loosely similar to economy-wide rate of return
34	AVERAGE REAL WAGE RATE	
85	AGGREGATE NOMINAL OTHER DEMAND	Basically government spending
87	PRICE INDEX EXPORTS ($A)	Including any subsidies or taxes
88	PRICE INDEX IMPORTS ($A)	Not including any subsidies or taxes
89	GDP DEFLATOR	Weighted mean of (18), (19) and a price index for (85)
91	TOTAL NOMINAL LAND RENTALS	Aggregate rentals to land
92	TOTAL NOMINAL CAPITAL RENTALS	Aggregate rentals to fixed capital
94	TOTAL NOMINAL WAGE PAYMENTS	
101	NOMINAL GDP FROM INCOME SIDE	Sum of factor payments plus indirect taxes
103	GNP: NATIONAL INCOME	Income accruing to Australians
104	F: RATIO CONSUMPTION/SAVING	Ratio of two nominals
105	Q: OVERALL AUSTRALIAN SHARE	Local share of aggregate capital stock
106	TOTAL NOMINAL NATIONAL SAVING	Includes any saving by government
107	TOTAL REAL CAPITAL STOCK	Industry quantity changes aggregated with rental shares
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	Average unit rental price,local capital owned locally
	AVE.RENTAL,FOREIGNER'S CAPITAL	Average unit rental price,local capital owned overseas
109	AVE.RENTAL,ALL LOCAL CAPITAL	Average unit rental price,all local capital
110	AVE.CREATION PRICE OF CAPITAL	Average unit creation price of locally-owned capital
111	AMOUNT,LOCALLY OWNED CAPITAL	As (107) but only for Australian-owned capital
112	NET NOMINAL RENTALS TO OVERSEAS	In A$, (114) - (115)
113	NET NOMINAL FOREIGN INVESTMENT	In A$, (27) less (106)
114	NOMINAL RENTALS TO OVERSEAS	In A$
115	NOMINAL RENTALS FROM OVERSEAS	In A$

*The numbers at left are computer program numbers.

The deflated variables shown below the rest in the tables have the same name as their nominal equivalents. The result given is just the nominal result less the appropriate value for the GDP deflator.

TABLE R2: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

NO.	SELECTED MACRO RESULTS ORANI VARIABLE	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
15	BALANCE OF TRADE ($FOREIGN)	-.07756	-.57494	-.46569	.14719
16	AGGREGATE IMPORTS ($FOREIGN)	.35884	1.60804	.84448	1.43133
17	AGGREGATE EXPORTS ($FOREIGN)	-.17112	-2.29963	-2.31154	2.39520
18	INVESTMENT PRICE INDEX	.18844	1.56541	1.66296	-2.61019
19	CONSUMER PRICE INDEX	.11939	2.21085	1.72634	-2.20441
20	AGGREGATE REAL INVESTMENT	1.00000	ZERO	ZERO	ZERO
21	AGGREGATE REAL CONSUMPTION	ZERO	1.00000	ZERO	ZERO
22	IR/CR	1.00000	-1.00000	ZERO	ZERO
24	U2 - AGGREGATE EMPLOYMENT	.19246	.06929	-.82513	.22342
27	AGGREGATE NOMINAL INVESTMENT	1.18845	1.56541	1.66296	-2.61019
28	AGGREGATE NOMINAL CONSUMPTION	.11939	3.21085	1.72634	-2.20441
30	INVESTMENT SLACK VARIABLE Ω	-2.36076	-4.13904	-6.58913	8.12246
34	AVERAGE REAL WAGE RATE	ZERO	ZERO	1.00000	ZERO
85	AGGREGATE NOMINAL OTHER DEMAND	.12757	3.10126	2.34070	-2.15521
87	PRICE INDEX EXPORTS ($A)	.02273	.31447	.32964	-.34181
88	PRICE INDEX IMPORTS ($A)	ZERO	ZERO	ZERO	ZERO
89	GDP DEFLATOR	.13581	2.04142	1.81151	-2.27973
91	TOTAL NOMINAL LAND RENTALS	-.22190	-2.92484	-3.36031	3.24771
92	TOTAL NOMINAL CAPITAL RENTALS	.38231	2.71417	.68640	-1.19166
94	TOTAL NOMINAL WAGE PAYMENTS	.30795	2.31209	1.92355	-1.99014
101	NOMINAL GDP FROM INCOME SIDE	-.21422	2.24007	1.35485	-2.08972
103	GNP: NATIONAL INCOME	.26943	2.27688	1.39491	-2.21162
104	F: RATIO CONSUMPTION/SAVING	-.76749	4.72345	2.27489	.08233
105	Q: OVERALL AUSTRALIAN SHARE	ZERO	ZERO	ZERO	ZERO
106	TOTAL NOMINAL NATIONAL SAVING	.88687	-1.51260	-.54855	-2.28673
107	TOTAL REAL CAPITAL STOCK	ZERO	ZERO	ZERO	ZERO
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	.36642	3.24938	.97436	-1.50428
	AVE.RENTAL,FOREIGNER'S CAPITAL	.44876	.47570	-.51797	.06584
109	AVE.RENTAL,ALL LOCAL CAPITAL	.38231	2.71417	.68640	-1.19166
110	AVE.CREATION PRICE OF CAPITAL	.32662	1.72915	1.83287	-2.41193
111	AMOUNT,LOCALLY OWNED CAPITAL	ZERO	ZERO	ZERO	ZERO
112	NET NOMINAL RENTALS TO OVERSEAS	.48528	.51447	-.56011	.12530
113	NET NOMINAL FOREIGN INVESTMENT	2.69401	16.93211	12.70368	-4.22503
114	NOMINAL RENTALS TO OVERSEAS	.44865	.47563	-.51782	.11584
115	NOMINAL RENTALS FROM OVERSEAS	ZERO	ZERO	ZERO	ZERO
	SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR				
18d	INVESTMENT PRICE INDEX	.05263	-.47601	-.14855	-.33046
19d	CONSUMER PRICE INDEX	-.01642	.16943	-.08517	.07532
27d	AGGREGATE NOMINAL INVESTMENT	1.05264	-.47601	-.14855	-.33046
28d	AGGREGATE NOMINAL CONSUMPTION	-.01642	1.16943	-.08517	.07532
85d	AGGREGATE NOMINAL OTHER DEMAND	-.00824	1.05984	.52919	.12452
92d	TOTAL NOMINAL CAPITAL RENTALS	.24650	.67275	-1.12511	1.08807
94d	TOTAL NOMINAL WAGE PAYMENTS	.17214	.27067	.11204	.28959
101d	NOMINAL GDP FROM INCOME SIDE	.14161	.19865	-.45666	.19001
103d	GNP: NATIONAL INCOME	.13362	.23546	-.41660	.06811
106d	TOTAL NOMINAL NATIONAL SAVING	.75106	-3.55402	-2.36006	-.00700
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	.23061	1.20796	-.83715	.77545
d	AVE.RENTAL,FOREIGNER'S CAPITAL	.31295	-1.56572	-2.32948	2.34557
109d	AVE.RENTAL,ALL LOCAL CAPITAL	.24650	.67275	-1.12511	1.08807
110d	AVE.CREATION PRICE OF CAPITAL	.19081	-.31227	.02136	-.13220
112d	NET NOMINAL RENTALS TO OVERSEAS	.34947	-1.52695	-2.37162	2.40503
113d	NET NOMINAL FOREIGN INVESTMENT	2.55820	14.89069	10.89217	-1.94530
114d	NOMINAL RENTALS TO OVERSEAS	.31284	-1.56579	-2.32933	2.39557
115d	NOMINAL RENTALS FROM OVERSEAS	-.13581	-2.04142	-1.81151	2.27973

TABLE B3: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

EMPLOYMENT BY OCCUPATION NO.	ORANI OCCUPATIONAL CATEGORY	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
1	PROFESSIONAL WHITE-COLLAR	.11183	.66672	-.40522	.1000
2	PARA-PROFESSIONAL WHITE-COLLAR	.08978	.76686	-.40541	.0445
3	SKILLED WHITE-COLLAR	.22832	.26399	-.66520	.0516
4	SEMI- AND UNSKILLED WHITE-COLLAR	.13708	.54173	-.54038	.0987
5	SKILLED B.C. METAL AND ELECTRICAL	.30832	-.20156	-.99091	-.0194
6	SKILLED BLUE-COLLAR: BUILDING	.71089	.15377	-.41979	-.0508
7	SKILLED BLUE-COLLAR: OTHER	-.0049	-.21	-1.1	.4685
8	SEMI- AND UNSKILLED BLUE-COLLAR	.27577	-.14760	-.90220	.0701
9	RURAL WORKERS	-.092	-2.0	-2.5	2.2129
10	ARMED SERVICES	zero	.98795	zero	zero

TABLE R4: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

NO.	TARIFF CUT - WINNERS AND LOSERS ORANI INDUSTRY	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.E. TARIFF C
31	MAN-MADE FIBRES, YARNS	-.14162	-2.87435	-3.69650	-10.15291
39	FOOTWEAR	-.07754	-1.73641	-2.38184	-7.80096
68	MOTOR VEHICLES + PARTS	.18551	-1.29834	-2.16255	-6.57211
32	COTTON YARNS + FABRICS	-.12976	-2.12998	-2.77258	-5.37778
79	LEATHER PRODUCTS	-.04249	-1.00091	-1.53769	-3.00938
33	WORSTED + WOOLLEN YARN	.01555	-.08628	-.84307	-2.20745
38	CLOTHING	-.02429	-.16087	-.60511	-2.05283
37	KNITTING MILLS	-.03010	-.16865	-.64833	-1.84092
80	RUBBER PRODUCTS	.12612	-.42905	-1.20041	-1.56289
34	TEXTILE FINISHING	.01951	-.03808	-.62776	-1.43283
73	ELECTRONIC EQUIPMENT	.27794	.20429	-.92268	-1.35581
67	OTHER METAL PRODUCTS	.43126	-.48859	-.96700	-1.17110
51	PAINTS, VARNISHES	.34293	-.36665	-.68670	-1.03492
35	TEXTILE FLOOR OVERLAYS	.14460	.83400	-.59277	-1.00612
81	PLASTIC PRODUCTS, ETC.	.15003	-.53455	-1.15444	-.77213
50	OTHER BASIC CHEMICALS	.05936	-1.20759	-1.66896	-.68465
10	FORESTRY AND LOGGING	.91083	.38890	.33343	-.66723
83	OTHER MANUFACTURING	-.05049	-.02630	-.81465	-.55095
63	BASIC IRON AND STEEL	.37457	-.42566	-.75283	-.53757
78	OTH. MACHINERY + PLANT	.64127	-.25517	-.36094	-.53474
74	HOUSEHOLD APPLIANCES	.28232	.69222	-.50758	-.50493
77	CONSTRUCTION MACHINERY	.71665	-.47267	-.32987	-.49897
82	SIGNS, WRITING GEAR	.08884	-.12752	-.87280	-.49240
69	SHIPS AND BOATS	.36770	.38727	.16235	-.46465
75	OTHER ELECTRICAL GOODS	.51641	.19900	-.35962	-.46104
41	VENEERS AND BOARDS	.39828	.29262	-.41127	-.43101
43	FURNITURE + MATRESSES	.13507	1.32272	-.23816	-.25143
85	GAS	.06317	.63442	-.29660	-.21708
70	LOCOMOTIVES	.36364	-.25778	-.60812	.37092
93	ROAD TRANSPORT	.16568	-.24812	-.71017	.39065
52	PHARMACEUTICAL GOODS	-.03857	.35383	-.84814	.39908
96	AIR TRANSPORT	.01840	.66230	-.67421	.40666
7	OTHER FARMING - IMPORT	-.04148	-.39780	-.99354	.51195
11	FISHING AND HUNTING	-.03440	-.31294	-.60881	.53387
95	WATER TRANSPORT	.03630	-.53497	-.77185	.57266
94	RAIL + OTHER TRANSPORT	.04881	-.37557	-.90262	.69395
5	MILK CATTLE AND PIGS	-.05613	-.79269	-.98611	.89283
17	SERVICES TO MINING	.33765	-1.20120	-.88604	.94279
2	WHEAT-SHEEP ZONE	-.07131	-1.11432	-1.29255	1.16346
9	AGRICULTURAL SERVICES	-.07116	-.88464	-1.37418	1.18363
8	POULTRY	-.08379	-1.19840	-1.40432	1.30271
1	PASTORAL ZONE	-.08452	-1.36433	-1.60130	1.36838
49	CHEMICAL FERTILISERS	-.08362	-1.25954	-1.62186	1.40165
30	COTTON GINNING ETC.	-.14134	-2.30551	-2.75058	1.50149
12	FERROUS METAL ORES	-.09402	-1.50623	-1.61638	1.66670
3	HIGH RAINFALL ZONE	-.10745	-1.61481	-1.88390	1.68928
13	NON-FERROUS METAL ORES	-.12184	-2.08451	-2.22566	2.20682
18	MEAT PRODUCTS	-.16670	-2.42435	-2.78109	2.58959
64	OTHER BASIC METALS	-.11350	-2.49076	-2.64963	2.60737
6	OTHER FARMING - EXPORT	-.16644	-2.40303	-2.84774	2.65505
14	BLACK COAL	-.15904	-2.59985	-2.74925	2.72306
4	NORTHERN BEEF	-.17790	-2.58353	-2.99094	2.77694
25	OTHER FOOD PRODUCTS	-.30481	-4.67144	-5.03743	4.96921
76	AGRICULTURAL MACHINERY	.59916	-7.34121	-7.04802	7.73574

TABLE R5: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

INDUSTRY OUTPUTS NO.	ORANI INDUSTRY NAME	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.08452	-1.36433	-1.60130	1.36838
2	WHEAT-SHEEP ZONE	-.07131	-1.11432	-1.29255	1.16346
3	HIGH RAINFALL ZONE	-.10745	-1.61481	-1.88390	1.68928
4	NORTHERN BEEF	-.17790	-2.58353	-2.99094	2.77694
5	MILK CATTLE AND PIGS	-.05613	-.79269	-.98611	.89283
6	OTHER FARMING - EXPORT	-.16644	-2.40303	-2.84774	2.65505
7	OTHER FARMING - IMPORT	-.04148	-.39780	-.99354	.51195
8	POULTRY	-.08379	-1.19840	-1.40432	1.30271
9	AGRICULTURAL SERVICES	-.07116	-.88464	-1.37418	1.18363
10	FORESTRY AND LOGGING	.91083	.38890	.33343	-.66723
11	FISHING AND HUNTING	-.03440	-.31294	-.60881	.53387
12	FERROUS METAL ORES	-.09402	-1.50623	-1.61638	1.66670
13	NON-FERROUS METAL ORES	-.12184	-2.08451	-2.22566	2.20682
14	BLACK COAL	-.15904	-2.59985	-2.74925	2.72306
15	OIL, GAS + BROWN COAL	-.01099	-.19044	-.21690	.19529
16	OTHER MINERALS	.49377	-.36274	-.56866	.29040
17	SERVICES TO MINING	.33765	-1.20120	-.88604	.94279
18	MEAT PRODUCTS	-.16670	-2.42435	-2.78109	2.58959
19	MILK PRODUCTS	.00000	.02158	-.08736	.03600
20	FRUIT AND VEGETABLES	.00090	.37552	-.17439	-.06163
21	MARGARINE, OILS + FATS	-.01330	-.12667	-.63542	.00136
22	FLOUR + CEREAL PRODS.	-.01850	-.24817	-.45105	.32540
23	BREAD CAKES + BISCUITS	.00476	.12775	-.08167	.02550
24	CONFECTIONERY + COCOA	-.01304	.22725	-.27672	-.19494
25	OTHER FOOD PRODUCTS	-.30481	-4.67144	-5.03743	4.96921
26	SOFT DRINKS + CORDIALS	.04051	.37389	-.20010	-.11506
27	BEER AND MALT	-.00407	.73463	-.10274	.00702
28	OTHER ALCOHOLIC DRINKS	-.04011	.64139	-.68301	-.18152
29	TOBACCO PRODUCTS	-.00354	.41171	-.14793	.00292
30	COTTON GINNING ETC.	-.14134	-2.30551	-2.75058	1.50149
31	MAN-MADE FIBRES, YARNS	-.14162	-2.87435	-3.69650	-10.15293
32	COTTON YARNS + FABRICS	-.12976	-2.12998	-2.77258	-5.37778
33	WORSTED + WOOLLEN YARN	.01555	-.08628	-.84307	-2.20745
34	TEXTILE FINISHING	.01951	-.03808	-.62776	-1.43283
35	TEXTILE FLOOR OVERLAYS	.14460	.83400	-.59277	-1.00612
36	OTHER TEXTILE PRODUCTS	.08822	-.05486	-.85332	.11943
37	KNITTING MILLS	-.03010	-.16865	-.64833	-1.84092
38	CLOTHING	-.02429	-.16087	-.60511	-2.05283
39	FOOTWEAR	-.07754	-1.73641	-2.38184	-7.80096
40	SAWMILL PRODUCTS	.46424	-.64661	-.90978	.28440
41	VENEERS AND BOARDS	.39828	.29262	-.41127	-.43101
42	JOINERY + WOOD NEC	.61105	.17189	-.17307	-.18023
43	FURNITURE + MATRESSES	.13507	1.32272	-.23816	-.25143
44	PULP PAPER PAPERBOARD	.02418	-.53286	-1.24307	.28025
45	BAGS, FIBREBOARD BOXES	.07488	-.20246	-.81003	.33655
46	PAPER PRODUCTS NEC	.02443	.10573	-.58370	-.00391
47	NEWSPAPERS AND BOOKS	.05569	.03854	-.73907	.20385
48	COMMERCIAL PRINTING	.07481	.28639	-.48056	.00079
49	CHEMICAL FERTILISERS	-.08362	-1.25954	-1.62186	1.40165
50	OTHER BASIC CHEMICALS	.05936	-1.20759	-1.66896	-.68465
51	PAINTS, VARNISHES	.34293	-.36665	-.68670	-1.03492
52	PHARMACEUTICAL GOODS	-.03857	.35383	-.84814	.39908
53	SOAP AND DETERGENTS	.00478	.31713	-.32824	.10930
54	COSMETICS + TOILETRIES	-.01046	.41534	-.21350	-.07998
55	OTHER CHEMICAL GOODS	.11804	-.58398	-1.12235	-.12360
56	PETROL + COAL PRODUCTS	.10434	.27439	-.44611	.12541

TABLE R5: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

NO.	INDUSTRY OUTPUTS (CONTINUED) ORANI INDUSTRY NAME	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.13316	-.07891	-.75762	-.21185
58	CLAY PRODS, REFRACT'S	.67580	-.38235	-.55693	.27402
59	CEMENT	.86821	.00653	-.09857	.04711
60	READY MIXED CONCRETE	.93196	.07519	-.01900	-.01665
61	CONCRETE PRODUCTS	.93067	.07715	-.02111	-.01644
62	NON-METALLIC ORE GOODS	.76915	-.11203	-.22765	-.02479
63	BASIC IRON AND STEEL	.37457	-.42566	-.75283	-.53757
64	OTHER BASIC METALS	-.11350	-2.49076	-2.64963	2.60737
65	STRUCTURAL METAL GOODS	.77127	-.02083	-.25033	-.15710
66	SHEET METAL PRODUCTS	.36417	.05459	-.40792	-.13955
67	OTHER METAL PRODUCTS	.43126	-.48859	-.96700	-1.17110
68	MOTOR VEHICLES + PARTS	.18551	-1.29834	-2.16255	-6.57211
69	SHIPS AND BOATS	.36770	.38727	.16235	-.46465
70	LOCOMOTIVES	.36364	-.25778	-.60812	.37092
71	AIRCRAFT	.21302	.95834	-.22753	-.06017
72	SCIENTIFIC EQUIPMENT	.08109	.60699	-.25819	-.05029
73	ELECTRONIC EQUIPMENT	.27794	.20429	-.92268	-1.35581
74	HOUSEHOLD APPLIANCES	.28232	.69222	-.50758	-.50493
75	OTHER ELECTRICAL GOODS	.51641	.19900	-.35962	-.46104
76	AGRICULTURAL MACHINERY	.59916	-7.34121	-7.04802	7.73574
77	CONSTRUCTION MACHINERY	.71665	-.47267	-.32987	-.49897
78	OTH. MACHINERY + PLANT	.64127	-.25517	-.36094	-.53474
79	LEATHER PRODUCTS	-.04249	-1.00091	-1.53769	-3.00938
80	RUBBER PRODUCTS	.12612	-.42905	-1.20041	-1.56289
81	PLASTIC PRODUCTS, ETC.	.15003	-.53455	-1.15444	-.77213
82	SIGNS, WRITING GEAR	.08884	-.12752	-.87280	-.49240
83	OTHER MANUFACTURING	-.05049	-.02630	-.81465	-.55095
84	ELECTRICITY	.04378	.33940	-.48057	.09668
85	GAS	.06317	.63442	-.29660	-.21708
86	WATER, SEWERS + DRAINS	.04581	.11611	-.34754	.15172
87	RESIDENTIAL BUILDING	.90230	.00001	-.00000	-.00000
88	OTHER CONSTRUCTION	.96456	.11925	-.02246	-.03000
89	WHOLESALE TRADE	.17880	-.14391	-.72421	.30914
90	RETAIL TRADE	.03860	.92489	.01653	.06699
91	MECHANICAL REPAIRS	.05797	.73128	-.36090	.27800
92	OTHER REPAIRS	.05522	.78741	-.34387	.23645
93	ROAD TRANSPORT	.16568	-.24812	-.71017	.39065
94	RAIL + OTHER TRANSPORT	.04881	-.37557	-.90262	.69395
95	WATER TRANSPORT	.03630	-.53497	-.77185	.57266
96	AIR TRANSPORT	.01840	.66230	-.67421	.40666
97	COMMUNICATION	.05906	.60739	-.42126	.04622
98	BANKING	.05434	.51258	-.36283	.03228
99	NON BANK FINANCE	.06023	.17628	-.36117	.07636
100	INVESTMENT + SERVICES	.04430	.51722	-.19769	-.07195
101	INSURANCE + SERVICES	.06339	.67259	-.45511	.09394
102	OTH. BUSINESS SERVICES	.19807	.30241	-.43192	.04112
103	OWNERSHIP OF DWELLINGS	0.00000	0.00000	0.00000	0.00000
104	PUBLIC ADMINISTRATION	.01732	.90855	-.09662	.00787
105	DEFENCE	.00000	.98795	-.00000	-.00000
106	HEALTH	-.00169	1.26606	-.22760	.00501
107	EDUCATION, LIBRARIES	.00058	1.04130	-.04515	.00023
108	WELFARE AND RELIGIOUS	.00572	1.05084	-.21210	.03937
109	ENTERTAINMENT, LEISURE	.02244	1.10209	-.22222	-.01358
110	RESTAURANTS, HOTELS	.02161	1.04526	-.29872	.00814
111	PERSONAL SERVICES	.01112	1.15598	-.30691	-.00162
112	NON-COMPETING IMPORTS	.01434	.87583	-.08345	-.00861

TABLE R6: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

INDUSTRY NO.	RATES OF RETURN ORANI INDUSTRY	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.63738	-7.17996	-7.95322	8.72597
2	WHEAT-SHEEP ZONE	-.77776	-8.56957	-9.35132	10.91394
3	HIGH RAINFALL ZONE	-1.52551	-16.98386	-18.85810	20.83303
4	NORTHERN BEEF	-1.87666	-22.84685	-25.74648	26.57150
5	MILK CATTLE AND PIGS	-1.80195	-13.17498	-14.76923	19.73486
6	OTHER FARMING - EXPORT	-2.81474	-32.40380	-36.97557	41.76602
7	OTHER FARMING - IMPORT	-.35860	-.58046	-3.00240	3.56179
8	POULTRY	-.72558	-6.80922	-7.37463	9.49590
9	AGRICULTURAL SERVICES	-.32966	-2.10415	-3.37016	5.99152
10	FORESTRY AND LOGGING	5.22511	3.79376	4.52488	-2.73271
11	FISHING AND HUNTING	-.23275	.56971	-.74652	5.58397
12	FERROUS METAL ORES	-.91298	-12.18303	-12.39850	15.81414
13	NON-FERROUS METAL ORES	-.85713	-11.82030	-12.06568	13.91124
14	BLACK COAL	-.98934	-13.76652	-14.02166	15.73174
15	OIL, GAS + BROWN COAL	-.46299	-5.23085	-5.44149	6.81088
16	OTHER MINERALS	3.21620	-1.27166	-1.96176	2.72311
17	SERVICES TO MINING	1.17578	-2.79833	-.88412	4.59359
18	MEAT PRODUCTS	-1.03693	-11.67994	-12.66846	15.22565
19	MILK PRODUCTS	-.11037	1.60572	1.95125	1.39919
20	FRUIT AND VEGETABLES	-.13986	4.13986	1.89585	.63585
21	MARGARINE, OILS + FATS	-.16764	.78046	-.78928	.66975
22	FLOUR + CEREAL PRODS.	-.17780	.01293	-.23424	2.15462
23	BREAD CAKES + BISCUITS	-.07252	1.63151	1.51467	.98194
24	CONFECTIONERY + COCOA	-.16630	2.35058	.75180	-.18982
25	OTHER FOOD PRODUCTS	-1.80862	-24.61618	-25.79447	28.55088
26	SOFT DRINKS + CORDIALS	.12877	2.97989	.94622	.31818
27	BEER AND MALT	-.14243	5.27445	1.10264	.41077
28	OTHER ALCOHOLIC DRINKS	-.30228	4.54859	-1.79187	-.39976
29	TOBACCO PRODUCTS	-.09325	2.82938	1.42479	.55913
30	COTTON GINNING ETC.	-.90355	-10.92134	-12.35785	8.95846
31	MAN-MADE FIBRES, YARNS	-.78676	-12.60269	-15.74564	-50.64350
32	COTTON YARNS + FABRICS	-.78005	-9.11900	-11.40677	-26.74266
33	WORSTED + WOOLLEN YARN	-.03322	1.39201	-1.31148	-10.02699
34	TEXTILE FINISHING	-.01207	1.58725	-.49217	-6.67131
35	TEXTILE FLOOR OVERLAYS	.68943	6.41927	-.60914	-4.80830
36	OTHER TEXTILE PRODUCTS	.38786	1.38264	-2.22035	1.82801
37	KNITTING MILLS	-.18289	.86818	-.31014	-6.78949
38	CLOTHING	-.21365	.63618	-.36428	-7.40949
39	FOOTWEAR	-.33053	-4.98437	-6.61451	-28.18805
40	SAWMILL PRODUCTS	2.42397	-2.10583	-2.65472	2.72511
41	VENEERS AND BOARDS	1.98280	3.15440	.39986	-1.39321
42	JOINERY + WOOD NEC	2.36912	1.74918	1.04426	.10208
43	FURNITURE + MATRESSES	.39352	5.88930	.79650	-.19743
44	PULP PAPER PAPERBOARD	.04336	-.53430	-2.60889	1.88701
45	BAGS, FIBREBOARD BOXES	.28453	.47317	-1.71832	2.47532
46	PAPER PRODUCTS NEC	.02858	1.99402	-1.07455	.68763
47	NEWSPAPERS AND BOOKS	.13858	1.39601	-1.01640	1.50361
48	COMMERCIAL PRINTING	.23075	2.45320	.06201	.76857
49	CHEMICAL FERTILISERS	-.61705	-6.61061	-8.06614	10.34058
50	OTHER BASIC CHEMICALS	.30260	-6.18179	-8.22687	-3.74091
51	PAINTS, VARNISHES	1.25448	-.44154	-.98602	-3.29337
52	PHARMACEUTICAL GOODS	-.31904	2.78630	-2.17201	2.57387
53	SOAP AND DETERGENTS	-.05890	2.86131	.26772	1.33712
54	COSMETICS + TOILETRIES	-.17761	2.65796	.72145	.26723
55	OTHER CHEMICAL GOODS	.30560	-1.19921	-2.51791	.04468
56	PETROL + COAL PRODUCTS	.66213	3.60101	-.42738	1.63473

TABLE R6: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

INDUSTRY RATES OF RETURN (CONTINUED) NO.	ORANI INDUSTRY	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.80237	1.14002	-2.69747	-.74799
58	CLAY PRODS, REFRACT'S	2.81774	-.24829	-.23505	1.97797
59	CEMENT	5.28795	1.68936	1.86922	1.17971
60	READY MIXED CONCRETE	6.12526	2.03271	2.24687	1.18188
61	CONCRETE PRODUCTS	4.73862	1.79494	2.09786	.89509
62	NON-METALLIC ORE GOODS	3.72233	.77036	.99101	.68956
63	BASIC IRON AND STEEL	1.86601	-.26788	-.97621	-1.69752
64	OTHER BASIC METALS	-.93133	-16.83110	-17.05819	20.13468
65	STRUCTURAL METAL GOODS	3.15594	1.26287	1.07070	.08490
66	SHEET METAL PRODUCTS	1.41383	1.59903	.47771	.15924
67	OTHER METAL PRODUCTS	1.70711	-.85579	-2.12737	-4.25006
68	MOTOR VEHICLES + PARTS	.93029	-5.26435	-8.99253	-36.06844
69	SHIPS AND BOATS	1.04609	2.15697	2.05261	-.95233
70	LOCOMOTIVES	.94663	.01856	-.45695	1.40576
71	AIRCRAFT	.54935	3.89629	.75272	.12617
72	SCIENTIFIC EQUIPMENT	.26649	4.11489	.96418	.42194
73	ELECTRONIC EQUIPMENT	1.30576	2.79888	-1.94742	-5.91566
74	HOUSEHOLD APPLIANCES	1.28944	5.14031	.09908	-1.55016
75	OTHER ELECTRICAL GOODS	2.51032	2.57815	.66680	-1.54301
76	AGRICULTURAL MACHINERY	2.37492	-29.14780	-27.11739	33.00318
77	CONSTRUCTION MACHINERY	2.81385	-.65097	.73696	-1.27765
78	OTH. MACHINERY + PLANT	2.60103	.31858	.69239	-1.36494
79	LEATHER PRODUCTS	-.38742	-4.00658	-6.03048	-16.02446
80	RUBBER PRODUCTS	.64850	-.37448	-3.72738	-8.05199
81	PLASTIC PRODUCTS, ETC.	.71974	-1.05599	-3.35319	-3.05608
82	SIGNS, WRITING GEAR	.37007	1.11407	-1.33752	-1.10031
83	OTHER MANUFACTURING	-.38689	1.18770	-2.30127	-2.19105
84	ELECTRICITY	.12694	3.00977	-1.38015	.89896
85	GAS	.31405	5.77760	.03491	-.77111
86	WATER, SEWERS + DRAINS	.13567	1.39205	-.70714	1.42529
87	RESIDENTIAL BUILDING	5.09134	1.15318	1.87916	1.01372
88	OTHER CONSTRUCTION	3.68124	1.89656	2.11703	1.21988
89	WHOLESALE TRADE	.47600	.21065	-1.15151	1.63728
90	RETAIL TRADE	.01999	3.73943	1.28826	.88172
91	MECHANICAL REPAIRS	.09267	3.38534	.10325	1.65682
92	OTHER REPAIRS	.08085	3.55356	.17638	1.50123
93	ROAD TRANSPORT	.62436	.52560	-.29206	4.64259
94	RAIL + OTHER TRANSPORT	-.04974	-.65440	-1.81638	2.38275
95	WATER TRANSPORT	.07443	-1.16978	-1.62679	2.93097
96	AIR TRANSPORT	.08074	6.26790	-.36691	1.39146
97	COMMUNICATION	.18399	4.59652	-.50819	.78871
98	BANKING	.06573	3.85446	-.51236	.65780
99	NON BANK FINANCE	.40918	2.52940	-2.58596	1.15418
100	INVESTMENT + SERVICES	.28321	6.88499	-.91711	-.46923
101	INSURANCE + SERVICES	.04152	2.84837	-.57386	.59526
102	OTH. BUSINESS SERVICES	.66627	1.83755	-.73956	.46477
103	OWNERSHIP OF DWELLINGS	-.69247	5.04005	-.41816	-.12812
104	PUBLIC ADMINISTRATION	-.12164	3.06183	.81247	.30676
105	DEFENCE	-.22593	3.09945	.83348	-.01980
106	HEALTH	-.16111	4.36959	.52785	.13193
107	EDUCATION, LIBRARIES	-.16684	3.47577	.96604	.15761
108	WELFARE AND RELIGIOUS	-.14422	3.55980	.53093	.41114
109	ENTERTAINMENT, LEISURE	-.09708	4.34795	.30739	.20679
110	RESTAURANTS, HOTELS	-.08228	4.04615	.10290	.26794
111	PERSONAL SERVICES	-.11263	5.05843	.01278	.26327
112	NON-COMPETING IMPORTS	-.18651	2.79134	.60416	-.04345

TABLE R7: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

EMPLOYMENT BY INDUSTRY NO.	ORANI INDUSTRY	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.15734	-2.53971	-2.98084	2.54724
2	WHEAT-SHEEP ZONE	-.16128	-2.52027	-2.92336	2.63140
3	HIGH RAINFALL ZONE	-.19717	-2.96321	-3.45699	3.09985
4	NORTHERN BEEF	-.36152	-5.25002	-6.07790	5.64305
5	MILK CATTLE AND PIGS	-.09426	-1.33114	-1.65594	1.49930
6	OTHER FARMING - EXPORT	-.24549	-3.54429	-4.20020	3.91600
7	OTHER FARMING - IMPORT	-.05362	-.51422	-1.28431	.66178
8	POULTRY	-.14001	-2.00235	-2.34640	2.17663
9	AGRICULTURAL SERVICES	-.08577	-1.06622	-1.65623	1.42658
10	FORESTRY AND LOGGING	1.04442	.44594	.38234	-.76510
11	FISHING AND HUNTING	-.05189	-.47207	-.91841	.80535
12	FERROUS METAL ORES	-.23100	-3.70080	-3.97146	4.09509
13	NON-FERROUS METAL ORES	-.23799	-4.07164	-4.34734	4.31055
14	BLACK COAL	-.29947	-4.89555	-5.17688	5.12755
15	OIL, GAS + BROWN COAL	-.10757	-1.86443	-2.12345	1.91189
16	OTHER MINERALS	1.01096	-.74269	-1.16430	.59458
17	SERVICES TO MINING	.36773	-1.30819	-.96496	1.02676
18	MEAT PRODUCTS	-.20283	-2.94988	-3.38394	3.15093
19	MILK PRODUCTS	.00000	.02809	-.11370	.04686
20	FRUIT AND VEGETABLES	.00107	.44288	-.20567	-.07269
21	MARGARINE, OILS + FATS	-.01644	-.15661	-.78558	.00168
22	FLOUR + CEREAL PRODS.	-.02652	-.35586	-.64679	.46661
23	BREAD CAKES + BISCUITS	.00573	.15376	-.09830	.03069
24	CONFECTIONERY + COCOA	-.01700	.29619	-.36067	-.25409
25	OTHER FOOD PRODUCTS	-.42293	-6.48190	-6.98973	6.89507
26	SOFT DRINKS + CORDIALS	.06056	.55898	-.29915	-.17203
27	BEER AND MALT	-.00737	1.32836	-.18577	.01270
28	OTHER ALCOHOLIC DRINKS	-.06662	1.06536	-1.13448	-.30150
29	TOBACCO PRODUCTS	-.00405	.47187	-.16954	.00334
30	COTTON GINNING ETC.	-.16515	-2.69384	-3.21386	1.75439
31	MAN-MADE FIBRES, YARNS	-.15387	-3.12305	-4.01633	-11.03139
32	COTTON YARNS + FABRICS	-.14206	-2.33201	-3.03556	-5.88785
33	WORSTED + WOOLLEN YARN	.01631	-.09050	-.88433	-2.31551
34	TEXTILE FINISHING	.02182	-.04259	-.70218	-1.60269
35	TEXTILE FLOOR OVERLAYS	.17472	1.00772	-.71625	-1.21569
36	OTHER TEXTILE PRODUCTS	.10940	-.06803	-1.05821	.14810
37	KNITTING MILLS	-.03360	-.18829	-.72382	-2.05527
38	CLOTHING	-.02620	-.17357	-.65290	-2.21495
39	FOOTWEAR	-.08309	-1.86070	-2.55233	-8.35936
40	SAWMILL PRODUCTS	.61849	-.86145	-1.21205	.37889
41	VENEERS AND BOARDS	.50363	.37002	-.52004	-.54501
42	JOINERY + WOOD NEC	.75139	.21137	-.21282	-.22162
43	FURNITURE + MATRESSES	.16097	1.57626	-.28381	-.29963
44	PULP PAPER PAPERBOARD	.02594	-.57170	-1.33367	.30067
45	BAGS, FIBREBOARD BOXES	.09714	-.26265	-1.05087	.43661
46	PAPER PRODUCTS NEC	.03589	.15532	-.85747	-.00574
47	NEWSPAPERS AND BOOKS	.06751	.04671	-.89588	.24710
48	COMMERCIAL PRINTING	.09160	.35065	-.58840	.00096
49	CHEMICAL FERTILISERS	-.13080	-1.97020	-2.53694	2.19249
50	OTHER BASIC CHEMICALS	.09040	-1.83897	-2.54156	-1.04262
51	PAINTS, VARNISHES	.39296	-.42015	-.78689	-1.18591
52	PHARMACEUTICAL GOODS	-.05049	.46327	-1.11045	.52251
53	SOAP AND DETERGENTS	.00719	.47743	-.49417	.16455
54	COSMETICS + TOILETRIES	-.01340	.53210	-.27352	-.10246
55	OTHER CHEMICAL GOODS	.14616	-.72309	-1.38971	-.15304
56	PETROL + COAL PRODUCTS	.17699	.46546	-.75676	.21274

TABLE R7: RESULTS FOR SHORTRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

EMPLOYMENT BY INDUSTRY (CONTINUED) NO.	ORANI INDUSTRY	1% RISE IN REAL INVESTMENT	1% RISE IN REAL CONSUMPTION	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.19090	-.11312	-1.08608	-.30370
58	CLAY PRODS, REFRACT'S	.83413	-.47192	-.68740	.33821
59	CEMENT	1.44864	.01089	-.16447	.07861
60	READY MIXED CONCRETE	1.67879	.13545	-.03422	-.03000
61	CONCRETE PRODUCTS	1.31112	.10868	-.02974	-.02316
62	NON-METALLIC ORE GOODS	1.03963	-.15143	-.30771	-.03351
63	BASIC IRON AND STEEL	.44144	-.50166	-.88724	-.63355
64	OTHER BASIC METALS	-.19478	-4.27453	-4.54718	4.47465
65	STRUCTURAL METAL GOODS	.92667	-.02502	-.30077	-.18875
66	SHEET METAL PRODUCTS	.42629	.06391	-.47749	-.16335
67	OTHER METAL PRODUCTS	.52083	-.59007	-1.16785	-1.41434
68	MOTOR VEHICLES + PARTS	.19540	-1.36752	-2.27779	-6.92233
69	SHIPS AND BOATS	.39957	.42084	.17642	-.50492
70	LOCOMOTIVES	.37797	-.26795	-.63209	.38555
71	AIRCRAFT	.23297	1.04812	-.24885	-.06581
72	SCIENTIFIC EQUIPMENT	.09981	.74710	-.31779	-.06190
73	ELECTRONIC EQUIPMENT	.30606	.22496	-1.01604	-1.49299
74	HOUSEHOLD APPLIANCES	.30624	.75086	-.55058	-.54772
75	OTHER ELECTRICAL GOODS	.57539	.22173	-.40069	-.51370
76	AGRICULTURAL MACHINERY	.65305	-8.00146	-7.68189	8.43146
77	CONSTRUCTION MACHINERY	.77171	-.50898	-.35522	-.53731
78	OTH. MACHINERY + PLANT	.70937	-.28227	-.39927	-.59153
79	LEATHER PRODUCTS	-.05004	-1.17877	-1.81094	-3.54414
80	RUBBER PRODUCTS	.14382	-.48929	-1.36896	-1.78234
81	PLASTIC PRODUCTS, ETC.	.18720	-.66699	-1.44045	-.96342
82	SIGNS, WRITING GEAR	.10477	-.15038	-1.02928	-.58069
83	OTHER MANUFACTURING	-.07273	-.03788	-1.17350	-.79363
84	ELECTRICITY	.08431	.65367	-.92555	.18619
85	GAS	.11361	1.14104	-.53346	-.39043
86	WATER, SEWERS + DRAINS	.09780	.24788	-.74199	.32392
87	RESIDENTIAL BUILDING	1.52681	.00001	-.00000	-.00000
88	OTHER CONSTRUCTION	1.09433	.13529	-.02548	-.03404
89	WHOLESALE TRADE	.23183	-.18659	-.93899	.40083
90	RETAIL TRADE	.04763	1.14134	.02040	.08267
91	MECHANICAL REPAIRS	.07444	.93906	-.46344	.35698
92	OTHER REPAIRS	.07014	1.00027	-.43683	.30037
93	ROAD TRANSPORT	.17678	-.26474	-.75775	.41682
94	RAIL + OTHER TRANSPORT	.04881	-.37557	-.90262	.69395
95	WATER TRANSPORT	.04850	-.71483	-1.03137	.76520
96	AIR TRANSPORT	.02231	.80310	-.81755	.49312
97	COMMUNICATION	.09114	.93734	-.65009	.07133
98	BANKING	.07780	.73391	-.51949	.04622
99	NON BANK FINANCE	.18316	.53605	-1.09825	.23219
100	INVESTMENT + SERVICES	.14027	1.63788	-.62603	-.22784
101	INSURANCE + SERVICES	.08154	.86513	-.58539	.12083
102	OTH. BUSINESS SERVICES	.30484	.46543	-.66475	.06329
103	OWNERSHIP OF DWELLINGS	-.03252	1.69286	-.50057	-.01917
104	PUBLIC ADMINISTRATION	.01732	.90855	-.09662	.00787
105	DEFENCE	.00000	.98795	-.00000	-.00000
106	HEALTH	-.00180	1.34841	-.24240	.00534
107	EDUCATION, LIBRARIES	.00058	1.05406	-.04570	.00024
108	WELFARE AND RELIGIOUS	.00586	1.07616	-.21721	.04032
109	ENTERTAINMENT, LEISURE	.02816	1.38331	-.27892	-.01704
110	RESTAURANTS, HOTELS	.02626	1.27025	-.36302	.00989
111	PERSONAL SERVICES	.01543	1.60455	-.42601	-.00225
112	NON-COMPETING IMPORTS	.01434	.87583	-.08345	-.00861

TABLE R8: RESULTS FOR SHORTRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

NO.	SELECTED MACRO RESULTS ORANI VARIABLE	1% RISE IN REAL INVESTMENT	1% RISE CONSUMPTION /SAVING	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
15	BALANCE OF TRADE ($FOREIGN)	-.17098	-.12172	-.18878	.15721
16	AGGREGATE IMPORTS ($FOREIGN)	.62012	.34044	.07002	1.40330
17	AGGREGATE EXPORTS ($FOREIGN)	-.54478	-.48685	-1.20400	2.43528
18	INVESTMENT PRICE INDEX	.44280	.33141	.90903	-2.63748
19	CONSUMER PRICE INDEX	.47861	.46806	.66156	-2.24294
20	AGGREGATE REAL INVESTMENT	1.00000	ZERO	ZERO	ZERO
21	AGGREGATE REAL CONSUMPTION	.16248	.21171	-.48162	-.01743
22	IR/CR	.83752	-.21171	.48162	.01743
24	U2 - AGGREGATE EMPLOYMENT	.20372	.01467	-.85850	.22221
27	AGGREGATE NOMINAL INVESTMENT	1.44280	.33141	.90903	-2.63748
28	AGGREGATE NOMINAL CONSUMPTION	.64110	.67977	.17995	-2.26037
30	INVESTMENT SLACK VARIABLE Ω	-3.03329	-.87628	-4.59569	8.19460
34	AVERAGE REAL WAGE RATE	ZERO	ZERO	1.00000	ZERO
85	AGGREGATE NOMINAL OTHER DEMAND	.63148	.65657	.84708	-2.20926
87	PRICE INDEX EXPORTS ($A)	.07383	.06658	.17818	-.34729
88	PRICE INDEX IMPORTS ($A)	ZERO	ZERO	ZERO	ZERO
89	GDP DEFLATOR	.46751	.43219	.82832	-2.31532
91	TOTAL NOMINAL LAND RENTALS	-.69715	-.61922	-1.95166	3.29869
92	TOTAL NOMINAL CAPITAL RENTALS	.82332	.57462	-.62079	-1.23896
94	TOTAL NOMINAL WAGE PAYMENTS	.68363	.48949	.81001	-2.03044
101	NOMINAL GDP FROM INCOME SIDE	.63679	.47424	.27600	-2.12876
103	GNP: NATIONAL INCOME	.63939	.48204	.29833	-2.25130
104	F: RATIO CONSUMPTION/SAVING	ZERO	1.00000	ZERO	ZERO
105	Q: OVERALL AUSTRALIAN SHARE	ZERO	ZERO	ZERO	ZERO
106	TOTAL NOMINAL NATIONAL SAVING	.64110	-.32023	.17995	-2.26037
107	TOTAL REAL CAPITAL STOCK	ZERO	ZERO	ZERO	ZERO
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	.89440	.68793	-.59060	-1.56092
	AVE.RENTAL,FOREIGNER'S CAPITAL	.52603	.10071	-.74705	.10761
109	AVE.RENTAL,ALL LOCAL CAPITAL	.82332	.57462	-.62079	-1.23896
110	AVE.CREATION PRICE OF CAPITAL	.60758	.36608	1.00008	-2.44206
111	AMOUNT,LOCALLY OWNED CAPITAL	ZERO	ZERO	ZERO	ZERO
112	NET NOMINAL RENTALS TO OVERSEAS	.56888	.10892	-.80789	.11633
113	NET NOMINAL FOREIGN INVESTMENT	5.44522	3.58469	4.54889	-4.52014
114	NOMINAL RENTALS TO OVERSEAS	.52593	.10069	-.74689	.10755
115	NOMINAL RENTALS FROM OVERSEAS	ZERO	ZERO	ZERO	ZERO
	SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR				
18d	INVESTMENT PRICE INDEX	-.02471	-.10078	.08071	-.32216
19d	CONSUMER PRICE INDEX	.01110	.03587	-.16676	.07238
27d	AGGREGATE NOMINAL INVESTMENT	.97529	-.10078	.08071	-.32216
28d	AGGREGATE NOMINAL CONSUMPTION	.17359	.24758	-.64837	.05495
85d	AGGREGATE NOMINAL OTHER DEMAND	.16397	.22438	.01876	.10606
92d	TOTAL NOMINAL CAPITAL RENTALS	.35581	.14243	-1.44911	1.07636
94d	TOTAL NOMINAL WAGE PAYMENTS	.21612	.05730	-.01831	.28488
101d	NOMINAL GDP FROM INCOME SIDE	.16928	.04205	-.55232	.18656
103d	GNP: NATIONAL INCOME	.17188	.04985	-.52999	.06402
106d	TOTAL NOMINAL NATIONAL SAVING	.17359	-.75242	-.64837	.05495
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	.42689	.25574	-1.41892	.75440
d	AVE.RENTAL,FOREIGNER'S CAPITAL	.05852	-.33148	-1.57537	2.42293
109d	AVE.RENTAL,ALL LOCAL CAPITAL	.35581	.14243	-1.44911	1.07636
110d	AVE.CREATION PRICE OF CAPITAL	.14007	-.06611	.17176	-.12674
112d	NET NOMINAL RENTALS TO OVERSEAS	.10137	-.32327	-1.63621	2.43165
113d	NET NOMINAL FOREIGN INVESTMENT	4.97771	3.15250	3.72057	-2.20482
114d	NOMINAL RENTALS TO OVERSEAS	.05842	-.33150	-1.57521	2.42287
115d	NOMINAL RENTALS FROM OVERSEAS	-.46751	-.43219	-.82832	2.31532

TABLE R9: RESULTS FOR SHORTRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

EMPLOYMENT BY OCCUPATION TYPE	ORANI OCCUPATIONAL CATEGORY	1% RISE IN REAL INVESTMENT	1% RISE CONSUMPTION /SAVING	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
1	PROFESSIONAL WHITE-COLLAR	.22016	.14115	-.72632	.08837
2	PARA-PROFESSIONAL WHITE-COLLAR	.21438	.16235	-.77474	.03111
3	SKILLED WHITE-COLLAR	.27121	.05589	-.79234	.04701
4	SEMI- AND UNSKILLED WHITE-COLLAR	.22510	.11469	-.80128	.08924
5	SKILLED B.C. METAL AND ELECTRICAL	.27557	-.04267	-.89384	-.01589X
6	SKILLED BLUE-COLLAR: BUILDING	.73587	.03256	-.49385	-.05352
7	SKILLED BLUE-COLLAR: OTHER	-.03944	-.04502	-.98196	.47218
8	SEMI- AND UNSKILLED BLUE-COLLAR	.25179	-.03125	-.83112	.07263
9	RURAL WORKERS	-.41361	-.41912	-1.58746	2.24741
10	ARMED SERVICES	.16053	.20916	-.47581	-.01722

TABLE R10: RESULTS FOR SHORTRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

TARIFF CUT - WINNERS AND LOSERS NO.	ORANI INDUSTRY	1% RISE IN REAL INVESTMENT	1% RISE CONSUMPTION /SAVING	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
31	MAN-MADE FIBRES, YARNS	-.60866	-.60853	-2.31216	-10.10283
39	FOOTWEAR	-.35968	-.36761	-1.54555	-7.77070
68	MOTOR VEHICLES + PARTS	-.02545	-.27487	-1.53725	-6.54948
32	COTTON YARNS + FABRICS	-.47585	-.45094	-1.74675	-5.34065
79	LEATHER PRODUCTS	-.20512	-.21190	-1.05564	-2.99193
33	WORSTED + WOOLLEN YARN	.00153	-.01827	-.80151	-2.20595
38	CLOTHING	-.05042	-.03406	-.52763	-2.05003
37	KNITTING MILLS	-.05750	-.03571	-.56710	-1.83798
80	RUBBER PRODUCTS	.05640	-.09083	-.99377	-1.55541
34	TEXTILE FINISHING	.01332	-.00806	-.60942	-1.43216
73	ELECTRONIC EQUIPMENT	.31113	.04325	-1.02107	-1.35937
67	OTHER METAL PRODUCTS	.35187	-.10344	-.73168	-1.16258
51	PAINTS, VARNISHES	.28335	-.07762	-.51012	-1.02853
35	TEXTILE FLOOR OVERLAYS	.28012	.17657	-.99444	-1.02066
81	PLASTIC PRODUCTS, ETC.	.06317	-.11317	-.89699	-.76281
10	FORESTRY AND LOGGING	.97402	.08233	.14613	-.67401
50	OTHER BASIC CHEMICALS	-.13685	-.25566	-1.08736	-.66360
83	OTHER MANUFACTURING	-.05476	-.00557	-.80199	-.55049
78	OTH. MACHINERY + PLANT	.59981	-.05402	-.23805	-.53030
63	BASIC IRON AND STEEL	.30540	-.09012	-.54783	-.53015
74	HOUSEHOLD APPLIANCES	.39479	.14655	-.84096	-.51700
77	CONSTRUCTION MACHINERY	.63985	-.10007	-.10223	-.49073
82	SIGNS, WRITING GEAR	.06812	-.02700	-.81138	-.49018
11	FISHING AND HUNTING	-.08524	-.06625	-.45810	.53932
95	WATER TRANSPORT	-.05062	-.11326	-.51420	.58198
94	RAIL + OTHER TRANSPORT	-.01222	-.07951	-.72174	.70049
5	MILK CATTLE AND PIGS	-.18493	-.16782	-.60434	.90665
17	SERVICES TO MINING	.14248	-.25431	-.30752	.96372
2	WHEAT-SHEEP ZONE	-.25237	-.23591	-.75587	1.18288
9	AGRICULTURAL SERVICES	-.21490	-.18729	-.94812	1.19905
8	POULTRY	-.27852	-.25371	-.82715	1.32360
1	PASTORAL ZONE	-.30620	-.28884	-.94422	1.39216
49	CHEMICAL FERTILISERS	-.28828	-.26666	-1.01524	1.42360
30	COTTON GINNING ETC.	-.51595	-.48810	-1.64020	1.54167
12	FERROUS METAL ORES	-.33876	-.31888	-.89096	1.69295
3	HIGH RAINFALL ZONE	-.36983	-.34187	-1.10618	1.71742
13	NON-FERROUS METAL ORES	-.46054	-.44131	-1.22172	2.24315
18	MEAT PRODUCTS	-.56062	-.51326	-1.61348	2.63184
64	OTHER BASIC METALS	-.51821	-.52732	-1.45004	2.65078
6	OTHER FARMING - EXPORT	-.55689	-.50874	-1.69040	2.69693
14	BLACK COAL	-.58147	-.55041	-1.49713	2.76837
4	NORTHERN BEEF	-.59769	-.54696	-1.74666	2.82197
25	OTHER FOOD PRODUCTS	-1.06384	-.98899	-2.78759	5.05063
76	AGRICULTURAL MACHINERY	-.59367	-1.55421	-3.51236	7.86369

TABLE R11: RESULTS FOR SHORTRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

INDUSTRY OUTPUTS NO.	ORANI INDUSTRY NAME	1% RISE IN REAL INVESTMENT	1% RISE CONSUMPTION /SAVING	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.30620	-.28884	-.94422	1.39216
2	WHEAT-SHEEP ZONE	-.25237	-.23591	-.75587	1.18288
3	HIGH RAINFALL ZONE	-.36983	-.34187	-1.10618	1.71742
4	NORTHERN BEEF	-.59769	-.54696	-1.74666	2.82197
5	MILK CATTLE AND PIGS	-.18493	-.16782	-.60434	.90665
6	OTHER FARMING - EXPORT	-.55689	-.50874	-1.69040	2.69693
7	OTHER FARMING - IMPORT	-.10612	-.08422	-.80195	.51889
8	POULTRY	-.27852	-.25371	-.82715	1.32360
9	AGRICULTURAL SERVICES	-.21490	-.18729	-.94812	1.19905
10	FORESTRY AND LOGGING	.97402	.08233	.14613	-.67401
11	FISHING AND HUNTING	-.08524	-.06625	-.45810	.53932
12	FERROUS METAL ORES	-.33876	-.31888	-.89096	1.69295
13	NON-FERROUS METAL ORES	-.46054	-.44131	-1.22172	2.24315
14	BLACK COAL	-.58147	-.55041	-1.49713	2.76837
15	OIL, GAS + BROWN COAL	-.04193	-.04032	-.12518	.19861
16	OTHER MINERALS	.43483	-.07680	-.39396	.29672
17	SERVICES TO MINING	.14248	-.25431	-.30752	.96372
18	MEAT PRODUCTS	-.56062	-.51326	-1.61348	2.63184
19	MILK PRODUCTS	.00351	.00457	-.09775	.03563
20	FRUIT AND VEGETABLES	.06192	.07950	-.35525	-.06818
21	MARGARINE, OILS + FATS	-.03388	-.02682	-.57441	.00357
22	FLOUR + CEREAL PRODS.	-.05882	-.05254	-.33153	.32972
23	BREAD CAKES + BISCUITS	.02552	.02705	-.14320	.02327
24	CONFECTIONERY + COCOA	.02388	.04811	-.38616	-.19891
25	OTHER FOOD PRODUCTS	-1.06384	-.98899	-2.78759	5.05063
26	SOFT DRINKS + CORDIALS	.10126	.07916	-.38017	-.12158
27	BEER AND MALT	.11529	.15553	-.45655	-.00578
28	OTHER ALCOHOLIC DRINKS	.06411	.13579	-.99192	-.19270
29	TOBACCO PRODUCTS	.06336	.08716	-.34622	-.00426
30	COTTON GINNING ETC.	-.51595	-.48810	-1.64020	1.54167
31	MAN-MADE FIBRES, YARNS	-.60866	-.60853	-2.31216	-10.10283
32	COTTON YARNS + FABRICS	-.47585	-.45094	-1.74675	-5.34065
33	WORSTED + WOOLLEN YARN	.00153	-.01827	-.80151	-2.20595
34	TEXTILE FINISHING	.01332	-.00806	-.60942	-1.43216
35	TEXTILE FLOOR OVERLAYS	.28012	.17657	-.99444	-1.02066
36	OTHER TEXTILE PRODUCTS	.07931	-.01161	-.82690	.12038
37	KNITTING MILLS	-.05750	-.03571	-.56710	-1.83798
38	CLOTHING	-.05042	-.03406	-.52763	-2.05003
39	FOOTWEAR	-.35968	-.36761	-1.54555	-7.77070
40	SAWMILL PRODUCTS	.35918	-.13689	-.59836	.29567
41	VENEERS AND BOARDS	.44583	.06195	-.55220	-.43611
42	JOINERY + WOOD NEC	.63898	.03639	-.25586	-.18322
43	FURNITURE + MATRESSES	.35000	.28003	-.87520	-.27449
44	PULP PAPER PAPERBOARD	-.06240	-.11281	-.98643	.28953
45	BAGS, FIBREBOARD BOXES	.04198	-.04286	-.71252	.34008
46	PAPER PRODUCTS NEC	.04161	.02238	-.63462	-.00575
47	NEWSPAPERS AND BOOKS	.06196	.00816	-.75763	.20318
48	COMMERCIAL PRINTING	.12134	.06063	-.61849	-.00421
49	CHEMICAL FERTILISERS	-.28828	-.26666	-1.01524	1.42360
50	OTHER BASIC CHEMICALS	-.13685	-.25566	-1.08736	-.66360
51	PAINTS, VARNISHES	.28335	-.07762	-.51012	-1.02853
52	PHARMACEUTICAL GOODS	.01893	.07491	-1.01855	.39292
53	SOAP AND DETERGENTS	.05631	.06714	-.48098	.10377
54	COSMETICS + TOILETRIES	.05703	.08793	-.41354	-.08722
55	OTHER CHEMICAL GOODS	.02316	-.12363	-.84110	-.11342
56	PETROL + COAL PRODUCTS	.14892	.05809	-.57826	.12063

TABLE R11: RESULTS FOR SHORTRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

INDUSTRY OUTPUTS (CONTINUED) NO.	ORANI INDUSTRY NAME	1% RISE IN REAL INVESTMENT	1% RISE CONSUMPTION /SAVING	1% GENERAL WAGE RISE	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.12034	-.01671	-.71961	-.21048
58	CLAY PRODS, REFRACT'S	.61368	-.08095	-.37278	.28068
59	CEMENT	.86927	.00138	-.10171	.04700
60	READY MIXED CONCRETE	.94418	.01592	-.05521	-.01797
61	CONCRETE PRODUCTS	.94320	.01633	-.05827	-.01778
62	NON-METALLIC ORE GOODS	.75094	-.02372	-.17370	-.02284
63	BASIC IRON AND STEEL	.30540	-.09012	-.54783	-.53015
64	OTHER BASIC METALS	-.51821	-.52732	-1.45004	2.65078
65	STRUCTURAL METAL GOODS	.76789	-.00441	-.24030	-.15674
66	SHEET METAL PRODUCTS	.37305	.01156	-.43421	-.14050
67	OTHER METAL PRODUCTS	.35187	-.10344	-.73168	-1.16258
68	MOTOR VEHICLES + PARTS	-.02545	-.27487	-1.53725	-6.54948
69	SHIPS AND BOATS	.43063	.08199	-.02417	-.47140
70	LOCOMOTIVES	.32175	-.05457	-.48396	.37541
71	AIRCRAFT	.36873	.20289	-.68908	-.07687
72	SCIENTIFIC EQUIPMENT	.17972	.12851	-.55053	-.06087
73	ELECTRONIC EQUIPMENT	.31113	.04325	-1.02107	-1.35937
74	HOUSEHOLD APPLIANCES	.39479	.14655	-.84096	-.51700
75	OTHER ELECTRICAL GOODS	.54874	.04213	-.45546	-.46451
76	AGRICULTURAL MACHINERY	-.59367	-1.55421	-3.51236	7.86369
77	CONSTRUCTION MACHINERY	.63985	-.10007	-.10223	-.49073
78	OTH. MACHINERY + PLANT	.59981	-.05402	-.23805	-.53030
79	LEATHER PRODUCTS	-.20512	-.21190	-1.05564	-2.99193
80	RUBBER PRODUCTS	.05640	-.09083	-.99377	-1.55541
81	PLASTIC PRODUCTS, ETC.	.06317	-.11317	-.89699	-.76281
82	SIGNS, WRITING GEAR	.06812	-.02700	-.81138	-.49018
83	OTHER MANUFACTURING	-.05476	-.00557	-.80199	-.55049
84	ELECTRICITY	.09893	.07186	-.64403	.09076
85	GAS	.16625	.13431	-.60215	-.22813
86	WATER, SEWERS + DRAINS	.06467	.02458	-.40346	.14970
87	RESIDENTIAL BUILDING	.90230	.00000	-.00000	-.00000
88	OTHER CONSTRUCTION	.98394	.02525	-.07989	-.03208
89	WHOLESALE TRADE	.15542	-.03047	-.65490	.31165
90	RETAIL TRADE	.18888	.19581	-.42891	.05087
91	MECHANICAL REPAIRS	.17679	.15482	-.71310	.26525
92	OTHER REPAIRS	.18316	.16670	-.72310	.22272
93	ROAD TRANSPORT	.12536	-.05253	-.59067	.39497
94	RAIL + OTHER TRANSPORT	-.01222	-.07951	-.72174	.70049
95	WATER TRANSPORT	-.05062	-.11326	-.51420	.58198
96	AIR TRANSPORT	.12601	.14021	-.99318	.39512
97	COMMUNICATION	.15775	.12859	-.71379	.03563
98	BANKING	.13762	.10852	-.60969	.02335
99	NON BANK FINANCE	.08888	.03732	-.44607	.07328
100	INVESTMENT + SERVICES	.12834	.10950	-.44680	-.08096
101	INSURANCE + SERVICES	.17268	.14239	-.77904	.08221
102	OTH. BUSINESS SERVICES	.24721	.06402	-.57757	.03585
103	OWNERSHIP OF DWELLINGS	0.00000	0.00000	0.00000	0.00000
104	PUBLIC ADMINISTRATION	.16495	.19235	-.53419	-.00796
105	DEFENCE	.16053	.20916	-.47581	-.01722
106	HEALTH	.20402	.26804	-.83736	-.01706
107	EDUCATION, LIBRARIES	.16977	.22045	-.54666	-.01792
108	WELFARE AND RELIGIOUS	.17646	.22247	-.71820	.02105
109	ENTERTAINMENT, LEISURE	.20151	.23332	-.75300	-.03279
110	RESTAURANTS, HOTELS	.19145	.22129	-.80214	-.01008
111	PERSONAL SERVICES	.19894	.24473	-.86365	-.02177
112	NON-COMPETING IMPORTS	.15665	.18542	-.50527	-.02387

TABLE R12: RESULTS FOR LONGRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

SELECTED MACRO RESULTS NO.	ORANI VARIABLE	1% RISE IN REAL CONSUMPTION	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
15	BALANCE OF TRADE ($FOREIGN)	-.54943	.57918	.08968	-.01055
16	AGGREGATE IMPORTS ($FOREIGN)	.93230	-.21268	-.18491	2.58408
17	AGGREGATE EXPORTS ($FOREIGN)	-2.79001	3.69591	.42328	2.46180
18	INVESTMENT PRICE INDEX	.45242	-.60893	-.06969	-1.18478
19	CONSUMER PRICE INDEX	.49785	-.66580	-.07623	-.70579
20	AGGREGATE REAL INVESTMENT	-.39190	1.36732	-.41197	2.22726
21	AGGREGATE REAL CONSUMPTION	1.00000	ZERO	ZERO	ZERO
22	IR/CR	-1.39190	1.36732	-.41197	2.22726
24	U2 - AGGREGATE EMPLOYMENT	ZERO	1.00000	ZERO	ZERO
27	AGGREGATE NOMINAL INVESTMENT	.06051	.75839	-.48166	1.04248
28	AGGREGATE NOMINAL CONSUMPTION	1.49785	-.66581	-.07623	-.70579
30	INVESTMENT SLACK VARIABLE Ω	ZERO	ZERO	1.00000	ZERO
34	AVERAGE REAL WAGE RATE	.19307	-.26548	-.03035	.91459
85	AGGREGATE NOMINAL OTHER DEMAND	1.60943	-.82078	-.09393	-.10183
87	PRICE INDEX EXPORTS ($A)	.29886	-.40209	-.04616	-.25438
88	PRICE INDEX IMPORTS ($A)	ZERO	ZERO	ZERO	ZERO
89	GDP DEFLATOR	.50518	-.67746	-.07755	-.70760
91	TOTAL NOMINAL LAND RENTALS	-.32628	.63067	.07014	.40529
92	TOTAL NOMINAL CAPITAL RENTALS	.68950	.38485	-.03904	.65109
94	TOTAL NOMINAL WAGE PAYMENTS	.71868	.04576	-.10664	.21231
101	NOMINAL GDP FROM EXPENDITURE SIDE	.61487	.23532	-.07529	-.22193
103	GNP: NATIONAL INCOME	-.05186	.66719	-.08610	-.43847
104	F: RATIO CONSUMPTION/SAVING	8.10640	-7.02690	.03476	-.82719
105	Q: OVERALL AUSTRALIAN SHARE	-3.75481	2.47409	-.053256	-1.08211
106	TOTAL NOMINAL NATIONAL SAVING	-6.60855	6.36110	-.11098	.12140
107	TOTAL REAL CAPITAL STOCK	.20710	1.03407	.03526	1.59560
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	.48688	-.65522	-.07499	-.90559
	AVE.RENTAL,FOREIGNER'S CAPITAL	.46372	-.62413	-.07142	-1.10728
109	AVE.RENTAL,ALL LOCAL CAPITAL	.48241	-.64922	-.07430	-.94451
110	AVE.CREATION PRICE OF CAPITAL	.48688	-.65522	-.07499	-.90559
111	AMOUNT,LOCALLY OWNED CAPITAL	-3.54772	3.50816	-.01800	.51349
112	NET NOMINAL RENTALS TO OVERSEAS	17.97735	-11.00613	.20628	5.41722
113	NET NOMINAL FOREIGN INVESTMENT	33.35519	-27.21257	-2.33222	5.64089
114	NOMINAL RENTALS TO OVERSEAS	16.37059	-9.93503	.18652	5.01280
115	NOMINAL RENTALS FROM OVERSEAS	-3.30428	3.18055	-.05549	.06070
	SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR				
18d	INVESTMENT PRICE INDEX	-.05276	.06853	.00786	-.47718
19d	CONSUMER PRICE INDEX	-.00733	.01166	.00132	.00181
27d	AGGREGATE NOMINAL INVESTMENT	-.44467	1.43585	-.40411	1.75008
28d	AGGREGATE NOMINAL CONSUMPTION	.99267	.01165	.00132	.00181
85d	AGGREGATE NOMINAL OTHER DEMAND	1.10425	-.14332	-.01638	.60577
92d	TOTAL NOMINAL CAPITAL RENTALS	.18432	1.06231	.03851	1.35869
94d	TOTAL NOMINAL WAGE PAYMENTS	.21350	.72322	-.02909	.91991
101d	NOMINAL GDP FROM EXPENDITURE SIDE	.10969	.91278	.00226	.48567
103d	GNP: NATIONAL INCOME	-.55704	1.34465	-.00855	.26913
106d	TOTAL NOMINAL NATIONAL SAVING	-7.11373	7.03856	-.03343	.82900
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.01830	.02224	.00256	-.19799
d	AVE.RENTAL,FOREIGNER'S CAPITAL	-.04146	.05333	.00613	-.39968
109d	AVE.RENTAL,ALL LOCAL CAPITAL	-.02277	.02824	.00325	-.23691
110d	AVE.CREATION PRICE OF CAPITAL	-.01830	.02224	.00256	-.19799
112d	NET NOMINAL RENTALS TO OVERSEAS	17.47217	-1 .32867	.28383	6.12482
113d	NET NOMINAL FOREIGN INVESTMENT	32.85001	-26.53511	-2.25467	6.34849
114d	NOMINAL RENTALS TO OVERSEAS	15.86541	-9.25757	.26407	5.72040
115d	NOMINAL RENTALS FROM OVERSEAS	-3.80946	3.85801	.02206	.76830

TABLE R13: RESULTS FOR LONGRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

EMPLOYMENT BY OCCUPATION NO.	ORANI OCCUPATIONAL CATEGORY	1% RISE IN REAL CONSUMPTION	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
1	PROFESSIONAL WHITE-COLLAR	.49509	.57014	.00389	.0732
2	PARA-PROFESSIONAL WHITE-COLLAR	.61725	.47120	.00114	-.0771
3	SKILLED WHITE-COLLAR	.10118	.86780	-.02170	-.0988
4	SEMI- AND UNSKILLED WHITE-COLLAR	.35329	.65489	-.00182	-.1149
5	SKILLED B.C. METAL AND ELECTRICAL	-.38597	1.45493	-.01971	.0444
6	SKILLED BLUE-COLLAR: BUILDING	-.08630	1.13710	-.18154	.5030
7	SKILLED BLUE-COLLAR: OTHER	-.00122	.77384	.05975	-.4415
8	SEMI- AND UNSKILLED BLUE-COLLAR	-.27389	1.29237	-.01444	.0606
9	RURAL WORKERS	-.95976	1.70777	.17119	.1946
10	ARMED SERVICES	.98795	.00000	.00000	.0000

TABLE R14: RESULTS FOR LONGRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

TARIFF CUT - WINNERS AND LOSERS NO.	ORANI INDUSTRY	1% RISE IN REAL CONSUMPTION	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
31	MAN-MADE FIBRES, YARNS	-.83421	1.82465	.15273	-14.84426
39	FOOTWEAR	-.41513	1.09717	.08776	-10.52538
32	COTTON YARNS + FABRICS	-.54031	1.24789	.11705	-8.62653
68	MOTOR VEHICLES + PARTS	-.16330	1.29495	-.04588	-7.96919
79	LEATHER PRODUCTS	-.20887	.78309	.05970	-4.64278
33	WORSTED + WOOLLEN YARN	.20065	.46828	.01627	-2.84595
38	CLOTHING	.11036	.24365	.02266	-2.61989
37	KNITTING MILLS	.13460	.25669	.02563	-2.47617
34	TEXTILE FINISHING	.17041	.37948	.00806	-1.98836
50	OTHER BASIC CHEMICALS	-.56096	1.53969	.04940	-1.78699
80	RUBBER PRODUCTS	-.32457	1.39003	.03564	-1.76364
73	ELECTRONIC EQUIPMENT	.36616	.87420	-.09999	-1.44797
81	PLASTIC PRODUCTS, ETC.	-.11132	1.01056	-.02223	-1.24510
83	OTHER MANUFACTURING	.29999	.52773	.03885	-1.16271
35	TEXTILE FLOOR OVERLAYS	.73234	.56412	-.04204	-1.14996
28	OTHER ALCOHOLIC DRINKS	.95761	.28347	.03225	-.84384
82	SIGNS, WRITING GEAR	.14813	.74586	-.00232	-.79957
67	OTHER METAL PRODUCTS	-.27711	1.35425	-.14488	-.75824
51	PAINTS, VARNISHES	.20666	.95566	-.11873	-.74681
30	COTTON GINNING ETC.	-.85891	1.51383	.15303	-.71364
57	GLASS + GLASS PRODUCTS	.23948	.66540	-.03843	-.43238
74	HOUSEHOLD APPLIANCES	.73520	.49750	-.14022	-.41851
24	CONFECTIONERY + COCOA	.28189	.11697	.01189	-.40546
21	MARGARINE, OILS + FATS	.06547	.43848	.03333	-.40384
76	AGRICULTURAL MACHINERY	-.87577	1.49741	-.53242	1.16690
78	OTH. MACHINERY + PLANT	-.56099	1.53099	-.21248	1.19414
16	OTHER MINERALS	-.29865	1.20811	-.22073	1.22629
4	NORTHERN BEEF	-2.41421	3.70187	.42194	1.35350
65	STRUCTURAL METAL GOODS	-.29490	1.31279	-.30715	1.43568
94	RAIL + OTHER TRANSPORT	-1.10161	2.18702	.18217	1.46732
58	CLAY PRODS, REFRACT'S	-.36118	1.46364	-.25983	1.62974
62	NON-METALLIC ORE GOODS	-.28908	1.34193	-.30417	1.64738
10	FORESTRY AND LOGGING	-.62465	1.73740	-.13550	1.65272
25	OTHER FOOD PRODUCTS	-2.68988	3.78330	.43174	1.65462
70	LOCOMOTIVES	-.90244	1.98079	-.00697	1.69940
59	CEMENT	-.24099	1.28062	-.36057	1.89074
88	OTHER CONSTRUCTION	-.23377	1.21883	-.41581	1.89661
60	READY MIXED CONCRETE	-.20931	1.22078	-.39480	1.91679
61	CONCRETE PRODUCTS	-.22641	1.23750	-.39168	1.93101
87	RESIDENTIAL BUILDING	-.19126	1.23697	-.37135	2.00261
77	CONSTRUCTION MACHINERY	-1.90879	3.19265	-.02643	2.78771
64	OTHER BASIC METALS	-3.38673	4.90029	.44845	3.57708
13	NON-FERROUS METAL ORES	-3.66539	5.15486	.51551	3.78163
12	FERROUS METAL ORES	-4.75982	6.45487	.72147	6.68809
14	BLACK COAL	-7.94004	10.92917	1.21193	7.27618
17	SERVICES TO MINING	-5.50141	7.95974	.65755	7.80784
15	OIL, GAS + BROWN COAL	-7.34405	10.66642	1.15649	11.28751

TABLE R15: RESULTS FOR LONGRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

INDUSTRY OUTPUTS NO.	ORANI INDUSTRY NAME	1% RISE IN REAL CONSUMPTION	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.77848	1.10927	.12389	.17248
2	WHEAT-SHEEP ZONE	-.93027	1.33764	.15244	.60455
3	HIGH RAINFALL ZONE	-.58709	.96446	.10903	.03518
4	NORTHERN BEEF	-2.41421	3.70187	.42194	1.35350
5	MILK CATTLE AND PIGS	-.35673	.63646	.07054	.18273
6	OTHER FARMING - EXPORT	-1.35994	2.16294	.24457	.80449
7	OTHER FARMING - IMPORT	-.00012	.59771	.05820	-.18891
8	POULTRY	-.63149	.99822	.11328	.32814
9	AGRICULTURAL SERVICES	-.41184	1.05383	.11606	.29189
10	FORESTRY AND LOGGING	-.62465	1.73740	-.13550	1.65272
11	FISHING AND HUNTING	-.11783	.42599	.04783	.14310
12	FERROUS METAL ORES	-4.75982	6.45487	.72147	6.68809
13	NON-FERROUS METAL ORES	-3.66539	5.15486	.51551	3.78163
14	BLACK COAL	-7.94004	10.92917	1.21193	7.27618
15	OIL, GAS + BROWN COAL	-7.34405	10.66642	1.15649	11.28751
16	OTHER MINERALS	-.29865	1.20811	-.22073	1.22629
17	SERVICES TO MINING	-5.50141	7.95974	.65755	7.80784
18	MEAT PRODUCTS	-1.28016	1.96610	.22342	.64832
19	MILK PRODUCTS	.03342	.06148	.00427	-.00822
20	FRUIT AND VEGETABLES	.31471	.10669	.00587	-.15798
21	MARGARINE, OILS + FATS	.06547	.43848	.03333	-.40384
22	FLOUR + CEREAL PRODS.	-.11814	.35685	.03484	.05718
23	BREAD CAKES + BISCUITS	.06101	.13245	.00941	.06070
24	CONFECTIONERY + COCOA	.28189	.11697	.01189	-.40546
25	OTHER FOOD PRODUCTS	-2.68988	3.78330	.43174	1.65462
26	SOFT DRINKS + CORDIALS	.30183	.22641	-.00630	-.10632
27	BEER AND MALT	.63270	.05494	.00573	-.03847
28	OTHER ALCOHOLIC DRINKS	.95761	.28347	.03225	-.84384
29	TOBACCO PRODUCTS	.22219	.30389	.03072	.12417
30	COTTON GINNING ETC.	-.85891	1.51383	.15303	-.71364
31	MAN-MADE FIBRES, YARNS	-.83421	1.82465	.15273	-14.84426
32	COTTON YARNS + FABRICS	-.54031	1.24789	.11705	-8.62653
33	WORSTED + WOOLLEN YARN	.20065	.46828	.01627	-2.84595
34	TEXTILE FINISHING	.17041	.37948	.00806	-1.98836
35	TEXTILE FLOOR OVERLAYS	.73234	.56412	-.04204	-1.14996
36	OTHER TEXTILE PRODUCTS	.00109	.94320	.02302	-.00908
37	KNITTING MILLS	.13460	.25669	.02563	-2.47617
38	CLOTHING	.11036	.24365	.02266	-2.61989
39	FOOTWEAR	-.41513	1.09717	.08776	-10.52538
40	SAWMILL PRODUCTS	-.34883	1.36062	-.17921	.93219
41	VENEERS AND BOARDS	.32881	.76631	-.16611	.18600
42	JOINERY + WOOD NEC	.06944	.95166	-.25226	1.07174
43	FURNITURE + MATRESSES	1.03054	.29604	-.05675	-.06938
44	PULP PAPER PAPERBOARD	-.03593	.89579	.03875	-.36895
45	BAGS, FIBREBOARD BOXES	-.08127	.83895	.02207	.14791
46	PAPER PRODUCTS NEC	.26192	.48522	.01850	-.24907
47	NEWSPAPERS AND BOOKS	.26914	.58625	.00505	-.08011
48	COMMERCIAL PRINTING	.28560	.56319	.00160	-.00255
49	CHEMICAL FERTILISERS	-.82726	1.43022	.15566	.52246
50	OTHER BASIC CHEMICALS	-.56096	1.53969	.04940	-1.78699
51	PAINTS, VARNISHES	.20666	.95566	-.11873	-.74681
52	PHARMACEUTICAL GOODS	.57559	.50438	.04816	-.20650
53	SOAP AND DETERGENTS	.30774	.27776	.01705	-.01754
54	COSMETICS + TOILETRIES	.42295	.08638	.00797	-.24990
55	OTHER CHEMICAL GOODS	-.56087	1.54983	.05595	-.03585
56	PETROL + COAL PRODUCTS	.07128	.79435	.01104	.36956

TABLE R15: RESULTS FOR LONGRUN ENVIRONMENT: REAL CONSUMPTION EXOGENOUS

NO.	INDUSTRY OUTPUTS (CONTINUED) ORANI INDUSTRY NAME	1% RISE IN REAL CONSUMPTION	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.23948	.66540	-.03843	-.43238
58	CLAY PRODS, REFRACT'S	-.36118	1.46364	-.25983	1.62974
59	CEMENT	-.24099	1.28062	-.36057	1.89074
60	READY MIXED CONCRETE	-.20931	1.22078	-.39480	1.91679
61	CONCRETE PRODUCTS	-.22641	1.23750	-.39168	1.93101
62	NON-METALLIC ORE GOODS	-.28908	1.34193	-.30417	1.64738
63	BASIC IRON AND STEEL	-.36033	1.25498	-.10922	.01947
64	OTHER BASIC METALS	-3.38673	4.90029	.44845	3.57708
65	STRUCTURAL METAL GOODS	-.29490	1.31279	-.30715	1.43568
66	SHEET METAL PRODUCTS	.03164	.87156	-.12442	.51948
67	OTHER METAL PRODUCTS	-.27711	1.35425	-.14488	-.75824
68	MOTOR VEHICLES + PARTS	-.16330	1.29495	-.04588	-7.96919
69	SHIPS AND BOATS	-.10552	.80142	-.10788	.58440
70	LOCOMOTIVES	-.90244	1.98079	-.00697	1.69940
71	AIRCRAFT	.55249	.44307	-.07019	.30011
72	SCIENTIFIC EQUIPMENT	.52843	.27077	-.02474	.01029
73	ELECTRONIC EQUIPMENT	.36616	.87420	-.09999	-1.44797
74	HOUSEHOLD APPLIANCES	.73520	.49750	-.14022	-.41851
75	OTHER ELECTRICAL GOODS	-.29769	1.40718	-.15144	.85500
76	AGRICULTURAL MACHINERY	-.87577	1.49741	-.53242	1.16690
77	CONSTRUCTION MACHINERY	-1.90879	3.19265	-.02643	2.78771
78	OTH. MACHINERY + PLANT	-.56099	1.53099	-.21248	1.19414
79	LEATHER PRODUCTS	-.20887	.78309	.05970	-4.64278
80	RUBBER PRODUCTS	-.32457	1.39003	.03564	-1.76364
81	PLASTIC PRODUCTS, ETC.	-.11132	1.01056	-.02223	-1.24510
82	SIGNS, WRITING GEAR	.14813	.74586	-.00232	-.79957
83	OTHER MANUFACTURING	.29999	.52773	.03885	-1.16271
84	ELECTRICITY	.04607	1.02826	.06298	.41208
85	GAS	.55418	.45204	-.00524	-.13291
86	WATER, SEWERS + DRAINS	.81310	.47034	.01240	.14736
87	RESIDENTIAL BUILDING	-.19126	1.23697	-.37135	2.00261
88	OTHER CONSTRUCTION	-.23377	1.21883	-.41581	1.89661
89	WHOLESALE TRADE	-.09488	.92559	-.02515	.39973
90	RETAIL TRADE	.65325	.05271	-.01553	.20287
91	MECHANICAL REPAIRS	.55954	.42796	.00429	.31466
92	OTHER REPAIRS	.42902	.65170	.02791	.48171
93	ROAD TRANSPORT	-.35752	1.16138	.00954	.66501
94	RAIL + OTHER TRANSPORT	-1.10161	2.18702	.18217	1.46732
95	WATER TRANSPORT	-.56222	1.09565	.06819	.65300
96	AIR TRANSPORT	.72646	.46000	.01915	.08636
97	COMMUNICATION	.58885	.48951	.00146	.05214
98	BANKING	.77502	.44900	.00464	.02643
99	NON BANK FINANCE	.59855	.66210	.01470	.21261
100	INVESTMENT + SERVICES	.60032	.40242	-.00515	.04825
101	INSURANCE + SERVICES	.47666	.76443	.02980	.27915
102	OTH. BUSINESS SERVICES	.22469	.75030	-.04917	.36911
103	OWNERSHIP OF DWELLINGS	1.66171	.03322	.00372	-.07207
104	PUBLIC ADMINISTRATION	.89455	.11499	-.00025	.00764
105	DEFENCE	.98795	.00000	.00000	.00000
106	HEALTH	1.12319	.06625	.00682	-.18514
107	EDUCATION, LIBRARIES	1.01285	.01677	.00143	-.03487
108	WELFARE AND RELIGIOUS	.93237	.16504	.01130	-.05145
109	ENTERTAINMENT, LEISURE	.93317	.23822	.00708	-.02685
110	RESTAURANTS, HOTELS	.89937	.21870	.00494	-.10220
111	PERSONAL SERVICES	1.14394	.17749	.00536	-.15349
112	NON-COMPETING IMPORTS	.87385	.12108	.00213	.00709

TABLE R16: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

NO.	SELECTED MACRO RESULTS ORANI VARIABLE	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
15	BALANCE OF TRADE ($FOREIGN)	-.06778	.10291	.09203	-.06662
16	AGGREGATE IMPORTS ($FOREIGN)	.11501	.59547	-.18891	2.67921
17	AGGREGATE EXPORTS ($FOREIGN)	-.34417	1.27744	.43525	2.17710
18	INVESTMENT PRICE INDEX	.05581	-.21676	-.07163	-1.13862
19	CONSUMER PRICE INDEX	.06141	-.23426	-.07836	-.65499
20	AGGREGATE REAL INVESTMENT	-.04834	1.02761	-.41029	2.18727
21	AGGREGATE REAL CONSUMPTION	.12336	.86683	-.00429	.10204
22	IR/CR	-.17170	.16077	-.40600	2.08523
24	U2 - AGGREGATE EMPLOYMENT	ZERO	1.00000	ZERO	ZERO
27	AGGREGATE NOMINAL INVESTMENT	.00747	.81085	-.48192	1.04866
28	AGGREGATE NOMINAL CONSUMPTION	.18477	.63258	-.08265	-.55295
30	INVESTMENT SLACK VARIABLE Ω	ZERO	ZERO	1.00000	ZERO
34	AVERAGE REAL WAGE RATE	.02382	-.09811	-.03118	.93429
85	AGGREGATE NOMINAL OTHER DEMAND	.19854	.57433	-.10084	.06240
87	PRICE INDEX EXPORTS ($A)	.03687	-.14302	-.04744	-.22388
88	PRICE INDEX IMPORTS ($A)	ZERO	ZERO	ZERO	ZERO
89	GDP DEFLATOR	.06232	-.23955	-.07971	-.65605
91	TOTAL NOMINAL LAND RENTALS	-.04025	.34784	.07154	.37200
92	TOTAL NOMINAL CAPITAL RENTALS	.08506	.98253	-.04200	.72145
94	TOTAL NOMINAL WAGE PAYMENTS	.08866	.66874	-.10972	.28565
101	NOMINAL GDP FROM EXPENDITURE SIDE	.07585	.76851	-.07792	-.15918
103	GNP: NATIONAL INCOME	-.00640	.62224	-.08588	-.44376
104	F: RATIO CONSUMPTION/SAVING	1.00000	ZERO	ZERO	ZERO
105	Q: OVERALL AUSTRALIAN SHARE	-.46319	-.78071	-.03716	-1.46525
106	TOTAL NOMINAL NATIONAL SAVING	-.81523	.63258	-.08265	-.55295
107	TOTAL REAL CAPITAL STOCK	.02555	1.21359	.03437	1.61673
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	.06006	-.23318	-.07708	-.85591
	AVE.RENTAL,FOREIGNER'S CAPITAL	.05881	-.22219	-.07340	-1.05994
109	AVE.RENTAL,ALL LOCAL CAPITAL	.05951	-.23106	-.07637	-.89528
110	AVE.CREATION PRICE OF CAPITAL	.06006	-.23318	-.07708	-.85591
111	AMOUNT,LOCALLY OWNED CAPITAL	-.43764	.43288	-.00279	.15148
112	NET NOMINAL RENTALS TO OVERSEAS	2.21767	4.57724	.12920	7.25166
113	NET NOMINAL FOREIGN INVESTMENT	4.11467	1.70083	-2.47523	9.04451
114	NOMINAL RENTALS TO OVERSEAS	2.01946	4.25554	.11632	6.68328
115	NOMINAL RENTALS FROM OVERSEAS	-.40761	.31629	-.04132	-.27647
	SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR				
18d	INVESTMENT PRICE INDEX	-.00651	.02279	.00808	-.48257
19d	CONSUMER PRICE INDEX	-.00091	.00529	.00135	.00106
27d	AGGREGATE NOMINAL INVESTMENT	-.05485	1.05040	-.40221	1.70471
28d	AGGREGATE NOMINAL CONSUMPTION	.12245	.87213	-.00294	.10310
85d	AGGREGATE NOMINAL OTHER DEMAND	.13622	.81388	-.02113	.71845
92d	TOTAL NOMINAL CAPITAL RENTALS	.02274	1.22208	.03771	1.37750
94d	TOTAL NOMINAL WAGE PAYMENTS	.02634	.90829	-.03001	.94170
101d	NOMINAL GDP FROM EXPENDITURE SIDE	.01353	1.00806	.00179	.49687
103d	GNP: NATIONAL INCOME	-.06872	.86179	-.00617	.21229
106d	TOTAL NOMINAL NATIONAL SAVING	-.87755	.87213	-.00294	.10310
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.00226	.00637	.00263	-.19986
d	AVE.RENTAL,FOREIGNER'S CAPITAL	-.00351	.01736	.00631	-.40389
109d	AVE.RENTAL,ALL LOCAL CAPITAL	-.00281	.00849	.00334	-.23923
110d	AVE.CREATION PRICE OF CAPITAL	-.00226	.00637	.00263	-.19986
112d	NET NOMINAL RENTALS TO OVERSEAS	2.15535	4.81679	.20891	7.90771
113d	NET NOMINAL FOREIGN INVESTMENT	4.05235	1.94038	-2.39552	9.70056
114d	NOMINAL RENTALS TO OVERSEAS	1.95714	4.49509	.19603	7.33933
115d	NOMINAL RENTALS FROM OVERSEAS	-.46993	.55584	.03839	.37958

TABLE R17: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

EMPLOYMENT BY OCCUPATION TYPE	ORANI OCCUPATIONAL CATEGORY	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
1	PROFESSIONAL WHITE-COLLAR	.06107	.99930	.00177	.12374
2	PARA-PROFESSIONAL WHITE-COLLAR	.07614	1.00625	-.00151	-.01407
3	SKILLED WHITE-COLLAR	.01248	.95551	-.02214	-.08851
4	SEMI- AND UNSKILLED WHITE-COLLAR	.04358	.96113	-.00333	-.07885
5	SKILLED B.C. METAL AND ELECTRICAL	-.04761	1.12036	-.01806	.00500
6	SKILLED BLUE-COLLAR: BUILDING	-.01065	1.06229	-.18117	.49414
7	SKILLED BLUE-COLLAR: OTHER	-.00015	.77279	.05975	-.44160
8	SEMI- AND UNSKILLED BLUE-COLLAR	-.03379	1.05495	-.01326	.03264
9	RURAL WORKERS	-.11840	.87582	.17530	.09663
10	ARMED SERVICES	.12187	.85639	-.00424	.10081

TABLE R18: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

TARIFF CUT - WINNERS AND LOSERS NO.	ORANI INDUSTRY	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
31	MAN-MADE FIBRES, YARNS	-.10291	1.10153	.15631	-14.92938
39	FOOTWEAR	-.05121	.73732	.08954	-10.56774
32	COTTON YARNS + FABRICS	-.06665	.77953	.11937	-8.68166
68	MOTOR VEHICLES + PARTS	-.02014	1.15340	-.04518	-7.98585
79	LEATHER PRODUCTS	-.02577	.60203	.06059	-4.66410
33	WORSTED + WOOLLEN YARN	.02475	.64220	.01541	-2.82548
38	CLOTHING	.01361	.33932	.02219	-2.60863
37	KNITTING MILLS	.01660	.37336	.02505	-2.46243
34	TEXTILE FINISHING	.02102	.52720	.00733	-1.97098
50	OTHER BASIC CHEMICALS	-.06920	1.05343	.05180	-1.84423
80	RUBBER PRODUCTS	-.04004	1.10868	.03703	-1.79676
73	ELECTRONIC EQUIPMENT	.04517	1.19160	-.10156	-1.41060
81	PLASTIC PRODUCTS, ETC.	-.01373	.91406	-.02175	-1.25646
83	OTHER MANUFACTURING	.03701	.78777	.03757	-1.13209
35	TEXTILE FLOOR OVERLAYS	.09034	1.19894	-.04518	-1.07523
30	COTTON GINNING ETC.	-.10595	.76930	.15671	-.80129
67	OTHER METAL PRODUCTS	-.03418	1.11404	-.14369	-.78652
82	SIGNS, WRITING GEAR	.01827	.87427	-.00295	-.78445
28	OTHER ALCOHOLIC DRINKS	.11813	1.11356	.02814	-.74612
51	PAINTS, VARNISHES	.02549	1.13481	-.11962	-.72572
57	GLASS + GLASS PRODUCTS	.02954	.87298	-.03946	-.40795
21	MARGARINE, OILS + FATS	.00808	.49523	.03305	-.39716
24	CONFECTIONERY + COCOA	.03477	.36132	.01068	-.37669
44	PULP PAPER PAPERBOARD	-.00443	.86465	.03891	-.37261
74	HOUSEHOLD APPLIANCES	.09069	1.13479	-.14337	-.34349
75	OTHER ELECTRICAL GOODS	-.03672	1.14913	-.15016	.82462
40	SAWMILL PRODUCTS	-.04303	1.05824	-.17772	.89660
76	AGRICULTURAL MACHINERY	-.10803	.73826	-.52866	1.07754
42	JOINERY + WOOD NEC	.00857	1.01186	-.25256	1.07882
4	NORTHERN BEEF	-.29781	1.60915	.43229	1.10715
78	OTH. MACHINERY + PLANT	-.06920	1.04471	-.21008	1.13689
16	OTHER MINERALS	-.03684	.94923	-.21945	1.19581
94	RAIL + OTHER TRANSPORT	-.13589	1.23211	.18689	1.35491
25	OTHER FOOD PRODUCTS	-.33182	1.45162	.44327	1.38014
65	STRUCTURAL METAL GOODS	-.03638	1.05716	-.30589	1.40559
10	FORESTRY AND LOGGING	-.07706	1.19593	-.13282	1.58898
58	CLAY PRODS, REFRACT'S	-.04455	1.15056	-.25828	1.59288
70	LOCOMOTIVES	-.11132	1.19853	-.00310	1.60732
62	NON-METALLIC ORE GOODS	-.03566	1.09135	-.30293	1.61789
59	CEMENT	-.02973	1.07172	-.35954	1.86615
88	OTHER CONSTRUCTION	-.02884	1.01619	-.41481	1.87275
60	READY MIXED CONCRETE	-.02582	1.03934	-.39390	1.89543
61	CONCRETE PRODUCTS	-.02793	1.04124	-.39071	1.90791
87	RESIDENTIAL BUILDING	-.02359	1.07118	-.37053	1.98309
77	CONSTRUCTION MACHINERY	-.23547	1.53805	-.01825	2.59294
64	OTHER BASIC METALS	-.41778	1.96456	.46297	3.23149
13	NON-FERROUS METAL ORES	-.45216	1.97758	.53122	3.40761
12	FERROUS METAL ORES	-.58717	2.32889	.74187	6.20239
14	BLACK COAL	-.97948	4.04647	1.24598	6.46596
17	SERVICES TO MINING	-.67865	3.19093	.68114	7.24647
15	OIL, GAS + BROWN COAL	-.90596	4.30035	1.18798	10.53812

TABLE R19: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

INDUSTRY OUTPUTS NO.	ORANI INDUSTRY NAME	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.09603	.43446	.12723	.09304
2	WHEAT-SHEEP ZONE	-.11476	.53125	.15643	.50963
3	HIGH RAINFALL ZONE	-.07242	.45555	.11155	-.02473
4	NORTHERN BEEF	-.29781	1.60915	.43229	1.10715
5	MILK CATTLE AND PIGS	-.04401	.32723	.07207	.14633
6	OTHER FARMING - EXPORT	-.16776	.98410	.25040	.66572
7	OTHER FARMING - IMPORT	-.00002	.59760	.05821	-.18892
8	POULTRY	-.07790	.45082	.11598	.26370
9	AGRICULTURAL SERVICES	-.05080	.69684	.11783	.24986
10	FORESTRY AND LOGGING	-.07706	1.19593	-.13282	1.58898
11	FISHING AND HUNTING	-.01454	.32385	.04834	.13108
12	FERROUS METAL ORES	-.58717	2.32889	.74187	6.20239
13	NON-FERROUS METAL ORES	-.45216	1.97758	.53122	3.40761
14	BLACK COAL	-.97948	4.04647	1.24598	6.46596
15	OIL, GAS + BROWN COAL	-.90596	4.30035	1.18798	10.53812
16	OTHER MINERALS	-.03684	.94923	-.21945	1.19581
17	SERVICES TO MINING	-.67865	3.19093	.68114	7.24647
18	MEAT PRODUCTS	-.15792	.85641	.22891	.51769
19	MILK PRODUCTS	.00412	.09045	.00412	-.00481
20	FRUIT AND VEGETABLES	.03882	.37948	.00453	-.12587
21	MARGARINE, OILS + FATS	.00808	.49523	.03305	-.39716
22	FLOUR + CEREAL PRODS.	-.01457	.25444	.03534	.04513
23	BREAD CAKES + BISCUITS	.00753	.18533	.00915	.06693
24	CONFECTIONERY + COCOA	.03477	.36132	.01068	-.37669
25	OTHER FOOD PRODUCTS	-.33182	1.45162	.44327	1.38014
26	SOFT DRINKS + CORDIALS	.03723	.48805	-.00759	-.07552
27	BEER AND MALT	.07805	.60339	.00302	.02610
28	OTHER ALCOHOLIC DRINKS	.11813	1.11356	.02814	-.74612
29	TOBACCO PRODUCTS	.02741	.49649	.02977	.14685
30	COTTON GINNING ETC.	-.10595	.76930	.15671	-.80129
31	MAN-MADE FIBRES, YARNS	-.10291	1.10153	.15631	-14.92938
32	COTTON YARNS + FABRICS	-.06665	.77953	.11937	-8.68166
33	WORSTED + WOOLLEN YARN	.02475	.64220	.01541	-2.82548
34	TEXTILE FINISHING	.02102	.52720	.00733	-1.97098
35	TEXTILE FLOOR OVERLAYS	.09034	1.19894	-.04518	-1.07523
36	OTHER TEXTILE PRODUCTS	.00013	.94414	.02302	-.00897
37	KNITTING MILLS	.01660	.37336	.02505	-2.46243
38	CLOTHING	.01361	.33932	.02219	-2.60863
39	FOOTWEAR	-.05121	.73732	.08954	-10.56774
40	SAWMILL PRODUCTS	-.04303	1.05824	-.17772	.89660
41	VENEERS AND BOARDS	.04056	1.05134	-.16752	.21956
42	JOINERY + WOOD NEC	.00857	1.01186	-.25256	1.07882
43	FURNITURE + MATRESSES	.12713	1.18935	-.06117	.03578
44	PULP PAPER PAPERBOARD	-.00443	.86465	.03891	-.37261
45	BAGS, FIBREBOARD BOXES	-.01003	.76850	.02242	.13961
46	PAPER PRODUCTS NEC	.03231	.71227	.01738	-.22234
47	NEWSPAPERS AND BOOKS	.03320	.81955	.00390	-.05265
48	COMMERCIAL PRINTING	.03523	.81075	.00037	.02660
49	CHEMICAL FERTILISERS	-.10205	.71312	.15920	.43804
50	OTHER BASIC CHEMICALS	-.06920	1.05343	.05180	-1.84423
51	PAINTS, VARNISHES	.02549	1.13481	-.11962	-.72572
52	PHARMACEUTICAL GOODS	.07100	1.00332	.04569	-.14777
53	SOAP AND DETERGENTS	.03796	.54453	.01573	.01387
54	COSMETICS + TOILETRIES	.05218	.45301	.00615	-.20674
55	OTHER CHEMICAL GOODS	-.06919	1.06365	.05836	-.09308
56	PETROL + COAL PRODUCTS	.00879	.85614	.01073	.37683

TABLE R19: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

INDUSTRY OUTPUTS (CONTINUED) NO.	ORANI INDUSTRY NAME	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.02954	.87298	-.03946	-.40795
58	CLAY PRODS, REFRACT'S	-.04455	1.15056	-.25828	1.59288
59	CEMENT	-.02973	1.07172	-.35954	1.86615
60	READY MIXED CONCRETE	-.02582	1.03934	-.39390	1.89543
61	CONCRETE PRODUCTS	-.02793	1.04124	-.39071	1.90791
62	NON-METALLIC ORE GOODS	-.03566	1.09135	-.30293	1.61789
63	BASIC IRON AND STEEL	-.04445	.94263	-.10768	-.01730
64	OTHER BASIC METALS	-.41778	1.96456	.46297	3.23149
65	STRUCTURAL METAL GOODS	-.03638	1.05716	-.30589	1.40559
66	SHEET METAL PRODUCTS	.00390	.89899	-.12456	.52270
67	OTHER METAL PRODUCTS	-.03418	1.11404	-.14369	-.78652
68	MOTOR VEHICLES + PARTS	-.02014	1.15340	-.04518	-7.98585
69	SHIPS AND BOATS	-.01302	.70995	-.10743	.57363
70	LOCOMOTIVES	-.11132	1.19853	-.00310	1.60732
71	AIRCRAFT	.06815	.92199	-.07256	.35649
72	SCIENTIFIC EQUIPMENT	.06519	.72883	-.02701	.06421
73	ELECTRONIC EQUIPMENT	.04517	1.19160	-.10156	-1.41060
74	HOUSEHOLD APPLIANCES	.09069	1.13479	-.14337	-.34349
75	OTHER ELECTRICAL GOODS	-.03672	1.14913	-.15016	.82462
76	AGRICULTURAL MACHINERY	-.10803	.73826	-.52866	1.07754
77	CONSTRUCTION MACHINERY	-.23547	1.53805	-.01825	2.59294
78	OTH. MACHINERY + PLANT	-.06920	1.04471	-.21008	1.13689
79	LEATHER PRODUCTS	-.02577	.60203	.06059	-4.66410
80	RUBBER PRODUCTS	-.04004	1.10868	.03703	-1.79676
81	PLASTIC PRODUCTS, ETC.	-.01373	.91406	-.02175	-1.25646
82	SIGNS, WRITING GEAR	.01827	.87427	-.00295	-.78445
83	OTHER MANUFACTURING	.03701	.78777	.03757	-1.13209
84	ELECTRICITY	.00568	1.06819	.06278	.41678
85	GAS	.06836	.93242	-.00762	-.07636
86	WATER, SEWERS + DRAINS	.10030	1.17516	.00892	.23033
87	RESIDENTIAL BUILDING	-.02359	1.07118	-.37053	1.98309
88	OTHER CONSTRUCTION	-.02884	1.01619	-.41481	1.87275
89	WHOLESALE TRADE	-.01170	.84334	-.02474	.39005
90	RETAIL TRADE	.08058	.61896	-.01833	.26952
91	MECHANICAL REPAIRS	.06902	.91299	.00189	.37176
92	OTHER REPAIRS	.05292	1.02358	.02607	.52549
93	ROAD TRANSPORT	-.04410	.85148	.01107	.62853
94	RAIL + OTHER TRANSPORT	-.13589	1.23211	.18689	1.35491
95	WATER TRANSPORT	-.06936	.60830	.07060	.59563
96	AIR TRANSPORT	.08962	1.08972	.01603	.16049
97	COMMUNICATION	.07264	.99994	-.00106	.11223
98	BANKING	.09561	1.12081	.00132	.10551
99	NON BANK FINANCE	.07384	1.18095	.01213	.27368
100	INVESTMENT + SERVICES	.07405	.92279	-.00772	.10950
101	INSURANCE + SERVICES	.05880	1.17762	.02775	.32779
102	OTH. BUSINESS SERVICES	.02772	.94507	-.05013	.39204
103	OWNERSHIP OF DWELLINGS	.20499	1.47364	-.00340	.09750
104	PUBLIC ADMINISTRATION	.11035	.89042	-.00408	.09892
105	DEFENCE	.12187	.85639	-.00424	.10081
106	HEALTH	.13856	1.03987	.00201	-.07053
107	EDUCATION, LIBRARIES	.12494	.89475	-.00291	.06848
108	WELFARE AND RELIGIOUS	.11502	.97324	.00730	.04369
109	ENTERTAINMENT, LEISURE	.11512	1.04713	.00308	.06837
110	RESTAURANTS, HOTELS	.11095	.99830	.00108	-.01043
111	PERSONAL SERVICES	.14112	1.16910	.00045	-.03676
112	NON-COMPETING IMPORTS	.10780	.87856	-.00162	.09626

TABLE R20: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

CAPITAL STOCKS BY INDUSTRY NO.	ORANI INDUSTRY	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.10176	.47554	.13575	1.32330
2	WHEAT-SHEEP ZONE	-.15589	.73969	.21443	2.01257
3	HIGH RAINFALL ZONE	-.07992	.57149	.13043	1.33152
4	NORTHERN BEEF	-.41718	2.29008	.60954	2.77587
5	MILK CATTLE AND PIGS	-.03591	.35891	.06795	1.40367
6	OTHER FARMING - EXPORT	-.17873	1.11341	.27363	2.44775
7	OTHER FARMING - IMPORT	.03535	.56035	.02255	1.47319
8	POULTRY	-.05661	.36711	.08855	1.30075
9	AGRICULTURAL SERVICES	-.01080	.53994	.06633	2.21782
10	FORESTRY AND LOGGING	-.04619	1.07454	-.17259	3.15748
11	FISHING AND HUNTING	.02506	.16900	-.00260	1.61902
12	FERROUS METAL ORES	-.56965	2.26013	.71931	7.00909
13	NON-FERROUS METAL ORES	-.43431	1.90739	.50822	4.21594
14	BLACK COAL	-.96060	3.97227	1.22165	7.29288
15	OIL, GAS + BROWN COAL	-.90233	4.28608	1.18330	10.69716
16	OTHER MINERALS	-.01727	.87236	-.24466	2.16578
17	SERVICES TO MINING	-.63181	3.00715	.62082	9.63243
18	MEAT PRODUCTS	-.12417	.72388	.18543	2.13015
19	MILK PRODUCTS	.03396	-.02681	-.03432	1.54582
20	FRUIT AND VEGETABLES	.07354	.24317	-.04019	1.47270
21	MARGARINE, OILS + FATS	.04112	.36548	-.00951	1.08758
22	FLOUR + CEREAL PRODS.	.01387	.14273	-.00130	1.34972
23	BREAD CAKES + BISCUITS	.04052	.05572	-.03335	1.75279
24	CONFECTIONERY + COCOA	.06576	.23965	-.02922	1.06991
25	OTHER FOOD PRODUCTS	-.30188	1.33407	.40470	2.75592
26	SOFT DRINKS + CORDIALS	.06558	.37676	-.04410	1.33339
27	BEER AND MALT	.09826	.52395	-.02302	.89452
28	OTHER ALCOHOLIC DRINKS	.14200	1.01978	-.00261	.33890
29	TOBACCO PRODUCTS	.06524	.34805	-.01895	1.78872
30	COTTON GINNING ETC.	-.07114	.63260	.11187	.74014
31	MAN-MADE FIBRES, YARNS	-.05972	.93217	.10070	-13.01611
32	COTTON YARNS + FABRICS	-.02745	.62570	.06889	-6.96139
33	WORSTED + WOOLLEN YARN	.06611	.47989	-.03786	-1.01522
34	TEXTILE FINISHING	.05928	.37707	-.04193	-.27824
35	TEXTILE FLOOR OVERLAYS	.12512	1.06242	-.08997	.48457
36	OTHER TEXTILE PRODUCTS	.03375	.81217	-.02028	1.62112
37	KNITTING MILLS	.05801	.21093	-.02827	-.52114
38	CLOTHING	.05050	.19443	-.02532	-.78123
39	FOOTWEAR	-.00672	.56284	.03225	-8.41734
40	SAWMILL PRODUCTS	-.01284	.93964	-.21661	2.45724
41	VENEERS AND BOARDS	.07537	.91477	-.21234	1.80664
42	JOINERY + WOOD NEC	.03916	.89162	-.29198	2.64579
43	FURNITURE + MATRESSES	.15953	1.06204	-.10291	1.64385
44	PULP PAPER PAPERBOARD	.03947	.69248	-.01762	1.53925
45	BAGS, FIBREBOARD BOXES	.02336	.63749	-.02057	1.66821
46	PAPER PRODUCTS NEC	.06047	.60172	-.01889	1.05236
47	NEWSPAPERS AND BOOKS	.06820	.68219	-.04117	1.55771
48	COMMERCIAL PRINTING	.07097	.67051	-.04565	1.69911
49	CHEMICAL FERTILISERS	-.07327	.60022	.12215	1.81336
50	OTHER BASIC CHEMICALS	-.04177	.94572	.01646	-.62806
51	PAINTS, VARNISHES	.05628	1.01371	-.15929	.90250
52	PHARMACEUTICAL GOODS	.09843	.89547	.01035	1.17429
53	SOAP AND DETERGENTS	.06452	.44020	-.01848	1.30798
54	COSMETICS + TOILETRIES	.07949	.34560	-.02904	1.12094
55	OTHER CHEMICAL GOODS	-.03997	.94877	.02070	1.27802
56	PETROL + COAL PRODUCTS	.03619	.74868	-.02455	1.58340

TABLE R20: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

NO.	CAPITAL STOCKS BY INDUSTRY (CONTINUED) ORANI INDUSTRY	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.05632	.76776	-.07396	.79336
58	CLAY PRODS, REFRACT'S	-.00850	1.00911	-.30471	3.27667
59	CEMENT	-.00050	.95713	-.39717	3.19585
60	READY MIXED CONCRETE	-.00013	.93855	-.42698	3.23331
61	CONCRETE PRODUCTS	.00221	.92293	-.42953	3.40181
62	NON-METALLIC ORE GOODS	-.00539	.97247	-.34193	3.06108
63	BASIC IRON AND STEEL	-.00379	.78320	-.16002	1.85472
64	OTHER BASIC METALS	-.39232	1.86464	.43018	4.32640
65	STRUCTURAL METAL GOODS	-.00021	.91519	-.35247	3.07319
66	SHEET METAL PRODUCTS	.04165	.75085	-.17317	2.23920
67	OTHER METAL PRODUCTS	-.00113	.98422	-.18627	.75080
68	MOTOR VEHICLES + PARTS	.02129	.99078	-.09855	-6.07132
69	SHIPS AND BOATS	.02236	.57098	-.15300	2.19630
70	LOCOMOTIVES	-.07898	1.07132	-.04478	3.01066
71	AIRCRAFT	.10138	.79141	-.11536	1.77682
72	SCIENTIFIC EQUIPMENT	.09863	.59750	-.07008	1.56050
73	ELECTRONIC EQUIPMENT	.08380	1.03997	-.15131	.39456
74	HOUSEHOLD APPLIANCES	.12821	.98746	-.19170	1.43067
75	OTHER ELECTRICAL GOODS	-.00201	1.01277	-.19488	2.43133
76	AGRICULTURAL MACHINERY	-.07091	.59246	-.57649	2.87155
77	CONSTRUCTION MACHINERY	-.19899	1.39477	-.06523	4.31418
78	OTH. MACHINERY + PLANT	-.03149	.89666	-.25865	2.94222
79	LEATHER PRODUCTS	.00839	.46790	.01660	-3.02503
80	RUBBER PRODUCTS	.00020	.95084	-.01478	-.01040
81	PLASTIC PRODUCTS, ETC.	.02275	.77094	-.06872	.44292
82	SIGNS, WRITING GEAR	.05960	.71219	-.05616	1.18923
83	OTHER MANUFACTURING	.06512	.67734	.00135	.20261
84	ELECTRICITY	.02318	.99936	.04023	1.16760
85	GAS	.08922	.85045	-.03449	.90417
86	WATER, SEWERS + DRAINS	.11602	1.11334	-.01134	1.03908
87	RESIDENTIAL BUILDING	-.00015	.97911	-.40073	3.22544
88	OTHER CONSTRUCTION	.01224	.85509	-.46769	4.10280
89	WHOLESALE TRADE	.01432	.74094	-.05829	1.79052
90	RETAIL TRADE	.10626	.51785	-.05143	1.67758
91	MECHANICAL REPAIRS	.09676	.80389	-.03386	1.81367
92	OTHER REPAIRS	.08096	.91331	-.01007	1.98306
93	ROAD TRANSPORT	.00125	.67337	-.04735	4.22727
94	RAIL + OTHER TRANSPORT	-.11230	1.13900	.15645	2.37569
95	WATER TRANSPORT	-.03587	.47711	.02750	1.72565
96	AIR TRANSPORT	.13641	.90664	-.04417	1.19664
97	COMMUNICATION	.09616	.90749	-.03137	1.17362
98	BANKING	.11472	1.04543	-.02333	1.01334
99	NON BANK FINANCE	.08221	1.14789	.00133	.66874
100	INVESTMENT + SERVICES	.08249	.88953	-.01860	.50805
101	INSURANCE + SERVICES	.07894	1.09813	.00177	1.27942
102	OTH. BUSINESS SERVICES	.04572	.87408	-.07335	1.23433
103	OWNERSHIP OF DWELLINGS	.20499	1.47364	-.00340	.09750
104	PUBLIC ADMINISTRATION	.13776	.78237	-.03943	1.38273
105	DEFENCE	.14300	.77282	-.03151	.94089
106	HEALTH	.16765	.92530	-.03551	1.08661
107	EDUCATION, LIBRARIES	.15241	.78650	-.03833	1.23758
108	WELFARE AND RELIGIOUS	.14308	.86268	-.02888	1.34654
109	ENTERTAINMENT, LEISURE	.13691	.96119	-.02503	1.06597
110	RESTAURANTS, HOTELS	.13351	.90934	-.02802	1.01765
111	PERSONAL SERVICES	.16302	1.08283	-.02779	.93824
112	NON-COMPETING IMPORTS	.12893	.79500	-.02889	.93634

TABLE R21: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

EMPLOYMENT BY INDUSTRY NO.	ORANI INDUSTRY	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
1	PASTORAL ZONE	-.13764	.61657	.18198	-.36159
2	WHEAT-SHEEP ZONE	-.19269	.88431	.26184	.28951
3	HIGH RAINFALL ZONE	-.11544	.71113	.17620	-.33617
4	NORTHERN BEEF	-.45073	2.42207	.65278	1.22209
5	MILK CATTLE AND PIGS	-.06713	.48182	.10820	-.01899
6	OTHER FARMING - EXPORT	-.21780	1.26689	.32396	.57609
7	OTHER FARMING - IMPORT	-.00372	.71382	.07288	-.39846
8	POULTRY	-.09218	.50698	.13439	-.43200
9	AGRICULTURAL SERVICES	-.05901	.72904	.12840	-.15406
10	FORESTRY AND LOGGING	-.08158	1.21374	-.12698	1.35891
11	FISHING AND HUNTING	-.03467	.40259	.07424	-.62557
12	FERROUS METAL ORES	-.61270	2.42907	.77475	5.02703
13	NON-FERROUS METAL ORES	-.46918	2.04448	.55315	2.63703
14	BLACK COAL	-.99615	4.11200	1.26746	5.73579
15	OIL, GAS + BROWN COAL	-.93788	4.42581	1.22911	9.14008
16	OTHER MINERALS	-.05735	1.02975	-.19303	.17981
17	SERVICES TO MINING	-.68282	3.20730	.68652	7.03394
18	MEAT PRODUCTS	-.16524	.88514	.23833	.16816
19	MILK PRODUCTS	-.00487	.12581	.01572	-.47236
20	FRUIT AND VEGETABLES	.03259	.40394	.01255	-.41261
21	MARGARINE, OILS + FATS	.00027	.52589	.04311	-.74803
22	FLOUR + CEREAL PRODS.	-.02692	.30292	.05124	-.52102
23	BREAD CAKES + BISCUITS	.00081	.21173	.01780	-.27636
24	CONFECTIONERY + COCOA	.02537	.39823	.02279	-.81557
25	OTHER FOOD PRODUCTS	-.34343	1.49718	.45821	.84694
26	SOFT DRINKS + CORDIALS	.02320	.54314	.01048	-.77298
27	BEER AND MALT	.06172	.66759	.02406	-.67576
28	OTHER ALCOHOLIC DRINKS	.10235	1.17555	.04847	-1.46333
29	TOBACCO PRODUCTS	.02188	.51818	.03688	-.09307
30	COTTON GINNING ETC.	-.11182	.79232	.16426	-1.06091
31	MAN-MADE FIBRES, YARNS	-.10664	1.11619	.16112	-15.09492
32	COTTON YARNS + FABRICS	-.07037	.79412	.12416	-8.84483
33	WORSTED + WOOLLEN YARN	.02273	.65015	.01802	-2.91409
34	TEXTILE FINISHING	.01649	.54500	.01317	-2.17165
35	TEXTILE FLOOR OVERLAYS	.08310	1.22737	-.03585	-1.40013
36	OTHER TEXTILE PRODUCTS	-.00794	.97583	.03341	-.40036
37	KNITTING MILLS	.01178	.39227	.03126	-2.68848
38	CLOTHING	.01070	.35076	.02594	-2.75295
39	FOOTWEAR	-.05440	.74981	.09364	-10.72166
40	SAWMILL PRODUCTS	-.05306	1.09765	-.16479	.37808
41	VENEERS AND BOARDS	.03136	1.08746	-.15567	-.20020
42	JOINERY + WOOD NEC	.00154	1.03947	-.24351	.71894
43	FURNITURE + MATRESSES	.12092	1.21375	-.05316	-.27247
44	PULP PAPER PAPERBOARD	-.00763	.87720	.04303	-.51196
45	BAGS, FIBREBOARD BOXES	-.01995	.80745	.03520	-.31486
46	PAPER PRODUCTS NEC	.01910	.76412	.03439	-.82022
47	NEWSPAPERS AND BOOKS	.02578	.84869	.01346	-.39431
48	COMMERCIAL PRINTING	.02721	.84222	.01070	-.34870
49	CHEMICAL FERTILISERS	-.11829	.77683	.18011	-.33794
50	OTHER BASIC CHEMICALS	-.08354	1.10975	.07028	-2.48011
51	PAINTS, VARNISHES	.02100	1.15247	-.11383	-.96326
52	PHARMACEUTICAL GOODS	.06252	1.03668	.05663	-.55666
53	SOAP AND DETERGENTS	.02454	.59726	.03302	-.64030
54	COSMETICS + TOILETRIES	.04450	.48320	.01605	-.57997
55	OTHER CHEMICAL GOODS	-.07615	1.09101	.06733	-.41970
56	PETROL + COAL PRODUCTS	-.01029	.93097	.03530	-.46337

TABLE R21: RESULTS FOR LONGRUN ENVIRONMENT: RATIO CONSUMPTION/SAVING EXOGENOUS

NO.	EMPLOYMENT BY INDUSTRY (CONTINUED) ORANI INDUSTRY	1% RISE CONSUMPTION /SAVING	1% RISE IN TOTAL EMPLOYMENT	1% RISE IN OMEGA R/R	25% A.T.B. TARIFF CUT
57	GLASS + GLASS PRODUCTS	.01793	.91860	-.02450	-.92877
58	CLAY PRODS, REFRACT'S	-.05300	1.18370	-.24741	1.19842
59	CEMENT	-.04927	1.14833	-.33439	.97720
60	READY MIXED CONCRETE	-.04640	1.12010	-.36740	.82334
61	CONCRETE PRODUCTS	-.04025	1.08961	-.37485	1.29722
62	NON-METALLIC ORE GOODS	-.04631	1.13315	-.28922	1.11037
63	BASIC IRON AND STEEL	-.05171	.97110	-.09833	-.35153
64	OTHER BASIC METALS	-.43602	2.03611	.48645	2.44736
65	STRUCTURAL METAL GOODS	-.04367	1.08577	-.29650	1.06961
66	SHEET METAL PRODUCTS	-.00254	.92426	-.11627	.22994
67	OTHER METAL PRODUCTS	-.04105	1.14101	-.13485	-1.10583
68	MOTOR VEHICLES + PARTS	-.02235	1.16206	-.04234	-8.08787
69	SHIPS AND BOATS	-.01608	.72200	-.10348	.43298
70	LOCOMOTIVES	-.11260	1.20354	-.00146	1.55198
71	AIRCRAFT	.06504	.93422	-.06855	.22342
72	SCIENTIFIC EQUIPMENT	.05747	.75914	-.01707	-.28117
73	ELECTRONIC EQUIPMENT	.04126	1.20694	-.09652	-1.59325
74	HOUSEHOLD APPLIANCES	.08751	1.14727	-.13928	-.49380
75	OTHER ELECTRICAL GOODS	-.04069	1.16471	-.14505	.64110
76	AGRICULTURAL MACHINERY	-.11137	.75138	-.52436	.91619
77	CONSTRUCTION MACHINERY	-.23827	1.54905	-.01464	2.46070
78	OTH. MACHINERY + PLANT	-.07321	1.06043	-.20492	.94517
79	LEATHER PRODUCTS	-.03184	.62587	.06841	-4.95536
80	RUBBER PRODUCTS	-.04569	1.13084	.04431	-2.04759
81	PLASTIC PRODUCTS, ETC.	-.02277	.94952	-.01011	-1.67748
82	SIGNS, WRITING GEAR	.01086	.90333	.00659	-1.13832
83	OTHER MANUFACTURING	.02462	.83642	.05352	-1.72001
84	ELECTRICITY	-.01052	1.13192	.08366	-.27844
85	GAS	.05171	.99789	.01384	-.85937
86	WATER, SEWERS + DRAINS	.08247	1.24533	.03190	-.68757
87	RESIDENTIAL BUILDING	-.03982	1.13491	-.34963	1.12321
88	OTHER CONSTRUCTION	-.03436	1.03787	-.40769	1.57273
89	WHOLESALE TRADE	-.01942	.87371	-.01480	-.02530
90	RETAIL TRADE	.07458	.64263	-.01058	-.06000
91	MECHANICAL REPAIRS	.06114	.94398	.01205	-.03793
92	OTHER REPAIRS	.04534	1.05339	.03584	.13145
93	ROAD TRANSPORT	-.04714	.86341	.01498	.38745
94	RAIL + OTHER TRANSPORT	-.13589	1.23211	.18689	1.35491
95	WATER TRANSPORT	-.08062	.65241	.08509	.21569
96	AIR TRANSPORT	.07967	1.12864	.02883	-.05979
97	COMMUNICATION	.05986	1.05016	.01540	-.46434
98	BANKING	.08735	1.15336	.01197	-.28647
99	NON BANK FINANCE	.05675	1.24842	.03419	-.53256
100	INVESTMENT + SERVICES	.05579	.99485	.01584	-.75402
101	INSURANCE + SERVICES	.05304	1.20037	.03519	.05537
102	OTH. BUSINESS SERVICES	.01801	.98334	-.03761	-.06201
103	OWNERSHIP OF DWELLINGS	.17827	1.57951	.03112	-.93656
104	PUBLIC ADMINISTRATION	.11035	.89042	-.00408	.09892
105	DEFENCE	.12187	.85639	-.00424	.10081
106	HEALTH	.13666	1.04732	.00445	-.14579
107	EDUCATION, LIBRARIES	.12461	.89607	-.00248	.05416
108	WELFARE AND RELIGIOUS	.11434	.97591	.00818	.01229
109	ENTERTAINMENT, LEISURE	.10956	1.06905	.01025	-.18618
110	RESTAURANTS, HOTELS	.10609	1.01745	.00735	-.23172
111	PERSONAL SERVICES	.13261	1.20258	.01141	-.41510
112	NON-COMPETING IMPORTS	.10780	.87856	-.00162	.09626

TABLE C1: ABSORPTION FIXED - COMPARISON OF LONG AND SHORTRUN MODELLING OF FACTOR SUPPLY

SELECTED MACRO RESULTS - 25% A.T.B. TARIFF CUT

NO.	ORANI VARIABLE	LONGRUN	SHORTRUN	DIFFERENCE
15	BALANCE OF TRADE ($FOREIGN)	.4743	.1472	.3271
16	AGGREGATE IMPORTS ($FOREIGN)	1.5844	1.4313	.1531
17	AGGREGATE EXPORTS ($FOREIGN)	4.7502	2.3952	2.3550
18	INVESTMENT PRICE INDEX	-1.5616	-2.6102	1.0486
19	CONSUMER PRICE INDEX	-1.1179	-2.2044	1.0865
20	AGGREGATE REAL INVESTMENT	ZERO	ZERO	ZERO
21	AGGREGATE REAL CONSUMPTION	ZERO	ZERO	ZERO
24	U2 - AGGREGATE EMPLOYMENT	ZERO	.2234	-.2234
27	AGGREGATE NOMINAL INVESTMENT	-1.5616	-2.6102	1.0486
28	AGGREGATE NOMINAL CONSUMPTION	-1.1179	-2.2044	1.0865
30	INVESTMENT SLACK VARIABLE Q	5.4064	8.1225	-2.7161
34	AVERAGE REAL WAGE RATE	.7505	ZERO	.7505
85	AGGREGATE NOMINAL OTHER DEMAND	-.6097	-2.1552	1.5456
87	PRICE INDEX EXPORTS ($A)	-.5039	-.3418	-.1621
89	GDP DEFLATOR	-1.1269	-2.2797	1.1529
91	TOTAL NOMINAL LAND RENTALS	.7845	3.2477	-2.4632
92	TOTAL NOMINAL CAPITAL RENTALS	.4400	-1.1917	1.6317
94	TOTAL NOMINAL WAGE PAYMENTS	-.3642	-1.9901	1.6259
101	NOMINAL GDP FROM INCOME SIDE	-.6290	-2.0897	1.4607
103	GNP: NATIONAL INCOME	-.9040	-2.2116	1.3077
104	F: RATIO CONSUMPTION/SAVING	-.6393	.0823	-.7216
105	Q: OVERALL AUSTRALIAN SHARE	-1.3700	ZERO	-1.3700
106	TOTAL NOMINAL NATIONAL SAVING	-.4726	-2.2867	1.8081
107	TOTAL REAL CAPITAL STOCK	1.7862	ZERO	1.7862
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	-1.3110	-1.5043	.1933
	AVE.RENTAL,FOREIGNER'S CAPITAL	-1.4934	.0658	-1.5592
109	AVE.RENTAL,ALL LOCAL CAPITAL	-1.3462	-1.1917	-.1545
110	AVE.CREATION PRICE OF CAPITAL	-1.3110	-2.4119	1.1009
111	AMOUNT,LOCALLY OWNED CAPITAL	.4162	ZERO	.4162
112	NET NOMINAL RENTALS TO OVERSEAS	6.5324	.1253	6.4071
113	NET NOMINAL FOREIGN INVESTMENT	-6.9679	-4.2250	-2.7429
114	NOMINAL RENTALS TO OVERSEAS	6.0212	.1158	5.9054
115	NOMINAL RENTALS FROM OVERSEAS	-.2393	.1158	-.3551

SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR

18d	INVESTMENT PRICE INDEX	-.4347	-.3305	-.1042
19d	CONSUMER PRICE INDEX	.0090	.0753	-.0664
27d	AGGREGATE NOMINAL INVESTMENT	-.4347	-.3305	-.1042
28d	AGGREGATE NOMINAL CONSUMPTION	.0090	.0753	-.0664
85d	AGGREGATE NOMINAL OTHER DEMAND	.5172	.1245	.3927
92d	TOTAL NOMINAL CAPITAL RENTALS	1.5669	1.0881	.4788
94d	TOTAL NOMINAL WAGE PAYMENTS	.7626	.2896	.4731
101d	NOMINAL GDP FROM INCOME SIDE	.4979	.1900	.3079
103d	GNP: NATIONAL INCOME	.2229	.0681	.1548
106d	TOTAL NOMINAL NATIONAL SAVING	.6483	-.0070	.6553
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.1842	.7755	-.9596
d	AVE.RENTAL,FOREIGNER'S CAPITAL	-.3665	2.3456	-2.7121
109d	AVE.RENTAL,ALL LOCAL CAPITAL	-.2193	1.0881	-1.3074
110d	AVE.CREATION PRICE OF CAPITAL	-.1842	-.1322	-.0520
112d	NET NOMINAL RENTALS TO OVERSEAS	7.6593	2.4050	5.2543
113d	NET NOMINAL FOREIGN INVESTMENT	-5.8411	-1.9453	-3.8958
114d	NOMINAL RENTALS TO OVERSEAS	7.1461	2.3956	4.7525
115d	NOMINAL RENTALS FROM OVERSEAS	.8876	2.2797	-1.3922

TABLE C2: ABSORPTION FIXED - COMPARISON OF LONG AND SHORTRUN MODELLING OF FACTOR SUPPLY

INDUSTRY OUTPUTS - 25% A.T.B. TARIFF CUT - RANKED BY DIFFERENCE

NO.	ORANI INDUSTRY	LONGRUN	SHORTRUN	DIFFERENCE
76	AGRICULTURAL MACHINERY	-1.7116	7.7357	-9.4473
31	MAN-MADE FIBRES, YARNS	-14.0186	-10.1529	-3.8656
32	COTTON YARNS + FABRICS	-7.9937	-5.3778	-2.6159
39	FOOTWEAR	-10.0509	-7.8010	-2.2500
68	MOTOR VEHICLES + PARTS	-8.2172	-6.5721	-1.6451
30	COTTON GINNING ETC.	.1137	1.5015	-1.3878
79	LEATHER PRODUCTS	-4.3200	-3.0094	-1.3106
3	HIGH RAINFALL ZONE	.6246	1.6893	-1.0646
25	OTHER FOOD PRODUCTS	3.9888	4.9692	-.9805
50	OTHER BASIC CHEMICALS	-1.5199	-.6847	-.8353
18	MEAT PRODUCTS	1.8562	2.5896	-.7334
74	HOUSEHOLD APPLIANCES	-1.1766	-.5049	-.6717
73	ELECTRONIC EQUIPMENT	-1.9886	-1.3558	-.6327
81	PLASTIC PRODUCTS, ETC.	-1.3653	-.7721	-.5932
33	WORSTED + WOOLLEN YARN	-2.7580	-2.2075	-.5505
6	OTHER FARMING - EXPORT	2.1267	2.6551	-.5283
1	PASTORAL ZONE	.8423	1.3684	-.5261
34	TEXTILE FINISHING	-1.9448	-1.4328	-.5120
37	KNITTING MILLS	-2.3376	-1.8409	-.4967
28	OTHER ALCOHOLIC DRINKS	-.6695	-.1815	-.4880
38	CLOTHING	-2.4974	-2.0523	-.4446
44	PULP PAPER PAPERBOARD	-.1595	.2803	-.4397
57	GLASS + GLASS PRODUCTS	-.6402	-.2119	-.4283
83	OTHER MANUFACTURING	-.9527	-.5510	-.4017
7	OTHER FARMING - IMPORT	.1257	.5120	-.3862
35	TEXTILE FLOOR OVERLAYS	-1.3772	-1.0061	-.3711
67	OTHER METAL PRODUCTS	-1.5415	-1.1711	-.3704
8	POULTRY	.9406	1.3027	-.3621
2	WHEAT-SHEEP ZONE	1.4287	1.1635	.2652
29	TOBACCO PRODUCTS	.2903	.0029	.2873
56	PETROL + COAL PRODUCTS	.4293	.1254	.3038
93	ROAD TRANSPORT	.7166	.3907	.3259
101	INSURANCE + SERVICES	.4403	.0939	.3463
55	OTHER CHEMICAL GOODS	.2666	-.1236	.3902
92	OTHER REPAIRS	.6326	.2365	.3962
95	WATER TRANSPORT	1.0217	.5727	.4490
69	SHIPS AND BOATS	.0012	-.4647	.4658
75	OTHER ELECTRICAL GOODS	.0363	-.4610	.4973
78	OTH. MACHINERY + PLANT	.0454	-.5347	.5801
84	ELECTRICITY	.7526	.0967	.6559
4	NORTHERN BEEF	3.6347	2.7769	.8577
70	LOCOMOTIVES	1.6617	.3709	1.2908
10	FORESTRY AND LOGGING	.9202	-.6672	1.5874
94	RAIL + OTHER TRANSPORT	2.4522	.6940	1.7583
77	CONSTRUCTION MACHINERY	2.6448	-.4990	3.1438
64	OTHER BASIC METALS	6.0016	2.6074	3.3942
13	NON-FERROUS METAL ORES	6.5687	2.2068	4.3618
12	FERROUS METAL ORES	10.5886	1.6667	8.9219
17	SERVICES TO MINING	11.3628	.9428	10.4200
14	BLACK COAL	13.8283	2.7231	11.1053
15	OIL, GAS + BROWN COAL	17.5399	.1953	17.3446

TABLE C3: EFFECT OF ENDOGENIZING AGGREGATE INVESTMENT IN LONGRUN CLOSURE - CONSUMPTION FIXED

SELECTED MACRO RESULTS - 25% A.T.B. TARIFF CUT

NO.	ORANI VARIABLE	REAL CONSUMPTION FIXED	ALL ABSORPTION FIXED	DIFFERENCE
15	BALANCE OF TRADE ($FOREIGN)	-.0106	.4743	-.4848
16	AGGREGATE IMPORTS ($FOREIGN)	2.5841	1.5844	.9997
17	AGGREGATE EXPORTS ($FOREIGN)	2.4618	4.7502	-2.2884
18	INVESTMENT PRICE INDEX	-1.1848	-1.5616	.3768
19	CONSUMER PRICE INDEX	-.7058	-1.1179	.4121
20	AGGREGATE REAL INVESTMENT	2.2273	ZERO	2.2273
21	AGGREGATE REAL CONSUMPTION	ZERO	ZERO	ZERO
24	U2 - AGGREGATE EMPLOYMENT	ZERO	ZERO	ZERO
27	AGGREGATE NOMINAL INVESTMENT	1.0425	-1.5616	2.6040
28	AGGREGATE NOMINAL CONSUMPTION	-.7058	-1.1179	.4121
30	INVESTMENT SLACK VARIABLE Ω	ZERO	5.4064	-5.4064
34	AVERAGE REAL WAGE RATE	.9146	.7505	.1641
85	AGGREGATE NOMINAL OTHER DEMAND	-.1018	-.6097	.5078
87	PRICE INDEX EXPORTS ($A)	-.2544	-.5039	.2496
89	GDP DEFLATOR	-.7076	-1.1269	.4193
91	TOTAL NOMINAL LAND RENTALS	.4053	.7845	-.3792
92	TOTAL NOMINAL CAPITAL RENTALS	.6511	.4400	.2111
94	TOTAL NOMINAL WAGE PAYMENTS	.2123	-.3642	.5765
101	NOMINAL GDP FROM EXPENDITURE SIDE	-.2219	-.6290	.4071
103	GNP: NATIONAL INCOME	-.4385	-.9040	.4655
104	F: RATIO CONSUMPTION/SAVING	-.8272	-.6393	-.1879
105	Q: OVERALL AUSTRALIAN SHARE	-1.0821	-1.3700	.2879
106	TOTAL NOMINAL NATIONAL SAVING	.1214	-.4786	.6000
107	TOTAL REAL CAPITAL STOCK	1.5956	1.7862	-.1906
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.9056	-1.3110	.4054
	AVE.RENTAL,FOREIGNER'S CAPITAL	-1.1073	-1.4934	.3861
109	AVE.RENTAL,ALL LOCAL CAPITAL	-.9445	-1.3462	.4017
110	AVE.CREATION PRICE OF CAPITAL	-.9056	-1.3110	.4054
111	AMOUNT,LOCALLY OWNED CAPITAL	.5135	.4162	.0973
112	NET NOMINAL RENTALS TO OVERSEAS	5.4172	6.5324	-1.1152
113	NET NOMINAL FOREIGN INVESTMENT	5.6409	-6.9679	12.6088
114	NOMINAL RENTALS TO OVERSEAS	5.0128	6.0212	-1.0084
115	NOMINAL RENTALS FROM OVERSEAS	.0607	-.2393	.3000

SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR

18d	INVESTMENT PRICE INDEX	-.4772	-.4347	-.0425
19d	CONSUMER PRICE INDEX	.0018	.0090	-.0071
27d	AGGREGATE NOMINAL INVESTMENT	1.7501	-.4347	2.1848
28d	AGGREGATE NOMINAL CONSUMPTION	.0018	.0090	-.0071
85d	AGGREGATE NOMINAL OTHER DEMAND	.6058	.5172	.0886
92d	TOTAL NOMINAL CAPITAL RENTALS	1.3587	1.5669	-.2082
94d	TOTAL NOMINAL WAGE PAYMENTS	.9199	.7626	.1573
101d	NOMINAL GDP FROM EXPENDITURE SIDE	.4857	.4979	-.0122
103d	GNP: NATIONAL INCOME	.2691	.2229	.0462
106d	TOTAL NOMINAL NATIONAL SAVING	.8290	.6483	.1807
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.1980	-.1842	-.0138
d	AVE.RENTAL,FOREIGNER'S CAPITAL	-.3997	-.3665	-.0331
109d	AVE.RENTAL,ALL LOCAL CAPITAL	-.2369	-.2193	-.0176
110d	AVE.CREATION PRICE OF CAPITAL	-.1980	-.1842	-.0138
112d	NET NOMINAL RENTALS TO OVERSEAS	6.1248	7.6593	-1.5345
113d	NET NOMINAL FOREIGN INVESTMENT	6.3485	-5.8411	12.1896
114d	NOMINAL RENTALS TO OVERSEAS	5.7204	7.1481	-1.4277
115d	NOMINAL RENTALS FROM OVERSEAS	.7683	.8876	-.1193

TABLE C4: EFFECT OF ENDOGENIZING AGGREGATE INVESTMENT IN LONGRUN CLOSURE - CONSUMPTION FIXED

INDUSTRY OUTPUTS - 25% A.T.B. TARIFF CUT - RANKED BY DIFFERENCE

NO.	ORANI INDUSTRY	REAL CONSUMPTION FIXED	ALL ABSORPTION FIXED	DIFFERENCE
14	BLACK COAL	7.2762	13.8283	-6.5521
15	OIL, GAS + BROWN COAL	11.2875	17.5399	-6.2524
12	FERROUS METAL ORES	6.6881	10.5886	-3.9005
17	SERVICES TO MINING	7.8078	11.3628	-3.5550
13	NON-FERROUS METAL ORES	3.7816	6.5687	-2.7870
64	OTHER BASIC METALS	3.5771	6.0016	-2.4245
25	OTHER FOOD PRODUCTS	1.6546	3.9888	-2.3341
4	NORTHERN BEEF	1.3535	3.6347	-2.2812
6	OTHER FARMING - EXPORT	.8045	2.1267	-1.3222
18	MEAT PRODUCTS	.6483	1.8562	-1.2079
94	RAIL + OTHER TRANSPORT	1.4673	2.4522	-.9849
49	CHEMICAL FERTILISERS	.5225	1.3640	-.8416
30	COTTON GINNING ETC.	-.7136	.1137	-.8273
31	MAN-MADE FIBRES, YARNS	-14.8443	-14.0186	-.8257
2	WHEAT-SHEEP ZONE	.6046	1.4287	-.8242
1	PASTORAL ZONE	.1725	.8423	-.6698
32	COTTON YARNS + FABRICS	-8.6265	-7.9937	-.6328
9	AGRICULTURAL SERVICES	.2919	.9194	-.6275
8	POULTRY	.3281	.9406	-.6124
3	HIGH RAINFALL ZONE	.0352	.6246	-.5895
39	FOOTWEAR	-10.5254	-10.0509	-.4745
5	MILK CATTLE AND PIGS	.1827	.5641	-.3814
95	WATER TRANSPORT	.6530	1.0217	-.3687
84	ELECTRICITY	.4121	.7526	-.3405
79	LEATHER PRODUCTS	-4.6428	-4.3200	-.3228
35	TEXTILE FLOOR OVERLAYS	-1.1500	-1.3772	.2273
68	MOTOR VEHICLES + PARTS	-7.9692	-8.2172	.2480
102	OTH. BUSINESS SERVICES	.3691	.1033	.2658
43	FURNITURE + MATRESSES	-.0694	-.3762	.3068
71	AIRCRAFT	.3001	-.0794	.3795
73	ELECTRONIC EQUIPMENT	-1.4480	-1.9886	.5406
69	SHIPS AND BOATS	.5844	.0012	.5832
63	BASIC IRON AND STEEL	.0195	-.5710	.5905
51	PAINTS, VARNISHES	-.7468	-1.3887	.6419
66	SHEET METAL PRODUCTS	.5195	-.1532	.6727
10	FORESTRY AND LOGGING	1.6527	.9202	.7326
74	HOUSEHOLD APPLIANCES	-.4185	-1.1766	.7581
67	OTHER METAL PRODUCTS	-.7582	-1.5415	.7833
75	OTHER ELECTRICAL GOODS	.8550	.0363	.8187
41	VENEERS AND BOARDS	.1860	-.7121	.8981
40	SAWMILL PRODUCTS	.9322	-.0367	.9689
78	OTH. MACHINERY + PLANT	1.1941	.0454	1.1487
16	OTHER MINERALS	1.2263	.0329	1.1934
42	JOINERY + WOOD NEC	1.0717	-.2921	1.3638
58	CLAY PRODS, REFRACT'S	1.6297	.2250	1.4047
62	NON-METALLIC ORE GOODS	1.6474	.0029	1.6445
65	STRUCTURAL METAL GOODS	1.4357	-.2249	1.6606
59	CEMENT	1.8907	-.0586	1.9494
87	RESIDENTIAL BUILDING	2.0026	-.0050	2.0077
61	CONCRETE PRODUCTS	1.9310	-.1866	2.1176
60	READY MIXED CONCRETE	1.9168	-.2176	2.1344
88	OTHER CONSTRUCTION	1.8966	-.3514	2.2480
76	AGRICULTURAL MACHINERY	1.1669	-1.7116	2.8785

TABLE C5: LONGRUN CLOSURES WITH ENDOGENOUS INVESTMENT - EFFECT OF ENDOGENISING REAL CONSUMPTION

SELECTED MACRO RESULTS - 25% A.T.B. TARIFF CUT

NO.	ORANI VARIABLE	FC EXOGENOUS	CR EXOGENOUS	DIFFERENCE
15	BALANCE OF TRADE ($FOREIGN)	-.0666	-.0106	-.0561
16	AGGREGATE IMPORTS ($FOREIGN)	2.6792	2.5841	.0951
17	AGGREGATE EXPORTS ($FOREIGN)	2.1771	2.4618	-.2847
18	INVESTMENT PRICE INDEX	-1.1386	-1.1848	.0462
19	CONSUMER PRICE INDEX	-.6550	-.7058	.0508
20	AGGREGATE REAL INVESTMENT	2.1873	2.2273	-.0400
21	AGGREGATE REAL CONSUMPTION	.1020	ZERO	.1020
24	U2 - AGGREGATE EMPLOYMENT	ZERO	ZERO	ZERO
27	AGGREGATE NOMINAL INVESTMENT	1.0487	1.0425	.0062
28	AGGREGATE NOMINAL CONSUMPTION	-.5530	-.7058	.1528
30	INVESTMENT SLACK VARIABLE Ω	ZERO	ZERO	ZERO
34	AVERAGE REAL WAGE RATE	.9343	.9146	.0197
85	AGGREGATE NOMINAL OTHER DEMAND	.0624	-.1018	.1642
87	PRICE INDEX EXPORTS ($A)	-.2239	-.2544	.0305
89	GDP DEFLATOR	-.6561	-.7076	.0516
91	TOTAL NOMINAL LAND RENTALS	.3720	.4053	-.0333
92	TOTAL NOMINAL CAPITAL RENTALS	.7215	.6511	.0704
94	TOTAL NOMINAL WAGE PAYMENTS	.2857	.2123	.0733
101	NOMINAL GDP FROM INCOME SIDE	-.1592	-.2219	.0628
103	GNP: NATIONAL INCOME	-.4438	-.4385	-.0053
104	F: RATIO CONSUMPTION/SAVING	ZERO	-.8272	.8272
105	Q: OVERALL AUSTRALIAN SHARE	-1.4653	-1.0821	-.3831
106	TOTAL NOMINAL NATIONAL SAVING	-.5530	.1214	-.6744
107	TOTAL REAL CAPITAL STOCK	1.6167	1.5956	.0211
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.8559	-.9056	.0497
	AVE.RENTAL,FOREIGNER'S CAPITAL	-1.0599	-1.1073	.0473
109	AVE.RENTAL,ALL LOCAL CAPITAL	-.8953	-.9445	.0492
110	AVE.CREATION PRICE OF CAPITAL	-.8559	-.9056	.0497
111	AMOUNT,LOCALLY OWNED CAPITAL	.1515	.5135	-.3620
112	NET NOMINAL RENTALS TO OVERSEAS	7.2517	5.4172	1.8344
113	NET NOMINAL FOREIGN INVESTMENT	9.0445	5.6409	3.4036
114	NOMINAL RENTALS TO OVERSEAS	6.6833	5.0128	1.6705
115	NOMINAL RENTALS FROM OVERSEAS	-.2765	.0607	-.3372
	SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR			
18d	INVESTMENT PRICE INDEX	-.4826	-.4772	-.0054
19d	CONSUMER PRICE INDEX	.0011	.0018	-.0008
27d	AGGREGATE NOMINAL INVESTMENT	1.7047	1.7501	-.0454
28d	AGGREGATE NOMINAL CONSUMPTION	.1031	.0018	.1013
85d	AGGREGATE NOMINAL OTHER DEMAND	.7185	.6058	.1127
92d	TOTAL NOMINAL CAPITAL RENTALS	1.3775	1.3587	.0188
94d	TOTAL NOMINAL WAGE PAYMENTS	.9417	.9199	.0218
101d	NOMINAL GDP FROM INCOME SIDE	.4969	.4857	.0112
103d	GNP: NATIONAL INCOME	.2123	.2691	-.0568
106d	TOTAL NOMINAL NATIONAL SAVING	.1031	.8290	-.7259
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.1999	-.1980	-.0019
d	AVE.RENTAL,FOREIGNER'S CAPITAL	-.4039	-.3997	-.0042
109d	AVE.RENTAL,ALL LOCAL CAPITAL	-.2392	-.2369	-.0023
110d	AVE.CREATION PRICE OF CAPITAL	-.1999	-.1980	-.0019
112d	NET NOMINAL RENTALS TO OVERSEAS	7.9077	6.1248	1.7829
113d	NET NOMINAL FOREIGN INVESTMENT	9.7006	6.3485	3.3521
114d	NOMINAL RENTALS TO OVERSEAS	7.3393	5.7204	1.6189
115d	NOMINAL RENTALS FROM OVERSEAS	.3796	.7683	-.3887

TABLE C6: LONGRUN CLOSURES WITH ENDOGENOUS INVESTMENT - EFFECT OF ENDOGENISING REAL CONSUMPTION

INDUSTRY OUTPUTS - 25% A.T.B. TARIFF CUT - RANKED BY DIFFERENCE

NO.	ORANI INDUSTRY	FC EXOGENOUS	CR EXOGENOUS	DIFFERENCE
14	BLACK COAL	6.4660	7.2762	-0.8102
15	OIL, GAS + BROWN COAL	10.5381	11.2875	-0.7494
17	SERVICES TO MINING	7.2465	7.8078	-0.5614
12	FERROUS METAL ORES	6.2024	6.6881	-0.4857
13	NON-FERROUS METAL ORES	3.4076	3.7816	-0.3740
64	OTHER BASIC METALS	3.2315	3.5771	-0.3456
25	OTHER FOOD PRODUCTS	1.3801	1.6546	-0.2745
4	NORTHERN BEEF	1.1072	1.3535	-0.2464
77	CONSTRUCTION MACHINERY	2.5929	2.7877	-0.1948
6	OTHER FARMING - EXPORT	0.6657	0.8045	-0.1388
18	MEAT PRODUCTS	0.5177	0.6483	-0.1306
94	RAIL + OTHER TRANSPORT	1.3549	1.4673	-0.1124
2	WHEAT-SHEEP ZONE	0.5096	0.6046	-0.0949
70	LOCOMOTIVES	1.6073	1.6994	-0.0921
76	AGRICULTURAL MACHINERY	1.0775	1.1669	-0.0894
30	COTTON GINNING ETC.	-0.8013	-0.7136	-0.0877
31	MAN-MADE FIBRES, YARNS	-14.9294	-14.8443	-0.0851
49	CHEMICAL FERTILISERS	0.4380	0.5225	-0.0844
1	PASTORAL ZONE	0.0930	0.1725	-0.0794
8	POULTRY	0.2637	0.3281	-0.0644
10	FORESTRY AND LOGGING	1.5890	1.6527	-0.0637
3	HIGH RAINFALL ZONE	-0.0247	0.0352	-0.0599
95	WATER TRANSPORT	0.5956	0.6530	-0.0574
78	OTH. MACHINERY + PLANT	1.1369	1.1941	-0.0573
55	OTHER CHEMICAL GOODS	-0.0931	-0.0359	-0.0572
50	OTHER BASIC CHEMICALS	-1.8442	-1.7870	-0.0572
32	COTTON YARNS + FABRICS	-8.6817	-8.6265	-0.0551
71	AIRCRAFT	.3565	.3001	.0564
85	GAS	-.0764	-.1329	.0566
91	MECHANICAL REPAIRS	.3718	.3147	.0571
52	PHARMACEUTICAL GOODS	-.1478	-.2065	.0587
97	COMMUNICATION	.1122	.0521	.0601
99	NON BANK FINANCE	.2737	.2126	.0611
100	INVESTMENT + SERVICES	.1095	.0483	.0613
27	BEER AND MALT	.0261	-.0385	.0646
90	RETAIL TRADE	.2695	.2029	.0667
96	AIR TRANSPORT	.1605	.0864	.0741
35	TEXTILE FLOOR OVERLAYS	-1.0752	-1.1500	.0747
74	HOUSEHOLD APPLIANCES	-.3435	-.4185	.0750
98	BANKING	.1055	.0264	.0791
86	WATER, SEWERS + DRAINS	.2303	.1474	.0830
112	NON-COMPETING IMPORTS	.0963	.0071	.0892
104	PUBLIC ADMINISTRATION	.0989	.0076	.0913
110	RESTAURANTS, HOTELS	-.0104	-.1022	.0918
108	WELFARE AND RELIGIOUS	.0437	-.0515	.0951
109	ENTERTAINMENT, LEISURE	.0684	-.0269	.0952
28	OTHER ALCOHOLIC DRINKS	-.7461	-.8438	.0977
105	DEFENCE	.1008	ZERO	.1008
107	EDUCATION, LIBRARIES	.0685	-.0349	.1034
43	FURNITURE + MATRESSES	.0358	-.0694	.1052
106	HEALTH	-.0705	-.1851	.1146
111	PERSONAL SERVICES	-.0368	-.1535	.1167
103	OWNERSHIP OF DWELLINGS	.0975	-.0721	.1696

TABLE C7: COMPARISON OF STANDARD ORANI SHORTRUN CLOSURE WITH PROPOSED LONGRUN CLOSURE

SELECTED MACRO RESULTS - 25% A.T.B. TARIFF CUT

NO.	ORANI VARIABLE	PROPOSED LONGRUN	STANDARD SHORTRUN	DIFFERENCE
15	BALANCE OF TRADE ($FOREIGN)	-.0666	.1472	-.2138
16	AGGREGATE IMPORTS ($FOREIGN)	2.6792	1.4313	1.2479
17	AGGREGATE EXPORTS ($FOREIGN)	2.1771	2.3952	-.2181
18	INVESTMENT PRICE INDEX	-1.1386	-2.6102	1.4716
19	CONSUMER PRICE INDEX	-.6550	-2.2044	1.5494
20	AGGREGATE REAL INVESTMENT	2.1873	ZERO	2.1873
21	AGGREGATE REAL CONSUMPTION	.1020	ZERO	.1020
22	IR/CR(RATIO INVESTMENT/CONSUMPTION)	2.0852	ZERO	2.0852
24	U2 - AGGREGATE EMPLOYMENT	ZERO	.2234	-.2234
27	AGGREGATE NOMINAL INVESTMENT	1.0487	-2.6102	3.6589
28	AGGREGATE NOMINAL CONSUMPTION	-.5530	-2.2044	1.6515
30	INVESTMENT SLACK VARIABLE Ω	ZERO	8.1224	-8.1224
34	AVERAGE REAL WAGE RATE	.9343	ZERO	.9343
85	AGGREGATE NOMINAL OTHER DEMAND	.0624	-2.1552	2.2176
87	PRICE INDEX EXPORTS ($A)	-.2239	-.3418	.1179
89	GDP DEFLATOR	-.6561	-2.2797	1.6237
91	TOTAL NOMINAL LAND RENTALS	.3720	3.2477	-2.8757
92	TOTAL NOMINAL CAPITAL RENTALS	.7215	-1.1917	1.9131
94	TOTAL NOMINAL WAGE PAYMENTS	.2857	-1.9901	2.2758
101	NOMINAL GDP FROM INCOME SIDE	-.1592	-2.0897	1.9305
103	GNP: NATIONAL INCOME	-.4438	-2.2116	1.7679
104	F: RATIO CONSUMPTION/SAVING	ZERO	.0823	-.0823
105	Q: OVERALL AUSTRALIAN SHARE	-1.4653	ZERO	-1.4653
106	TOTAL NOMINAL NATIONAL SAVING	-.5530	-2.2867	1.7338
107	TOTAL REAL CAPITAL STOCK	1.6167	ZERO	1.6167
108	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.8559	-1.5043	.6484
	AVE.RENTAL,FOREIGNER'S CAPITAL	-1.0599	.0658	-1.1258
109	AVE.RENTAL,ALL LOCAL CAPITAL	-.8953	-1.1917	.2964
110	AVE.CREATION PRICE OF CAPITAL	-.8559	-2.4119	1.5560
111	AMOUNT,LOCALLY OWNED CAPITAL	.1515	ZERO	.1515
112	NET NOMINAL RENTALS TO OVERSEAS	7.2517	.1253	7.1264
113	NET NOMINAL FOREIGN INVESTMENT	9.0445	-4.2250	13.2695
114	NOMINAL RENTALS TO OVERSEAS	6.6833	.1158	6.5674
115	NOMINAL RENTALS FROM OVERSEAS	-.2765	.1158	-.3923

SELECTED NOMINAL VARIABLES FROM ABOVE DEFLATED BY GDP DEFLATOR

18d	INVESTMENT PRICE INDEX	-.4826	-.3305	-.1521
19d	CONSUMER PRICE INDEX	.0011	.0753	-.0743
27d	AGGREGATE NOMINAL INVESTMENT	1.7047	-.3305	2.0352
28d	AGGREGATE NOMINAL CONSUMPTION	.1031	.0753	.0278
85d	AGGREGATE NOMINAL OTHER DEMAND	.7185	.1245	.5939
92d	TOTAL NOMINAL CAPITAL RENTALS	1.3775	1.0881	.2894
94d	TOTAL NOMINAL WAGE PAYMENTS	.9417	.2896	.6521
101d	NOMINAL GDP FROM INCOME SIDE	.4969	.1900	.3069
103d	GNP: NATIONAL INCOME	.2123	.0681	.1442
106d	TOTAL NOMINAL NATIONAL SAVING	.1031	-.0070	.1101
108d	AVE.RENTAL,LOCALLY OWNED CAPITAL	-.1999	.7755	-.9753
d	AVE.RENTAL,FOREIGNER'S CAPITAL	-.4039	2.3456	-2.7495
109d	AVE.RENTAL,ALL LOCAL CAPITAL	-.2392	1.0881	-1.3273
110d	AVE.CREATION PRICE OF CAPITAL	-.1999	-.1322	-.0677
112d	NET NOMINAL RENTALS TO OVERSEAS	7.9077	2.4050	5.5027
113d	NET NOMINAL FOREIGN INVESTMENT	9.7006	-1.9453	11.6459
114d	NOMINAL RENTALS TO OVERSEAS	7.3393	2.3956	4.9438
115d	NOMINAL RENTALS FROM OVERSEAS	.3796	2.2797	-1.9002

TABLE C8: COMPARISON OF STANDARD ORANI SHORTRUN CLOSURE WITH PROPOSED LONGRUN CLOSURE

INDUSTRY OUTPUTS - 25% A.T.B TARIFF CUT - RANKED BY DIFFERENCE

NO.	ORANI INDUSTRY	PROPOSED LONGRUN	STANDARD SHORTRUN	DIFFERENCE
76	AGRICULTURAL MACHINERY	1.0775	7.7357	-6.6582
31	MAN-MADE FIBRES, YARNS	-14.9294	-10.1529	-4.7765
25	OTHER FOOD PRODUCTS	1.3801	4.9692	-3.5891
32	COTTON YARNS + FABRICS	-8.6817	-5.3778	-3.3039
39	FOOTWEAR	-10.5677	-7.8010	-2.7668
30	COTTON GINNING ETC.	-.8013	1.5015	-2.3028
18	MEAT PRODUCTS	.5177	2.5896	-2.0719
6	OTHER FARMING - EXPORT	.6657	2.6551	-1.9893
3	HIGH RAINFALL ZONE	-.0247	1.6893	-1.7140
4	NORTHERN BEEF	1.1072	2.7769	-1.6698
79	LEATHER PRODUCTS	-4.6641	-3.0094	-1.6547
68	MOTOR VEHICLES + PARTS	-7.9859	-6.5721	-1.4137
1	PASTORAL ZONE	.0930	1.3684	-1.2753
50	OTHER BASIC CHEMICALS	-1.8442	-.6847	-1.1596
8	POULTRY	.2637	1.3027	-1.0390
49	CHEMICAL FERTILISERS	.4380	1.4017	-.9636
9	AGRICULTURAL SERVICES	.2499	1.1836	-.9338
5	MILK CATTLE AND PIGS	.1463	.8928	-.7465
7	OTHER FARMING - IMPORT	-.1889	.5120	-.7009
2	WHEAT-SHEEP ZONE	.5096	1.1635	-.6538
44	PULP PAPER PAPERBOARD	-.3726	.2803	-.6529
37	KNITTING MILLS	-2.4624	-1.8409	-.6215
33	WORSTED + WOOLLEN YARN	-2.8255	-2.2075	-.6180
83	OTHER MANUFACTURING	-1.1321	-.5510	-.5811
28	OTHER ALCOHOLIC DRINKS	-.7461	-.1815	-.5646
38	CLOTHING	-2.6086	-2.0528	-.5558
52	PHARMACEUTICAL GOODS	-.1478	.3991	-.5469
34	TEXTILE FINISHING	-1.9710	-1.4328	-.5382
81	PLASTIC PRODUCTS, ETC.	-1.2565	-.7721	-.4843
40	SAWMILL PRODUCTS	.8966	.2844	.6122
64	OTHER BASIC METALS	3.2315	2.6074	.6241
41	VENEERS AND BOARDS	.2196	-.4310	.6506
94	RAIL + OTHER TRANSPORT	1.3549	.6940	.6610
66	SHEET METAL PRODUCTS	.5227	-.1396	.6623
16	OTHER MINERALS	1.1958	.2904	.9054
69	SHIPS AND BOATS	.5736	-.4647	1.0383
13	NON-FERROUS METAL ORES	3.4076	2.2068	1.2008
70	LOCOMOTIVES	1.6073	.3709	1.2364
42	JOINERY + WOOD NEC	1.0788	-.1802	1.2591
75	OTHER ELECTRICAL GOODS	.8246	-.4610	1.2857
58	CLAY PRODS, REFRACT'S	1.5929	.2740	1.3189
65	STRUCTURAL METAL GOODS	1.4056	-.1571	1.5627
62	NON-METALLIC ORE GOODS	1.6179	-.0248	1.6427
78	OTH. MACHINERY + PLANT	1.1369	-.5347	1.6716
59	CEMENT	1.8662	.0471	1.8190
88	OTHER CONSTRUCTION	1.8728	-.0300	1.9028
60	READY MIXED CONCRETE	1.8954	-.0167	1.9121
61	CONCRETE PRODUCTS	1.9079	-.0164	1.9244
87	RESIDENTIAL BUILDING	1.9831	ZERO	1.9831
10	FORESTRY AND LOGGING	1.5890	-.6672	2.2562
77	CONSTRUCTION MACHINERY	2.5929	-.4990	3.0919
14	BLACK COAL	6.4660	2.7231	3.7429
12	FERROUS METAL ORES	6.2024	1.6667	4.5357
17	SERVICES TO MINING	7.2465	.9428	6.3037
15	OIL, GAS + BROWN COAL	10.5381	.1953	10.3428