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HOW DOMESTIC ECONOMIC CONDITIONS
INFLUENCE THE REAL EXCHANGE RATE

by

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IMPACT is an economic and demographic research project which aims to improve the publicly
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are briefly examined.

sectors' implications on the above economic policies are
and other exogenous macroeconomic variables. The
the extent of these influences on the real exchange rate
rates. In this paper the ARMAX model is used to estimate
wages, and the tax-rate, can influence the real exchange
e.g., the level of after-tax-goods' price, etc., for
Domestic economic policies that determine for

ABSTRACT
REFERENCES


Nguyen, D.T. and W.J. Martin (1987) "When is the Real Exchange Rate a Useful Concept?", paper presented to the 31st Conference of the Australian Agricultural Economics Society, University of Adelaide.
INTRODUCTION

Peter, J. H. 1989

The Real Exchange Rate

How Domestic Economic Conditions Influence the Real Exchange Rate

NOTES
\[ \varphi_R = \varphi_{A/US} + \varphi_{US} - \varphi_A \]  

where \( \varphi_{A/US} \) is the percentage change in the nominal exchange rate (\( \$A/\$US \)); and \( \varphi_{US} \) and \( \varphi_A \) are the percentage changes in price indices in the U.S. and Australia, respectively. To provide some intuition on equation (1) let us assume that we are interested in exporting a given physical volume of Australian goods to the U.S. and that initially \( \$1A \) is worth \$0.70US (i.e., the nominal exchange rate = \( \$1A/\$0.70US = 1.43 \)). Now suppose that there is a 5 per cent nominal depreciation of the exchange rate (\( \varphi_{A/US} = 5.0 \)) such that \( \$1A \) is worth \$0.67US (\$0.70US \times 0.95 = \$0.67US). If there are no changes in domestic or foreign price indices (i.e., \( \varphi_{US} = \varphi_A = 0 \)), then according to equation (1) the real exchange rate also depreciates by 5 per cent (i.e., \( \varphi_R = 5.0 \)). In other words, our exports are 5 per cent more competitive. Note that a depreciation in the real exchange rate is shown in equation (1) as a positive change in \( \varphi_R \). Now consider the case of a 5 per cent rise in the U.S. price index (\( \varphi_{US} = 5.0 \)) with the nominal exchange rate and the domestic price index held constant (\( \varphi_{A/US} = \varphi_A = 0 \)). This is also equivalent to a 5 per cent depreciation in the real exchange rate because in terms of \$US our exports are again 5 per cent more competitive. On the other hand, a 5 per cent rise in the domestic price index (\( \varphi_A = 5.0 \)) with the nominal exchange rate and the foreign price index held constant (\( \varphi_{A/US} = \varphi_{US} = 0 \)) causes a 5 per cent appreciation of the real exchange rate (i.e., \( \varphi_R = -5.0 \)). This is because a given physical volume of Australian goods is now worth 5 per cent more in Australian dollars before conversion at the fixed nominal exchange rate, into U.S. dollars of fixed U.S. purchasing power. That is, in terms of \$US our exports are 5 per cent less competitive.

As an index of competitiveness, the CPI is not the appropriate deflator.

A given depreciation of the real exchange rate can be achieved in a number of ways, each of which can have different macroeconomic and sectoral effects. For example cuts in real absorption and in real wages both generate a depreciation of the real exchange rate; a cut in real absorption, however, causes a fall in aggregate employment, whereas a cut in the real wage rate has the opposite effect. An across-the-board tariff cut also generates a depreciation of the real exchange rate. However, such a cut causes a contraction in the manufacturing sector, whereas a cut in real absorption or in real wage rates causes an expansion. Therefore if a reduction in the real exchange rate is required to improve Australia’s competitiveness, then this should be achieved in a balanced way with due consideration of the employment and sectoral consequences.

Finally, as has been argued by Dixon and Johnson (1986), the real exchange rate is essentially an endogenous variable and therefore it is not legitimate to think of independent movements in the real exchange rate as determinants of trade performance. If we are really concerned with, say, the balance of trade or aggregate employment, then we should concentrate on the effects of domestic economic policies on these variables directly, rather than on the real exchange rate; see, for example, Higgs and Stonekel (1987).
The key features of the economic environment are:

3. The Assumed Economic Environment

The effect on the two determinants of the real exchange rate is different. It will be shown how changes in consumption patterns can have quite different

\[ V_1 = S_1 + Y_1 + G_1 \]

Without a change in Y or G, a change in consumption can have an impact on the real exchange rate. The CPI is increased here for this purpose. Consumption patterns are not the same as Y increases. The most striking example of this, and not surprising, is that the competitive position can influence the real exchange rate. Not surprising, the competitive position can influence the real exchange rate.

S. Conclusion

The importance of the trade deficit in a one-off jump in consumer surplus not necessarily production costs in fast fall activity. Hence, the second point is that we must understand, the impact of the tax is.

The second is the consumer price index (CPI), which requires a competitiveness test. While each country has its own price index (CPI), each country has its own competitiveness test. The tax is based on the real exchange rate. Not surprising, the competitiveness mix is the tax rate that is relevant to the measure mix. Two changes in the competitive position can make a difference in the tax rate.

When dealing with the CPI, it is the proportion of the CPI and of the real exchange rate that can be used as a guide to employment. The proportion to increase income taxes are very sensitive to those for the out of the 0.2% per year in a competitive test of the future of competitiveness.
is assumed that induced changes in the real exchange rate appear as changes in domestic relative to foreign price indices and not as changes in the nominal exchange rate. In all simulations the change in the nominal exchange rate was fixed exogenously at zero (i.e., $\Delta/\$ = 0$). It is also assumed that the domestic economic policies under consideration have a negligible effect on foreign price indices (i.e., $\$ = \$0$. Thus in the ORANI simulations, adjustments in the real exchange rate are reflected as adjustments in the relevant domestic price index. In other words, equations (2) and (3) reduce to the percentage change in the real exchange rate being equal to the negative of the percentage change in the nominal Australian wage rate and the negative of the percentage change in the Australian consumer price index, respectively. There are assumed to be no shortages of labour at the going real wage rates. Thus employment levels are demand determined. It is assumed that induced changes in national income appear as changes in the balance of trade and not as changes in real aggregate absorption (i.e., the real value of consumption plus investment plus government spending) which is set exogenously. Finally, plant and equipment in use in every industry do not change (from the levels they otherwise would have reached) due to the shock under analysis (i.e., industry capital stocks in use are exogenous). Note that the short-run time period simulated allows for revisions in all industries' investment plans, for orders for capital goods to be placed and met, and for the new plant and equipment to be installed (but not yet switched on). The length of the short run in ORANI has been estimated by Cooper (1983) as 7.9 quarters. In policy work 'about two years' is the appropriate level of precision for describing the ORANI 'short run'.

be expected to meet with compliance by organized labour. The outcome is also going to depend on the distribution of the compensating tax cuts between labour and capital income. Here it is assumed that only the effective tax rate on labour income is cut. Under the above conditions, the imposition of a consumption tax of 1.67 per cent would cause a one per cent depreciation in the real exchange rate (calculated using the nominal wage as a deflator).

A brief explanation of the above result is as follows. The government imposes a consumption tax of 1.67 per cent from which it collects revenue. When the tax is paid this causes a fall in real private absorption. The government then gives tax cuts on labour income to restore real private absorption to its original level. Next we note that the consumption tax is inflationary; therefore, under the conditions set out above, the nominal rate of take-home pay must increase by the percentage change in the CPI. This leads us to the key empirical question to be answered: will the real wage rate as a cost to employers increase or fall as a result of the tax package? In other words, how will the increase in take-home pay be funded? If the tax rate on labour income had remained unchanged then clearly the pre-tax wage rate would have to have increased to maintain the purchasing power of take-home pay. However, it turns out that the cut in the effective tax rate on labour income (of 7.42 per cent) is sufficiently large to permit a fall in the pre-tax nominal wage rate of one per cent while maintaining the purchasing power of the take-home component of that wage rate. Furthermore, since the consumption tax is not levied on inputs to production, the fall in pre-tax nominal wage rates induces a fall in producers' prices. The end result is that real wage rates as a cost to employers (defined using an index of producers' prices) fall by
The direct impact of a fall in interest rates on the real exchange rate is an increase in the price of foreign goods, which leads to an increase in the demand for foreign goods and a decrease in the supply of domestic goods. This results in a fall in the real exchange rate, which is the exchange rate adjusted for inflation. A fall in interest rates can also lead to an increase in investment, which stimulates economic growth and leads to an increase in the demand for domestic goods, resulting in a further decline in the real exchange rate. The results of this analysis support the belief that a fall in interest rates can lead to a decrease in the real exchange rate, which improves the competitiveness of the domestic economy.
<table>
<thead>
<tr>
<th>Variables</th>
<th>A Cut in Real Absorption(^a) of</th>
<th>An Across-the-Board Tariff Cut(^b) of</th>
<th>A Cut in the Real Wage Rate as a Cost to Employers of</th>
<th>The Imposition of a Consumption Tax of 1.67 per cent, Accompanied by Compensating Cut in Income Taxes(^c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Exchange Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Wage Deflators(^d)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>1.00</td>
<td>1.00</td>
<td>0.63</td>
<td>-1.06</td>
</tr>
<tr>
<td>Nominal Wage Rate as a Cost to Employers</td>
<td>-1.00</td>
<td>-1.00</td>
<td>-1.00</td>
<td>-1.00</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>-1.00</td>
<td>-1.00</td>
<td>-0.63</td>
<td>1.06</td>
</tr>
<tr>
<td>Aggregate Exports</td>
<td>1.10</td>
<td>1.12</td>
<td>0.88</td>
<td>0.89</td>
</tr>
<tr>
<td>(Foreign currency value)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Imports (Foreign currency value)</td>
<td>-0.85</td>
<td>0.66</td>
<td>-0.31</td>
<td>-0.32</td>
</tr>
<tr>
<td>Balance of Trade</td>
<td>0.55</td>
<td>0.14</td>
<td>0.33</td>
<td>0.33</td>
</tr>
<tr>
<td>Aggregate Employment(^e)</td>
<td>-0.09</td>
<td>0.12</td>
<td>0.32</td>
<td>0.33</td>
</tr>
<tr>
<td>Real Gross Domestic Product(^f)</td>
<td>-0.06</td>
<td>0.07</td>
<td>0.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Sectoral Outputs(^h)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>0.57</td>
<td>0.60</td>
<td>0.58</td>
<td>0.59</td>
</tr>
<tr>
<td>Mining</td>
<td>0.72</td>
<td>0.74</td>
<td>0.64</td>
<td>0.62</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.26</td>
<td>-0.12</td>
<td>0.47</td>
<td>0.48</td>
</tr>
<tr>
<td>Services</td>
<td>-0.26</td>
<td>0.05</td>
<td>0.11</td>
<td>0.11</td>
</tr>
</tbody>
</table>

\(^a\) All projections, with the exception of the balance of trade, are percentage deviations from the value the variable in question would have taken in about two years time in the absence of the shock at the head of the column. The balance of trade, while also a deviation from control, has the units billions of 1985-86 Australian dollars ($1 billion = $1000 million).

\(^b\) Absorption is defined as the sum of household consumption, investment and government spending.

\(^c\) Note that quantitative restrictions have been expressed in terms of tariff equivalents.

\(^d\) It is assumed that post-tax wage rates are maintained in real terms and that the direct tax cuts in effective tax rates on labour are calculated to hold constant real private disposable income.

\(^e\) See equation (3).

\(^f\) See equation (3).

\(^g\) Aggregate employment is calculated using person weights. The seasonally adjusted number of persons employed in June 1985 was 6,537,905; Australian Bureau of Statistics (1985). Therefore a fall of, say, 0.09 per cent is equivalent to a reduction in employment of 5,975 persons.

\(^h\) Real GDP has been calculated as a weighted sum of industry output responses using value-added weights.

\(^i\) In terms of the industries distinguished in the ORANI model the Agricultural sector consists of Industries 1 to 11, the Mining sector consists of Industries 12 to 17, the Manufacturing sector consists of Industries 18 to 83, and the Services sector consists of Industries 84 to 112. A mapping between the ORANI industries and the industrial classification as used in the ABS 1977-78 input-output table is contained in Higgins (1986).

The next domestic economic policy to be examined is a cut in the real wage rate. We need to distinguish between real wages as a cost to employers of labour, and real wages as take-home pay. The real wage as a cost to employers includes the gross wage, payroll taxes and other costs of employing labour deflated by an index of the general level of prices. For this simulation, the CPI will serve as a deflator.\(^g\) It can be seen from the table that a 0.37 per cent cut in the real wage rate as a cost to employers will cause a one per cent depreciation in the real exchange rate (calculated using the nominal wage as a deflator). Note that due to multiplier effects, for each one per cent the nominal wage