EXCHANGE RATE POLICY AND THE RESOURCES BOOM

W.M. Corden

Discussion Paper No. 23

March 1981

P.O. Box 4, Canberra 2600, Australia
EXCHANGE RATE POLICY AND THE RESOURCES BOOM

W.H. Corden

Discussion Paper No. 23

March 1981

ISBN: 0 949838 22 5
# Table of Contents

DISCUSSION PAPER NO. 23

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>I  The Four Policy Choices</td>
<td>2</td>
</tr>
<tr>
<td>II Adjustment Through Appreciation, Real and Nominal</td>
<td>4</td>
</tr>
<tr>
<td>The Investment Boom</td>
<td>4</td>
</tr>
<tr>
<td>The Export Boom</td>
<td>7</td>
</tr>
<tr>
<td>III Fixed Exchange Rate and Sterilisation: The Non-Adjustment Option</td>
<td>12</td>
</tr>
<tr>
<td>The Investment Boom</td>
<td>14</td>
</tr>
<tr>
<td>The Export Boom</td>
<td>16</td>
</tr>
<tr>
<td>IV Fixed Exchange Rate Without Sterilisation: The Inflationary Option</td>
<td>19</td>
</tr>
<tr>
<td>V  The Exchange Rate Regime: Flexible Peg versus Managed Floating</td>
<td>22</td>
</tr>
<tr>
<td>VI Adjustment with Lower - Or Higher - Protection?</td>
<td>26</td>
</tr>
<tr>
<td>Tariffs</td>
<td>27</td>
</tr>
<tr>
<td>Quotas</td>
<td>29</td>
</tr>
<tr>
<td>Income Effects</td>
<td>30</td>
</tr>
<tr>
<td>APPENDIX: Monetary Policy Implications of the Investment Boom</td>
<td>32</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>35</td>
</tr>
<tr>
<td>FIGURE 1</td>
<td>38</td>
</tr>
</tbody>
</table>
EXCHANGE RATE POLICY AND THE RESOURCES BOOM*

This paper aims to set out some of the issues for exchange rate policy posed by the prospective resources boom. It distinguishes between the investment boom - which has already started - and the export boom - which may start before the former boom has come to an end. It takes as given that the two booms will take place, and that the investment boom will be largely financed by foreign capital. It is concerned only with the adjustment of the economy to these two booms and does not touch on many other important policy issues that the resources boom raises. It has nothing to say on magnitudes [1].

* I am indebted to comments on an earlier draft from James Cassing, Ben Smith, Richard Snape, and various participants at an A.N.U. seminar.

1. The central issues of this paper are discussed in Gregory (1976), Snape (1977a, 1977b), Lindner (1978), Smith (1978), Porter (1978a), Stoeckel (1979), and Stone (1979). A convenient survey of all aspects of resources policy in Australia is in Harris (1980). Recent estimates of the likely extent of the investment boom are in Institute of Applied Economic and Social Research (1980, pp.11-12) and in Interdepartmental Committee (1980, Appendix A). Detailed export volume forecasts for minerals are in Bureau of Mineral Resources (1980). The fullest comprehensive estimates of the likely effects of the two booms on the balance of payments at a constant real exchange rate are in Department of Trade and Resources (1980). Information about bauxite, alumina and aluminium developments is in The Treasury (1981).
The Four Policy Choices

In outline, this paper is about the four policy choices that the Australian Government has to make in responding to the two booms. In each case there are not just the two extreme options to be listed here but various combinations in between.

First there is the adjustment choice: is there to be adjustment or non-adjustment to the boom? Non-adjustment means here building up foreign exchange reserves and thus trying to insulate the economy from the domestic impact of the boom. It is a politically tempting option. It would be done by maintaining a fixed exchange rate and sterilising the domestic monetary effects of the capital inflow or the export surplus. Its difficulties will be described later, and it will be shown that this option is likely to require exchange control.

Let us now assume that there is to be full adjustment; a second choice - the protection choice - has then to be made. Is the adjustment to be brought about by reducing tariff and quota protection or is it to be brought about by appreciation of the real exchange rate? Let us now assume, perhaps realistically, that protection is not changed significantly, so that the real exchange rate has to appreciate; a third choice - the inflation choice - then follows. Is the real exchange rate to appreciate by a rise in the average price-level of domestically-produced goods, with the nominal exchange
rate fixed, or is it to be brought about by a nominal appreciation with monetary policy holding the prices of domestically-produced goods constant? The first outcome would result from a fixed rate policy combined with non-sterilisation of the resultant monetary inflows; adjustment would then take place through temporary inflation. The alternative non-inflationary approach should be understood to mean that the prices of domestically-produced goods do not rise relative to the level they would have reached otherwise in any particular year.

Finally, let us assume that policy is so devised that the real exchange rate appreciates through nominal appreciation and not through an inflationary adjustment. There remains then the exchange rate system choice, namely whether the exchange rate system should be, as now, a "flexible peg", with explicit policy decisions being made to appreciate appropriately, or whether it should be a floating rate system, possibly with some intervention (i.e. a managed float).

I shall begin in section II with outlining the effects of the two booms when adjustment does take place and when it is by means of real appreciation and not by changes in protection levels. This is done briefly as the main ideas are by now well-known. At this stage it is assumed that adjustment is by nominal appreciation, not temporary inflation. Section III considers the non-adjustment option and section IV adjustment through temporary inflation. Section V looks at the exchange rate system choice. Up to this point it is assumed that protection levels stay constant. Finally, section VI deals with the implications of the resources boom for protection policy.
II

Adjustment through Appreciation, Real and Nominal

The Investment Boom

The investment boom involves (i) an inflow of foreign capital and (ii) increased investment spending. Assume that there is no intervention in the foreign exchange market so that the current account deficit must be equal to the capital account surplus. A current account deficit (or increase in the deficit) equal to the capital inflow for resource development has to be generated. If the whole of the extra investment spending went directly on imports (including any immediate servicing of the debt) this result would be automatic and require no relative price changes. We now assume, realistically, that a substantial part of the extra investment spending leads to extra demand for home-produced goods and services, and also that there was full employment of these resources initially. There must then be a rise in the prices of these goods and services relative to the Australian currency prices of imports, this being a real appreciation [2]. This real appreciation will increase the

2. A real appreciation can also be defined in other ways, in particular as a rise in the relative price of non-tradeables to tradeables. The present story could be told using this definition, in which case the two booms would still turn out to require real appreciation. It should be noted that in this paragraph the implicit model is one where import-competing goods are not perfect substitutes for imports. The underlying formal model distinguishes foreign-produced goods (imports) from home-produced goods, the latter including import-competing goods, exportables, and non-tradeables. In the next paragraph emphasis is put on the distinction between the first two types of home-produced goods (tradeables) on the one hand and non-tradeables on the other.
demand for imports so as to generate the required current account
deficit. At the same time it will reduce the demand for home-produced
products to the level of total supply available.

Within the total category of home-produced goods and services,
prices of import-competing goods and of exportables (i.e. of
tradeables) will fall relative to prices of non-tradeables. The
adverse effect on the former is akin to the notorious "Gregory
effect", called in Britain the "Dutch disease" [3]. There will be two
structural effects on the pattern of domestic output. First, the
output pattern will shift at least marginally from consumption goods
and services to investment goods and activities. Secondly, it will
switch somewhat from tradeables to non-tradeables. These two shifts
may have further effects on the regional and skill patterns of the
demand for labour, on demands for public infrastructure, on relative
profitability, on share prices, and so on [4].

3. See Gregory (1976) and Snape (1977a) on the "Gregory effect" and
Forsyth and Kay (1980) and Corden (1981) on the "Dutch disease". I
have said "akin" here because normally the "Gregory effect" and the
"Dutch disease" refer not to the investment boom, but to the export
boom, to which I come below.

4. Effects on the demand for skilled labour in relation to prospective
supply are discussed in Institute of Applied Economic and Social
The assumption of a floating exchange rate without any intervention means that there are no automatic domestic monetary consequences of the capital inflow. Monetary effects depend on the particular monetary policy the authorities choose to pursue. A reasonable assumption is that they aim to keep the average price-level of home-produced goods and services constant [3]. This can be called the "non-inflationary option" and must be thought of as superimposed on a given initial rate of inflation and monetary expansion. In that case a nominal appreciation would have to yield the required real appreciation. Alternatively, the "non-inflationary option" might be described as a policy aimed to keep the average domestic price-level constant. Given that the relative domestic prices of imports have to fall, this would involve some rise in the average price-level of home-produced goods and services (again, relative to the increase that would have taken place in any case). There would still have to be a nominal appreciation, though somewhat less than in the previous case.

5. The monetary policy implications of such an objective are analysed in more detail in the Appendix.
The Export Boom

Let us now turn to the export boom which will build up more slowly than the investment boom, be less dramatic in its effects, but also more long-lasting. The story is very similar here. At a given real exchange rate (i) exports rise, so that the current account goes into surplus on that account, and (ii) some of the extra export income is spent on imports and exportables, thus moderating the surplus. But provided part of the extra spending goes on home-produced goods and services a current account surplus remains, and so a real appreciation is required. Extra spending includes government spending out of higher company tax revenue and royalties and extra private spending resulting from income tax remissions made possible by greater company tax income. The remittance of profits abroad by foreign companies has the same effect as spending on extra imports.

Some of the higher income may be used to buy Australian bonds and equities from foreigners ("buy back the farm") and to buy foreign bonds and equities. This will moderate the real appreciation required. There will be some capital outflow because of this. As the export boom gradually dominates the investment boom net capital inflow may turn into net capital outflow.

Both the investment boom and the export boom lead to a movement of resources out of non-mining tradeables into non-tradeables, induced by the reduced relative profitability of the former. The greater the increased demand for non-tradeables at the initial real exchange rate, the greater the required real appreciation. The resultant decline in
non-mining tradeables is the Gregory effect or Dutch disease. In
addition, in the case of the export boom (though not the investment
boom) some resource movement will be induced into mining out of both
other sectors [5]. The movement from non-mining tradeables into
mining will directly strengthen the adverse impact on the non-mining
tradeables sector (this effect not acting through a real
appreciation). The movement from non-tradeables into mining will
increase the excess demand for non-tradeables at the initial real
exchange rate and so increase the required real appreciation. It also
means that finally the output of non-tradeables could contract, though
in practice this is rather unlikely [7].

As has been widely pointed out, a stress on the adverse Gregory
effect of a real appreciation has to be qualified. Firstly, the two
booms may well not have adverse effects on the manufacturing sector as
a whole. A considerable part of that sector produces goods that are

6. The term "mining" is meant to include here and throughout the paper
the processing of minerals, notably alumina and aluminium smelting.

7. This simple exposition rests on a three-good model (mining, non-mining
tradeables and non-tradeables) where there is a specific factor in
each sector and one factor mobile between all three sectors. A real
appreciation refers here to a rise in the relative price of
non-tradeables to non-mining tradeables. See Snape (1977a) for a more
rigorous analysis, and also Gorden (1978). More complicated models
can be constructed, and it is quite conceivable that parts of the
non-mining tradeables sector expand even though the sector as a whole
contracts.
closer to being non-tradeables than tradeables. Furthermore, manufacturers are heavy users of imported inputs, and may benefit more from the fall in relative prices of inputs owing to appreciation than they lose from a possible squeeze on their own ex-factory prices. Presumably particular sectors that closely compete with imports would lose, but empirical work suggests that the sector as a whole could even be a net gainer [8]. The real losers will be the agricultural exporters [9]. With imported inputs relatively less important, with the non-tradeable element smaller, and with the domestic demand for their products inelastic, the combination of real appreciation and rise in domestic demand seems certain to produce, on balance, an adverse effect.

Secondly, the export boom should raise the total real incomes of Australians mainly through the tax gain. The resident population as a whole (which includes those who are adversely affected by the Gregory effect) will become richer owing to the extra tax revenue, the royalties, and the net increase in producers' surplus to local labour and capital resulting from the increased demand for their services. This must be set against the costs of public subsidisation of extra infrastructure, of cheap electricity supply, of counteracting adverse environmental effects, and so on. Since the tax gain should be large

8. Dixon et al. (1979, pp.53-65), Pope (1980). It should be added that the manufacturing sector may gain not only from the reduced cost of imported inputs but also from the lower costs of exportable inputs, i.e. coal, steel, etc.

a net gain seems likely. Much will hinge on taxation arrangements since it is above all through tax collections that the Australian people should gain [10][11].

10. The tax issues are crucial, as pointed out in Inter-Departmental Committee (1980, p.23). Information on taxation of mining is in Fitzgerald (1974), Industries Assistance Commission (1976), The Treasury (1981), and Smith (ed.) (1979), the latter conveniently covering all the main issues and arguments and referring to a large literature. On the resource rent question, see Garnaut and Glumies Ross (1975, 1979). Some of the potential national gains are in process of being dissipated by State Governments’ subsidisation of aluminium smelting through the provision of excessively cheap electricity. What governments gain on the one hand from higher tax revenues they may throw away on the other by making inefficient use of their investment funds and by failing to sell the coal their own mines produce to the highest-paying markets. Insofar as aluminium developments and thus electricity use for aluminium smelting would be much the same even if electricity were appropriately priced, a present is simply being made to various companies, some of which may, of course, come back to governments through higher company tax revenue. See The Treasury (1981) and Swan (1981).

11. There are, of course, ways other than through the tax system in which Australians may gain, notably through higher real wages (or a higher level of employment if wages are not flexible) for particular kinds of workers and higher profits in industries supplying materials for the mining industry. Land values will rise in some parts of the country. Migration could, conceivably, moderate some of the real wage effects by overcoming short-term skilled labour shortages. There are complex general equilibrium repercussions which might scatter marginal changes in factor incomes, both increases and decreases, through the community. My guess, nevertheless, is that the principal gains to Australian residents - or at least potential gains - are likely to come through direct and indirect tax collections.
The effects of exchange rate expectations on the actual movement of the exchange rate in a free-floating system should be noted at this point. In advance of the actual export boom itself nominal appreciation may come to be expected because of the expected boom. The same applies to the investment boom that is immediately in prospect. This will lead to incipient capital inflows that appreciate the exchange rate. In the short-run there may be little or no resource allocation effects and no significant effects on the current account, so that there will be no actual change in net capital flows (though the precise effects depend on how monetary policy reacts). But there will be large redistributive effects, relative prices signalling well in advance the eventual resource movements that will be required.

There are two difficulties about this process. Firstly, the appreciation can be quite sudden, more sudden than the underlying boom the expectation of which gives rise to the appreciation. The domestic redistributive effects of the boom come thus in advance of the boom itself, and can have sudden adverse effects on the tradeables sector—a phenomenon currently to be observed in Britain where the recent appreciation of sterling is to be explained in part by the expectations generated by North Sea oil development and by the possibility of a further rise in the world oil price. The second difficulty is that short-term intersectoral labour immobility combined with downward rigidity of real wages would cause a severe sudden real appreciation to lead to reduced employment in non-mining tradeables not offset by increased employment in non-tradeables. Hence total
employment would fall. It follows that some "leaning against the wind" intervention in the foreign exchange market will be appropriate in response to sudden expectations-determined appreciation, the aim being to moderate rather than avoid the required changes. A policy of this kind may, of course, easily slide into the next option— the "non-adjustment option"— to which I now turn.

III

**Fixed Exchange Rate and Sterilisation:**

*The Non-Adjustment Option*

The authorities might seek to avoid the Gregory effect. The mechanism would be to intervene in the foreign exchange market to prevent nominal appreciation, and then to sterilise the domestic monetary effects of the resultant overall surplus. Foreign exchange reserves would be built up. This will be called here the non-adjustment option. A policy of this kind is very tempting to politicians. When exchange rate policy is motivated by a desire to protect tradeable goods producers—there being more real depreciation or less real appreciation than a free market would yield—the policy can be described as "exchange rate protection" [12]. Strictly, any

nominal exchange rate adjustment required to compensate for the
difference between the foreign and the initial domestic rate of
inflation can still be allowed; the issue here is whether the nominal
rate should be allowed to appreciate relative to this reference point.

Before discussing whether the non-adjustment option is either
desirable or feasible, it should be noted that it would not really
avoid structural and income distribution changes. While it would
avoid those changes that go with a real appreciation, the pattern of
demand for resources would still change. Consider first the
investment boom. There would still be an increase in mining
investment financed by foreign capital inflow, with all the demands
this makes on domestic resources. At the same time there would be a
reduction in demand from other sources resulting from the contraction
of domestic credit to the private sector or from the reduced budget
deficit required by the sterilisation policy. Thus investment in
private housing, in consumer durables and in manufacturing (other than
that closely related to mining investment) would decline, being in
fact crowded-out by mining investment. If credit to the public sector
is reduced by reduction in the budget deficit, public expenditure
might decline. The same sort of argument applies to the export boom.
Spending by the beneficiaries from the extra income would increase,
while spending by those sections of the community adversely affected
by credit contraction would be crowded-out.
Let us now consider the desirability and feasibility of the non-adjustment option, looking at each of the two booms separately.

The Investment Boom

The case for non-adjustment is that the boom may be large but short-lived. The real appreciation which it would produce in the absence of intervention would thus only be temporary. Intervention might be regarded as a medium-term smoothing operation. Against this there are two points. (1) If it were widely expected that the exchange rate would only appreciate temporarily in the absence of intervention — moving back again later — speculative capital movements would also bring about this smoothing. It would be profitable for the private sector to stabilise the rate. (2) The case for accumulation of foreign exchange reserves other than protection of tradeable goods industries is weak. While the period during which the reserves increase would be temporary, the level of reserves would be permanently higher as a result. It is not self-evident that Australia should join OPEC as a large official lender of short-term funds abroad.

Given that the non-adjustment option is chosen nevertheless, there remain three major difficulties, which explain why full sterilisation in such situations tends to break down in time.
(1) Sterilisation requires credit contraction and thus an increase in interest rates, or alternatively a reduction in the budget deficit. These measures have adverse effects on some sectors of the community. In order to avoid the adverse sectoral effects of a real appreciation, other adverse sectoral effects are thus required. There is a clash of interest groups, though sometimes the identical firms may benefit from prevention of real appreciation while losing from the associated credit contraction. If the budget deficit is to be reduced so as to avoid a rise in interest rates, and this is to be brought about by a reduction in public expenditure rather than by an increase in taxes, it has to be remembered that public investment complementary with private investment for mining development will increase substantially so that the squeeze on the rest of the public sector would have to be all the greater.

(2) The higher interest rate would stimulate capital inflow (above the inflow which finances the mining investment). This would increase the need for sterilisation and make the control of the money supply more difficult. It is well-known that in the limiting case of perfect capital mobility it is not possible to control the money supply while at the same time keeping the exchange rate fixed. Of course, the perfect-capital-mobility model is not the appropriate one for Australia, but it highlights the nature of the problem.

(3) As the reserves accumulated, appreciation would be expected. This expectation effect would generate further (and on past experience, massive) capital inflows, as we well know from the
experience of 1971-72 [13].

The only way to deal with problems (2) and (3) is with exchange control. Thus choice of the non-adjustment option involves inevitably heavy reliance on exchange control. I shall not pursue the implications of this here, except to note my impression that exchange control has generally been found to be partially effective, and could make the non-adjustment option feasible in Australia for some time, provided problem (1) can be faced. Of course, controls inevitably set up tensions and distortions, and are costly to administer when there are strong pressures for capital inflows.

The Export Boom

It is hard to make a case for the non-adjustment option when the boom is expected to be long-lived. The medium-term smoothing argument does not apply, and there is little point in continually accumulating foreign exchange reserves over a long period - in fact, transforming assets in the ground into officially-owned short-term financial claims abroad [14].


14. The portfolio choice is between keeping assets in the ground, building up new assets in Australia or accumulating financial claims abroad. The new Australian assets could be public or private, and they could take the form of real assets (infrastructure, fixed capital equipment etc.) or human capital. The financial claims on foreigners could be short-term or long-term and either publicly or privately-held. Foreign exchange is a special case of publicly-owned short-term claims. Optimal depletion theory is concerned with the choice between assets in the ground and all other assets, usually thought of as yielding a uniform rate of return discounted for risk. See Hotelling (1931), Solow (1974) and Dasgupta and Heal (1979). It cannot be completely ruled out that some asset transformation at the margin from mine-site-in-the-ground to foreign exchange (or repayment of official debt) would be part of an optimal portfolio policy. This paper is not concerned with these fundamental issues.
Given that the option is chosen nevertheless, would it be harder or easier than in the case of the investment boom? (1) On the one hand it would be harder because the market would recognise the long-term nature of the boom and expect appreciation. Speculative inflows would be more and more difficult to keep out by controls and the monetary effects of inflows would become more and more difficult to sterilise. (2) In another respect sterilisation might be easier. A large part of the gain from the export boom would (or should) go to the government in higher tax revenues [15]. It is open to the government not to spend any of this, nor to reduce other taxes, but rather to generate a budget surplus or reduced deficit. This would make it possible to sterilise a large part of the monetary inflows without the need to raise interest rates. The government would redeem debt, and, when one day all its debt is redeemed, it could either accumulate foreign securities directly or build up balances with the Reserve Bank, while the Bank held the foreign securities.

There are two alternative uses of the extra tax revenues. Suppose, as a limiting case, that all the higher income from the export boom went to the government, one way or another, and that this

15. How much of the gains end up in tax revenue is a complex matter. See the references in footnote 9, and particularly The Treasury (1981). Much depends on investment allowances, the vigilance of the taxation authorities to avoidance devices, and so on, quite apart from formal tax and royalty rates. At present the willingness or ability of the Australian Government to collect taxes adequately from persons or entities other than wage and salary-earners must be somewhat in doubt.
revenue were spent directly in ways that used up foreign exchange, with no extra calls on domestic resources. This is an extreme case, but the general argument is still relevant if a large part, though not the whole, of the income goes to the government and if, in turn, a large part of its extra funds are used in the ways indicated. For example, the revenue might be spent on foreign aid or on imported military equipment. In this case the tendency for the exchange rate to appreciate in the absence of intervention in the foreign exchange market would be avoided since extra supply of foreign exchange from the export boom would be matched by extra demand from the government. There would be no need for intervention in the market to protect tradeable goods producers. This may be seen as a desirable policy by those interests concerned with the possible Gregory effect who would otherwise advocate exchange rate protection. But the question then arises whether the Australian community wishes to spend its extra income in these particular ways.

The other alternative is to use the government's extra resources not to prevent adjustment by financing additional foreign exchange reserves nor by focussing extra spending on imports or overseas transfers, but rather to foster adjustment and to compensate for its costs. Retraining schemes, employment subsidies and compensation to adversely affected States or regions can be financed. Furthermore, workers and shareholders whose pre-tax real incomes fall as a result of the real appreciation may nevertheless end up with higher post-tax incomes if the revenues from the export boom make possible reductions in income or company tax rates. In addition, there may be gains in
inflation) when only a once-for-all price adjustment in relation to the rest of the world is required, policy-makers may be unwise to rely on the rationality of expectations. A policy of nominal appreciation seems preferable. Yet the country may stumble into the inflationary option through two mechanisms, possibly operating simultaneously.

Firstly, the intention of the politicians may be to choose the non-adjustment option in order to shelter tradeable goods producers. The authorities may not aim to prevent appreciation altogether but may intervene in the foreign exchange market so as to moderate it. Their aim, of course, is to moderate real appreciation, not just nominal appreciation. Thus the intention is also to sterilise the monetary consequences. Temporarily they may succeed in doing so, at least to some extent. But eventually sterilisation will break down for reasons discussed earlier [17]. There will then be a real appreciation, so that the protection of tradeable goods producers will only have been temporary. Eventually their costs rise owing to the inflationary adjustment while their sales prices are held down by the fixed exchange rate.

The policy of intervention in the foreign exchange market to moderate appreciation associated with partial and temporary sterilisation has thus, from the point of view of policy-makers, a cost and a benefit. The cost is the risk of rekindling inflationary expectations. The benefit is temporary exchange rate protection with its political rewards. The national cost-benefit calculus may, of

17. This is the story of 1971-72. See the references in footnote 13.
course, differ from the political one.

Secondly, the nation may stumble into the inflationary option through wage inflation stimulated as a direct result of either of the two booms. In the case of the investment boom this may be caused by excess demand for particular types of skilled labour putting more upward pressure on the average wage-level than excess supply of unskilled labour exerts downward pressure. The asymmetrical process by which changes in relative demands for labour push up the average wage-level is well-known. In the case of the export boom wages may increase because of the view that such national gains should be broadly spread across the community, and that the traditional mechanism for achieving this is through nominal wage increases, possibly obtained at National Wage cases. It is in the interests of trade union leaders, though not necessarily their members, that the gains should be seen to come through hard-fought-for nominal wage increases rather than through the moderation of price inflation resulting from appreciation of the exchange rate [18].

Given higher wage inflation, extra monetary expansion then becomes necessary if unemployment is not to result. This extra monetary expansion could be brought about by non-sterilisation of monetary inflows resulting from the fixed exchange rate policy, though it is also possible to conceive of a deliberate monetary expansion which, to some extent, anticipates the export boom and so avoids the

18. In any case, as pointed out earlier, the main gains are likely to come through increased tax collections, not higher pre-tax real wages.
The present Australian exchange rate system can be described as a flexible peg. The authorities peg the value of the Australian dollar in relation to a trade-weighted basket of foreign currencies. They continually review and frequently change the peg, but only by small amounts at a time. To some extent they change the peg in line with their assessment of market conditions [19]. This system has to be viewed in the perspective of a continuum of four possible systems. At one end is the par value system: the authorities firmly commit themselves to a particular rate; changes in the rate are usually large and result from major policy decisions, unless forced by

speculative crises. The bias is to keep the rate fixed as long as possible. Next in the continuum is the flexible peg: the authorities still fix a rate and intervene in the market to maintain it, but there is not a commitment to a particular rate as with the par value system, the peg being frequently changed. Third in line is the system of managed floating: the rate is determined in the market and can change continuously; the authorities do not peg it, but intervene at times to influence it. One possible choice is to peg it for a period. Finally there is the pure float, when the rate is wholly market-determined.

A return to a par value system is out of the question for Australia. The system has led to speculative crises, to unnecessary profits for speculators, and to large dislocating jumps in the rate. In addition, it is not sensible for Australia to fix its dollar to a particular currency, such as the U.S. dollar or the yen, because trade and capital movements are not sufficiently concentrated on dealings in one currency — as they were many years ago in relation to sterling. Fixing the rate firmly in relation to a basket of currencies does not have the same value in creating certainty in international trade nor in imposing a discipline on the labour market as when the rate is fixed to one well-known and widely-used currency.

Similarly, it is out of the question that the authorities commit themselves never to interfere in the market, not even to prevent "disorderly conditions" or to engage in a little short-term exchange rate protection by moderating a sudden tendency to appreciation.
("leaning against the wind"). All countries - even the United States since 1978 - intervene at least to some extent. Thus the practical choice is between the present flexible peg system and managed floating. A current Australian policy issue is whether there should be a shift to the latter.

The two systems appear to be very similar. Under both systems it would be possible to pursue any of the policies discussed earlier. Both allow for the possibility of fixing the nominal rate in relation to a basket or to any particular currency for long periods, and both also allow for rapid appreciation in response to changing market conditions. The question is whether there is any significant difference between them.

With the present system of the flexible peg the policy-makers fix a price (the exchange rate) and any sudden shocks are absorbed by quantity changes (in foreign exchange). Policy initiatives are required to change the price. By contrast, with managed floating the policy-makers fix the quantity and any sudden shocks are absorbed by price changes. Thus "doing nothing" with the present system means keeping the exchange rate fixed while with managed floating it means not intervening, and so keeping the reserves fixed.

The two systems may thus lead to different results when policy initiatives require a political input. It may be safely assumed that Australian politicians incline to exchange rate protection. Suppose then that there is a sudden inflow of capital. In the present system the public servants administering the peg will require political
approval for a substantial change in the peg in line with market conditions. The tendency will be for the exchange rate to lag behind market forces, with politicians holding back the appreciation. By contrast, with managed floating market forces will have an opportunity to express themselves. Of course the authorities could still intervene sufficiently to yield the same result as in the flexible peg case. But with managed floating intervention requires initiative, and political approval is not needed to allow the rate to rise. If the system were so operated that such approval were needed – so that any change in the rate were inevitably delayed – the system would have to be described as a flexible peg system.

In recent years there have not been strong and sudden pressures in the foreign exchange market. It has hardly mattered whether a flexible peg or a managed float was being operated. But if capital inflow builds up rapidly, perhaps encouraged by expectations of appreciation, the distinction between the two systems might turn out to be crucial. A flexible peg system might lead to adjustment mainly through inflation (assuming failure to sterilise the monetary inflows sufficiently), and insofar as the exchange rate is eventually allowed to appreciate sufficiently, it would lead to a transfer of income from the Reserve Bank to speculators. By contrast, a managed float would be more likely to lead to adjustment through nominal appreciation [20].

20. The argument in favour of the present system is put in The Treasury (1979). The issues are discussed in Porter (1978b) and in Sloper and Fane (1980).
VI

Adjustment with Lower - or Higher - Protection?

It has been assumed so far that, if adjustment is to take place, it must be brought about by real appreciation. But an alternative would be a reduction in protection [21]. As this could, in practice, only be brought about gradually, it seems a more relevant option for the long-lived export boom than for the briefer investment boom. The further alternative of raising protection in order to avoid adverse effects on import-competing industries must also be considered here.

To analyse this issue I shall start with two propositions. (1) Most or all of the textbook arguments for protection do not apply to present-day Australia, so that protection imposes the familiar distortion (Pareto-efficiency) cost. From a social efficiency point of view there is thus always a case for reducing or getting rid of protection. (2) We still have protection in spite of the distortion cost because reducing or even eliminating protection would have adverse effects on some sections of the community for which they could be compensated out of the gains to others, but for which they do not

21. This has been suggested in a well-known paper by the Secretary of the Treasury, See Stone (1979). His main point is that, if output of the import-competing sector is to decline, at least in relation to GNP, it is more sensible that the less economic activities bear the impact. But he does not rule out some real appreciation as well.
actually expect adequate compensation to take place.

The question then arises whether the resources boom alters these considerations. (1) Is the case for reducing protection on resource misallocation (Pareto-efficiency) grounds strengthened - i.e. does the production distortion cost become even greater? (2) Would the adverse effects of reducing protection on particular sectors become less? I shall consider each of these questions first for tariff protection and then for quota protection.

Tariffs

Assume to begin with that all protection is by ad valorem tariffs, and that these are given. There appears to be no general presumption that the production distortion cost would rise or fall as a result of the resources boom, though the matter would lend itself to more rigorous analysis. It should be noted that the distortion cost refers to distortion within the tradeables sector. If there is little net inflow of domestic resources into mining, the principal resource movement should be out of non-mining tradeables into non-tradeables. If, in addition, there is no reason to expect any change in the distortion cost within non-mining tradeables resulting from the given tariff system it follows that the distortion cost as a proportion of GNP would actually fall as a result of the resources boom.

Turning next to the question of the adverse effects on particular sectors, the starting point must be the proposition that a real appreciation would have adverse effects both on the protected sector
and on the non-protected sector within the tradeables category as a whole. We can then consider two policies designed to moderate or avoid adverse effects on one sector or the other. (1) If the whole of the required adjustment were brought about by reduction of protection, the adverse effects on the protected industries would be even greater while the non-protected industries would actually gain. Thus there is some combination of real appreciation and reduction of tariff protection which would, broadly, leave the profitability of the non-protected industries unchanged and confine the adverse effects to the protected industries. (2) If protection were actually increased sufficiently it would be possible to avoid adverse effects for the protected industries. This could be done by combining real appreciation with an increase in tariff protection - the latter compensating these industries for the losses of the appreciation. Suggestions of a policy of this kind are sometimes made, but it has to be pointed out that the adverse effects on non-protected industries would be even greater than if there were a real appreciation on its own. The key point is that any gains (or reduced losses) for the protected industries are always obtained at the cost of the non-protected industries, and vice versa. There seems no general argument in favour of focussing the losses imposed on the non-mining tradeables sector as a whole more on one part of it rather than another, and in particular in trying to shelter completely one part at the cost of increasing the adverse effect on the other part.
Quotas

Assume now that a part of the tradeables sector is protected by fixed import quotas and that tariffs are kept unchanged [22]. A real appreciation cannot lead to any increase in imports subject to quotas; the balance of payments must then be equilibrated by a greater rise in other imports, whether competing with tariff-protected or with non-protected industries, and by a greater fall in non-mining exports. Thus the real appreciation must be greater than if there were no quotas. This has two implications. (1) The distortion cost is likely to increase because the implicit rate of protection of quota-protected industries will rise when the exchange rate appreciates. (The implicit rate is that rate of tariff protection that would have the same effect as the quota on the quantity of imports). (2) The whole of the adverse effects of a real appreciation on profitability and employment within tradeables will be concentrated on non-quota industries.

The case seems clear for abolishing quotas, and replacing them with tariffs, as the resources boom gets under way. Alternatively the quotas might be appropriately enlarged. There can surely be little argument for actually allowing by default a rise in implicit rates of

22. In 1977-78 about two per cent of manufacturing production (principally textiles, clothing, footwear and motor vehicles and parts) was protected by quotas, these also being the sectors with the highest levels of effective protection (Industries Assistance Commission, 1980).
protection as a result of the resources boom - unless it is a political argument resting on the greater strength and effectiveness of the interests benefiting from quota protection than of the exporting and other import-competing interests, including those benefiting from tariff protection [23].

Income Effects

The export boom will make the nation wealthier, and a substantial part of the extra wealth should end up in the public coffers. This could also be relevant for protection policy. On the one hand it could be argued that protection is a luxury: it is a consequence of our pressure-group dominated political system which a rich nation can afford more than a poor one. The richer the nation is the more it can bear the economic costs of political inefficiency, and hence the readier it should be to live with protection. On the other hand - and more convincingly - it can be argued that the reduction of protection is a social investment, involving a short-term cost and a long-term benefit. The short-term cost consists of the adjustment cost and of the adverse effects on particular sectors, including possible employment effects. These can be easily overcome by various forms of publicly financed temporary subsidies and aids, and the export boom

23. This provides one rationale for the suggestion in Stone (1979) that protection should be reduced because of the resources boom, the argument thus having to apply specifically to quota-protected industries.
will make these easier to finance. In other words, a richer nation can afford many kinds of investment, including investment in improving the long-term efficiency of the economy.
APPENDIX

Monetary Policy Implications of the Investment Boom

The exchange rate floats. Monetary policy is designed to keep demand for home-produced goods and services constant so that their average price-level stays constant. Figure I is the LM/IS diagram, with real expenditure along the horizontal axis. Inflationary expectations are assumed zero, so that the nominal interest rate equals the real rate. The demand for money is assumed to depend on expenditure, not income. Since the investment boom will generate a current account deficit (or a greater deficit than before), expenditure will exceed income, so that the distinction between expenditure and income is important.

Initially the interest rate is \( r_0 \) and expenditure is \( Y_1 \). The extra investment spending, whether financed abroad or domestically, shifts the IS curve from \( IS_1 \) to \( IS_2 \), bringing total expenditure at the initial interest rate to \( Y_2 \). Assume that capital inflow to finance this investment is \( Y_1 Y_3 \). Thus it is assumed here that not all the extra investment is foreign-financed. The exchange rate is assumed to float, so that the current account deficit (or increase in the deficit) must be equal to the extra capital inflow. It will also be assumed for the moment that the increase in capital inflow is given,
not varying with the interest rate.

In the final equilibrium income should stay constant, since the demand for home-produced goods and services is to stay constant. Monetary policy is assumed to bring about this result. It follows that, finally, expenditure should rise to $Y_3$, yielding an increase in the current account deficit equal to the capital inflow. Since $Y_3$ is less than $Y_2$ this requires the interest rate to rise to $r_1$, which ensures that some investment is crowded out to keep expenditure down to the required level. The new equilibrium is at point A and would be achieved by an appropriate change in the real money supply. In the diagram A is to the right of B, so that the real money supply needs to increase. But it could be to the left of A, in which case the real money supply would need to fall.

Since the appreciation will lower the Australian currency prices of imports the average price-level will fall (the average price-level of home-produced goods being constant). Thus a given nominal money supply will yield a higher real money supply. This automatic increase may or may not be sufficient to bring about the required rise in the real money supply to point A, so that the nominal money supply might need to rise, fall or stay constant.

If the assumption that capital flows are interest-elastic is removed, allowance must be made for the fact that the higher interest rate will increase capital inflow. The increase in expenditure and in the real money supply can then be greater, and the rise in the interest rate less, the system settling at some point between A and C.
Finally, to repeat, all this must be superimposed on an initial
and given rate of price increase and rate of monetary expansion.
REFERENCES


Corden, W.M. (1978), 'Exchange Rate Protection', Working Paper No.60, April, Department of Economics, RSSS, Australian National University (to be published).


Harris, S. (1980), 'Resources Policies in Australia', Resources Policy, June, 179-91.


Reserve Bank of Australia (1979), Submission to the Committee of Inquiry into the Australian Financial System, Occasional Paper No.7, Sydney, December.


Smith, B. (ed) (1979), Taxation of the Mining Industry: Papers presented to a Workshop on Mining Industry Taxation, Centre for Resource and Environmental Studies, Australian National University, Canberra.


The Treasury (1979), Foreign Exchange Arrangements, Submission to the Committee of Inquiry into the Australian Financial System, Treasury Paper No. 4, Canberra, December.

The Treasury (1981), The Development of the Bauxite, Alumina and Aluminium Industries, Submission to the Senate Standing Committee on National Resources, Canberra, February.
Figure 1