DISCUSSION PAPERS

TRADEABLE GOODS PRICES, INFLATION AND THE MONEY SUPPLY IN AUSTRALIA

J.D. Pitchford

Discussion Paper No. 35

September 1981

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ABSTRACT

Given the substantial rises in traded goods prices which have occurred in Australia since the early 1970's it is somewhat surprising that there is so little discussion of these movements in relation to policy on inflation, unemployment and the exchange rate. The paper uses the traded/non-traded goods model (drawing on Long and Pitchford [1981]) to formulate appropriate policy responses to various external stimuli. This analytical framework is then used to structure discussion of Australian macro-economic experience and policy in the 1970's. Econometric tests suggest that a significant portion of fluctuations in the unemployment rate can be explained by real wage movements, and as well monetary policy through its effects on the real money supply also seems to affect unemployment. Both real wage rises and monetary restrictions appear to have contributed to the jump in unemployment in 1974-5, and since then the continuing high and rising unemployment rate is closely associated with the low growth rate of the real money supply.

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"But money has one feature that these other machines do not share. Because it is so pervasive, when it gets out of order, it throws a monkey wrench into the operation of all other machines. The Great Contraction is the most dramatic example but not the only one. Every other major contraction in this country has been either produced by monetary disorder or greatly exacerbated by monetary disorder." Milton Friedman [1968, p.12]

In December 1969 the unemployment rate in Australia was 1.4% and the consumer price index rose by 3.7% in the financial year 1969-70. A decade later the figures were 6.6% for unemployment and 11.3% for the inflation rate. The 1969-70 experience was typical of what had happened during the sixties, while the 1979-80 figures are in line with those of the second half of the 1970’s. The growth performance of the economy (graph 3) follows the same general pattern. Through the 60’s and early 70’s the annual growth rate of non-farm real GDP was of the order of 4-5%. Since 1974-5 it has averaged around 2%. Much of the rise in unemployment occurred during 1974. This drastic change in the performance of the economy invites explanation. What may have caused the rise in unemployment in 1974, and why has unemployment stayed high and even risen since then? Why has the rate of inflation been so much higher than in the early years of the decade? One hypothesis on unemployment which has a number of adherents is that its jump and subsequent high level is accounted for by the jump in 1974 and subsequent high level of real wages. With respect to the higher inflation, many would attribute its beginning to the monetary and perhaps fiscal expansion of 1972/3 coupled with the failure to appreciate the exchange rate early in the export boom of that time. In the latter part of the 1970’s the problems associated with financing the large fiscal deficits of that period, combined with the build up of inflationary expectations have been blamed for the higher rate of inflation.

The attached graphs illustrate the behaviour of some key series. It is clear that the change in unemployment experience came exceedingly rapidly with a rise of three percentage points between the August and November values in
1974 (graphs 1 and 2). The inflation rate built up more slowly during 1972 and 1973 (graph 4), its increase preceding that of the unemployment rate. Both real wage rates and real earnings jumped in 1974 and 1975 and have been comparatively stable since then (graph 7 and 8).

Yet in the aggregative data presented there is another factor which gets scant attention in discussion of unemployment and inflation, but which certainly merits further examination. This is the rapid rise in tradable goods prices (graphs 5 and 6) which began in the early part of the decade and has continued since then. Apart from the wool boom period of the 1950's there have been no price increases of similar magnitude since the early post war years.

The price indexes of imports and exports are constructed to reflect Australian currency prices, so already include the impact of exchange rate changes. It is generally agreed that domestic conditions in Australia have little or no effect in determining the prices of many of our traded products. Given exchange rate movements, the price rises shown constitute an element of inflation which domestic policies were powerless to influence. There is little doubt, perhaps general agreement, that Australian inflation in the 1970's was partly imported. I take it that this is not at issue. This paper advances the additional hypothesis that the policy responses in an attempt to control the domestic inflation rate contributed to the change in the performance of the economy with respect to both inflation and unemployment. It is not contended that this hypothesis replaces that based on real wage experience, but rather that it should be regarded as an additional part of the explanation.

Section I contains theoretical analysis meant to illuminate monetary, exchange rate and price behaviour issues in a small open economy. With some help from this theory the discussion of section II attempts to trace the performance of the economy in such a way as to reveal the possible outcome of
the stance of monetary policy in a context of rapid rises in tradeable goods prices. Section III discusses tests relating to the questions raised in section II. It is concluded that it is not possible to reject the hypothesis of a relationship between changes in unemployment and previous changes in both real wages and the real money supply.

I. PRICE AND EXCHANGE RATE MOVEMENTS FOR INTERNAL AND EXTERNAL BALANCE

Through the 1970's domestic currency price indexes for imports and exports have usually risen faster than the consumer price index. In this section an attempt is made to understand the implications of such an outcome in a theoretical setting. One useful approach is the Swan-Salter-Dornbusch model\(^3\) which concentrates on the relation between movements in tradeable goods prices, domestic expenditure policy, the exchange rate and the state of internal and external balance. This section also draws on some extensions to this model by Long and Pitchford [1981] to the case in which exportables and importables prices move separately.

Start with the simple case in which these traded goods prices move together. Figure 1 shows internal and external balance lines drawn in terms of nominal expenditure (\(Z\)) and the absolute price level of non-traded goods (\(P_N\)), holding constant the domestic currency levels of traded goods prices (\(P_T\)). If, given \(P_N\), nominal expenditure is raised from point \(a\), excess demand for non-traded goods and a balance of payments deficit develop. To restore internal balance then requires a rise in the price of non-traded goods, whilst external balance is regained by a fall in this price. Thus the internal balance line (\(S=0\)) has a positive slope, and the external balance line (\(B=0\)) a negative slope.

Suppose now that domestic currency measured traded goods prices all rise by 15\%. Assuming there is no money illusion in demand and supply reactions,
and that no other factors have changed, the full equilibrium point moves from $a$ to $b$, involving a 15% rise in both $z$ and $P_N$, and the internal and external balance lines shift, to $D' = 0$ and $B' = 0$, respectively. No real effects occur.

What are the various policy combinations available to maintain internal and external balance in the face of such changes? The full equilibrium points $a$ and $b$ are solutions for $P_N$ and $z$ of the underlying demand and supply conditions of the form

1. $z = \mathcal{Z}(P_T)$
2. $P_N = \mathcal{P}(P_T)$

which are homogeneous of degree unity in $P_T$. Defining the exchange rate $(e)$ as the number of units of foreign currency exchanging for $SAI$, the relation between the domestic $(P_T)$ and foreign currency price $(P^*_F)$ of tradeables is

3. $P_T = P^*_F/e$
Internal balance involves equilibrium in the goods market. Leaving aside, for the moment, the questions of labour market equilibrium, a further important target is the rate of inflation. This target must be formulated in terms of some price index

\[
(4) \quad I = I(P_N, P_T)
\]

homogenous of degree unity in \( P_N \) and \( P_T \).

(1), (2), (3) and (4) are four equations in the six variables \( P_N, P_T, N, z, I \) and \( e \). As \( P_T^e \) is exogenously determined, several different policy regimes can be identified depending upon the authority's actions regarding expenditure and the exchange rate. To see this in a relevant setting consider a particular annual rise in foreign currency denominated traded goods prices (say 15%). The change in equilibrium magnitudes will be given by

\[
(1') \quad \dot{z} = \dot{P}_T^e - \dot{e} = \dot{P}_T \\
(2') \quad \dot{P}_N = \dot{P}_T^e - \dot{e} = \dot{P}_T \\
(3') \quad \dot{I} = I_T \dot{P}_T + I_N \dot{P}_N, \quad I_T + I_N = 1 \\
(4') \quad \dot{P}_T = \dot{P}_T - \dot{e}
\]

where the \(^\cdot\) indicates the proportional rate of change of a variable, and \( I_T, I_N \) the appropriate elasticities. The results can be summarized, combining \((1'),(...,(4'))\) as

\[
(5) \quad \dot{P}_N = \dot{I} - \dot{z} = \dot{P}_T = \dot{P}_T^e - \dot{e}
\]

\( \dot{Z} \) exogenous.

This could result, say, from the magnitude of the budget deficit being relatively inflexible and being a significant determinant of nominal expenditure through the money supply. A form of this argument has appeared in recent budget speeches. Suppose this rise in expenditure is 10% per annum, then the appropriate policy response is an appreciation of 5%. Non-traded
goods prices will rise by 10% in domestic currency, and this is also true of
the rate of inflation. The expenditure constraint thus determines the rate of
inflation and the movement in the exchange rate.

(ii) \( \hat{e} \) given

For example, a fixed exchange rate is represented by \( \hat{e} = 0 \), or the rate
could be used as an instrument to achieve some other target of government
endeavour, for instance, involving export incomes. With a fixed exchange rate
nominal expenditure and domestic currency prices will rise by 15%. There can
be no autonomous expenditure policy or inflation rate in such a regime.

(iii) \( \hat{i} \) given

A zero rate of inflation requires a 15% appreciation. Alternatively, if,
because of constraints imposed by the financing of the budget deficit or by
the level of inflationary expectations the target inflation rate is, say, 10%,
the appreciation needed is 5%.

(iv) \( \hat{e} \) and \( \hat{i} \) given

A government which attempts to pursue both an independent expenditure
policy (say, aimed at achieving a 10% inflation rate), and an independent
exchange rate policy (say, a fixed exchange rate) will in general not achieve
internal and external balance.

What (5) obviously does not allow is an outcome in which domestic
currency traded goods prices and the domestic price index rise at
significantly different rates. If the model has any relevance, such an
observation must imply either that equilibrium is not maintained or that
shifts in demand and/or supply curves resulting from factors unrelated to
proportional shifts in traded goods prices have occurred in such a way as to
require the observed relative price change. A number of reasons for such
shifts can be suggested:
a. A Change in the terms of trade

Considering exportables prices \((p_E)\) and importables prices \((p_M)\) separately the equilibrating expressions may be written^5

\[
\begin{align*}
\hat{z} &= z_E p_E^a + z_M p_M^a - \hat{e}, \quad z_E + z_M = 1 \\
\hat{p}_N &= \hat{p}_E p_E^a + \hat{p}_M p_M^a - \hat{e}, \quad \hat{p}_E + \hat{p}_M = 1 \\
\hat{r} &= I_E p_E + I_M p_M + I_N \hat{p}_N, \quad I_E + I_M + I_N = 1 \\
\hat{p}_i &= \hat{p}_M^a - \hat{e}, \quad i = E, M
\end{align*}
\]

There is now no simple relation such as (5) between non-traded goods prices, the inflation rate, expenditure, and domestic currency traded goods prices. From (6),(7),(9)

\[
\begin{align*}
\hat{p}_N &= \hat{p}_E p_E + \hat{p}_M p_M \\
\hat{z} &= z_E p_E + z_M p_M \\
\hat{r} &= (I_E + I_N \hat{p}_E) p_E + (I_M + I_N \hat{p}_M) p_M
\end{align*}
\]

\(\hat{p}_N, \hat{z}, \) and \(\hat{r}\) are each weighted averages of traded goods prices, but in general the weights are different. Provided the weights are all positive, divergence in the movements of \(\hat{p}_E\) and \(\hat{p}_M\) would have to be considerable for the substance of the previous results to be invalidated. Expenditure, the inflation rate, and non-traded goods prices would move more or less together for given changes in \(p_E\) and \(p_M\). A full discussion of the size and signs of these weights is beyond the scope of this paper, but can be found in Long and Pitchford [1981]. Essentially \(\hat{p}_E\) and \(z_E\) will in most cases be positive. The elasticity \(\hat{\epsilon}_M = \frac{\hat{p}_M}{p_M} \hat{p}_M\) can be shown to consist of a pure substitution element which is positive provided importables and non-traded goods are substitutes, and a terms of trade effect resulting from the fall in real income implied by a rise in import prices. Such a fall in real income implies a reduced demand for non-traded goods via the income effect and so a tendency for their price to fall. It will be sufficient for \(\hat{\epsilon}_M\) to be positive if non-
traded goods and importables are gross substitutes. However, the possibility of a negative $\Delta_N$ cannot be ruled out. It is then simple to confirm that a negative value of $\Delta_N$ could account for a rise in the domestic price index which was less than the rise in domestic currency valued export prices, provided the export price index rises significantly less than the export price index. The ambiguity about the sign of $\Delta_N$ reduces the reliability of such an explanation of divergence between price movements.

b. An increased rate of capital inflow

The definition of external balance must allow for some "appropriate" rate of long term capital inflow. If this rate rises an increased balance of payments deficit on current account is required, and so the new external balance line is now located further out in the region of balance of payments deficits. Abstracting from any direct effects of the capital inflow on demand for and supply of non-traded goods, the non-traded goods price and the level of nominal expenditure will rise. A reduction in the rate of capital inflow would have the opposite effect, and would thus be consistent with the observation of a lower rate of increase of non-traded goods prices than of the indexes of traded goods prices.

c. A shift in the supply of exportables

In recent years increased long term capital inflow has been associated with the development of mineral export industries. Discussions of the Gregory thesis have suggested a variety of nominal and real effects from this process. An important impact of mineral export development would seem to be the supply effect, shifting the external balance line to the right and raising non-traded goods prices.

Another type of supply effect can come about through fluctuations in the output of traditional exports because of drought and similar exogenous factors. These will have analogous impacts on the external balance situation. For instance, a drought is likely to reduce rural exportables
production and have an adverse effect on the balance of payments, shifting the \( z = 0 \) line to the left and reducing equilibrium expenditure and the non-traded goods price level, other things being equal.

Internal and external balance are not the only targets of macroeconomic policy. Already a target inflation rate has been added to the list. If internal balance is defined in terms of non-traded goods market equilibrium, there remains the further target of labour market balance. The production of non-traded goods could reasonably be supposed to depend, among other things, on real wage costs. What effect could a rise in real wage costs be expected to have on the equilibrium values of \( z \) and \( p_N \)? Higher real wage costs will be likely to reduce the supply of these goods both through marginal firms going out of business and via a reduction in the production of extra-marginal firms. Writing the internal balance condition

\[
\eta_N(p_N, p_T, z) = X_N(p_N, p_T, w)
\]

For a given \( z \) the rise in real wage costs \( w \) raises the non-traded goods price, so the \( z = 0 \) line shifts upward. The domestic supply of importables is also likely to be adversely affected by real wage rises. The external balance condition can be written

\[
\delta = P_T[X_T(p_T, p_N, w) - \eta_T(p_T, p_N, z)] = 0
\]

Holding \( p_N \) constant it is clear that \( z \) must be reduced to offset the rise in \( w \). The \( \delta = 0 \) line shifts to the left. The final outcome is a lower equilibrium value of \( z \), and the equilibrium change in \( p_N \) is ambiguous.

In the latter part of the 1970's the authorities have attempted to design a monetary policy to reduce the rate of inflation. Setting monetary growth targets which they hope to lower each year the notion is to reduce the inflationary expectations and the excessive liquidity which are thought to be part, at least, of the reason for inflation. This process is not as
straightforward as it sounds, for inflation and inflationary expectations involve traded goods price rises, and to reduce this component of inflationary expectations requires an appropriate exchange rate policy. Suppose foreign currency measured traded goods prices have been rising at a particular rate $E_p^T$, and this is expected to continue. Given the exchange rate policy a particular domestic currency price rise $E_p^N$ will be expected. From the simple accelerationist model of inflation,$^5$

\[
\begin{align*}
\hat{p}_N - \hat{w} &= a E(p^T) + b E(p^N) + f(u), f'(u) < 0, f(u_n) = 0 \\
\end{align*}
\]

where $a + b = 1$, and $u$ is the rate of unemployment. At the steady state $E(p^T) = \hat{p}_T$ and $E(p^N) = \hat{p}_N$, so

\[
\begin{align*}
\hat{p}_N &= a \hat{p}_T + b \hat{p}_N, \\
(16) &\hat{p}_N = \hat{p}_T \\
(17) &\hat{p}_N = \hat{p}_T
\end{align*}
\]

Inflationary expectations will not be zero unless the exchange rate is appreciating sufficiently to make $\hat{p}_T$ zero. When $\hat{p}_T$ is high, as has been the case in the 70's, significantly reducing inflationary expectations will be a difficult task not necessarily consistent with continuing equilibrium.

II. INFLATION, UNEMPLOYMENT AND TRADEABLE GOODS PRICES IN THE 1970'S

This section of the paper traces developments in the economy during the 1970's paying particular attention to changes in traded goods prices, domestic inflation and unemployment. For discussion the decade is divided into two periods, the former 1970-1976 containing the early export and import price booms, the jump in the inflation rate, the credit squeeze of 1973-4 and the jump in unemployment and real wages. In the period since 1975 traded goods prices have continued to rise strongly, particularly import prices, unemployment has remained high, and a monetary policy aimed at containing inflation has been in operation.
1970 to 1976

In 1974 unemployment rose from 2.1% (January 1974) to 5.4% (January 1975). Since then it has hardly looked back. It is instructive to compare the state of the economy at particular points before and after this event and I have chosen June 1970 and June 1976 for this exercise. These dates are convenient because between them Australian currency denominated traded goods prices rose substantially and by similar proportions for both imports and exports. Moreover, 1970 was a year of comparative stability. Certainly unemployment was then at a level regarded as close to equilibrium (1.7%, June 1970), and the rise in the consumer price index (5.4% in 1969-70) was the same order of magnitude as experienced through the 1960's. Externally the balance of payments was improving, showing falling deficits, and money supply growth was kept low (6.9% growth in M₃, 1969-70) by sterilisation of the rising capital inflow. In term of figure 1 the economy could be said to be on the internal balance line to the left of point α, indicating an undervalued currency.

By June 1976 the revised export price index had risen by 101% and the implicit price deflator for imports by 86%. These rises represented average annual rates of change of 12.4% and 10.9%, respectively. Given these rises it could be expected that domestic prices and domestic expenditure would have risen by about the same percentage if approximate equilibrium were to be maintained.\(^9\) Allowing for mineral export growth, other domestic growth, the need to adjust the real exchange rate (\(P_m/P_n\)) in 1970, and for rising capital inflow, domestic goods prices and expenditure could well have required a higher increase to maintain equilibrium.

In fact the consumer price index rose only 82% over the six years at an average annual rate of 10%. This index contains prices of exportable and importable items as well as of non-tradeables. As an exercise to indicate orders of magnitude suppose tradeables items in the index have a weight of one
half (one quarter to each category). Then the rise in the price of non-traded goods would have had to be

\[ \hat{p}_N = 2 \left[ 1 - \frac{1}{4} \hat{p}_E - \frac{1}{4} \hat{p}_M \right] = 8.35\% \]

Over the six years involved the money supply \( (M_3) \) grew by 120%, an average annual growth rate of 14%. The average annual growth of the money supply in this period conceals substantial year to year variations. Given the asymmetries which are thought to be present in the relationship between changes in the money supply and in real expenditure it is necessary later to look at these yearly variations in detail, and in particular to examine the period of monetary restraint in 1973 and 1974.

Substantial yearly variations in the rates of price increase occurred in the period. The export price index had been relatively steady, even falling somewhat through 1970 and 1971. It started to rise early in 1972 and registered a 30.5% increase that year. In 1973 the index rose 18% in the face of an appreciation of the $A$ of about 20%, and in 1974 increased 23%, this time with a depreciating exchange rate. Import prices, by contrast, were comparatively stable until towards the beginning of 1974, but in that year jumped by 37% (see table 1 and table 3). Through 1972 and 1973 it seems safe to say that the main external influence on the economy was the rise in export prices, taking place in the context of exchange rate appreciations in both years. Whatever else was happening to the economy at the time, the theory suggests that the domestic price level and nominal expenditure should have risen considerably if internal and/or external imbalance were to be avoided. The rates of increase of these factors is set out in table 1.

It can be seen from the table that the growth in the \( M_3 \) over the two years taken together was less than that of export prices and that the domestic price level rose only moderately compared with export prices. The growth of \( M_3 \) was nevertheless very high by comparison with earlier growth rates (graph 9).
Towards the end of 1973 policies were undertaken to offset the effects of the export boom on domestic prices.

"Further policy action was taken in September with a view to moderating the rate of growth of prices. The Prime Minister announced on 9 September that the Government had decided to revalue the Australian dollar by a further 5 per cent and that it concurred with the Reserve Bank pressing its open market operations vigorously with the aim of significantly increasing sales of government securities. In announcing these measures, the Prime Minister pointed to the pace at which liquidity and the money supply had been growing and indicated that the prospects were for an over-large increase arising at least in part from a continuing external surplus. The general economic background to the decision was one in which demand and spending were rising rapidly. This was being reflected in continuing tightening of the labour market. Although imports were providing an increasing proportion of the growth in demand (and the process was being facilitated by the earlier appreciation and the July cut in tariffs), current and prospective pressures on domestic prices remained strong."

Reserve Bank Bulletin [September, 1973]

The impact of the credit squeeze can be seen in the reduced rate of growth of $M_3$ during 1974. Indeed by the third quarter of 1974 the authorities were attempting to revive the growth of the money supply. Coincidentally with the credit squeeze in 1974 prices continued to rise strongly, and it is notable that the import price boom had commenced. A large part, but by no means the whole, of the import price rise was due to rises in oil prices. (The "mineral fuels and lubricants" item in the Reserve Bank index rose by 20%, while if this item is excluded the rise in the index was 39%) The balance of payments deteriorated in that year and capital inflow was down considerably on previous years. There seems little doubt that 1974 was a year of disequilibrium, with unemployment and business failures rising (graph 18). The economy can be
thought of either as in a constrained disequilibrium with excess supply and unemployment, or at a reduced level of activity due to the disappointed expectations brought about by the credit squeeze.

The unemployment rate fell through 1973. For February 1974 the Round-up of Economic Statistic summarized the economic outlook as follows:

"Some of the latest statistics are affected by erratic influences and are difficult to interpret but the overall picture remains one of continuing strong growth in output and employment. New dwelling approvals and lending for housing have declined sharply over recent months; none the less the number of private dwellings under construction at the end of December remained 32 per cent higher than a year earlier.

Demand for labour remains strong. Employment has been growing very rapidly, reaching a seasonally adjusted annual rate of 5.2 per cent in the three months to November; overtime working returned to record levels in December, and job vacancies, which had been falling during the previous three months, rose by 5,600 (seasonally adjusted) in January.

Prices as measured by the consumer price index were rising at the fastest rate for twenty years in the first half of 1973-74. Reflecting tighter monetary conditions, the rate of growth in major monetary aggregates has slackened over recent months.

Imports continue to rise sharply."

By about the middle of 1974 unemployment had started to rise. In February it was 1.7% and by December it had reached 4.5%.

The real wage rate had been rising at 4 to 5% from 1969 to 1973. In 1973, the year inflation accelerated to 11.2%, money wage rates rose quite rapidly, but the real wage rate recorded only a small increase (1.8%). The big rise in money and real wage rates came in the third quarter of 1974 (11% and 5.8%, respectively).

The pattern of movement of these series suggests that the inflation in 1973 began in a manner which had little relation to wage movements but at least in part was due to the export price boom. Real wages (both rates and earnings) fell below their trend growth rate that year indicating a slower response in wages than prices to the inflationary conditions, and demand for labour rose. As noted, the authorities responded to the inflation with a credit squeeze in the latter part of 1973 and early 1974. There was a great deal of talk at the time about how the economy needed a short sharp shock to
reduce the inflation rate. Looking at the behaviour of tradeables goods prices it is very doubtful that this medicine could have worked. It seems plausible that the rise in unemployment in 1974 was at least partly attributable to the credit squeeze, and the other factor which could have contributed was the rise in real wages.

I have written elsewhere [1977] about the behaviour of wages during the two great export booms of 1950-51 and 1972-3-4. In both cases there was a fall in the real wage in the first year of the boom. In both cases, approximately a year after the boom started there was a very sharp increase in industrial disputes (working days lost per work force member), followed by substantial increases in money and real wage rates and earnings (earnings rose 5.4% in the third quarter of 1974). The timing of these events in the latter episode could not have been worse so far as unemployment was concerned, coming as it did towards the end of the exercise in tight credit. One suspects that there was a failure to realize the degree to which domestic inflation was due to the export boom and export price increases whose effects could have been offset only by a much more substantial appreciation. Surely too the lesson of the 1950-51 real wage experience was not appreciated otherwise the timing of the credit squeeze, and the approach to wage setting would have been very different. Although it is conventional to blame the arbitration system and the political climate for the 1974-5 jump in real wages there is also evidence that the tight labour market conditions induced by the boom could have been responsible. Further it appears that rises in real wages during these episodes are not readily reversed by rising unemployment (graphs 6 and 7). If exchange rate policy had been used to prevent the build up in foreign exchange reserves in 1971 and 1972 and so to moderate or prevent the subsequent monetary expansion, the history of real wage movements and perhaps of unemployment in the 1970's may well have been considerably different. The high unemployment of 1952 dissipated by 1954, and unlike the 1970's export
boom the 1950-51 export price rise substantially reversed itself by 1953. By contrast, since the events of 1974 the unemployment rate has remained high, indeed has risen, and tradeables goods prices have continued to rise, particularly those of imports.

Graphs 11, 12 and 13 illustrate aspects of our external situation over the decade. While the trade weighted exchange rate appreciated in 1972 and 1973, it was depreciated in 1974 and again in 1976. Official reserve assets, including both gold and foreign exchange, valued in terms of imports went up approximately threefold from 1970 to 1972 but by 1976 were back to their 1970 level (graph 13). The balance of payments on current account (deflated by the C.P.I.) improved significantly in 1972 and 1973 but became substantially adverse in 1974. It was part of the Labour government’s anti-inflation policy, aimed at taking the pressure off demand for domestic goods, to encourage an inflow of imports by raising the exchange rate and by the 25% tariff cut. The behaviour of reserves and of the current account is consistent with this policy. However, the substantial fall in net apparent capital inflow in 1973, 1974, and 1975 is perhaps also attributable to other policy objectives of the government at the time, in particular the less than favourable attitude towards foreign ownership of Australian enterprises.

The fall in the ratio of non-traded to traded goods prices over the period 1970 to 1976 noted at the beginning of this section should have had a favourable effect on Australia’s external situation. As it turned out the various indicators of the state of external balance were all adverse towards the end of the period. The effects of exchange rate movements have been allowed for in this comparison of price changes leaving the tariff cut and the adverse effects on capital inflow to explain the contrary result. In addition it should be noted that 1974-5 was a time of world recession. Certainly the volume of exports fell through most of 1974 while the import volume index rose substantially that year.
(iii) Since 1974

Table 2 sets out changes in prices and other relevant magnitudes in this period.

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<th>( \hat{P}_R )</th>
<th>( \hat{P}_M )</th>
<th>( \hat{I} )</th>
<th>( \hat{M}_3 )</th>
<th>( \hat{M}_3 - \hat{P} )</th>
<th>( \hat{Z}_{\text{dec}} )</th>
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<td>24.7</td>
<td>16.9</td>
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<td>-2.3</td>
<td>4.5</td>
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<td>1975-6</td>
<td>11.8</td>
<td>11.4</td>
<td>12.3</td>
<td>14.2</td>
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<td>5.4</td>
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<td>3.5</td>
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<td>11.0</td>
<td>10-12</td>
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<td>7.6</td>
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<td>1978-9</td>
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<td>1980-81</td>
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<td>8.8</td>
<td>12.7</td>
<td>10-11</td>
<td>3.9</td>
<td>6.3*</td>
<td>5.6</td>
</tr>
</tbody>
</table>

*ABS series. CES figure unavailable due to industrial dispute.

The import price index used in tables 1 and 2 is the one prepared by the Reserve Bank, and this index has been criticized for perhaps possessing an out of date weighting system. The implicit deflator of imports of goods and services is an alternative measure, and is compared with the Reserve Bank index in tables 1 and 3.

### Table 3

**Import Price Index:**

<table>
<thead>
<tr>
<th>Percentage Change between June quarters</th>
<th>National Accounts</th>
<th>Reserve Bank</th>
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<tr>
<td>1969-70</td>
<td>4.8</td>
<td>3.5</td>
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<td>1970-1</td>
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<td>1972-3</td>
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<td>45.2</td>
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<td>1974-5</td>
<td>22.8</td>
<td>26.6</td>
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<table>
<thead>
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<th>National Accounts</th>
<th>Reserve Bank</th>
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<tr>
<td>1975-6</td>
<td>6.0</td>
</tr>
<tr>
<td>1976-7</td>
<td>22.1</td>
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<tr>
<td>1977-8</td>
<td>6.9</td>
</tr>
<tr>
<td>1978-9</td>
<td>13.8</td>
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<tr>
<td>1979-80</td>
<td>18.5</td>
</tr>
<tr>
<td>1980-1</td>
<td>3.4</td>
</tr>
</tbody>
</table>

NA
In two cases (1973-4, 1979-80) the Reserve Bank index gives significantly larger increases than the National Accounts index presumably because the weight for fuel imports is excessive in the former index. Otherwise they move in a similar fashion.

In the four years to 1979-80 unemployment generally increased while real wages generally fell. From June 1976 to June 1980 the Reserve Bank import price index rose at an average annual rate of 20.1% the National Accounts index at 15%, the export price index at 11.4% and the consumer price index at 10.2%. Table 2 shows considerable yearly variations (notably the tradeables goods price comparative stability of 1977-8) but confirms that most years these price changes conformed to the overall pattern. Using the import deflator the adverse terms of trade movements are less marked than with the Reserve Bank index although they are still evident in “oil shock” years.

In 1980-81 the December CES unemployment figure is not available for comparison with earlier years. However there is considerable evidence to suggest that unemployment fell somewhat as is set out in the Budget speech for 1981-82 (pp. 10, 17). The fall in unemployment was accompanied by rises in real wages with earnings increasing faster than award wages.

The money supply (M₃) has grown less rapidly in the last five years than in 1974-5 and 1975-6. Presumably this reflects the adoption of monetary growth targets in that period and the implied commitment to lower rates of nominal monetary expansion. It is notable that the inflation rate (as measured by the C.P.I.) is of a similar order of magnitude to the money supply growth. Presenting annual figures for the nominal money supply suggest much greater stability for this magnitude than would be perceived in monthly or quarterly data. Considerable seasonal variation is present in this series. Further it can be seen that over the years 1976-7 to 1979-80 there was virtually no growth in the real money supply, but that 1980-81 showed a substantial increase.
An interesting feature of external experience for this period is the relative stability of the measure of reserves valued in terms of imports (graph 13), presenting a marked contrast to its behaviour in earlier periods. The exchange rate (graph 11) was depreciated substantially late in 1976, and since then "under new management" depreciated through much of 1977 and '78 (when reserves were falling or low) and has been appreciated through 1980 and '81 (when reserves have been generally rising). While the current account deficit has been generally higher in the latter part of the 1970's (graph 11) this is not inconsistent with the increased capital inflow particularly of the last few years.

It is arguable that while the economy should have taken some time to recover from the shock of the 1973-4 credit squeeze, that event cannot now account for high levels of unemployment. Further, while real wages may still be regarded as high, they have shown a marked tendency to fall in the recent years, with no convincing corresponding falls in unemployment. What explanations are left for the continuing unemployment? It could be due to factors tied up with the detailed structure of the labour market such as, for instance, the changing structure of the work force, the nature of technological change, and the level of unemployment benefits. The aggregative data and the model examined here would seem to imply yet another explanation, namely that monetary policy has been directed at an inflation target formulated with scant reference to the effect of traded goods prices on the domestic economy nor to their presence in the price index used to define the target.

Some examples will make clear the nature of this proposition. Suppose \( P_E = P_M = 20\% \) and that, initially, there is external equilibrium and balance in the domestic goods market. The model of section I \([(10), \ldots (12)]\) requires the consumer price index to rise by 20\%, other things being equal, to maintain equilibrium. An outcome involving a 10\% rise with relatively
constant real wages could be explained by a monetary growth rate which
restricted real expenditure and so reduced the demand for domestic goods, thus
bringing about the relative price change. It should be clear that a tendency
for import price rises to exceed consumer price rises does not necessarily
imply that the economy will be thrown into disequilibrium provided the terms
of trade are worsening.

The issue is an empirical one both because the size of these weights is
unknown, and because there well may have been a degree of disequilibrium in
the system from time to time making such equilibrium comparisons invalid. In
the next section the hypothesis that changes in unemployment have been due
both to changes in real wages and to changes in the real money supply is
examined.

III

The relationships tested are viewed as reduced forms relating the change
in the unemployment rate (Au) to previous real wage behaviour and monetary
experience. The real wage variables chosen are, alternatively, money wage
rates deflated by the consumer price index (W/P) and a measure of real wage
cost. Wage rates are thought to have a greater degree of exogeneity than
earnings which must respond in part to labour market conditions. Deflating by
the G.P.I. would seem the correct procedure to capture the supply side effects
of unemployment. Those who argue that the appropriate series to use is the
average employee compensation deflated by the GDP deflator, and perhaps also
compared with average labour productivity, are seeking a labour cost concept
reflecting the demand side of the labour market. 12

Since 1976-7 declared monetary policy is indicated by the M1 "growth
target". This cannot provide a useful series for the regressions because
quarterly targets are not specified, and targets do not cover the whole of the
period considered. The variable used is the quarterly proportionate change in the real money supply. It can be argued that expansionary monetary policy will in the short run mainly affect prices and nominal variables while contractionary policy mainly affects real variables. What happens to the real money supply this period will affect prices and/or output in subsequent periods, unless the change in the real money supply had already been fully anticipated and incorporated into all relevant decisions. A higher real money supply will generate expansion, but if output is relatively inflexible upwards in the short run this will produce higher prices. On the other hand, output, or even more plausibly output growth, may well be somewhat flexible downward in the short run. This notion is given effect by dividing the real change in $M_3$ into two variables: $(\hat{M}_3 - \hat{P})^+$ which is positive if the real money supply grows and zero if it stays constant or falls, and $(\hat{M}_3 - \hat{P})^-$ which is zero if the real money supply stays constant or rises and negative if it falls.

Excluding seasonal dummies the equation to be tested has the general form (with appropriate lags in the independent variables)

$$\Delta u = b_0 + b_1 (\hat{M}_3) + b_2 (\hat{M}_3 - \hat{P})^+ + b_3 (\hat{M}_3 - \hat{P})^-$$

(19)

To be consistent with the hypothesis the coefficients would have the signs $b_1 > 0$, $b_2 < 0$, $b_3 < 0$, and asymmetry in the monetary effect would require $|b_2| < |b_3|$. Two interpretations are given to $\Delta u$. The first ($\Delta u$) is the absolute change (number of percentage points change) in the unemployment rate. The second is $u$ or the rate of change of the unemployment rate. This is more consistent with the formulation of the independent variables, and is easily shown to be equal (to a very close degree of approximation) to the rate of change of the number of unemployed.

Using the C.E.S. unemployment series equations were estimated with quarterly data for the period 1969(1) to 1980(3). The Lagrange multiplier approach suggested third and fourth order autocorrelation. The corrected
equations were

\[
\begin{align*}
(20) \quad d_u_t &= 0.442 - 0.6868_{\hat{X}} - 0.4322_{\hat{P}} - 0.3623_{\hat{u}} + 0.0431_{\widehat{u}^+} - 0.068_{\hat{X}_2 + 0.148_{\hat{P}} - 0.339_{\hat{u}} - 0.375_{\hat{P}^+}} \\
&= (3.909)(-3.692)(-3.524)(-1.883)(2.834) \\
&= (-2.724)(-5.183) \\
R^2 &= 0.845
\end{align*}
\]

\[
\begin{align*}
(20') \quad \hat{u}_t &= 0.151 - 0.2588_{\hat{X}} - 0.320_{\hat{P}} \\
&= (4.741)(-4.604)(-5.535) \\
&= 0.018_{\widehat{u}^+} - 0.029_{\hat{X}_2 + 0.102_{\hat{P}} - 0.484_{\hat{u}}} \\
&= (3.264)(-3.048)(-10.410) \\
R^2 &= 0.851
\end{align*}
\]

D.W. = 2.05

Examination of the correlation matrix between the independent variables suggests that no problem of multicollinearity exists. The coefficients are of the right sign and imply the postulated asymmetry in the monetary effect, and the t statistics (in brackets) suggest significance. For each of the variables a lag of six months was the most appropriate to explain \( d_u \), but for \( \hat{u} \) a slightly different lag structure appeared. Two other variants of the equation using different data and over different periods were also estimated and are set out in tables 4 and 5.

Before discussing these it is useful to examine the contribution through time of the wage and monetary variables to changes in unemployment which equation (20) suggests. Graph 14 shows predicted and actual unemployment, and graph 15 shows predicted and actual unemployment changes, the rise in 1974 standing out as a peak in that period. Graphs 16 and 17 show the contribution of the independent variables to estimated \( d_u_t \). For real wages a peak is evident in 1974, and the same is true for the monetary contraction of 1974.
Since that date real wage movements overall have contributed towards a falling rather than rising unemployment level. The continued high level of unemployment is correlated with real monetary movements in the period since 1974. From graph 17 it is evident that the contribution of real money supply changes is, on balance negative since 1976.

Table 4 and 5 extend the regressions (for du and u) both to a longer estimation period (1959 - 1980) and to the Australian Bureau of Statistics unemployment series (which are not available before 1966). Examination of these results shows little change in the size and significance of the coefficients from those of equations (20) and (20'). The last two lines of the tables repeat the regressions using the notion of real wage cost as used by Stammer [1978] and in the recent Budget papers and of real wage cost minus productivity. Real wage cost is defined as (non-farm wages, salaries and supplements plus payroll tax) divided by (civilian employees times non-farm employees times the non-farm GDP deflator). Productivity is non-farm GDP divided by the same denominator as for real wage cost. The regressions using the change in real wage cost give reasonable results with lag structures differing from those for \( \frac{W}{P} \) in that shorter lags seem relevant for real wage cost, and the real monetary variables are also significant. Using real wage overhang (real wage cost less productivity) no significant results were obtained for this wage concept.

While the theoretical discussion gave prominence to traded goods prices they have not appeared explicitly in the regressions. However, these prices affect the consumer price index used as a deflator for real wages and the real money supply and so enter the regressions in a significant way. It would, of course, have been preferable to have formulated and tested a system with the structure of that of section II capable of describing the disequilibrium behaviour of the economy. Both theoretically and empirically this would have been a substantial task.
<table>
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<th></th>
<th>const.</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$\frac{\Delta P}{P_{t+2}}$</th>
<th>$\hat{\Delta (\hat{L} - \hat{P})_{t+2}}$</th>
<th>$\hat{\Delta (\hat{L} - \hat{P})_{t+2}}$</th>
<th>$R^2$</th>
<th>$\rho_1$</th>
<th>$\rho_3$</th>
<th>$\rho_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CES unemployment data, 1959(1) - 1980(3)</td>
<td>0.405</td>
<td>-0.438</td>
<td>-0.505</td>
<td>-0.384</td>
<td>0.038</td>
<td>-0.083</td>
<td>-0.159</td>
<td>0.747</td>
<td>.747</td>
<td>-.373</td>
<td></td>
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<tr>
<td></td>
<td>(4.856)</td>
<td>(-3.0)</td>
<td>(-3.437)</td>
<td>(-4.445)</td>
<td>(2.988)</td>
<td>(-4.263)</td>
<td>(-6.772)</td>
<td>(3.570)</td>
<td>(-3.809)</td>
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<tr>
<td>ABS unemployment data, 1969(1) - 1980(3)</td>
<td>0.760</td>
<td>-0.784</td>
<td>-1.098</td>
<td>-0.761</td>
<td>0.055</td>
<td>0.088</td>
<td>-0.115</td>
<td>0.808</td>
<td>-0.55</td>
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<td>(6.801)</td>
<td>(-4.005)</td>
<td>(-5.645)</td>
<td>(-7.167)</td>
<td>(2.770)</td>
<td>(-3.201)</td>
<td>(-3.208)</td>
<td>(-4.509)</td>
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<th>$S_3$</th>
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<th>$\hat{R}_{t-1}$</th>
<th>$\hat{\Delta (\hat{L} - \hat{P})}_{t-2}$</th>
<th>$\hat{\Delta (\hat{L} - \hat{P})}_{t-3}$</th>
<th>$R^2$</th>
<th></th>
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<td>CES unemployment data, 1959(1) - 1980(3)</td>
<td>0.856</td>
<td>-1.168</td>
<td>-1.334</td>
<td>-1.107</td>
<td>0.083</td>
<td>0.041</td>
<td>-0.046</td>
<td>-0.164</td>
<td>0.837</td>
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<td></td>
<td>(6.076)</td>
<td>(-5.037)</td>
<td>(-5.238)</td>
<td>(-5.738)</td>
<td>(4.015)</td>
<td>(1.83)</td>
<td>(-1.709)</td>
<td>(-5.396)</td>
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<th></th>
<th>const.</th>
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<th>$S_2$</th>
<th>$S_3$</th>
<th>$\hat{R}_t$</th>
<th>$\hat{R}_{t-2}$</th>
<th>$\hat{\Delta (\hat{L} - \hat{P})}_{t-2}$</th>
<th>$\hat{\Delta (\hat{L} - \hat{P})}_{t-3}$</th>
<th>$R^2$</th>
<th>$\rho_3$</th>
<th>$\rho_4$</th>
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<td>CES unemployment data, 1969(2) - 1980(3)</td>
<td>0.359</td>
<td>-0.391</td>
<td>-0.735</td>
<td>-0.771</td>
<td>-0.015</td>
<td>0.048</td>
<td>-0.164</td>
<td>0.821</td>
<td>.317</td>
<td>-.260</td>
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<td></td>
<td>(4.045)</td>
<td>(-7.15)</td>
<td>(-4.02)</td>
<td>(-2.75)</td>
<td>(-1.33)</td>
<td>(-1.865)</td>
<td>(-5.408)</td>
<td>(2.279)</td>
<td>(-2.030)</td>
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$\Delta$ is the proportional change in real wage cost
$C$ is the proportional change in real wage cost minus the proportional change in productivity
Table 5: \( \hat{\mu} \)

coefficients of

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<tr>
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<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( \frac{W}{E_{t-3}} )</th>
<th>( \hat{M}_3 \hat{P}_t^{-} )</th>
<th>( \hat{M}_3 \hat{P}_t^{+} )</th>
<th>( R^2 )</th>
<th>( \rho_1 )</th>
<th>( \rho_2 )</th>
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<tr>
<td>dent</td>
<td>0.227</td>
<td>-0.295</td>
<td>-0.139</td>
<td>-0.349</td>
<td>0.017</td>
<td>-0.035</td>
<td>-0.086</td>
<td>0.759</td>
<td>-0.360</td>
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<td>(S)</td>
<td>(8.434)</td>
<td>(-7.767)</td>
<td>(-3.947)</td>
<td>(-7.288)</td>
<td>(2.571)</td>
<td>(-3.037)</td>
<td>(-6.372)</td>
<td>(-3.40)</td>
<td>(3.19)</td>
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<tr>
<td>dent</td>
<td>0.262</td>
<td>-0.207</td>
<td>-0.347</td>
<td>-0.373</td>
<td>0.012</td>
<td>-0.027</td>
<td>-0.062</td>
<td>0.783</td>
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<tr>
<td>(S)</td>
<td>(8.327)</td>
<td>(-4.310)</td>
<td>(-8.102)</td>
<td>(-7.573)</td>
<td>(1.846)</td>
<td>(-2.324)</td>
<td>(-4.807)</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>D.W.</td>
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<th>( S_3 )</th>
<th>( R_{t-1} )</th>
<th>( \hat{M}_3 \hat{P}_t^{-} )</th>
<th>( \hat{M}_3 \hat{P}_t^{+} )</th>
<th>( R^2 )</th>
<th>( D.W. )</th>
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<td>-0.250</td>
<td>0.391</td>
<td>0.339</td>
<td>0.307</td>
<td>0.022</td>
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<tr>
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<td>(3.025)</td>
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<td>(-7.010)</td>
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<tr>
<td>dent</td>
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<td>0.285</td>
<td>0.332</td>
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<td>0.818</td>
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<tr>
<td>(S)</td>
<td>(-2.832)</td>
<td>(3.861)</td>
<td>(4.484)</td>
<td>(1.308)</td>
<td>(0.910)</td>
<td>(-3.034)</td>
<td>(-8.793)</td>
<td>(-3.229)</td>
</tr>
</tbody>
</table>

described under table 3).
Some corroboration for the view that monetary conditions have affected business activity can be found in the data on bankruptcies. For the period 1958-9 to 1979-80 annual data on bankruptcy liabilities deflated by the consumer price index ($B$/CPI) are correlated with a time trend ($T$) and the real money supply ($M_3$/CPI) as shown in equation (21)

\[
\text{(21)} \quad (B/CPI)_t = 497140 + 39114 T - 6108.5 \ [M_3/CPI]_{t-1} \\
(5.785) (6.235) (-4.87)
\]

\[R^2 = 0.8117 \quad F_{16} = 1.603\]

Rising bankruptcies do seem to be associated with prior falls in the real money supply (graph 18).

IV. CONCLUDING COMMENTS

While the correlation between the independent variables (real money supply and real wage movements) used in the regressions is insignificant it is still feasible that monetary movements can have an impact on real wages. Thus it is not inconsistent with the results obtained to argue that there is some lagged connection between the real money supply and wages (particularly earnings) such that a revival of real monetary growth rates to the levels of the latter half of the 1960’s (see table 6) might lead to such a rise in real wages as to have the net impact of increasing unemployment. If this were so unemployment could possibly be decreased by the opposite policy of reducing monetary growth rates, unless we wish to give credence to the view that the current level of unemployment is the lowest we can now achieve! More likely is the possibility that some modest expansion in the real money supply while it could raise real wages somewhat would do so in an environment involving higher growth, higher profits and the easing of the demand constraint imposed
Table 6

Annual Percentage Change (over the same quarter, preceding year) of Real M₃

<table>
<thead>
<tr>
<th>Year</th>
<th>Change</th>
<th>Year</th>
<th>Change</th>
<th>Year</th>
<th>Change</th>
<th>Year</th>
<th>Change</th>
</tr>
</thead>
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<td>2</td>
<td>1.58</td>
<td>2</td>
<td>10.14</td>
<td>2</td>
<td>15.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-3.37</td>
<td>3</td>
<td>9.63</td>
<td>3</td>
<td>13.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-3.65</td>
<td>4</td>
<td>7.59</td>
<td>4</td>
<td>8.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1956</td>
<td>-2.23</td>
<td>1965</td>
<td>6.10</td>
<td>1974</td>
<td>5.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-2.21</td>
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by present monetary growth, so contributing on balance to reduced unemployment.

One plausible way to rationalise the monetary policy choices shown in table 6 goes back to the failure to appreciate early in the 1970's. That and other events led to the rapid nominal and real $M_3$ growth rates late in 1972 and early in 1973 which partly produced the subsequent inflation and led to the "knee jerk" credit squeeze of 1973 and 1974. The authorities now shrink from anything remotely like monetary expansion for fear that the 1972-3 error is again perpetrated, compounding the problem by concentrating their attention on the impact of their policy on inflation, and largely neglecting its impact on real variables. Table 6 shows that real monetary growth of the order experienced since the beginning of 1976 has almost invariably been associated with high and rising unemployment. Periods of expansion in the 1950's and '60's have been characterised by significantly higher growth, and the recovery from the 1960-'61 credit squeeze during 1962-3-4 by even higher figures.

The traditional approach to the theory of policy makes it explicit that policy choices depend on the valuations placed on targets. In recent years various government authorities have attempted to persuade us otherwise, namely that all relevant targets are related to the inflation rate and that they all improve, albeit with some time lag, as the inflation rate drops. If monetary policy directed at squeezing down the inflation rate also has an impact on unemployment the policy issues are not so straightforward. At the very least such a connection should require the authorities to make their valuations explicit.

If traded goods prices are rising rapidly, properly coordinated monetary policy aimed at a falling rate of inflation would be expected to produce or be accompanied by an appreciating exchange rate. If this does not happen the task of reducing domestic inflation is made much more difficult and is likely to spill over into reduced growth and increased unemployment. Of course it is
possible that adverse factors may have been affecting the external situation so that instead of appreciation the rate of depreciation is found to be less than in the absence of the inflation-reducing monetary policy. If this is so the adverse factors should be discovered and it should be made clear as to the way in which they are hindering domestic policy. A large component of the inflation rate is then attributable to these adverse forces preventing the exchange rate from insulating the economy from rising traded goods prices. When these forces dissipate, the exchange rate could be expected to play the required offsetting role in a visible way. Between 1976 and 1980 the contribution of the exchange rate to reducing inflation has been insignificant. However, the possibility of a high capital inflow in the next few years implies a much better prospect for an appreciating rate. Indeed, the experience of the early years of the 1970's suggests that there is some danger that appreciation will be inadequate or delayed. Such fears strengthen the case for a floating exchange rate if only to remove this important price from the possibility of political influence.
Footnotes

* I am indebted to Katrina Ball and Roslyn Austie for research assistance.

1. Hagger [1978] surveying the state of Australian economists’ thinking on inflation states

"A second question of considerable interest in the context of Australian anti-inflation policy, though hardly of central importance, is the relative contribution made by domestic and overseas influences to the observed rate of inflation." [p.167]

Graph 6 is based on the Reserve Bank import price index which is thought to overstate the effect of oil price rises. The import deflator from the national accounts gives a similar picture to graph 6 but smaller rises in 1979-80 and 1979-80 (see table 3).

2. See Davis and Lewis [1980, p.235] for references to a variety of views on this question.

3. See Swan [1955] and [1960], Salter [1959], and Dornbusch [1974]. The treatment follows the Dornbusch analysis with internal balance defined in terms of the non-trade goods market.


5. See Long and Pitchford [1981] for the workings, and expressions for $Z_t$, $\phi_t$, and $I_t$.


7. Swan [1955] defines internal balance in terms of the labour market.

8. This abstracts from productivity change. A model of this general form is used by Hagger [1978] in his survey of empirical work on Australian inflation, but does not explicitly distinguish between traded and non-traded goods prices.

9. For issues associated with the balance of payments, the appropriate traded goods indexes could be those of import and export prices. For other issues such as domestic price increases, indexes of importables and exportables consumed domestically would be relevant. Unfortunately the latter indexes are not available. Provided that individual items did not show substantially different movements, the indices of traded and tradeable goods would move similarly. However, it could be misleading to use, say, the import price index to indicate behaviour in importables prices if for instance fuel has a low weight in the former because of large domestic production and low import requirements, and a high weight in the latter because of high domestic consumption. Nevertheless, in the absence of specific tradeables indexes the export and import price indexes must serve as substitutes.

10. The import price index is measured f.o.b., and so does not include the effect of tariff.
11. See, for instance, Davis and Lewis [1980, p.236] where it is shown that an index of O.E.C.D. industrial production showed little growth and at times substantial decline through much of this period.

12. Stammer [1978] and Snape [1979] are two who use such a concept.

13. Of course private financial institutions have access to foreign capital markets, subject to exchange control. Nevertheless, tight monetary conditions could be expected to fall on the marginal borrower needing funds, say, to weather a downturn in sales, and the marginal investment project just profitable at the current cost of borrowing. It is not likely that such borrowers would stimulate enthusiasm for an inflow of funds from overseas. Further, with more flexibility in exchange rate policy it would seem that as Mundell [1968] suggests there would be a greater possibility of an independent domestic money supply policy.

14. The procedure used to test for autocorrelation is that proposed by Breusch and Pagan [1980].
References


GRAPH 2


(VALUES AT FEB., MAY, AUG., NOV.,)

GRAPH 3

ANNUAL PERCENTAGE CHANGE IN NON-FARM REAL GDP.
ANNUAL PERCENTAGE CHANGE IN CONSUMER PRICE INDEX

SOURCE: CONSUMER PRICE INDEX FRT. NO. 601, A.A.B.S.
REAL HOURLY WAGE RATE - MALES
(DEFLATED BY C.P.I.)

SOURCE: WAGE RATES AUSTRALIA A.B.S.
CAT. NO. 6312.0
REAL SEASONALLY ADJUSTED AVERAGE WEEKLY EARNINGS
(deflated by CPI)
GRAPH 9

ANNUAL RATE OF CHANGE OF $M_3$ OVER PRECEDING FINANCIAL YEAR

SOURCE: RESERVE BANK BULLETIN
GRAPH 10

TRADE WEIGHTED EXCHANGE RATE INDEX

MAY 1970 = 100.

SOURCE: RESERVE BANK BULLETIN
GRAPH 12

CAPITAL INFLOW/CPI (BASE 1966-7 = 100)

NET APPARENT CAPITAL INFLOW

NET APPARENT CAPITAL INFLOW MINUS TOTAL GOVERNMENT CAPITAL INFLOW

SOURCE: BALANCE OF PAYMENTS, AUSTRALIA. A.B.S. CAT.NO.5302.0
GRAPH 13

OFFICIAL RESERVE ASSETS/ IMPORT PRICE DEFLATOR BASE 1974-75=100

$ BILLION

GRAPH 17

CONTRIBUTION OF REAL MONEY SUPPLY CHANGES
TOTAL BANKRUPTCY LIABILITIES/CPI
(BASE 1966-67=100)

FINANCIAL YEAR DATA:
1948/49 50/51 52/53 54/55 56/57 58/59 60/61 62/63 64/65 66/67 68/69 70/71 72/73 74/75 76/77 78/79

SOURCE: REPORTS ON BANKRUPTCY BY THE MINISTER FOR BUSINESS AND CONSUMER AFFAIRS