THE REAL WAGE CONTROVERSY

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INTRODUCTION

By comparison with other countries, and particularly Australia, the level of real wages has not, until recently, held a central position in debate on macro-economic policy in New Zealand. On the whole, policy-makers have attributed the poor performance of the New Zealand economy to adverse international conditions, rather than to a 'real wage overhang'.[1]

The policy initiatives following the collapse of the terms of trade in 1975 were, initially, to devalue, increase overseas borrowing, and increase government employment. Later, efforts were made to increase exports by means of subsidies and to promote import substitution via the subsidies implied in artificially low energy prices.

Certainly there has been a long and largely unsuccessful[2] series of ad hoc wage and price controls in New Zealand. These have, in the main, been motivated by the authorities' unwillingness to accept the wage-inflation outcomes of the macro-policy stance. The use of policy inter\vention to reduce the rate of growth on money wages has been directed towards a reduction in the rate of price inflation rather than towards a reduction in real wages. Indeed, in the 1980 Budget, Mr. Muldoon indicated that the overall movement in real wages over the preceding three years had been 'not unreasonable'.

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By contrast, Australian policy-makers saw the major disturbance during the 1970s as being the 'wage explosion' of late 1974, when ordinary-time earnings for adult males rose to levels 40 percent higher than a year earlier. From 1975 onwards, the major preoccupation of Australian policy-makers was the perceived need to reduce labour costs per unit of real output – the strategy adopted being to argue before the Arbitration Commission for restraint in real wage growth while productivity increases reduced unit labour costs.

Some comparative data on the two economies are provided in Table A1. The New Zealand experience, following the 30 percent drop in the terms of trade in 1975, has been one of a sustained reduction in the rate of growth in employment and output. There was only a gradual increase in registered unemployment until 1978, but more recently an acceleration in the growth of registered unemployment rates.

The Australian figures to 1980 tell a rather different story. The adverse movement in the terms of trade in 1975 was less severe than in New Zealand's case, and the rate of increase in money wages was more rapidly brought down to the rates of the early '70s. Both employment and real output continued to grow, with relatively high rates of growth in the late 1970s. Unlike the situation in New Zealand,[3] however, the unemployment rate increased sharply from 1974 to 1978.

As was the case in Australia almost a decade ago, the recent emergence of higher rates of unemployment has brought the rate of real wages to the centre of the policy debate in New Zealand, and the objective of the remainder of this paper is to discuss some aspects of that debate, emphasizing particularly the impact of wages on employment and output.

Before beginning that topic, however, we quickly refer to two

important issues which will <u>not</u> be discussed in any detail in this paper. The first is whether it is appropriate or even possible to have centralised determination of real wages. Nevertheless, we draw attention to Table A1(vi), which shows that in spite of frequent and direct interventions on the part of the New Zealand Minister of Finance in wage-setting procedures, relative unit labour costs have deteriorated markedly in New Zealand, even allowing for exchange rate adjustments. Too often in New Zealand, the wage-setting arena has been divorced from macro-economic policy in general, with a resulting 'credibility overhang'. As a recent example, take the following from the 3 July 1980 Budget Speech:

'We will not allow credit to increase in order to validate soft wage settlements. If increases in wage costs and prices are excessive, the money will not be there to meet them. The business community has been warned.'

This statement was followed by a growth in private-sector credit to June 1981 of 24 percent.

The second important issue, which we will simply mention, concerns the degree to which real wages should be an instrument of income distribution. Two factors are involved here. The first is the question of the extent to which changes in wages incomes can be used to affect the distribution of household incomes. Although not providing an accurate picture of the effects of changes in wage rates, some relevant 'snapshot' information is provided in Table A2. The data shown emphasize the substantial differences in the importance of wage and salary incomes for households in different income classes, and for different family types. The second factor affecting income distribution, and about which relatively little is known in New Zealand, is the incidence of taxation and government expenditures across household income classes and household types.

## REAL WAGES, OUTPUT AND EMPLOYMENT

In this sector, we look at the process by which it is thought that changes in real wages impact on employment and output. We begin by focusing on some of the issues raised by the now well-known Reserve Bank *Bulletin* article of June 1982. In the next section, we will take up some of the issues raised by McDonald (1978).

In view of our belief that it is the rise in <u>unemployment</u> that has, in New Zealand and elsewhere, focused attention on real wage levels, it may seem surprising that we choose to focus on employment. The fact that this focus is a consequence of our earlier decision (to sidestep both the role of tax and expenditure policy and the process of real wage fixing) can be illustrated by recourse to what Harris (1982) described as 'naive market theory'.

The Naive Theory of the Labour Market

In the naive model, the labour market is analysed using the standard supply/demand framework as illustrated in Figure 1.

Figure 1

Real Wages

Supply

Demand

w_e

Employment
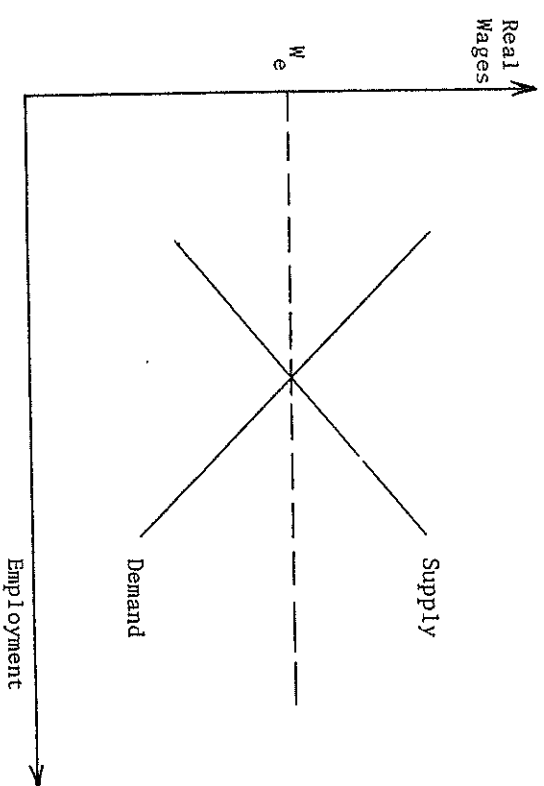
In the model, the supply curve (of workers or hours of labour) is the aggregate of the planned supplies of all the individual workers in the economy, acting in isolation from each other and maximising their own individual welfare. The curve slopes up because the typical worker is considered to regard extra work at the margin as imposing steadily increasing inconvenience.[4]

The demand curve slopes down to the right, and is taken to show the marginal product of labour. The meaning of this is clear enough in the context of a fully-employed macro-economy - economists since Ricardo have been accustomed to working with the idea of diminishing marginal returns at the economy-wide level. As more workers are employed to work with a given stock of land and capital, using a given technology, successively smaller increments to total output (and hence profits) are hypothesised to result.

Given these demand and supply curves, the naive theory asserts that at any real wage higher than W_e, unemployment will result. Conversely, any observed unemployment can be eliminated by a reduction in W.

Why do we label this theory "naive"?

The first reason is that the real wage relevant to labour demand differs from that which is relevant to labour supply. That which is relevant to labour supply is the after-tax money wage deflated by the prices of goods consumed by workers. Call this the real income wage. The real product wage, which is relevant to the demand for labour, is the sum of wages and other costs of employing labour, deflated by the prices of the products labour produces.

If we use the GDP deflator as representative of the price of a unit of output (value added), the consumer price index as the

price of the bundle of goods purchased by the representative consumer, and the aggregate average tax rate on wages and salaries as the average tax rate paid by the representative recipient of average ordinary-time hourly earnings, then it is clear that real income and product-wages have followed divergent paths. The relevant series are shown in Figure 2.

The divergent paths from 1975 onwards reflect several factors. The first, shown in Table A3, is the temporary decline in the rate of change of the GDP deflator relative to the Consumer Price index. The second, and more significant in the longer run, is the increase in the average personal income tax rate in 1975 by some five percentage points. This increase was associated with a substantial increase in transfers, and subsidies to traded-goods industries. These trends are documented in Tables A4 and A5.

These factors, coupled with a goal of unions to preserve real income wages and a government which conceived the real wage to be constant if pre-tax wages deflated by the CPI are constant, would produce the broad outlines of the result illustrated in Figure 2.[5]

But the story told by Figure 2 is an extremely superficial representation of the concepts of real income and product wages which are relevant to the labour market model. Consider income wages first, and recall that the labour supply curve is based on the work/leisure choices of individuals in the New Zealand population. At the margin, this choice is conditioned by the effective marginal tax rate on paid employment. To take an extreme case, particular sorts of social welfare beneficiaries with income-tested benefits have faced a marginal tax rate over 100 percent at times during the 1970s.[6] In that extreme case, the Figure 2 measure of real income wages hardly captures the rewards to labour supply. In fact, the real income wage measure of Figure 2 (which is conceptually similar to that used in Grimes

(1981) will only be strictly appropriate if all individuals face the same proportional income tax scale. In any event, we are not aware of any empirical work in New Zealand which attempts to estimate elasticities of labour supply at a disaggregated level; for surveys of overseas work, see Brown (1980) and Hausman (1981).

Figure 2   *REAL PRODUCT WAGE AND REAL INCOME WAGE*
(March years 1962-1982)

Index
(1962
= 1000)
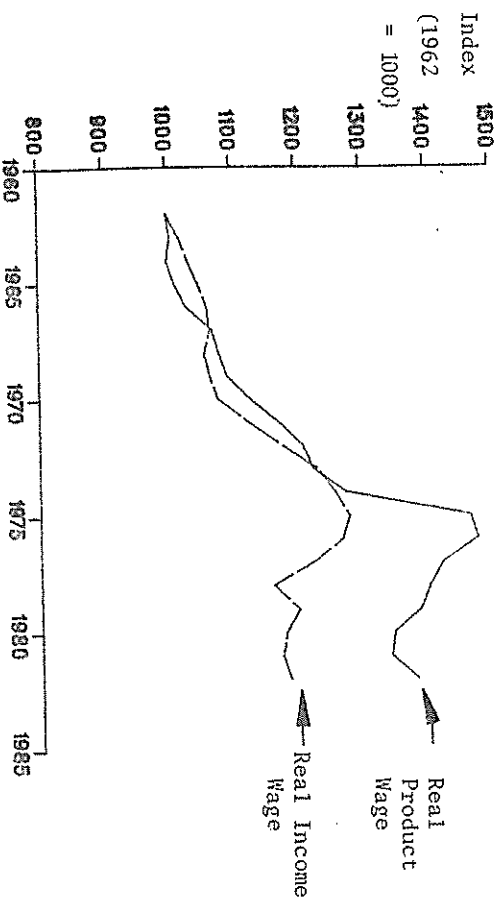
Sources:
The underlying series is surveyed average ordinary-time hourly earnings in both cases: April, October and April data are weighted 1:2:1. In the case of the income wage, the average tax rate on wages and salaries as calculated in Buckle and Tompkinson (1982) is deducted before deflation by the CPI index for the corresponding March year. For the real product wage, the underlying wage series is deflated by the GDP deflators given in Grindell (1981).

Turn now to the real product wage, and again it is clear that basic assumptions are required to speak in terms of 'the' real product wage. Two issues are involved here. The first is that 'labour' is not homogeneous, and - in particular - the relativities between wage rates for different sorts of labour have changed over time. A pertinent example over the 1970s is the changed female/male wage relativities following the introduction of equal pay. An equally important change is the relative importance of part-time work, which had the effect of giving greater flexibility in working hours for both employees and employers. In fact Table A6 shows that part-time female employment has accounted for almost all the private-sector employment growth in the two most recent years of data - from 1980 to 1982.

The second issue is that because firms sell a variety of products whose prices do not always move in the same direction, real product wage trends will differ when nominal wage changes are effectively indexed via relativity considerations. Of particular importance is the fact that the real product wage in the traded-goods industries has at times moved in markedly different directions than suggested by Figure 2. This can be seen by comparing the behaviour of the GDP deflator compared to the export and import prices indexes, details of which are provided in Table A3.

So far, we have discussed two reasons why the theory embodied in Figure 1 might be described as naive. The __first__ reflects the difference between real income and product wages. The __second__ is applicable to most aggregation relationships, potentially important micro detail is papered over. A __third__ justification for naivety is provided by the market-clearing version of the model, which argues that in the absence of any regulatory intervention, the real value would adjust so as to eliminate involuntary unemployment. This proposition has been a central feature of debate in macro-economics[7] in recent years but it is tangential to our present purpose. We do not propose to address the issue of whether,

in a free wage-bargaining situation in 1984 in New Zealand, a market-clearing real wage would emerge. Rather, we move on to the <u>fourth</u> reason why the theory might be labelled naive, and in doing so we elaborate the nature and interpretation of the "demand for labour" curve.

Remember that the labour demand schedule for Figure 1 reflects the falling marginal product of labour. The crucial assumption in this view of the demand for labour is that the available stocks of land and capital are fully utilised at each point along the curve. If capital and/or land are unemployed, then it is possible that the bringing together of these idle means of production and idle labour could yield increments to total output along a horizontal or upward sloping line. The labour demand curve then sets the outer limit of the set of feasible real wage/employment combinations, assuming that all output can be sold at prevailing prices.

That this frontier, or something resembling it, would define the limits of employment in a full-capacity economy is common ground to meet economists. It is therefore relatively uncontroversial to suggest that:

- if producers face no quantity limits on their products;
- if all capital which it is profitable to employ is in fact employed;
- if the criteria of perfect competition and profit maximisation are met,

then above a certain level of the real wage, increases in real wage rates would reduce the level of employment. In the theoretical literature, unemployment generated in this way is commonly referred to as 'classical unemployment', which can be reduced only by raising labour productivity or lowering real wages.

Where economists differ is over the question of whether this "marginal product frontier" is relevant for the analysis of real-world employment. If producers are quantity-takers in the market

for goods they produce; if competitive conditions do not prevail, if factors of production are not homogeneous, then situations which we are able to observe in reality do not correspond to points on the marginal-product frontier, but to points below or inside it. Statistical evidence of, for example, an inverse relation between wages and employment needs to be interpreted carefully if it is to identify the trade-off which would exist if the economy were to be on its marginal product of labour frontier.

In part, it is disagreement over such interpretation which has led to the continuing debate between Harris, Haywood and Moore, and Grimes.[8] The points at issue can be made more concrete by means of an example. Suppose we agree to live with the problem of aggregation, and treat the private sector of the economy as though it were one large firm. Suppose that this firm sets its product price on the basis of a fixed markup on unit costs of capital and labour inputs, and that the demand for its product is determined by factors beyond its control; describe it as a 'quantity-taker'.

Suppose that it minimises its costs of production by adjusting the quantities of factors it hires so that, in the optimum position, the factors are combined to produce output in a manner consistent with a constant elasticity of substitution production function. Then, as shown in Appendix B, the firm's demand for capital and labour is given by the following pairs of relationships:

$$\ln \hat{L} = \text{constant} + \ln Q - \alpha \ln \frac{w}{l} - \phi\,\sigma\,\ln A \qquad (1)$$

$$\ln \hat{K} = \text{constant} + \ln Q - \alpha \ln \frac{c}{p} - \phi\,\sigma\,\ln A \qquad (2)$$

where:

$\hat{L}$ and $\hat{K}$ are the desired values of labour and capital services per period;

Q is the value of real output per period;

w is the nominal price of a unit of labour services;

c is the nominal price of a unit of capital services;

p is the nominal price of a unit of output;

A is a technical progress term.

Equations (1) and (2) represent the desired or equilibrium flows of labour and capital services per period, and in the case of equation (1), what is being said is that labour demand depends on:

- real output, (Q)
- real product wages, $(^w/_p)$, and
- the rate of productivity change, (A).

In particular, the relationship implies that, holding other things fixed, a 10 percent change in real output will lead to a 10 percent change in demand for labour, but that, holding output and productivity change fixed, a 10 percent change in real product wages will lead to a change in labour demand which depends on the degree of substitutability between labour and capital.

In fact, the aggregate firm will rarely be in this desired position. When output or relative prices change, firms will adjust their actual purchases of labour and capital in a gradual way, for several reasons. One is that there are costs involved in expanding or contracting the volume of factors of production in use. Another is that firms will want to wait to see if any change is permanent before adjusting fully to changed circumstances. A very simple scheme to generate the actually-observed values for purchases of labour and capital services would be to suppose that the change in purchases is some proportion of the difference between the desired and actual values for purchases of labour and capital.

In other words,

$$\Delta \ln L = \delta (\ln \hat{L} - \ln L_{-1}) \tag{3}$$

and

$$\Delta \ln K = \gamma (\ln \hat{K} - \ln K_{-1}) \tag{4}$$

where we would expect the adjustment to be faster for labour than than for capital; i.e. $\delta > \gamma$. We might also expect that the speeds of adjustment are determined by, respectively, the availability of credit and the degree of tightness in the labour market,[9] but we will not pursue that avenue at this stage.

Readers familiar with the Reserve Bank of New Zealand (RBNZ) model will recognise (1) and (3), and (2) and (4) to be similar to the demand functions incorporated in that model: it is the Bank's labour demand function which has been the subject of a good deal of critical comment. While we ourselves would not take (1) and (3) to be the necessarily most appropriate specification of labour demand for reasons which are outlined in Appendix B, some confusion in the recent debate can be cleared up with the help of this relatively simple formulation.

First, take Harris' (1982) evident difficulty of reconciling 'cranky theory with stubborn fact', the facts in this case being that real product wages and employment have, in two sub-periods, moved in the same direction, contrary to what would be suggested by a movement along a fixed downward-sloping labour demand curve. As to the facts, we agree with Harris that some of the data on which early RBNZ studies are based are dubious.[10] However, if we use what we think are more acceptable data, the facts of the two sub-periods are as shown in Table 1. In the first sub-period, which is the one which seems to pose problems for the theory, we observe rising employment, rising real wages and rising output. If we take this seven-year period to be sufficiently long as to render the short-run adjustments implied by equation (3) to be relatively unimportant, and if we assume for the moment that the three pictured effects can be treated independently, then the facts are accommodated by the outcome of forces captured in equation (1), and which are represented diagrammatically in Figure 3.

TABLE 1 - EMPLOYMENT, REAL WAGES AND OUTPUT.

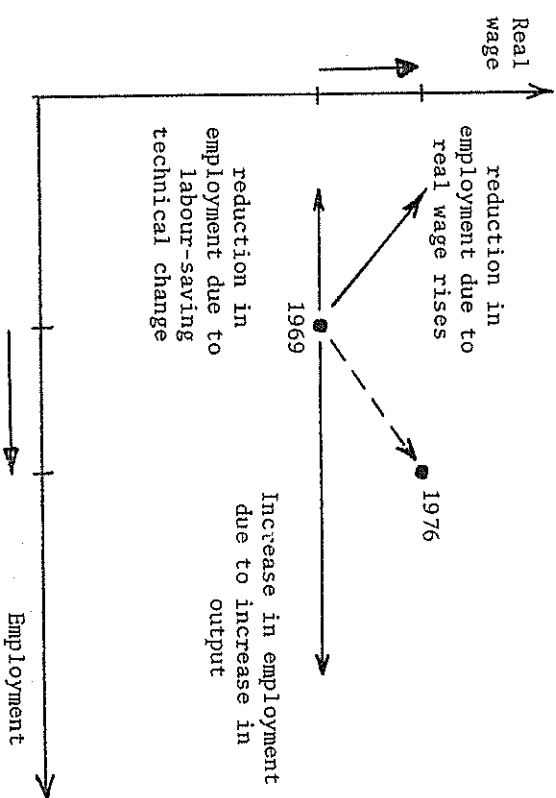|	1969-1976	1976-1979
Wages		
	$\frac{W}{P}$ → (+ 21.3%)	$\frac{W}{P}$ → (+ 1.03%)
Employment		
	L → (FT: + 12.3%)	L → (FT: -1.4%)
	(PT: + 78.9%)	(PT: +10.1%)
Output		
	Q → (Real GDP: + 28.2%)	Q → (Real GDP: + 4.7%)
	(Government: FT: + 30.3%)	(Government: FT: + 5.6%)
	(Employment: PT: + 66.0%)	(Employment: PT: + 26.7%)

Sources:

Real product wages are obtained by deflating surveyed private-sector ordinary time hourly wages by the corresponding March GDP deflator. Data from Department of Labour Statistical Tables and Grindell (1981). Employment data from Statistical Tables and real GDP data from Grindell (1981).

As a matter of general principle, then, the facts are not necessarily in conflict with the theory. The usual procedure in this case is to test the theory more precisely by econometrically estimating the parameters of (1) and (3) from the sample data. If the usual battery of econometric tests is satisfied, these parameter estimates would be provisionally accepted as being relevant to the labour demand function. .s can be seen from the illustrative examples in Appendix B, however, equations (1) and (3) are not the only specifications consistent with the general principles of mark-up pricing and cost minimisation, so that in practice it is quite difficult to establish whether or not the theory has been rejected by the data. In this vein, Haywood and Moore (1983) claim to have exposed deficiencies in the RBNZ labour demand function. But this work is itself subject to a number of serious weaknesses[11]; we are some way from the position where the weight of evidence favours one particular formulation of labour demand function.

But suppose that, in fact, (1) and (3) passed all the tests with flying colours. There then remains the question of how

Figure 3 CRANKY FACTS AND STUBBORN THEORIES 1969-1976

Real wage

reduction in employment due to real wage rises

reduction in employment due to labour-saving technical change

Increase in employment due to increase in output

1969   1976

Employment

one would use these relationships to address the question of the extent to which sustained changes in real wages affect employment in the long term. It is here that both the Reserve Bank Bulletin article and Haywood and Moore give a misleading interpretation of their results (and, at long last, the fourth reason why we describe the Figure 1 theory as naive).

For what both these studies do 's to take the estimated labour demand function and, keeping output fixed,[12] to calculate the ultimate effects on employment from a sustained change in the real product wage. A moment's reflection reveals that this approach omits the potentially important effects of real wages on output and hence, indirectly, on employment. An economy-wide model is required to test the empirical importance of these link-ages. To our knowledge, no such results have been reported for the SNA version of the RBNZ model, but Australian work[13] suggests that the economy-wide effects of a sustained 10 percent increase in real wages leads to a fall in employment of between 4 and 8 percent in the long run.

Leaving these econometric results to one side, there appeared to be a consensus in Australia that the indirect linkages (from real wages to aggregate demand and then to labour demand) were in fact more important than the direct effects of real wages on employment via a factor substitution effect. In other words, the Australian consensus was that over the 1970s, changes in real wages impacted on employment by inducing shifts of the labour demand function; rather than by movements along a given labour demand function. As Higgins would have it:

'I would be surprised if many dispute that given output, there is no more than a small detectable role for real wages in relationships for employment estimated for the post-war period, at least in terms of persons for the aggregate non-farm sector. However, one of the major lessons for the 1970s is that output cannot be taken as given in the face of marked changes in nominal inflation or in relative factor prices.'[14]

The general tenor of these remarks is echoed in the New Zealand context by Butcher et al (1981) who report on the basis of a detailed survey of business investment, that:

'Concern about profitability in the present slow-growth economy is widely reflected in firms' employment policies, and the substitution of capital for labour. Few firms want employment growth. Most want to reduce their labour force, and are doing so by attrition, and by both more efficient use of present plant and the use of new technology. This process is almost entirely oriented to profitability rather than to labour related problems. However, most firms find their input shares fairly fixedin the short term and only have flexibility to reduce their labour use in the longer term.'

The next section then, looks at some of these indirect ways in which real wage changes impact on real output, paying particular attention to the wage share of output and its consequences for profitability and relative competitiveness. The final section will address the question of whether New Zealand presently finds itself in a position where a reduction in real wages is a sufficient condition for an increase in employment.

WAGE SHARE, OUTPUT AND EMPLOYMENT

Distributive Shares of Social Product

The approach to the real wage/employment issue by writers of the Kaleckian school harks back to the political economy focus of the Classicals:- Smith, Ricardo, Marx. Those writers were centrally concerned with the distribution of the social product among the factors of production, and with the dynamic adjustments of economic actors in real time. In a closed economy framework the wage rate, the profit rate and the tax rate determine the distribution of the social product among labour, capital and the State. In an open economy model a fourth claimant, foreigners, is added. (A zero balance of payments current account indicates a zero net claim by foreigners on current output; a negative current account reflects negative claims by foreigners.)

In these models, the level of employment is determined by the sum total of hiring decisions by firms for the period; those decisions are determined by firms' estimates of the quantity of output which can be sold at the administered price (given by a target mark-up on prime costs including negotiated nominal wages). If the expected sales volume is not achieved, the rate of profit falls below its target level and firms may adjust in various ways, ranging from a cutback in planned investment to a reduction in employment of labour for the following period. The money wage outcome is not determined by the invisible hand as in the 'naive neoclassical' model of Figure 1, but by the relative bargaining strengths of firms and unions.

Firms, as already noted, are assumed to set their target markup and hence their product prices in advance, and then adjust employment and output in pursuit of their profit target. Suppose the aggregate outcome of the wage negotiation/price-fixing/employment-determining sequence is a rate of unemployment so low as to encourage unions to set a real-wage target above the level consis-

tent with the achievement by capitalists of their target profit share of the social product. Then the resulting conflict must be resolved either by the acceptance of a lower profit share, or by inflationary price adjustments by which the employers negate the gains of labour, or (in an open economy model) by processes which "export" the conflict via the balance of payments. (Obviously a fourth possible avenue is for the State to reduce its claim on social product, thereby leaving more to be shared between capital and labour; in other words, a wage/tax or profit/tax bargain).

The real wage/employment trade-off facing the unions in this model is thus quite different from that implied by a movement along a given labour demand, as in the 'naive' version of aggregate labour demand. A description of the model is provided by Rowthorn:

'No matter how strongly organised the trade union movement..... there are inherent limits to the effectiveness of purely economic struggle. Capitalists control production and they will not invest unless they receive a certain 'normal' rate of profit. If wages rise too rapidly, either because of extreme labour shortage or because of militant trade unionism, the rate of profit falls below its 'normal' level, capitalists refuse to invest, expansion grinds to a standstill and there is a crisis. The crisis has two effects. Firstly, it brings about changes in the sphere of production so that weaker capitals are weeded out and there is a general improvement in production techniques. In consequence, when the economy eventually recovers, less labour is needed than previous- ly and productivity rises sharply as the potential of these new techniques is exploited. Secondly, the crisis leads to a sharp increase in unemployment, which brings home to workers the pre- cariousness of their position and forces them to moderate their demands or even to accept a reduction in wages. So the crisis restores profitability by affecting both wages and production. By terrorising the working class it holds their demands in check, and by forcing a re-organisation in production it increases the ability of capitalism to meet those demands.'[15]

Hence the dilemma for the labour movement is that "workers cannot afford to be too successful in the wages struggle".[16] This perspective is one widely shared by both the Right and the Left of the political spectrum in the U.K. in recent years. Both sides agree that the solution, if any, must be political. Extreme

possibilities are an outcome of the class struggle in which either the power of unions is broken and the rate of profit and product- ivity growth restored, or the workers take control of production and try to improve upon the economic performance of private- enterprise capitalism. Less apocalyptic visions do also enjoy currency, notably the proposals by writer such as Meade (1981) for a negotiated incomes policy.

The tradeoff portrayed by Rowthorn is not a simple static one. The wage rate is seen as inversely related to the profit rate, and the level of investment and the growth rate are directly related to the profit rate. Up to a certain point, real wage increases are consistent with "adequate" levels of profits, and hence with continuing growth in output and employment; but *"after a certain point higher real wages result in crisis rather than growth"*.[17] Unemployment then emerges in a cyclical manner as the system tips over into crisis.

Before leaving Rowthorn, it should be noted that his is not a mechanistic view of the real-world effects of a rise in the real wage. As he puts his position, *"Depending on the response of capitalists and the State, the outcomes of a wages offensive may be inflation, crisis, or a faster rate of growth."*[18]

If there is a link from real wages to employment in such models, it must operate through one of three possible channels:

(1) A rise in the real wage which increases the labour share of the social product may squeeze the profit share, and thereby force down the rate of profit. The conditions for this to occur are, obviously, that the squeeze affects profits rather than the shares of the State or foreigners; and that the output/capital ratio does not rise, since

$$\frac{\text{Profits}}{\text{Capital}} = \frac{\text{Output}}{\text{Capital}} \cdot \frac{\text{Profits}}{\text{Output}}$$

(2) A rise in the real wage which raises the price of labour relative to the price of capital may induce firms to shift to more capital-intensive techniques via new investment. If successful, this adjustment raises labour productivity sufficiently to offset the increased relative factor price. Provided that an increased volume of total output can be sold profitably, no increase in unemployment need result in the long run, but in the short run labour displacement may exceed labour absorption (especially if total demand fails to grow while investment proceeds).

(3) A rise in the real wage which leads to a rate of inflation in unit costs of production higher than our overseas competitors. Unless offset by changes in the exchange rate, a worsening of the trade balance results.

It seems clear that some such model has been in the minds of several recent commentators on the wages issue in New Zealand. McDonald (1978, page 11) presents data showing a rise in real wage and salary payments relative to effective GDP, and comments that: *"the cost of salaries and wages to employers has risen..... much more rapidly than can be justified by the increase in Domestic Product and particularly Effective GDP over the period"*. Similarly, the Treasury, in its submission to the 1981 Arbitration Court hearings, produced data[19] relating wage changes to changes in effective and real GDP, and suggested that: *"if.... a real wage increase endured without a corresponding rise in real effective GDP, there is some prospect that a proportion of unemployment would result from the level of real wages"*.

Obviously, given our comments earlier about the relative significance of wages push versus terms of trade shocks for the New Zealand economy in the mid-1970s, the point should be made here that despite the conventional practice of analysing the distributional shares model in terms of its response to a successful wages

offensive, very similar forces are set in motion by an exogenously-imposed terms of trade decline. Such a fall in terms of trade, and hence in terms of GDP, reduces the size of the total social product measured in terms of command over goods and services; and hence puts pressure on the pre-established shares of all recipients of factor incomes. If the burden of adjustment is spread equally, then functional shares would remain unchanged (but of course the rate of profit would fall). If producers are unwilling to cut their markups, then the burden of adjustment is passed to the other three claimants; if neither labour nor the State is willing to forego its existing level of claims, then the final outcome is either balance of payments deterioration, or inflation, or both.

In Figure 4 we plot the ratio to effective GDP of the SNA categories "compensation of employees" and "operating Surplus", deflated in each case by the GDP deflator from the RBNZ data base.

These are rather crude indicators of the pre-tax labour and profit shares of social product.

The graphs show a long-run tendency for the pre-tax profit share to fall relative to effective GDP (the fall being of the order of 8 percentage points over the two decades 1960-1980). Meantime, the share of "compensation of employees" fell somewhat in the first half of the 1960s, then rose and fell again, so that by 1973 it was still at the 1960 level. It then shot up by 15 percentage points during 1974, before settling back to what seems to be a new level about 10 percentage points above the typical 1960s share.

The same trends are evident in series using real GDP rather than effective GDP as denominator (as we would expect in the absence of secular trends in terms of trade). To some extent this redistributive trend may reflect a shift in the incidence of taxation from company to personal incomes, as was documented in Table A5 and to some extent it undoubtedly reflects the changing composition of the labour force (particularly the rising proportion of salaries

Figure 4 **CLAIMS ON EFFECTIVE GDP**

(Quarterly RBNZ Data)

Compensation of Employees as % of Effective GDP

Operating Surplus as % of Effective GDP

Year
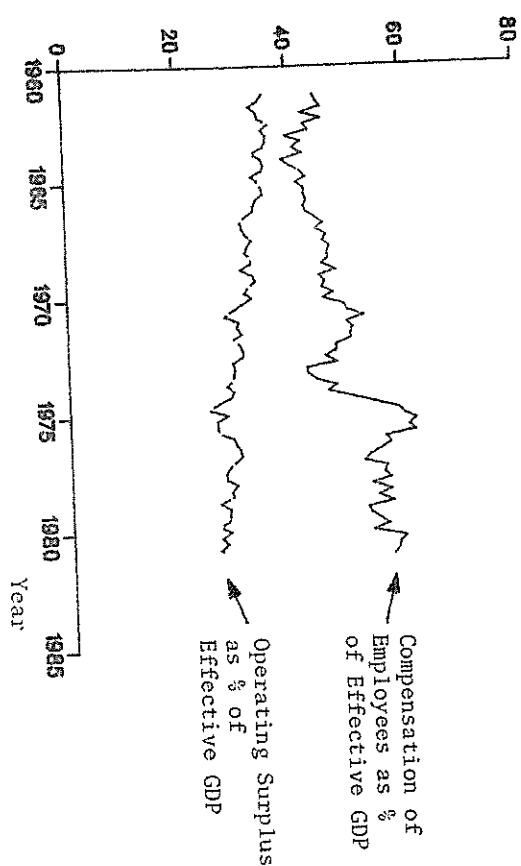
Source

All data from Reserve Bank quarterly database series. Effective GDP is calculated as NGDPAR-NXGR-NXSR + PX2(NXGR+NXSR)÷PM2. Private sector wage bill is WP.EP1÷NPGDPA. Operating surplus excluding central government is (NOSA-NOSCG)÷NPGDPA.

to wages in the "compensation of employees" series). The point of most interest to us here is that the declining trend in the profit share during the 1960s and early 1970s was consistent with the maintenance of full employment; there is no sign of any acceleration in the profit-share trend associated with the emergence of large-scale unemployment in the later 1970s.

There are several other striking features of these series.

The steep rise in the labour share between the fourth quarter of 1973 and the second quarter of 1975 had only a very slight impact on the (pre-tax) share of operating surplus; the benefits to labour, in other words, were obtained at the expense of foreigners, not of capitalists. Furthermore, although the labour share

eventually stabilised at a level nearly 10 percentage points above the 1960s, the profit share in 1980 was barely three percentage points below its 1970 level. It therefore appears that, up to 1980 at least, the rise in labour's pre-tax claim on product had not implied any drastic fall in the ratio of profits to output. If, then, the profit rate fell sharply during the second half of the 1970s, the proper focus for investigation is the output/capital ratio, not the profit/output ratio.

The timing of the rise in the labour share is of interest. During the period 1971-73, when effective GDP was rising very rapidly, both the labour and the profit shares fell as the balance of payments strengthened. Effective GDP peaked in the third quarter of 1973, and fell sharply through to the fourth quarter of 1974; it was during this period that the labour "share" rose rapidly, before dropping back again over the succeeding two years. The 1974 bulge in the labour share, in other words, related to the fall in our denominator as well as to the rise of real wages per se; it reflects, thus, the lag in labour market adjustment to terms of trade changes.

The Rate of Profit

As was noted earlier, there is no necessary correspondence between the profits share of total product and the rate of profit received by capitalists, expressed as a percentage rate of return on assets. In Kaleckian models, it is an (actual or expected) fall in the profit rate which induces capitalists to cut back on labour hiring and on new investment. This precipitates an unemployment crisis which curbs the demands of labour, in turn opening up the possibility of a rise in the profits share and hence, other things being equal, in the profit rate. Unfortunately, information on the real profit rate is not easy to come by. Horsfield and O'Dea (1983, page 30.) present a graph of the Reserve Bank share price index deflated by the CPI, as an indicator of trends in real share values. This graph shows a fall of almost 50 percent over

the period from 1971-73 to 1980-2. Had other things remained equal during that period, such a fall could have been taken as indirect evidence of a fall in the rate of profit.

As Horsfield and O'Dea point out, however, things are not so simple.[20] The fall in real equity values was a worldwide phenomenon in the 1970s, and the explanation appears to involve some mix of inflation, money illusion among investors, increased risk and lower real rates of return, with the precise weight to be attached to each quite unclear. The only data Horsfield and O'Dea could locate on real rates of return on capital were for pre-tax operating surplus.[21] These figures show a decline of the rate of return in manufacturing from around 14-15 percent in the early 1970s to around 12 percent in the late 1970s, while the rate of return in agriculture came down from around 6 percent to around 4 percent over the same period. These falls are of lesser magnitude than the change in real equity values; and the extent to which they provide a reliable indication of actual trends in the returns received by capitalists is problematic, given the reduction in tax incidence on the company sector and the change in interest rate structures during the second half of the 1970s. The drop in real share prices, Horsfield and O'Dea conclude, is not readily explained, although falling real returns may have played some role.

An alternative indirect indicator of expected real returns is provided by the level of private sector investment in plant and equipment. Table A7 shows the ratio of Gross Fixed Capital Formation, private-sector GFCF, and private investment in "plant, machinery and other equipment" to GDP and private-sector-generated GDP. The data do indeed show a slackening-off in rates of capital formation both for the economy as a whole and for the private sector; but the fall in plant and equipment investment after 1975, from about 6 percent of private GDP to about 4 percent, was reversed somewhat in 1980 when the ratio recovered to 4.7 percent. While these figures suggest some pressure on the expected profit-

ability of investment, it seems that investment in expansion or restructuring of the economy's capital stock continued through a period of stagnant total output. How much of this investment was aimed to reduce the labour/output or the energy/output ratios must remain at this stage a matter for speculation.

In so far as there was a slackening of investment during the later 1970s, this could be attributed to two possible causes (given that the profits share of total output held up reasonably well). A large part of the explanation, obviously, lies in the rising level of excess capacity in the economy, reflecting the fact that producers were rationed in product markets. A second line of explanation which might be offered would be a fall in the price of labour relative to the prices of investment goods.

Relative Prices of Capital and Labour

If the price of labour were to rise relative to the price of capital, some substitution would be predicted, so that the next generation of capital equipment installed by investment would embody more capital-intensive technology than the existing stock. Current investment would be aimed to raise labour productivity and thus compensate for the change in relative factor prices. In the context of stagnant total output, this would obviously lead to falling labour demand and rising unemployment, *ceteris paribus*. It is certainly possible that investment of this type has been occurring in New Zealand during recent years.

Trends in the relative prices of labour and capital, however, are notoriously difficult to measure. In the Australian context Gregory and Duncan (1979) used data from a 1978 paper by Johnston at al to show that, although there was evidence of a long-run upward trend in the price of labour relative to the price of capital, the "wages boom" of 1974 was accompanied by a _fall_ in this ratio, as capital costs rose ahead of labour costs. As they point

out:

'If there is sufficient time for new investment to occur, it is relative factor prices which matter. Hence.... real wage changes are irrelevant; what matters is relative factor prices.'[22]

For New Zealand there are two Reserve Bank series relevant to measurement of the price of capital goods. One is the deflator for "other private investment" (PIO in the latest Core Model); and the other is the "user cost of capital" (PKO), which is obtained by adjusting PIO to take account of changes in the company tax rate, the percentage of depreciation which is tax-deductible, and the rate of interest for private sector borrowers. (PKO, in other words, takes account of the costs of financing purchases of capital equipment.) During the late 1970s the rapid rise in nominal interest rates had the effect of raising PKO ahead of PIO.

In Figure 5 we show the result of deflating the nominal average wage per private sector employee (the Reserve Bank's WP) by PIO and PKO. The first of these seems likely to be similar to the measure used by Gregory and Duncan, and yields quite similar results; their graph for Australia is reproduced in Appendix A for comparison (Figure A2). As in Australia, it can be seen that there was a rapid rise in the relative price of labour in New Zealand during the period from 1970 t, the end of 1975; the ratio stabilised during 1974 and dropped dramatically (further than in Australia) thereafter, although there are some signs of upward drift in 1980/81. Using PKO as our denominator both lessens the long-run upward trend in the graph, and makes the fall after 1974 more dramatic and sustained. Certainly there is no evidence here to suggest that labour has been pricing itself out of competition with capital over the longer term. To explain the increase in unemployment during the second half of the 1970s by reference to relative factor prices, therefore, we would have to appeal to adjustment lags of the order of half a decade or more, even if the price mechanism works as a simple model would predict.

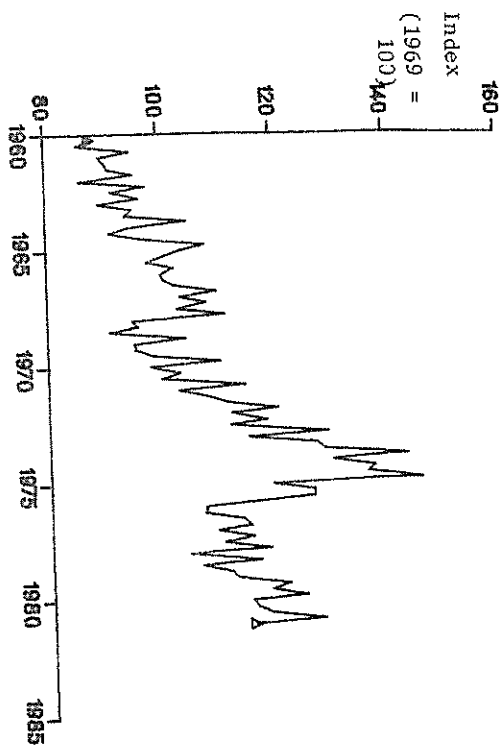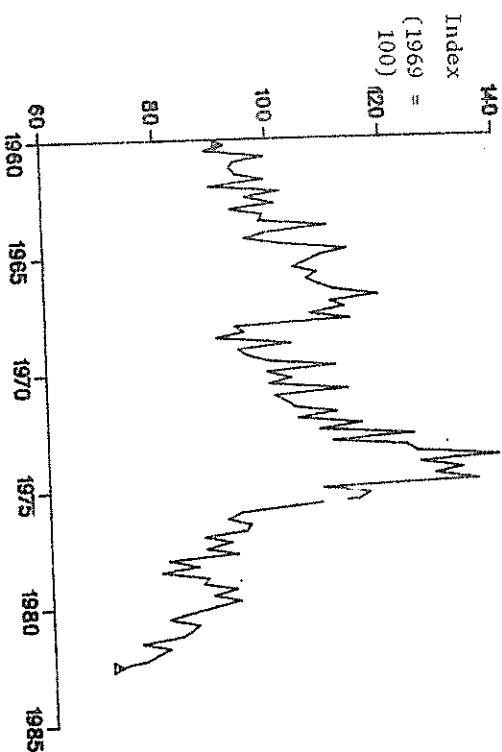Figure 5A   RELATIVE FACTOR PRICES: WP/PIO

Index
(1969 =
100)

Figure 5B: RELATIVE FACTOR PRICES: WP/PKO

Index
(1969 =
100)

Relative Competitiveness.

The second half of the 1970s witnessed a fall in the real product wage, which may have returned it to its 1975-74 level by 1981 (See Figure A5); a return of the relative price relationship between labour and capital equipment to only slightly above the level of the decade of "overfull employment" in the 1960s (See Figure 5A); and a steady continuation of the long-run trend in the distributive share of profits in effective GDP. Under these circumstances, the drop in the growth rate of employment in the economy is attributable mainly to the fall in the growth rate of real output, something not confined to New Zealand. In the context of a world recession, New Zealand output could have continued to grow only if markets for local production had continued to expand, which would have implied a fall in the economy's net import propensity (i.e. its propensity to run a balance-of-trade deficit at various levels of GDP). To achieve such a fall in the context of an open economy requires an improvement in the relative competitiveness of New Zealand producers vis-à-vis producers elsewhere in the world. Note that this is _not_ a matter of the terms of trade, but of the real exchange rate.

Relative competitiveness is determined by a complex set of factors – indeed, real wages _on their own_ are virtually irrelevant. What matters are labour productivity, the rate of markup on prime costs sought by firms, and relationships between the level of money wages and other prime costs and the nominal exchange rate. Measures of relative competitiveness attempt to measure differences in unit production costs for similar commodities after adjustment for exchange-rate changes. Because direct measurement of unit production costs is difficult, proxies such as unit labour costs or wholesale output price indices are used.[23] Direct international comparison of these proxies and, in particular, unit labour costs, is not really relevant unless one makes allowance for differences in the structure of production. Over a five-year period, however, production structures do not change markedly, with the result that trends in the proxies give a reasonably clear picture of relative competitiveness.

Whatever one's views about the niceties of the data, few would dispute that New Zealand's relative competitiveness (in manufacturing at least) has deteriorated since the mid-1970s. Looking back to Table A1, we note that unit labour costs in New Zealand manufacturing rose sharply relative to unit labour costs in Australia between 1977 and 1980 – the period when zero output growth struck New Zealand. There seems no reason to believe that this experience is not representative of a large proportion of our competitors.

To maintain rapid output growth without experiencing a balance of payments crisis (or its longrun counterpart, a burden of debt repayment), New Zealand producers would have had to capture a growing share of a sluggish world market, particularly for manufactured goods. In a competitive world, this would have required at least one of three trends: more rapid productivity growth than the rest of the world, a level of profits lower than the rest of the world, or a nominal exchange rate depreciating more rapidly than production costs (including nominal wages) rose relative to other countries.

We encounter here a mechanism which links money wages (but not necessarily real wages) to employment in ways somewhat reminiscent of the discussion of the preceding section. If productivity fails to rise; and the (controlled) nominal exchange rate fails to fall fast enough, then the only remaining avenue to improve relative competitiveness is via a reduction in the growth rate of money wages. But money wages and domestic prices have been mutually indexed. If inflation has resulted (as we suspect) originally from the strain of total claims which were in excess of the sum of effective GDP and the tolerable trade deficit, then one possible way to reduce inflation might have been for labour to reduce its share of national income. This would have meant accepting a lower rate of increase of nominal wages, and hoping that the consequent

improvement of relative competitiveness would:

a) not be swamped by the enlarged claims of other claimants for shares of the cake; [24]

b) lead to a relaxation of the quantity constraint on producers, and hence to an increase in employment.

If, in the process, domestic price inflation fell fast enough, the process might involve no fall in the real wage. [25]

To summarise this section, we have argued that slower growth of money wages might have left employment somewhat higher than it presently is, in the context of an international recession, and given the reluctance of the government (except for 1979-1982) to use changes in the nominal exchange rate in pursuit of improved international competitiveness. The mechanisms involved are indirect and their quantitative impact uncertain. Their effectiveness would have depended on:

a) the degree to which reduced nominal wage claims actually brought inflation down;

b) the price elasticities of demand in the markets where New Zealand producers sell; and

c) the extent to which other countries would have refrained from taking policy measures, for example, direct trade restrictions, in retaliation against New Zealand gains.

The processes involved take some time to work themselves out, and the implied tradeoff between real wages and employment with which unions are faced is not an easy one for the unions unilaterally to operate on.

SOME NOTES FOR POLICY

First, it is important to distinguish between two quite separate propositions. The first is that the present high level of unemployment in New Zealand has emerged as a result of a real wage rate above a sustainable full-employment level. The second is the proposition that a reduction in real product wages might contribute to a recovery process.

As to the first, we start from the proposition that the major exogenous disturbance to the New Zealand economy was the terms of trade collapse of 1975. Considering the output/employment paths which flow from that disturbance, our view is that one needs to consider the responses by policy-makers, employers and unions. Policy-makers for instance, have not pursued the option of pushing through real exchange rate changes, and indeed have made large transfers from wage earners to the elderly, thus widening the gap between income and product wages. The participants (combatants?) in the "labour market" have collectively responded by producing a real product wage outcome which, given the tolerable trade deficit, has probably led to a lower level of employment than would otherwise have emerged. To this extent, we are of the view that, while one might think of a number of contributing factors to the reduction in employment growth (including election-year lurches), a lower real wage path could have resulted in a somewhat higher level of employment than we presently have.

The second proposition may well be true, especially if such wage reductions feed through to a rise in the rate of profit (and a climate conducive to new investment) or to an improvement in relative competitiveness. The difficulty is, however, that while the problem of excessive claims on effective GDP originated in the import-price shock impacting on a fully-employed economy, we are now in a situation where, in the short-run, output is constrained by aggregate demand. [26] So, if a real product wage cut is to be helpful in increasing employment and output, aggregate demand for New Zealand production would need to be maintained. [27]

There are a number of possibilities here, including:

- expenditure switching policies, which direct existing demand away from imports towards home production;
- an increase in investment;
- the maintenance of real income wages while reducing product wages.

A real investment boom, if it once got under way, would obviously generate additional final demand and thereby validate itself to the extent that the expenditure was on home production rather than imports. A rise in disposable incomes would require either some sort of wage-tax tradeoff or an increase in the socially-provided component of the real wage, to compensate for any loss in disposable income derived from wages. An expenditure-switching policy, obviously, would imply a fall in real disposable incomes measured in terms of imported goods, but need not reduce the command of households over locally-produced (and especially non-traded) goods and services.

What this boils down to is that an incomes policy, if one is contemplated, involves far more than simply wages policy, and it is likely to prove counter-productive to address the wages issue in isolation from consideration of the profit rate, the profit share, the tax rate and the tax share, and the social wage in its full ramifications.

Of course, if no attempt at expenditure switching is made, so that the economy's net import propensity remains at its existing level, then any attempt to boost aggregate demand and thus get back towards the labour demand curve corresponding to full-employment will quickly run into the familiar balance of payments problem. Under the constraint of no expenditure switching, hence no restructuring, there is really nothing else that can be done except to wait for international recovery to rescue the New Zealand economy, while possibly attempting in the short-run to exploit

the effective demand curve for labour by forcing down the real wage below its long-run equilibrium. But the latter course is obviously fraught with difficulty, and in any case is second or third-best in the range of policy options. It seems more appropriate to address directly the reasons why real devaluation cannot be used to improve relative competitiveness and permit domestic reflation.

NOTES

1 For what it is worth, see Figure A1 for the New Zealand data, which mirrors the Australian experience.

2 See Hawke, (1982).

3 The Australian data in Table A1 from 1973 onwards are based on household surveys. For a comparison of the 'surveyed' and 'registered' unemployment figures, see Australian Treasury, Economic Paper No. 4, (1979). In New Zealand, the relevant comparison is only possible at the 1976 and 1981 Censuses. In 1976 'registered' unemployed were 20 percent of 'Census' unemployed, while in 1981 the ratio had risen to 59 percent. See Easton (1981).

4 It should be noted that an upward sloping supply curve is not essential for this analysis - all that is required is that the supply curve cuts the demand curve from below. This proviso is relevant in the recent New Zealand debate, since the econometric results reported in Grimes (1981) include a backward sloping aggregate labour supply curve, i.e. one where the rising real incomes generated by rising real wages lead to a choice in favour of more leisure, in spite of the fact that the cost of that leisure (in terms of wages foregone) has risen. In economists' jargon, the income effect outweighed the substitution effect.

5 We have already documented policy-makers' perceptions of the real wage path as revealed on page 8 of the 1980 Budget Speech. The negotiating goals of the unions are not known directly, but both Grimes (1982) and Buckle and Tompkinson (1982) have tested whether tax-effects are incorporated in money-wage outcomes. The evidence is inconclusive.

6 See, for instance, Easton (1980), page 85.

7 See Solow (1979) for example.

8 See Harris (1982); Reserve Bank Bulletin, June 1982; Haywood and Moore (1985 a, b); Grimes (1983).

9 The latter effect has been explored in the New Zealand context by Bailey, Hall and Phillips (1980).

10 See Harris (1982), p.105, and Wells and Evans (1982) Section 4. Note that the data used for Table 1 are quarterly, while those used in Figure 2 are yearly data.

11 See Wells (1983).

12 The RBNZ relationship has profits as an argument as well: consider profits to be fixed in that context.

13 See McKibbin (1982) but, take care, since Figures 9 and 10 in the Economic Record version of the article have been inadvertently interchanged. See also Fitzgerald and Higgins (1977) pp. 186-188.

14 Higgins (1979), p.347.

15 Rowthorn (1980), pp.133-134.

16 Ibid, p. 134.

17 Ibid, p. 145.

18 Ibid, p. 143.

19 Treasury (1981), p.17, Figure 1.

20 Horsfield and O'Dea (1983), pp.43-50.

21 Ibid, p. 46, Figure 8.

22 Gregory and Duncan (1977), pp.277-278.

23 See, for instance, Grimmond and Kay (1983).

24 Thus there would be no relative competitiveness benefit from a fall in wages which was simply matched by a rise in the rate of markup.

25 The point here is the real wage equivalent of our earlier point that the profit rate is not invariably linked to the profit share. In the case of labour, the real wage can be written as:

$$\frac{\text{money wage bill}}{\text{prices * employment}} = \frac{\text{money wage bill}}{\text{output}} * \frac{\text{output}}{\text{prices * employment}}$$

Thus, a fall in the wage share, if it leads to (or is accompanied by) an offsetting rise in productivity, may involve little change in the real wage. However, if an output expansion raises employment at unchanged productivity, a fall in the real wage results.

26 Evidence that producers are presently constrained by effective demand for their output is readily available - see N.Z. Institute of Economic Research Quarterly Survey of Business Opinion results which show that 85 percent of manufacturers cite 'orders' as the single factor most limiting production.

Stocks of unsold meat and wool are at very high levels by historical standards.

27

There are those who would argue that relative competitiveness would improve if stimulatory demand policies were applied at present wage levels. The argument here relies on the well-documented phenomenon that in past (relatively mild) recessions productivity has increased in the cyclical upturn. While not disagreeing with this description of past product-ivity behaviour, our view is that, in a downturn that is expected to be both deep and protracted, Rowthorn's description of the attrition of the capitalists has some force. This, together with the fact that labour hoarding is less likely in a long downturn, means that we may be having some of the productivity gains now rather than, as happened in the past, in the cyclical upturn. As happens with distress-ing frequency in matters of current policy, it will be historians who decide this issue.

APPENDIX A

TABLE A1 - COMPARATIVE DATA : AUSTRALIA AND NEW ZEALAND

Relative Unit Labour Costs in Manufacturing: NZ/A

Y.e. June	Annual Employment Growth		Percentage Unemployed		Annual Nominal Wages Growth		Real GDP Growth		Terms of Trade: %		Actual	Adjusted for Exchange Rates
	A (i)	NZ	A (ii)	NZ	A (iii)	NZ	A (iv)	NZ	A (v)	NZ		(vi)
1968	2.5	-2.0	1.3	0.58			3.4	-0.6	-3.7	-11.8		
1969	2.5	3.1	1.0	0.45			9.5	2.7	3.1	-1.2		
1970	4.1	4.3	0.9	0.18	8.4	5.9	5.7	7.3	1.1	1.1		
1971	2.2	3.4	1.2	0.13	11.1	17.3	5.1	1.3	-10.6	-4.6	1.006	1.073
1972	1.7	0.9	1.7	0.58	10.1	13.5	4.4	5.5	-1.8	12.8	1.022	1.039
1973	3.1	3.5	2.7	0.38	9.0	9.3	3.5	4.1	20.5	21.5	1.049	1.049
1974	3.2	5.3	2.2	0.11	16.2	15.7	5.4	7.8	6.1	-0.9	1.122	1.171
1975	-0.1	2.5	4.1	0.17	25.4	18.9	1.6	2.9	-8.7	-30.4	1.012	1.068
1976	1.2	1.5	4.9	0.41	14.4	12.9	2.1	0.5	-3.2	-7.7	0.973	0.852
1977	0.6	1.6	5.2	0.38	12.4	16.6	3.0	2.4	-4.0	9.7	1.049	0.953
1978	0.2	0.5	6.2	1.11	9.9	12.3	0.8	-4.6	-8.0	-1.3	1.195	1.136
1979	0.6	1.9	6.3	1.87	7.7	15.7	4.5	-2.2	5.5	10.3	1.331	1.309
1980	2.3	0.7	6.1	2.13	12.6	16.9	1.0	0.0	3.4	-4.7	1.483	1.386
1981	2.7	-0.5	5.9	3.52	13.4	20.3	3.7	1.5	-1.0	-7.3	1.576	1.333
1982	1.2	0.7	6.2	3.43	na	18.0	2.9	4.0	0.1	-2.0	1.752	1.357

Sources:
(i) Employment:
  (A) RBA *Bulletin*, December 1982, Table L.3 'Employed Persons'; Data for 1968-1973 are August-August growth rates from RBA Occasional Paper 8A, Table 4.3.
  (NZ) Department of Labour, *Statistical Tables*, 'Total Employment'.

(ii) Percentage Unemployed:
  (A) As per Employment 1973-82; data for 1968-1972 are June registrations data from RBA Occasional Paper 8A, Table 4.3.
  (NZ) 1968-80 - Registered Unemployed divided by 'Estimated Total Labour Force', Department of Labour, *Statistical Tables*, 1981 and 1982 figures are March 1981, March 1982, and are obtained from *Quarterly Predictions*, March 1983, p.15.

(iii) Annual Wages Growth:
  (A) Average weekly earnings per employed male unit, RBA *Bulletin*, December 1982, Table L.3, and *Australian Economic Review*, 4/82, Table 2, p.47.
  (NZ) Average ordinary-time hourly rate for all persons in the private sector. Annual data are average of October and April (or November and May) figures.

(iv) Real GDP Growth:
  (A) 1968-1974 based on 1974/75 prices, and obtained from RBA Occasional Paper No. 8A, Table 5.2 1975-1982 based on 1979/80 prices, and obtained from *Australian Economic Review*, 4/82, p.50.
  (NZ) RBNZ Data base for 1968-1980; estimates thereafter.

(v) Terms of Trade:
    (A) RBA Occasional Paper 8A, Table 1.15, *Australian Economic Review* 4/82, p.50.
    (NZ) Department of Statistics, *Prices, Wages and Labour*, Part A, 1982, p.39.

(vi) Relative Unit Labour Costs NZ/A:
        Linda Kay, *The Competitiveness of New Zealand's Manufacturing Exports*, NZIER, March 1983.

TABLE A2   SOURCES OF HOUSEHOLD INCOME BY HOUSEHOLD CHARACTERISTICS, YEAR ENDED 31 MARCH 1982

Principal Source of Income of the Household	Number of Households	Wage Salary	Self Employment	Government Benefits National Superannuation	Other Benefits	Interest, Rent Dividends Royalties	Other Regular Income	Average Weekly Income (All Sources)
			Average Gross Weekly Income of Household ($)					
Income by Household Member								
Head of Household	3,847	173.94	29.73	20.06	7.30	11.65	5.74	248.41
Spouse of Head	2,447	73.10	9.11	12.32	7.59	6.07	2.52	110.71
Sons and/or Daughters of Head	716	131.68	3.84	0.13	7.30	1.45	3.23	117.63
Other Household Members	346	155.85	4.00	19.22	7.26	4.61	6.85	197.79
Household Weekly Income Groups								
under $125	427	6.35	-6.24	49.72	20.77	4.84	3.50	78.95
$125 and under $153	223	17.46	7.62	65.46	34.21	8.79	7.59	141.13
$153 and under $192	264	41.97	8.09	85.93	15.54	11.69	8.09	171.31
$192 and under $230	253	115.30	21.57	39.45	14.19	12.97	8.51	211.98
$230 and under $268	215	163.97	25.72	27.82	13.04	11.76	7.18	249.49
$268 and under $307	226	208.85	27.13	21.55	11.33	12.78	7.30	288.94
$307 and under $385	420	260.11	26.72	21.10	13.70	11.32	8.72	344.68
$385 and under $480	460	358.46	28.87	12.15	10.60	11.31	8.64	430.21
$480 and under $575	379	425.20	51.57	12.76	11.45	16.06	7.42	524.47
$575 and over	620	595.17	109.27	13.28	11.65	40.14	15.72	785.23
Selected Family Types								
Couple with no children	841	224.39	28.92	66.21	3.55	26.66	14.18	363.91
- one child	386	338.59	40.37	14.50	7.80	19.93	6.91	428.10
- two children	595	352.00	69.81	2.87	12.15	12.01	5.96	454.80
- three or more	470	356.73	61.28	0.73	21.16	10.54	6.60	457.05
Solo Parent with child (ren)	203	128.88	11.96	13.58	63.46	8.76	11.22	237.87
Non-Family Households	734	139.98	12.83	42.17	5.45	14.49	6.76	241.68
Extended Family Households	258	352.39	30.99	38.08	45.30	13.47	9.24	499.46

Source: Unpublished data from *Household Survey*, Department of Statitics.

TABLE A3 - ANNUAL RATES OF PRICE CHANGE: CPI, GDP DEFLATOR, EXPORTS AND IMPORTS

	$\overset{o}{P}$ CPI	$\overset{o}{P}$ GDP	$\overset{o}{P}$ X	$\overset{o}{P}$ M
S 68	3.54	5.72	11.14	16.3
M 69	5.47	3.91	7.02	4.13
S 69	4.94	3.95	9.06	3.55
M 70	4.81	1.88	0.0	4.10
S 70	6.15	7.41	-0.60	7.76
M 71	10.6	14.57	8.84	8.84
S 71	11.26	11.38	7.81	7.81
M 72	8.31	13.44	19.83	2.15
S 72	6.44	10.88	21.44	2.15
M 73	5.89	9.63	29.49	3.43
S 73	8.93	11.78	29.66	3.43
M 74	10.31	5.90	7.39	5.25
S 74	11.37	0.54	-7.47	10.12
M 75	13.13	5.31	-10.90	29.97
S 75	14.72	10.21	1.8	44.38
M 76	17.18	19.51	31.63	25.89
S 76	15.71	19.02	34.30	25.90
M 77	14.48	14.59	25.78	26.13
S 77	14.74	16.39	15.11	14.48
M 78	11.11	15.11	-1.27	8.23
S 78	10.36	14.24	8.25	1.41
M 79	15.27	14.96	23.78	4.39
S 79	18.38	15.15	25.85	16.57
M 80	16.26	22.99	12.54	34.02
S 80	15.19	20.97	9.11	29.27
M 81	15.44	10.56	11.42	14.25
S 81	15.8	14.00	10.60	13.41
M 82	16.63	15.25	9.25	14.49
S 82		14.06		10.56

Sources

(a) CPI, P_X, P_M from N.Z. Department of Statistics, Prices, Wages and Labour, Part A, 1982, and Monthly Abstract of Statistics.

(b) P_{GDP} from Grindell (ed) (1981), Table 9.

TABLE A4 - NOMINAL GOVERNMENT EXPENDITURE RELATIVE TO NOMINAL GROSS NATIONAL EXPENDITURE (PERCENTAGES)

	Average (1) 1960/61 1964/65	Average (2) 1965/66 1969/70	Average (3) 1970/71 1974/75	Average (4) 1975/76 1979/80	1980/81
Central Government					
Current Expenditure on Goods and Services	9.5	11.4	11.5	13.4	15.3
Capital Formation	4.4	3.9	4.9	6.3	4.3
Total Final Expenditure	13.9	15.3	16.4	19.7	19.5
Current Transfers and Subsidies	11.3	10.5	12.5	17.4	17.8
Sub-Total	25.2	25.8	28.9	37.1	37.3
Net Financial (Capital) Transfers and Miscellaneous Investments			1.3	2.0	2.1
TOTAL			30.2	39.1	30.4

TABLE A5 - AVERAGE DIRECT PERSONAL AND COMPANY TAX RATES

(March years)	Direct Personal Tax: Percentage of Household Income (1)	Company Tax assessed as percentage of Net Operating Surplus (2)
1971	15.7	48
1972	16.8	44
1973	16.8	na
1974	17.0	na
1975	16.8	40
1976	20.1	45
1977	21.5	44
1978	23.6	34
1979	22.2	39
1980	22.1	36
1981	23.7	36

Sources

Table A4: Pope (1982) Table 2A
Table A5: Column 1: Pope (1982) Table 1A.
Column 2: OECD Economic Survey of New Zealand, 1982, Table 7, Annex I.

TABLE A6 - CHANGES IN COMPOSITION OF EMPLOYMENT, 1971 - 1982

(Point-to-Point Percentage Changes)

	Oct 71 -Oct 75	Oct 75 -Oct 77	Oct 75 -Oct 77	Oct 77 -Oct 79	Feb 80 -Feb 82	Distribution at Feb 1982 (Total)
Private Sector						
Full-time						
Male	4.08	0.18	-1.50	-1.51	-1.15	386,952
Female	5.45	1.09	2.55	5.81	-0.11	179,627
Part-time						
Male	15.82	-0.92	2.48	1.55	0.88	26,057
Female	23.36	11.45	8.47	7.17	6.92	90,536
Government						
Full-time						
Male	1.54	9.86	-0.26	1.81	-2.55	101,087
Female	-4.26	18.81	4.01	10.89	-2.76	40,421
Part-time						
Male	-15.34	31.28	1.30	-17.09	-15.99	667
Female	1.51	29.21	6.15	7.06	2.65	6,280
Government Corporations						
Full-time						
Male	6.34	22.17	2.98	5.15	-1.59	12,668
Female	13.22	31.07	10.46	7.55	4.75	7,292
Part-time						
Male	24.8	37.50	8.26	-23.66	-20.62	127
Female	56.6	77.1	-6.12	10.86	42.00	639
Local Authorities						
Full-time						
Male	12.76	8.51	2.11	4.01	-0.76	77,201
Female	19.26	12.55	4.16	3.81	-2.21	72,357
Part-time						
Male	3.69	-8.68	6.45	10.81	0.75	5,188
Female	19.62	15.27	22.94	17.26	2.58	22,463
Working Proprietors						
Male	5.61	16.58	5.71	-0.07	4.93	59,554
Female	10.72	13.79	11.52	9.79	12.77	25,040
						1,114,156

Source
Department of Labour: Statistical Tables.

TABLE A7 - CAPITAL FORMATION RELATED TO GDP

March Years	GFCF ÷ GDP	Private GFCF ÷ GDP	Private Investment in plant, machinery etc. ÷ Private Sector GDP
1972/73	22.61	15.00	5.42
1973/74	22.95	16.19	5.26
1974/75	26.08	17.55	5.99
1975/76	27.56	16.79	5.29
1976/77	25.28	16.45	6.07
1977/78	22.24	15.50	4.66
1978/79	20.44	12.01	4.09
1979/80	17.99	11.71	4.55
1980/81	18.08	12.03	4.70
1981/82*	20.68	14.00	n.a.
1982/83*	22.74	14.65	n.a.

Sources:

Monthly Abstract of Statistics, Department of Statistics, July 1982 and January 1983.

Quarterly Predictions, N.Z. Institute of Economic Research, December 1982. (* NZIER estimates).

Figure A1

PRODUCTIVITY AND REAL WAGES, PRIVATE SECTOR
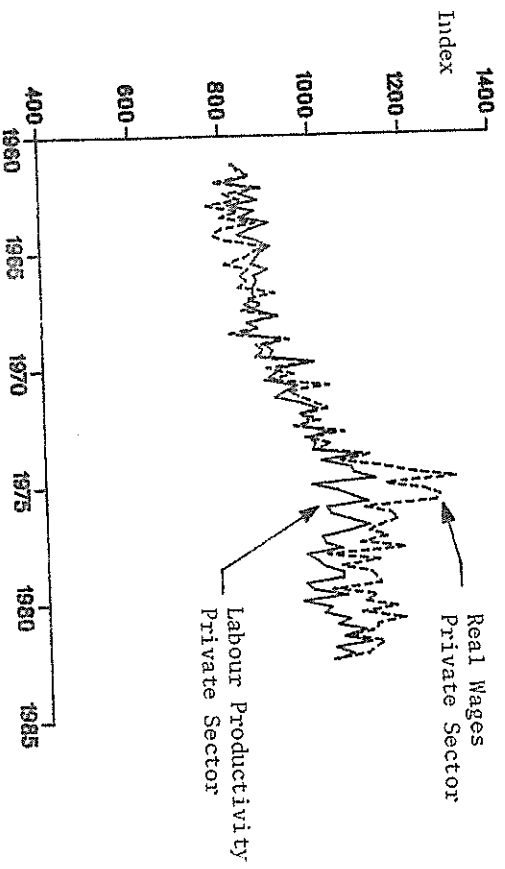(Base 1969 4th Quarter = 1000. RBNZ Data)

Real Wages
Private Sector

Labour Productivity
Private Sector

Figure A2

FIGURE 10 RATIO OF THE PRICES OF LABOUR TO CAPITAL

RATIO OF COST OF LABOUR TO COST OF CAPITAL

TREND RATIO

EXTRACT FROM GREGORY AND DUNCAN (1979) p.277

Figure A3

REAL WAGE RATE DATA
(Index Scale, 1975 Jan./June = 1000)

Surveyed
Ordinary
Hourly Wage
Rate, Private
Sector

RBNZ WP/P
Series.

Year
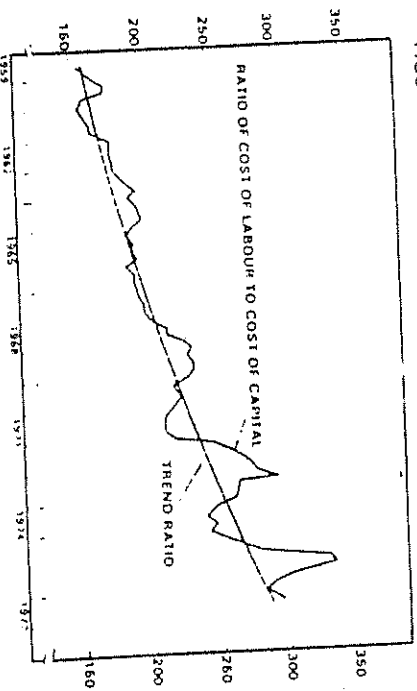
APPENDIX B: LABOUR DEMAND FUNCTIONS

In its 'Keynesian' mode, the Core Model has producers who are cost-minimisers, who take output as being determined from the demand side, and who set prices on the basis of a fixed markup on unit costs.   The fact that firms are assumed to be cost-minimisers rather than profit-maximisers has implications for the form of the factor demand functions.

We will adopt the following notation:

p is the price per unit of output

w is the wage rate per unit of labour input

Q is the volume of real output

c is the user cost per unit of capital services

K is the flow of capital services.

Suppose output is produced using the CES production function

$$Q = A (e K^{-\phi} + h L^{-\phi})^{-1/\phi} \qquad (i)$$

where A may include a time-indexed technical progress term. Following Bischoff (1971), suppose firms set output prices by the relation

$$p = \theta \left(\frac{wL}{Q} + \frac{cK}{Q} \right), \quad \text{where } \theta : 1 \text{ is the markup. (ii)}$$

The cost minimisation conditions are, in the CES case,

$$\frac{MP_K}{MP_L} = \frac{e}{h} \frac{L(1+\phi)}{K(1+\phi)} = \frac{c}{w} \qquad (iii)$$

i.e. cK $= \dfrac{e}{h} L(1+\phi) K^{-\phi} \frac{c}{w}$

The production function can be solved for $K^{-\phi}$, and an expression for cK obtained from (ii).   Together, these give a desired-labour equation in log form of :

$$\hat{Ln} L = \left(\frac{1}{1+\phi}\right) Ln \frac{h}{\theta} + Ln Q - \left(\frac{1}{1+\phi}\right) Ln \left(\frac{w}{p}\right) - \left(\frac{\phi}{1+\phi}\right) Ln A \qquad (v)$$

Noting that $\sigma = \dfrac{1}{1+\phi}$ is the elasticity of substitution, and assuming

- a constant markup
- a proportional first-order adjustment of actual labour hires to desired labour demand,

then we have:

(1) $\left.\begin{array}{l} \hat{Ln} L = \text{constant} + Ln Q - \sigma Ln \frac{w}{p} - \phi\sigma Ln A \\[2mm] \Delta \hat{Ln} L = \delta(\hat{Ln} L - Ln L_{-1}) \end{array}\right\}$ (vi)

and analogous equations can be derived for capital services.

Several points can be noted about the above expression:

(1)   It is not generally possible to obtain an expression of the above type, with these variables taken to be exogenous to the firm, from either standard cost minimisation or profit maximisation.

In the case of cost minimisation, the use of (i) and (iii) yields an expression of the form:

$$\hat{L} = f (Q, \frac{c}{w}, A) \qquad (vii)$$

or in other words the user cost of capital appears in the labour demand function.

In the case of profit maximisation, Q is a variable of choice for the firm, and profit maximisation yields

$$\hat{L} = f (A, c, w, p.) \qquad (viii)$$

or, in other words, output is not an argument of the labour demand function.

(2)   The labour demand function (vi) corresponds to that in the

RBNZ Core Model fairly closely. There we have (See Grimes ed. (1985a)),

$$\ell n \hat{L} = \text{constant} + \ell n Q - \sigma \ell n \frac{w}{p}$$

$$\Delta \ell n L = \delta(\ell n \hat{L} - \ell n L_{-1}) + \alpha \ell n \frac{w}{\Pi} \Big\} \qquad (ix)$$

This differs from our formulation in that real profits affect the adjustment process, and there is no technical progress term in $\ell n \hat{L}$.

The price equation in the RBNZ Model can be treated as a weighted average of domestic selling prices and export prices, with the former being set as a markup on unit costs. Thus

$$p = (p_d)^\eta (p_x)^{1-\eta} \qquad (x)$$

where $\quad p_d = \theta(t^\beta \left(\frac{wL}{Q}\right)^\gamma \left(\frac{cK}{Q}\right)^\mu) \qquad (xi)$

and $\quad$ t is unit sales taxes.

(3) The form of the adjustment relation is essentially arbitrary, and implicitly assumes firms take current-period values of output and prices to be the expected values over the planning horizon. Alternatively, if firms formed adaptive expectations of output, real wages and technical change, and for simplicity used an identical scheme for all variables, we would write the model as

$$\ell n \hat{L} = \text{constant} + \ell n Q - \sigma \ell n \frac{w}{p} - \phi \ell n A$$

$$(\ell n \hat{L}_t)^e = \lambda \sum_{i=0}^{n} (1-\lambda) \hat{L}_{t-i}^i \Big\}$$

$$\Delta L_t = \alpha(\ell n \hat{L}_t - \ell n L_{t-1}^e) \qquad (xii)$$

The above example is provided to sketch out a plausible basis for a different adjustment equation: because the adjustment process is an *ad hoc* imposition on an otherwise static model, a variety of adjustment processes could be consistent with the basic formulation.

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