NOT FOR QUOTE

A Wage/Tax Policy to Increase Employment

by
Peter B. Dixon and Maureen T. Rimmer

Centre of Policy Studies

June 2000

Abstract

We use MONASH, a dynamic CGE model, in an analysis of the macroeconomic effects of combining a freeze on Award wage rates in Australia with the granting of tax credits to low-wage workers in low-income families. Our results suggest that if this policy were successful in lowering the actual real before-tax wage rates of workers in the Award system, then it would have favourable short-run effects on aggregate employment. These effects would persist into the long run if the policy lead to a rightward shift in labour supply curves. A downside risk of the policy is that it would render the Award system irrelevant to the determination of wage rates, possibly increasing the costs of wage bargaining.

1. Introduction

Wage/tax bargains were an important feature of Australian economic policy during the 1980s. Via a series of Accords between the Australian Council of Trade Unions (ACTU) and the government, Australian workers were given cuts in income taxes as an alternative to increases in before-tax wage rates. Thus, after-tax wage rates were maintained while the costs of employing labour were reduced. This policy underlay strong employment growth from 1983 to 1990. Eventually, the policy foundered for two reasons. First, the government ran out of scope for budget-balancing reductions in public expenditure. Second, weakening of Australia's trade-union movement and centralized wage-fixing system reduced the ability of the government and the trade-union movement to reach agreements which were binding across a large proportion of the labour market.

Recently, interest in wage/tax bargains has been revived by Dawkins *et al.* (1999) and Dawkins (1999). Their variant of the wage/tax bargain is attuned to Australia's current Award-wage system which covers workers accounting for about 21 per cent of Australia's wagebill (see Table 1). Award wage rates for these workers are determined by centralized bargaining in the Industrial Relations Commission between unions, government and employers. Actual wage rates of workers in the Award system normally reflect Award wage rates. We suspect that this is because in determining Award wage rates, the Industrial Relations Commission explicitly or implicitly considers the factors which would be relevant in a freely operating labour market in determining wage rates for the group of workers currently in the Award system. In particular, the Commission is concerned with gaps between demand and supply. Wage rates for most workers outside the Award system are determined by agreements between individual enterprises and relevant unions, again we suspect largely mirroring free market outcomes. Wage rates for the remaining workers are determined directly by market forces.

Table 1. Shares in total wagebill

	AWARD	**NON-AWARD**	***Total***
ENTITLED	0.07	0.15	***0.22***
NOT ENTITLED	0.14	0.64	***0.78***
Total	***0.21***	***0.79***	***1.00***

Source: data provided by NATSEM. This table shows the shares of total labour income accounted for by workers partitioned into four categories: on Award and entitled to tax credits (AW-EN); not on Award and entitled to tax credits (NAW-EN); on Award and not entitled to tax credits (AW-NEN); and not on Award and not entitled to tax credits (NAW-NEN).

In this system, Dawkins and his colleagues suggest a three year freeze on Award wage rates combined with tax credits (equivalent to tax cuts) for low-wage workers living in low-income families. They hope to achieve a significant reduction in wage costs directly through reductions in the actual wage rates of Award workers and indirectly through induced effects on wage rates of non-Award workers. At the same time, they hope their proposed tax credits will mitigate adverse distributional effects and increase incentives to work.

In a central example of their proposal, real Award wage rates are reduced by 9 per cent over three years relative to the value they would have reached in the absence of the policy. In the absence of the policy, we would expect real Award wages to increase by about 1 per cent a year, approximately in line with actual wage increases that would have been determined by demand and supply factors in a free market. With the policy, we would expect an annual rate of reduction in real Award wage rates (but not necessarily actual wage rates of Award workers) of about 2 per cent, reflecting 2 per cent annual inflation.

The tax credits in the central example build up over three years from 1.5 to 3 to 4.5 per cent of the labour income of entitled workers [that is workers living is low-income families, details can be found in Lambert (1999)]. As can be seen from Table 1, the workers entitled to the tax credits account for about 22 per cent of the total wagebill. With Australia's wagebill being about $300 billion, the annual cost of the tax credits to the government for the third and subsequent years is about $3.0 billion (= 0.045*0.22*300).

The aim of this paper is to analyse the central example from a macroeconomic point of view.[1] We refer to this central example as *the policy*. The questions which we try to answer are: (a) under what conditions would the implementation of the policy generate a significant increase in employment? and (b) if employment were to increase, would the increase be permanent or temporary?

We analyse the policy via simulations with MONASH, a dynamic CGE model of the Australian economy.[2] Each simulation consists of two MONASH runs. The first run generates basecase forecasts under business-as-usual assumptions. The second generates forecasts which include the policy. Then we calculate the gaps between the two sets of results, that is we calculate deviations from the basecase forecasts induced by the policy.

Despite our reliance on model simulations, readers will not require familiarity with MONASH to follow the paper or to assess the results. We provide descriptions of the relevant features of the model and our explanations of the results involve well known mechanisms.

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1 Detailed distributional analysis has already been performed by Lambert (1999).

2 Details of MONASH can be found in Dixon and Rimmer (2000).

The paper is organized as follows. The next section contains a broad overview of the MONASH labour-market specification, followed by more detailed material on our assumptions concerning the ability of employers to substitute one category of labour for another and the ability of workers to transfer between labour categories. In section 3 we present our results and explain them via demand and supply diagrams. Section 4 contains concluding remarks.

2. The labour market in the MONASH model

To analyse the wage/tax-credits policy, we created a version of MONASH with 28 categories of labour: 7 occupations by 2 payment statuses (award, non-award) by 2 entitlement statuses (entitled, not entitled).

2.1 Stylized representation

A stylized representation of the labour market equations in this version of MONASH is as follows:

$$D_c(t) = H_c\left(BTW_1(t), \ \ldots \ , BTW_n(t); V(t)\right) \quad , \tag{1}$$

$$L_c(t) = G_c\left(ATW_1(t), \ \ldots \ , ATW_n(t)\right) * F_c(t) \quad , \tag{2}$$

$$ATW_c(t) = BTW_c(t) * \left(1 - T_c(t)\right) \quad , \tag{3}$$

$$E_c(t) = D_c(t) \tag{4}$$

and

$$\frac{ATW_c(t)}{ATW_{cb}(t)} - \frac{ATW_c(t-1)}{ATW_{cb}(t-1)} = \alpha \left(\frac{D_c(t)}{D_{cb}(t)} - \frac{L_c(t)}{L_{cb}(t)} \right) + J_c(t) \quad , \tag{5}$$

where

$D_c(t)$ is the demand for labour in category c in year t;
$BTW_c(t)$ is the real before-tax wage rate of labour in category c in year t;
$ATW_c(t)$ is the real after-tax wage rate of labour in category c in year t;
$T_c(t)$ is the rate of taxes (income and payroll tax) applying to labour income in category c;
V(t) is a vector of non-wage variables such as capital stocks and technology, which influence the demand for labour in category c ;
$L_c(t)$ is the supply of labour of category c in year t;
$E_c(t)$ is employment of labour in category c;
$ATW_{cb}(t)$, $D_{cb}(t)$ and $L_{cb}(t)$ are basecase forecasts for category c of the after-tax real wage rate, the demand for labour and the supply of labour;
α is a positive parameter;
$F_c(t)$ is a variable allowing for shifts in category c's supply function; and
$J_c(t)$ is a variable allowing for shifts in category c's wage-adjustment function.

Equation (1) relates the demand for labour in each category to costs per unit of labour (real before-tax wage rates) and to other variables [V(t)]. Equation (2) relates the supply of labour in each category to real after-tax wage rates and to other variables [$F_c(t)$]. Equation (3)

defines real after-tax wage rates as before-tax rates less income and payroll taxes. In equation (4) we assume that employers always operate on their demand curves. Equation (5) introduces a wage-adjustment mechanism to close gaps between demand and supply. It implies that if a policy causes the market for labour of category c in year t to be tighter than it was in the basecase forecast (i.e., if the policy causes a larger percentage deviation in demand than in supply), then there will be an increase between years t-1 and t in the deviation in the real after-tax wage rate. In other words, in periods in which a policy has elevated demand relative to supply, real wages will grow relative to their basecase values. The operation of our labour market specification (1) - (5) is illustrated for the one category case in Figure 2.1.

Although we assume that gaps between demand and supply are eventually closed by wage adjustments, this does not imply that the labour market converges to full employment.

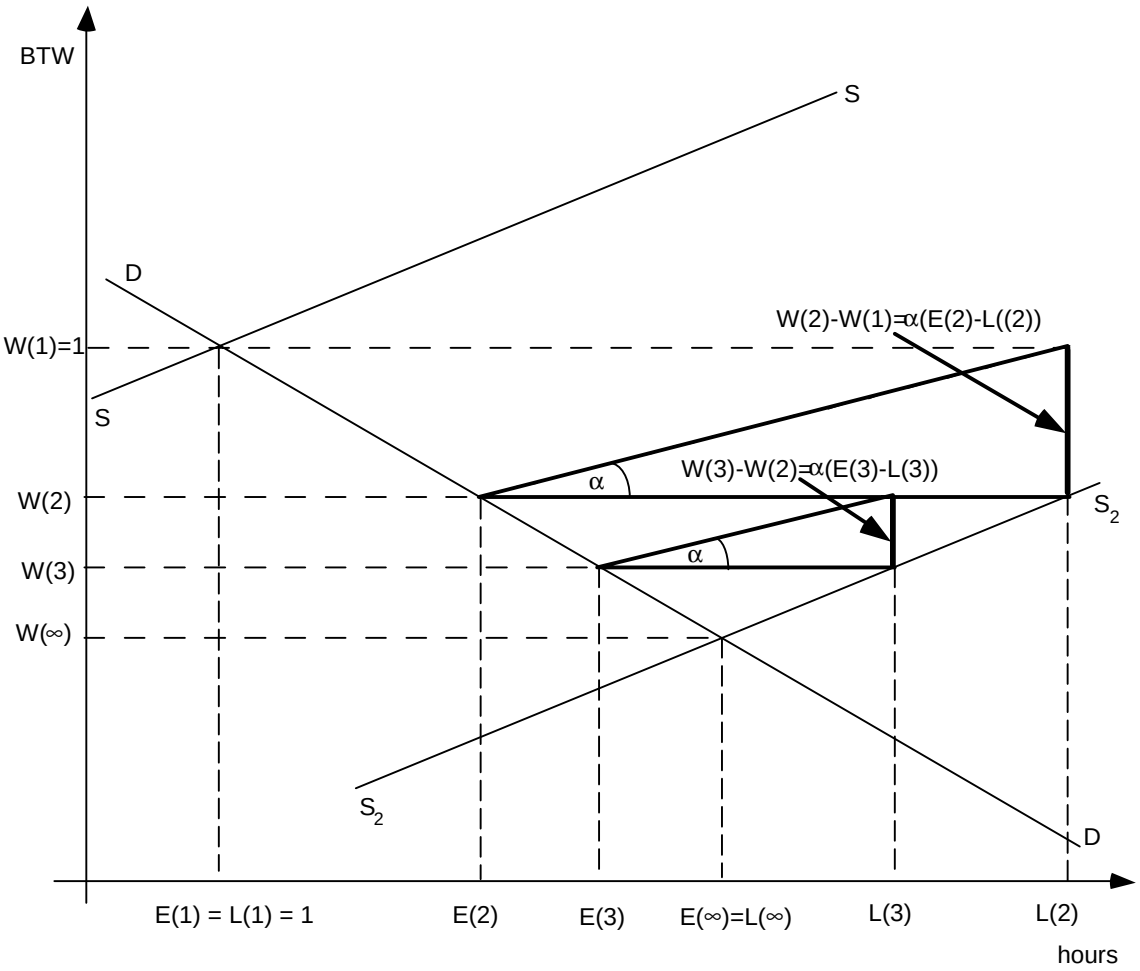
We interpret supply curves such as SS in Figure 2.1 as loci of points of employment and before-tax wage rates, (E,W), at which there is no pressure for wage change. To clarify this idea it is useful to start by assuming that all people have the same work skills implying that everyone is equally capable of performing the available jobs. At (E,W) points on the supply curve there is no pressure for wage change because all people who want jobs at wage W and who can effectively compete for jobs are employed. There may be some people who would be willing to work if they could obtain a job at the going wage rate W or slightly below but who do not compete effectively for employment for a variety of reasons. These may include: information failures such as lack of knowledge by potential employees concerning job availability or lack of knowledge by employers concerning the suitability of potential employees; the existence of qualification requirements imposed by professional associations, unions, the government or employers; discriminatory customs related to age, ethnicity, gender, religion and educational background; and wage rigidities imposed by wage tribunals and enterprise agreements preventing people without jobs from offering their services at slightly less than the going wage rate. Only if all potential workers can effectively compete for jobs can we consider the supply curve to represent a locus of full employment points. Even then there may be a considerable number of people without jobs who would be capable of holding jobs, but for lifestyle or other reasons they are not willing to do so at wage W.

The picture is more complicated when we recognize that there are many categories of jobs requiring widely varying skills. Now we must think of category c's supply curve as a locus of (E_c,W_c) points at which there is no pressure for change in W_c. At (E_c,W_c) points on c's supply curve there is no pressure for wage change because E_c consists of all people who (a) have the ability and desire to do category c work at wage W_c or slightly below and (b) can effectively compete for category c jobs. There may be people who satisfy (a) but not (b) because of information failures, qualification restrictions, discriminatory customs and wage rigidities. Only if all people satisfying criterion (a) also satisfy (b) can we consider c's supply curve to represent full employment points for category c.

With these definitions in mind, we see that supply curves can be moved to the right by: (1) policies which increase the number of people willing to work at any given before-tax wage rate and (2) policies which increase the number of people who can effectively compete for jobs. Policies in group (1) include reductions in taxes on labour income, reductions in removal costs (e.g. stamp duties on housing), improved child care facilities and increased flexibility regarding working hours. Policies in group (2) include provision of job information, elimination of qualification restrictions, outlawing of discriminatory customs and removal of wage rigidities.

Rightward moves in labour supply curves generate downward pressure on wages arising: from concern by unions about lack of job or overtime opportunities for their members; from concern by wage tribunals about unemployment; and from the ease with which employers can find and retain suitable workers. Downward pressure translates into lower wage rates than would otherwise have occurred and into higher levels of employment.

Figure 2.1. Operation of the labour-market specification in a steady state with one category of labour: a supply shock



In this illustration, but not in MONASH, we assume that the basecase was generated under steady-state assumptions in which technology, consumer tastes, foreign prices, capital availability, taxes, population and other variables affecting the demand for and supply of labour are unchanged from year to year. In this steady state the demand curve for labour [equation (1)] is DD and the supply curve [equation (2)], drawn for a fixed tax rate is SS. For convenience we assume that the before-tax wage rate, employment and the supply of labour are one in the steady state, allowing us to eliminate the basecase forecasts from equation (5). Now consider a policy simulation (e.g. an increase in migrant intake) involving a shift in the supply curve in year 2 to S_2S_2, where it remains for all future years. Assuming that the shift variable in (5) is fixed on zero and there is no change in tax rates so that changes in before-tax wage rates on the vertical axis are also changes in after-tax wage rates, then employment increases from E(1) to E(2) to … E(∞), labour supply increases from L(1) to L(2) and then falls from L(2) to L(3) to … L(∞), and wages fall from W(1) to W(2) to … W(∞).

There is considerable scope for rightward movements of labour supply curves in Australia. This is evidenced by lack of downward pressure on wages despite high levels of actual and disguised unemployment.

2.2 Detailed specification of labour supply and demand functions

At a more detailed level, the specification of the supply functions [equation (2)] in the version of MONASH created for this paper is as follows:

$$l_{ope} = \delta_{\bullet\bullet e} * w_{\bullet\bullet e} + \phi_{\bullet\bullet e} * (w_{o\bullet e} - w_{\bullet\bullet e}) + \phi_{o\bullet e} * (w_{ope} - w_{o\bullet e}) + f_{ope} \quad (6)$$

where

$$w_{o\bullet e} = \sum_{p=1}^{2} S_{ope} * w_{ope} \quad (7)$$

and

$$w_{\bullet\bullet e} = \sum_{o=1}^{n} S_{o\bullet e} * w_{o\bullet e} \quad . \quad (8)$$

In these equations

l_{ope} is the percentage change from year t-1 to t in the supply of labour in category ope, that is in occupation o, payment status p (award, not-award) and entitlement status e (entiled, not-entitled);

w_{ope} is the percentage change in the real after-tax wage rate of labour in category ope;

S_{ope} is the share of payment status p in the total after-tax wage income of workers in occupation o, entitlement status e;

$S_{o\bullet e}$ is the share of occupation o in the total after-tax wage income of workers in entitlement status e;

$w_{o\bullet e}$ is the percentage change in the real after-tax wage rate of labour in category oe, defined in (7) as a share-weighted average of w_{ope}, for p = award and non-award;

$w_{\bullet\bullet e}$ is the percentage change in the real after-tax wage rate of labour in entitlement category e, defined in (8) as a share-weighted average of $w_{o\bullet e}$, over all occupations o;

$\phi_{o\bullet e}, \phi_{\bullet\bullet e}$ and $\delta_{\bullet\bullet e}$ are positive parameters; and

f_{ope} is the percentage change in the variable allowing for shifts in the supply function for labour in category ope.

Via the first term on the RHS of (6) we allow the supply of labour in each entitlement group to respond to the group's average real post-tax wage rate. We set the parameter $\delta_{\bullet\bullet e}$ at 0.2 for both values of e. This value is at the high end of labour supply elasticities for broad groups of workers estimated by Kalb (1997).

Via the second term on the RHS of (6) we allow workers to move between occupations in response to changes in relative wages within their entitlement group. The ease of movement is controlled by the parameters $\phi_{\bullet\bullet e}$. In the simulations reported below these parameters are set at 0.5, allowing a moderate level of occupational movement.

Via the third term on the RHS of (6) we allow workers to move between Award and non-Award status in response to changes in Award wages relative to non-Award wages. The ease of movement is controlled by the parameters $\phi_{o\bullet e}$. In the simulations reported below we set $\phi_{o\bullet e}$ at 2 for all o and e. With this setting, we assume that workers show a high degree of willingness to switch to non-Award status in response to an increase in non-Award wages relative to Award wages.

In building the demand side [equation (1)] of our labour market specification we assumed that

$$d_{opej} = -\theta_{op\bullet} * (m_{opej} - m_{op\bullet j}) - \theta_{o\bullet\bullet} * (m_{op\bullet j} - m_{o\bullet\bullet j}) - \theta_{\bullet\bullet\bullet} * (m_{o\bullet\bullet j} - m_{\bullet\bullet\bullet j}) + Q_j(m_{\bullet\bullet\bullet j}, v_j) \quad (9)$$

where

$$m_{op\bullet j} = \sum_{e=1}^{2} R_{opej} * m_{opej} \quad , \quad (10)$$

$$m_{o\bullet\bullet j} = \sum_{p=1}^{2} R_{op\bullet j} * m_{op\bullet j} \quad (11)$$

and

$$m_{\bullet\bullet\bullet j} = \sum_{o=1}^{n} R_{o\bullet\bullet j} * m_{o\bullet\bullet j} \quad . \quad (12)$$

In these equations

d_{opej} is the percentage change from year t-1 to t in the demand for labour by industry j in category ope;

m_{opej} is the percentage change to industry j in the real before-tax wage rate of labour in category ope;

R_{opej} is the share of e in industry j's costs of employing op;

$R_{op\bullet j}$ is the share of p in industry j's costs of employing o;

$R_{o\bullet\bullet j}$ is the share of o in industry j's total labour costs;

$m_{op\bullet j}$ is the percentage change to industry j in the real before-tax wage rate of category op, defined in (10) as a share-weighted average of m_{opej} over both values of e;

$m_{o\bullet\bullet j}$ is the percentage change to industry j in the real before-tax wage rate of occupation o, defined in (11) as a share-weighted average of $m_{op\bullet j}$ over both values of p;

$m_{\bullet\bullet\bullet j}$ is the percentage change to industry j in the overall real before-tax wage rate, defined in (12) as a share-weighted average of $m_{o\bullet\bullet j}$ over all o;

$\theta_{op\bullet}$, $\theta_{o\bullet\bullet}$ and $\theta_{\bullet\bullet\bullet}$ are positive parameters; and

Q_j is a function relating the percentage change in j's overall demand for labour: to the percentage change in the average real before-tax wage rate applying to workers in industry j; and to other variables (v_j) such as the growth in j's capital stock.

Via the first term on the RHS of (9) we allow industry j to substitute between op workers in different entitlement groups. We assume that employers are barely able to distinguish between these groups. Thus we set the substitution parameter $\theta_{op\bullet}$ at a high value, 10.

Via the second term on the RHS of (9) we allow industry j to substitute between Award and non-Award workers in occupation o. We set the substitution parameter $\theta_{o\bullet\bullet}$ at 2, thereby assuming that employers respond quite strongly to changes in the differential between Award and non-Award wage rates.

Via the third term on the RHS of (9) we allow industry j to substitute between workers in different occupations. We set the substitution parameter $\theta_{\bullet\bullet\bullet}$ at 0.35, thereby assuming that employers have only moderate scope to respond to changes in the relative costs of different occupations.

Via the last term on the RHS of (9), we allow changes in the average wage payable by industry j to influence j's demand for labour through labour-capital substitution. We also include in this last term technical change and other non-wage variable which affect j's demand for labour.

3. Simulation results

Using MONASH we simulate the policy of freezing Award wages and introducing tax credits under two scenarios. In both scenarios, Award wage rates dominate the determination of actual wage rates for Award workers during the three year implementation period, implying that the policy leads to 9 per cent reductions (relative to forecast) in actual wage rates for Award workers. The scenarios differ in the way in which the labour market accommodates the policy-given paths for the actual wage rates of Award workers.

In scenario one the reduction in the actual wage rates of Award workers is made possible by a rightward shift in the supply curves for these workers. In terms of the stylized model (1) - (5) there is an increase in $F_c(t)$. As implied by the discussion in section 2, this could only come about if the freezing of Award wage rates caused an increase in the number of workers who are willing and able to compete for jobs. This would be the outcome if the existence of Award wage rates is currently preventing some unemployed people from offering their services for jobs within their skill range at slightly less than the going wage rate.

In scenario two we assume that the reduction in the actual wage rates of Award workers is made possible by a temporary change in the wage-adjustment dynamics of the labour market, with no shift in demand and supply curves. In terms of the stylized model (1) - (5), $J_c(t)$ is negative during the policy's three year implementation period whereas it was zero in the basecase forecasts. Temporary negative values for $J_c(t)$ would be the outcome under the policy if Award wage rates exert a temporary influence on the actual wage rates of Award workers, an influence that is eventually overcome by market forces.

A third scenario, rather like an extreme case of scenario two, is that the wage freeze makes Award rates irrelevant. They merely become a non-binding lower bound on actual wage rates. Under this scenario, actual wage rates for workers in the Award system become determined by normal market forces reflected in negotiations between employers and employees leading to over-Award payments. In other words, the policy does not move actual wage rates for award workers significantly from their basecase forecast path. For this case we do not need a MONASH simulation to tell us that the effect of the policy on employment would be negligible.

In our simulations for scenarios 1 and 2 we assume that the government does not allow the policy to cause the ratio of the public sector deficit to GDP to deviate from its basecase forecast path. We do this by allowing a uniform shift in the income tax rate applying to labour and capital income. In the absence of tax-generating changes in activity, the tax credits of $3 billion would be paid for by an increase in income tax rates of 0.6 percentage points ($3 billion is 0.6 per cent of labour and capital income). Thus, in the third year and beyond, workers entitled to tax credits would get a net reduction in their tax rate of 3.9 percentage points and workers not entitled would get a net increase of 0.6 percentage points. As we will see, under the assumptions of our simulations, the policy produces a considerable increase in tax-generating activity, more than sufficient to pay for the tax credits without increases in tax rates.

Simulation 1. Permanent shift in supply curves for Award workers

Charts 3.1 to 3.5 show deviations from basecase forecasts caused by the policy, assuming accommodating shifts in supply curves for Award workers.

As can be seen from Chart 3.1, the policy imposes after 3 years a reduction in the average real before-tax wage rate of 4.9 per cent. This is made up of a reduction of about 9 per

cent for Award workers and an induced reduction of 3.8 per cent for non-Award workers (0.21*9 +0.79*3.8≈ 4.9).

General equilibrium models such as MONASH describe producers as profit maximizers subject to technology and market constraints. MONASH does not treat the elasticity of demand for labour as a directly imposed parameter. Nevertheless we can deduce the implied elasticity for each year. In Chart 3.1 the implied elasticity starts at 0.44 in 2001 (a 1.50 per cent reduction in the wage rate produces a 0.66 per cent increase in employment). This is reasonable in light of the available econometric evidence. For example, Debelle and Vickery (1998) estimate the short-run elasticity as 0.4. By 2010 the implied elasticity reaches 0.89. It grows steadily because reduced labour costs generate higher rates of return on capital, higher investment and, with a lag, higher levels of capital stock. Increases in the capital stock allow higher levels of employment at any given real before-tax wage rate.

In the very long run we would expect the implied labour-demand elasticity to be close to infinity. The shifts in the labour supply curves assumed in this simulation produce a permanent increase in labour supply of about 4 per cent (Chart 3.4) leading to a similar permanent increase in aggregate employment (Chart 3.5). In the very long run, the increase in employment would require little change in the real before-tax wage rate. This can be explained in terms of the equations:

$$\mathrm{MPK}\left(\frac{K}{L}\right)=\frac{Q}{P} \quad \text{and} \quad \mathrm{MPL}\left(\frac{K}{L}\right)=\frac{W}{P} \quad , \tag{13}$$

where MPK and MPL are the marginal products of labour and capital, Q and W are the before-tax rental and wage rates and P is the product price. In the very long run, rates of return on capital in Australia must reflect world rates. Thus, assuming that P can represent capital asset prices, we would expect the policy to have little long-run effect on Q/P. Therefore the percentage increase in employment must be matched eventually by the percentage increase in capital, implying a zero long-run deviation in K/L and consequently in W/P.

Chart 3.1 does not take us to the very long run. At the end of the simulation period the deviation in employment has leveled out, but the deviation in capital is still growing and the deviation in the real before-tax wage rate (which was initially strongly negative) is still considerably below zero. MONASH recognizes two factors which produce relatively minor rates of diminishing returns not included in (13): agricultural land as a fixed input to production; and limitations on the size of world markets for Australian products. With these two factors, we would expect the policy to produce small reductions in W/P and K/L in the very long run.

Increased employment and capital produce increased GDP and increased tax revenue. Activity-linked increases in tax revenue together with reductions in unemployment benefits and reductions in the costs of government services (a labour-intensive category of expenditure) are more than sufficient in simulation 1 to pay for the tax credits. Thus we see in Chart 3.1 that the policy generates cuts in income-tax rates. By the end of the simulation period these cuts are 3.2 per cent of labour income (this includes the tax credits) and 1.9 per cent of capital income.

Charts 3.2 to 3.5 contain results for real after-tax wage rates, real before-tax wage rates, labour supply and labour demand (=employment) for four categories of labour:

Award workers who are entitled to tax credits (AW-EN);
Award workers who are not entitled to tax credits (AW-NEN);
non-Award workers who are entitled to tax credits (NAW-EN); and
non-Award workers who are not entitled to tax credits (NAW-NEN).

For understanding these results it is useful to draw demand and supply diagrams. From such diagrams we can deduce the partial equilibrium effects of the policy. Then we can describe the general equilibrium effects, that is the shifts in the demand and supply curves in the market for

labour of type c caused by changes in the prices of other types of labour and by other factors influencing the positions of c's demand and supply curves.

Award workers who are entitled to tax credits (AW-EN)

In Figure 3.1 we assume that the basecase forecast for this category of worker is a steady state with employment and the before-tax wage rate at [E(1),W(1)]. As in Figure 2.1, we define units so that this is the (1,1) point. DD and SS are the demand and supply curves. DD is drawn for fixed values of before-tax wage rates for other categories of workers and fixed values of other variables relevant to the demand for AW-EN workers. SS is drawn for fixed values of after-tax wage rates for other categories of workers and fixed values of other variables relevant to the supply of AW-EN workers. In drawing SS, we hold constant the tax rate on labour income of AW-EN workers. Thus SS can be drawn with the before-tax wage rate on the vertical axis. Changes in the tax rate will shift the SS curve.

The policy reduces the before-tax wage rate of AW-EN workers from W(1) to W(2), this is the assumed 9 per cent reduction. Under our assumption in simulation 1 that the wage reduction is accommodated by a supply shift, we see that the supply curve must shift from SS to S_2S_2. The new supply curve (S_2S_2) is positioned to satisfy the dynamic equation

$$W(2) - W^*(1) = \alpha\left(E(2) - L(2)\right) \quad . \tag{14}$$

In this equation $W^*(1)$ is the before-tax wage rate which, with the 4.5 per cent tax credits in place, would give the same after-tax wage rate as in the initial situation. Thus the LHS of (14) is the change in the after-tax wage rate between the pre-policy situation (period 1) and the immediate post-policy situation (period 2). Consistent with (5), this is equated to α times the gap between the demand (=employment) and supply for AW-EN workers in period 2. In deriving (14) from (5) we use the assumptions that the basecase forecast values for employment and wages are one and that in the policy situation J_c remains at its forecast value of zero.

With the supply curve fixed in its new position, S_2S_2, Figure 3.1 gives the following predictions for AW-EN workers: after a large increase in employment and decline in the before-tax wage rate between periods 1 and 2, there will be further employment increases and wage declines as the (E,W) point moves down the demand curve to close the gap between demand and supply. Another prediction is that labour supply will increase between periods 1 and 2 by an even larger percentage than labour demand, but then supply will decline. A final prediction is that the after-tax wage rate will decline between periods 1 and 2, but by a smaller percentage than the before-tax wage rate. Beyond period 2, we would expect the percentage declines in the after-tax wage rate to be in line with those in the before-tax wage rate, the only differences being caused by budget-balancing changes in the taxes on labour income.

From Charts 3.2 to 3.5, we see that these partial equilibrium predictions for AW-EN workers are largely realized in our MONASH simulation. During the period of policy implementation, 2001 to 2003: employment increases sharply (Chart 3.5); labour supply increases by even more than employment (Chart 3.4); the before-tax wage rate declines sharply (Chart 3.3); and the after-tax wage rate declines but not as sharply as the before-tax wage rate (Chart 3.2). Immediately beyond 2003 the before- and after-tax wage rates continue to decline and labour supply also declines. However, contrary to the partial equilibrium prediction, the deviation in AW-EN employment declines in 2004 (Chart 3.5).

This is due to general equilibrium factors. As explained in the next subsection in connection with Figure 3.2, and as can be seen from Chart 3.3, in 2004 the before-tax wage rate of AW-NEN workers falls slightly relative to that of AW-EN workers. These two categories of workers are very good substitutes [$\theta_{op\bullet}$ in (9) is set at 10]. Thus, the change in their relative

wage rates causes a leftward shift in the demand curve for AW-EN workers, leading to a reduction in AW-EN employment in 2004.

Beyond 2004, employment grows for all categories of labour, including AW-EN (Chart 3.5). This is in response to capital growth (Chart 3.1) which causes rightward movements in all labour-demand curves. These movements not only explain employment growth for all categories of labour but also the eventual upward trends in before- and after-tax wage rates and in labour supply (Charts 3.2 - 3.4).

Award workers who are not entitled to tax credits (AW-NEN)

The demand and supply diagram for AW-NEN workers (Figure 3.2) is similar to that for AW-EN workers (Figure 3.1). The only difference is that the AW-NEN workers do not receive tax credits. Thus for these workers the reduction between periods 1 and 2 in their real after-tax wage rate is the full reduction applying to the real before-tax wage rate of all Award workers [W(1) - W(2)].

Because AW-NEN workers are assumed to accept a larger reduction in real after-tax wage rates than do AW-EN workers, the accommodating percentage outward shift in the AW-NEN supply curve must be greater than that in the AW-EN supply curve. For this reason, the reduction in the equilibrium real before-tax wage rate of AW-NEN workers in Figure 3.2 [W(1) - W(∞)] is greater than that for AW-EN workers in Figure 3.1.

With the supply curve for AW-NEN workers fixed at S_2S_2, Figure 3.2 gives similar predictions for these workers as Figure 3.1 gave for AW-EN workers. However, relative to the outcomes for AW-EN workers, we would expect AW-NEN workers to have: similar short-run and greater long-run policy-induced increases in employment; greater policy-induced increases in labour supply; greater policy-induced reductions in real after-tax wage rates; and greater policy-induced reductions in real before-tax wage rates beyond the policy-implementation period. All of these predictions carry through to the MONASH results in Charts 3.2 to 3.5.

As mentioned in the previous subsection, AW-EN workers experience a reduction in employment in 2004 associated with the slower rate of decline of their real before-tax wage rate relative to that of AW-NEN workers. A complementary implication of this change in wage relativities is rapid growth in 2004 of AW-NEN employment relative to AW-EN employment (Chart 3.5).

non-Award workers who are entitled to tax credits (NAW-EN)

In a partial equilibrium diagram, the policy moves the supply curve for NAW-EN workers so that it passes through the point $[W^*(1),E(1)]$ where $W^*(1)$ is, as defined earlier, the before-tax wage rate which, with the tax credits in place, gives the same after-tax wage rate as in the initial situation. With this movement in the supply curve, Figure 3.3 indicates for NAW-EN workers that the policy will cause: employment to initially exhibit strong positive deviations and then weaker positive deviations; labour supply to exhibit positive and increasing deviations, but always smaller deviations than employment; real after-tax wage rates to exhibit positive and increasing deviations; and real before-tax wage rates to exhibit strong negative deviations followed by smaller negative deviations.

Consistent with these partial-equilibrium predictions for NAW-EN workers, Chart 3.4 shows positive and increasing supply deviations and Chart 3.5 shows strong positive employment deviations in the policy-implementation period followed by a smaller positive deviation in 2004. The increases in NAW-EN employment deviations beyond 2004 reflect capital growth, discussed earlier in this section.

The declines in NAW-EN real before- and after-tax wage rates in the years immediately following the implementation of the policy (2004 and 2005) contradict the partial equilibrium predictions. NAW-EN wage rates are reduced in these years by leftward shifts in the demand

curve for NAW-EN labour. The leftward shifts are caused by substitution by employers away from NAW-EN workers due to the continuing decline in the before-tax wage rates of Award workers. As explained earlier, Award wage rates continue to decline immediately after the policy-implementation period towards their long-run equilibrium levels. Beyond 2005, Award wages begin to rise (reflecting capital growth) allowing non-Award wages to rise.

non-Award workers who are not entitled to tax credits (NAW-NEN)

We have not drawn a demand and supply diagram for this group of workers because the policy has no direct effects on their demand and supply curves. The partial equilibrium prediction is no change in NAW-NEN employment, labour supply and wage rates. If we think of the NAW-NEN market as staying at the [E(1), W(1)] point and the NAW-EN market behaving as depicted in Figure 3.3, then relative to the NAW-EN workers, for NAW-NEN workers we would expect higher deviations in real before-tax wage rates, lower deviations in real after-tax wage rates, lower deviations in employment and lower deviations in labour supply. All of these comparative predictions between the NAW-EN and NAW-NEN markets are borne out in the MONASH results in Charts 3.2 to 3.5.

The NAW-NEN market is subject to the same general equilibrium effects as the NAW-EN market: substitution by employers away from non-Award towards Award workers; and movements of Award workers to non-Award status. These general equilibrium effects increase the supply of NAW-NEN workers, reduce their employment, and reduce their wage rates. Consequently, in Charts 3.2 to 3.5, we see for NAW-NEN workers negative wage deviations, positive supply deviations, and, at least in the early years, negative employment deviations. The employment deviations eventually become positive reflecting capital growth.

Simulation 2. Temporary change in wage-adjustment dynamics

The macro results in this simulation for the policy-implementation period (2001 to 2003) are the same as those in simulation 1 (compare Charts 3.6 and 3.1). During the period in which the market for Award workers accommodates the policy-determined reductions in wage rates, it makes no difference at the macro level whether this is via supply shifts or changes in wage dynamics. However beyond the policy-implementation period, when market forces are reinstated, the results in the two simulations are completely different. If the policy does not induce permanent shifts in labour supply, then it has only minor long-run effects. These include a small shift in income tax away from labour towards capital and a slight change in the costs to employers of Award workers relative to non-Award workers. The only significant long-run effect is that workers entitled to tax credits stay permanently advantaged relative to workers not entitled to credits. Thus the main long-run implications of the policy are for income distribution. For analysis of purely distributional effects see Lambert (1999).

4. Conclusion

A policy which restrained the growth of real before-tax wage rates of Award workers by 9 percentage points over the next three years would have favourable effects on employment: in our two MONASH simulations the employment increase by 2003 was 2.4 per cent. Further and permanent employment increases after 2003 were generated in simulation 1 where we assumed that the policy caused a rightward shift in the supply curve for labour.

To us, the policy seems very cheap: $3 billion of annual tax credits buys an increase in economic activity which delivers extra tax revenues well in excess of $3 billion. This is in tension with earlier analyses of wage-tax bargains. For example, Corden and Dixon (1980) found that a wage-tax bargain for Australia which had a significant effect on employment would involve a substantial move towards deficit in the government accounts. In the Corden-Dixon

analysis the tax credits (or tax cuts) applied to the entire workforce and were sufficient to ensure that no worker suffered a cut in his or her real after-tax wage rate. The present proposal is cheap because it envisages a situation in which most workers accept a reduction in their real after-tax wage rate. In the MONASH simulations, the reductions apply to all workers except those in the NAW-EN group which account for only 15 per cent of the wagebill.

Is the policy worth trying? As argued in section 2, we think that the key to reducing unemployment in Australia is to move labour supply curves to the right by: (1) policies which increase the number of people willing to work at any given before-tax wage rate and (2) policies which increase the number of people who can effectively compete for jobs. The lowering of real Award wage rates might be a useful policy under heading (2). This would be the case if growth in real Award wage rates is currently preventing some potential workers from competing in the labour market. Even if the policy did not shift labour supply curves, it might nevertheless achieve worthwhile short-run employment gains. This was illustrated by simulation 2 in which we assumed that the policy causes a temporary change in wage-adjustment dynamics. However the policy does carry a downside risk.

It is possible that the policy would have little affect on the *actual* wage rates of Award workers even though it reduced real Award wage rates. In this case there would be only minor macroeconomic effects in both the short and long runs. If the forces of demand, supply and wage-adjustment are substantially unaffected, then the policy will result in increased over-Award payments, rendering the Award system irrelevant to the operation of the labour market. This would be an undesirable outcome it the Award system is currently acting as a low-cost bargaining mechanism for a large number of workers. A policy which made Award wage rates significantly below those that would be determined in a free-market system would cause Award workers and their employers to engage in time-consuming and potentially expensive wage bargaining.

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Chart 3.1 Macro effects assuming labour supply shifts (Simulation 1)
(% deviations from basecase forecasts)

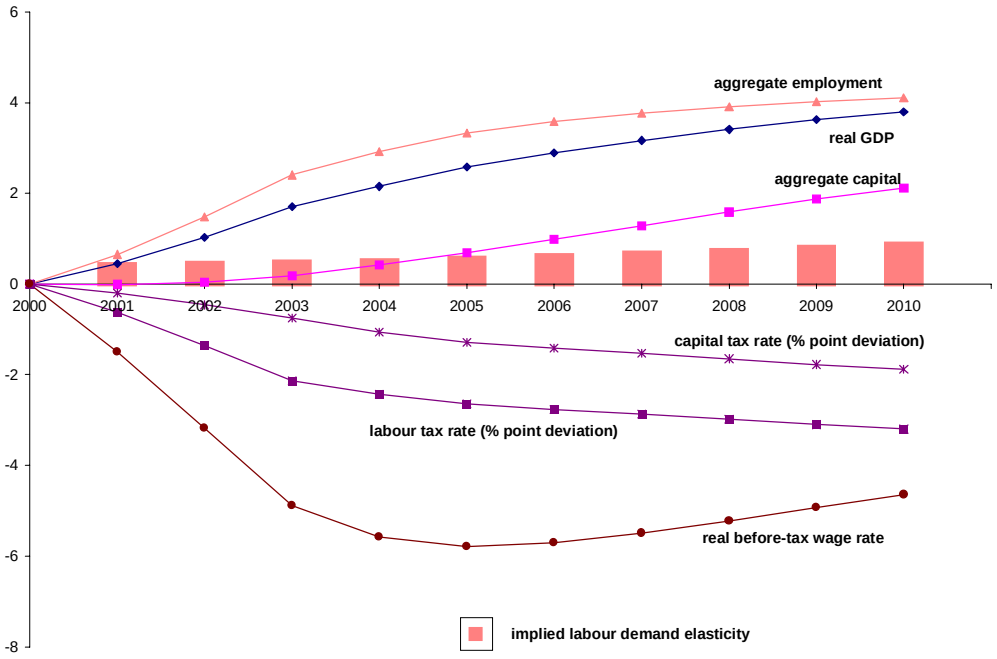

Chart 3.2 Real after-tax wage rates (Simulation 1)
(% deviations from basecase forecasts)

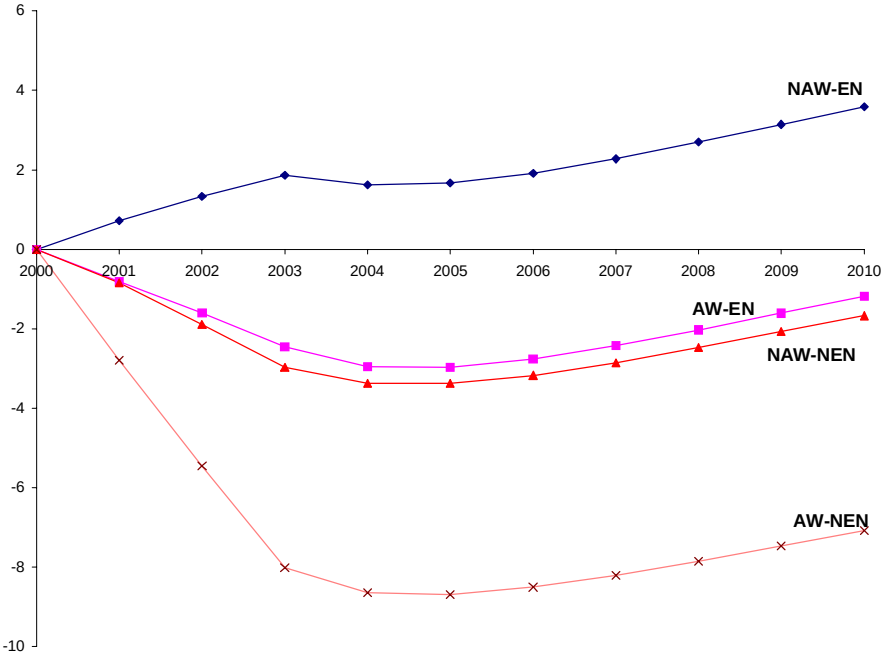

Chart 3.3 Real before-tax wage rates (Simulation 1)
(% deviations from basecase forecasts)

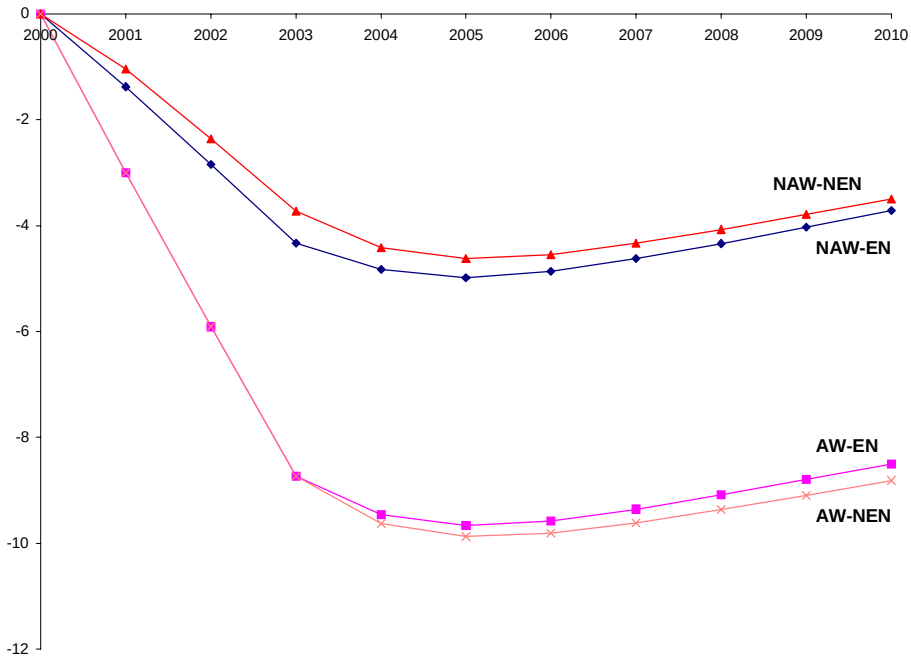

Chart 3.4 Labour supply (Simulation 1)
(% deviations from basecase forecasts)

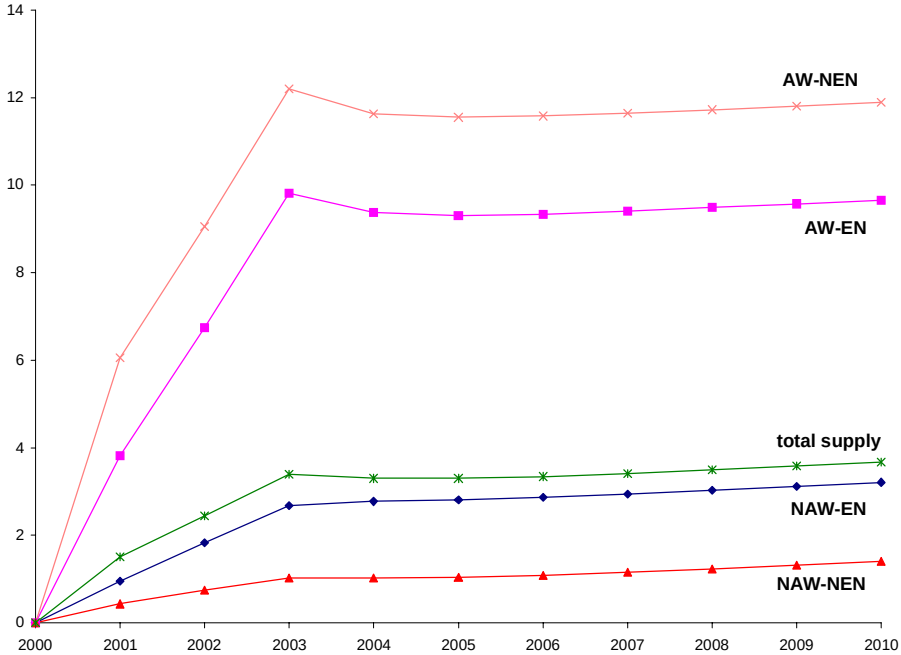

Chart 3.5 Employment (Simulation 1)
(% deviations from basecase forecasts)

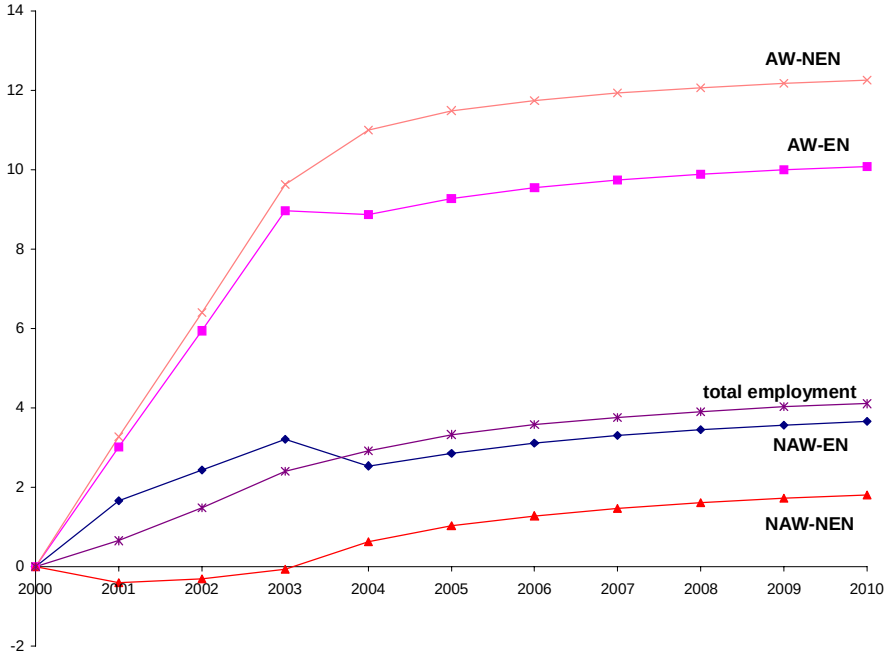

Chart 3.6 Macro effects assuming temporary change in wage dynamics (Simulation 2)
(% deviations from basecase forecasts)

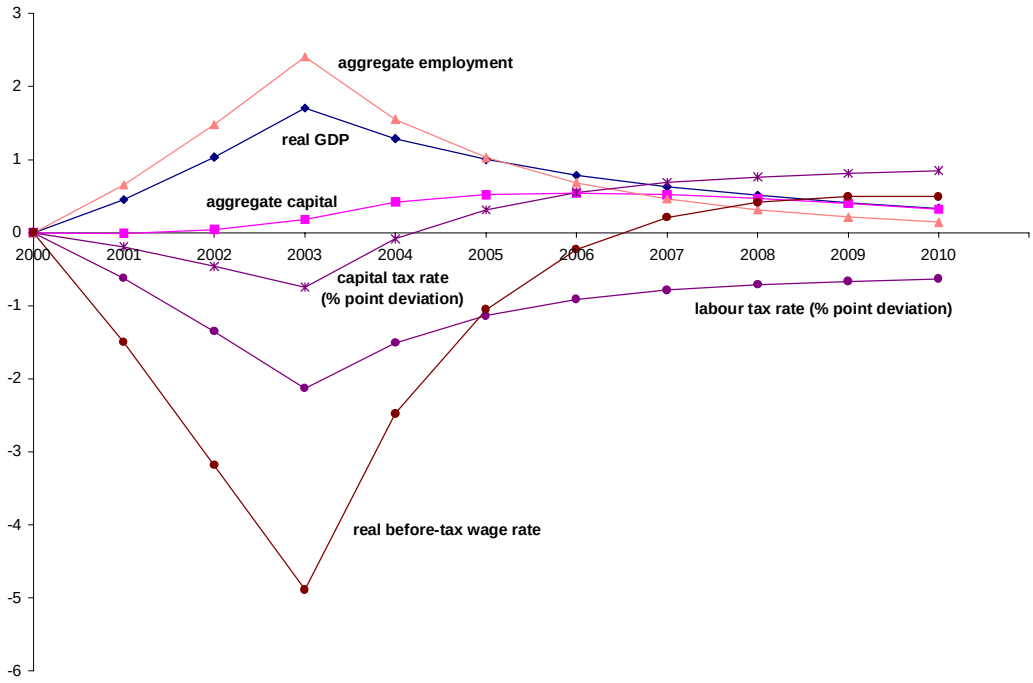

Figure 3.1. Partial equilibrium analysis for AW-EN workers, Simulation 1

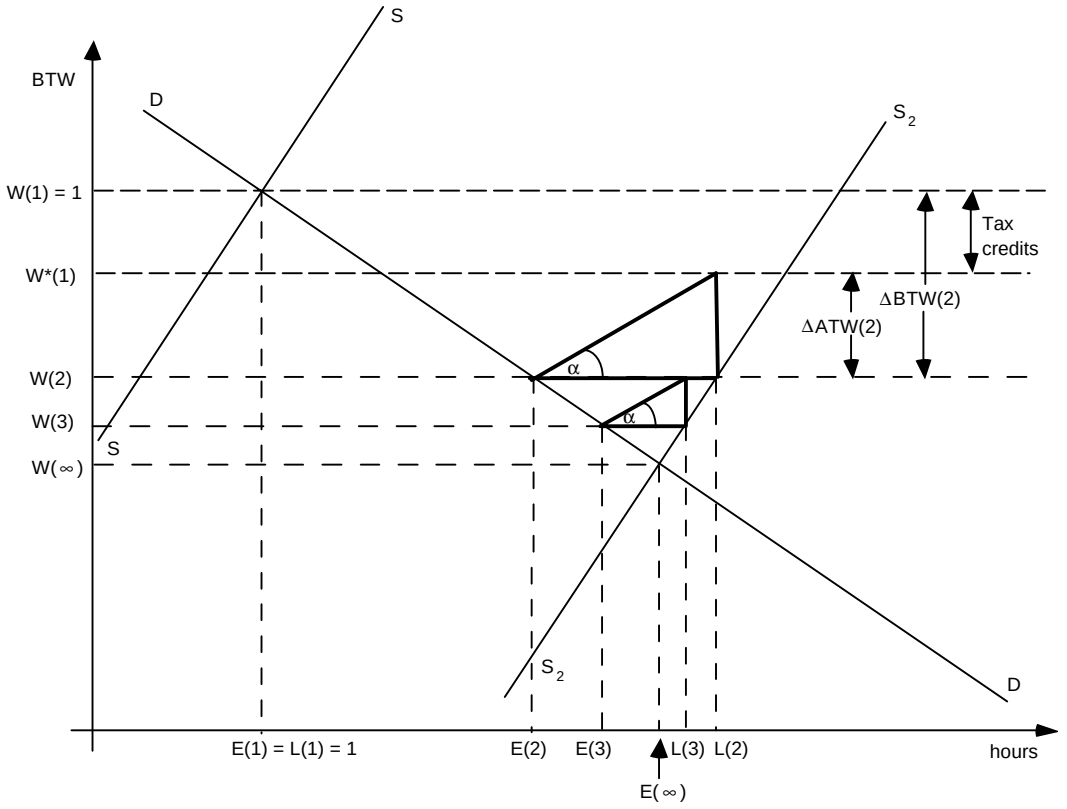

Figure 3.2. Partial equilibrium analysis for AW-NEN workers, Simulation 1

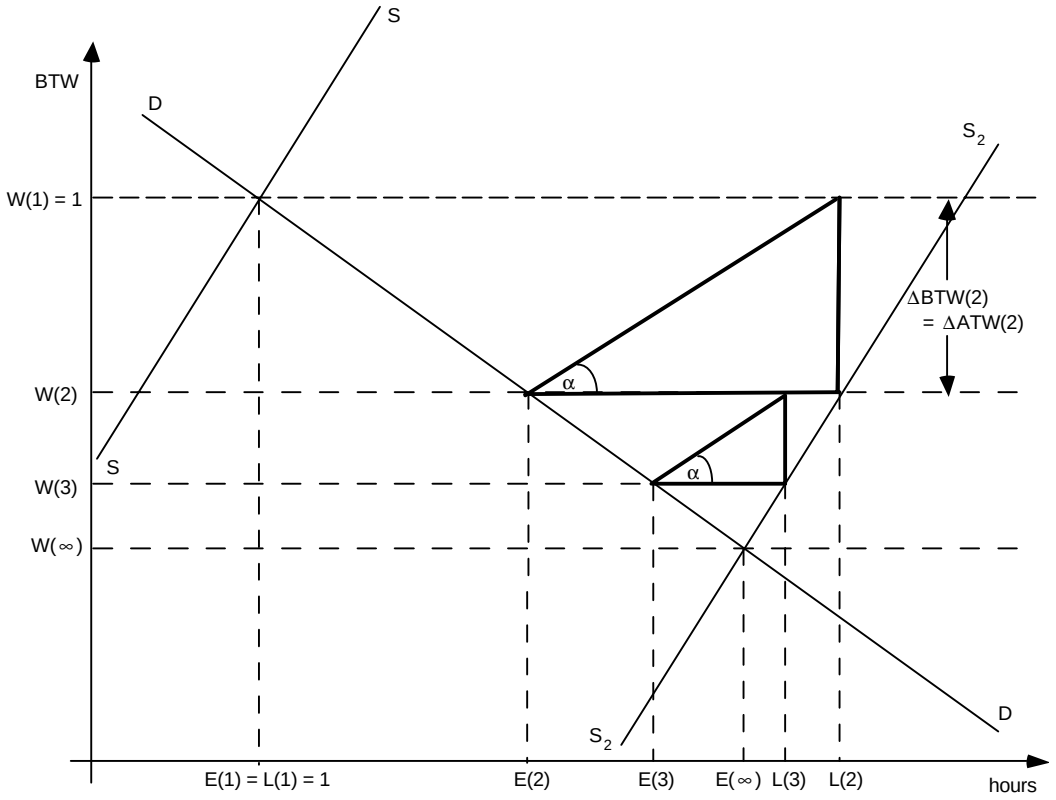

Figure 3.3. Partial equilibrium analysis for NAW-EN workers, Simulation 1