The macroeconomic impact of the New Deal for Young People

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August 2001

Abstract
The New Deal for Young People (NDYP) is one of the main components of the UK government's Welfare-to-Work strategy aimed at raising employment and reducing benefit dependency. It combines elements of an active labour market programme with a stricter benefit regime. This paper evaluates its impact on the wider economy, emphasising the importance of the programme's effect on wage pressure, which is identified separately from the impact of the National Minimum Wage introduced around the same time. While the impact of the NDYP on the wider economy appears modest it is associated with an economic gain.

JEL classification: E17, E24, H53, J31

Keywords: Wages; Unemployment; Labour market policy; Policy evaluation

Acknowledgements: We are grateful to Chris Anderson, Ray Barrell, Andrew Benito, Dominic Rice, Florence Hubert, Nigel Pain, Martin Weale and participants at Department for Education and Employment seminars for comments on this work. We are also grateful for the financial support received from the Employment Service and from the ESRC under grant L138250122. This paper is a development of an earlier study (Riley and Young, 2000) provided to the Employment Service. The views expressed here are those of the authors.

Despite the long and varying experience of unemployment over time and across countries, there is still controversy about appropriate policies to bring it down. For example, it is well known that high levels of unemployment are associated with widespread long-term unemployment (Machin and Manning, 1999). But the policy implications of this association depend on how it arises. Two possibilities are discussed in the literature. First, the relationship could be due to duration dependence whereby long spells of unemployment reduce the chances of those affected finding a suitable job. Second, it could simply be a statistical artifact with both the level and duration of unemployment being explained jointly by the rate of outflow from unemployment (as emphasised in Webster, 1996, and Machin and Manning, 1999). When there is significant duration dependence, a policy giving preferential treatment to the long-term unemployed in getting work, by subsidies for example, would raise effective labour supply, putting downward pressure on wages and thereby creating extra jobs (Nickell, 1999). But in the absence of duration dependence, such a policy would amount to an attack on the symptoms of unemployment rather than one of its causes.

Evidence on this issue is mixed. Given downward wage rigidity, negative duration dependence could arise if the individuals affected by long-term unemployment are scarred by the experience and become less employable at given wages. For the UK, Arulampalam *et al.* (2000) and Boheim and Taylor (2000) find evidence of state dependence in unemployment occurrence, while Arulampalam (2001) finds that earnings are adversely affected by earlier spells of unemployment. Duration dependence could also arise if the long-term unemployed reduce their efforts to find work, thereby becoming detached from the labour market. In either case, a build up of long-term unemployment is associated with a reduction in the number of competitive job-seekers, and hence a rise in wage pressure at any level of unemployment, raising the equilibrium rate of unemployment. Some UK evidence on wage setting is consistent with this view of how the duration structure of unemployment affects the level of unemployment (Nickell, 1987, and Manning, 1994). However, Machin and Manning (1999) doubt the robustness of the evidence and suggest that there may not be enough independent variation in long-term unemployment to identify separately in wage setting relationships the effects of the duration structure from those of dynamic adjustment to changes in unemployment.

Despite the lack of unambiguous evidence on the likely success of policy intervention to reduce long-term unemployment, 'welfare-to-work' programmes have been introduced in Europe during the 1990s in Denmark, the Netherlands and, more recently, Britain. They generally have two components (Boeri *et al.*, 2000). First, there is a work test to ensure that benefits are not paid when work is attainable. Second, this is linked to an active labour market policy that ensures that there is an

exit route from welfare into work. The main component of the British welfare-to-work programme is the New Deal for Young People (NDYP) introduced in April 1998. This aims to prevent long-term unemployment among young people by combining the 'carrot' of help in finding work with the 'stick' of benefit conditionality.

By design, the NDYP has contributed to a sharp reduction in long-term unemployment among young people by imposing an upper limit on the duration of unemployment spells. Of key importance for the success of the policy is whether this has led to a decline in wage pressure. This would arise when those scarred by previous long spells of unemployment are helped back into active labour market participation, but it would also come about when the programme encourages more effective job search by those not adversely affected by their experience of unemployment. An important contribution of this paper is to assess the effect of the NDYP on wage pressure.

Any fall in wage pressure would generate extra jobs through the market mechanism. As Boeri *et al.* (2000) have emphasised, this is ignored in the traditional approach to evaluating labour market programmes which focuses on deadweight, substitution and displacement effects, making inappropriate identifying assumptions about the behaviour of a control group of non-participants. Instead, as emphasised by Heckman *et al* (1999), evaluations of large-scale programmes such as the NDYP need to account for their general equilibrium effects. Thus the assessment of the success or failure of policy depends crucially on estimates of its macroeconomic impact. Another contribution of the paper is to quantify the effect of NDYP on the UK economy.

The plan of the paper is as follows. The first section outlines briefly the scale of the NDYP programme, and evidence on its direct effect on the youth labour market. The second section assesses its effect on wage pressure, investigating the influence of recent large scale labour market interventions on wage setting. The third section illustrates by model simulation the impact of NDYP on aggregate unemployment and employment, the public finances, private consumption and GDP. A final section concludes.

1. The NDYP and its impact on the youth labour market

The NDYP is a well-funded labour market programme with substantial political capital invested in it.[1] It affects those between the ages of 18 and 24 who have been claiming unemployment related benefits for six months or more. At this point, and

sometimes earlier, they are given extensive personal assistance in finding work. Initially this consists of a 'Gateway' period of up to four months where they are given help and advice in finding a suitable job. If this is unsuccessful, they are obliged to end their unemployment spell by choosing one of four options: subsidised employment, full time education or training (FTET), a job with the Environment Task Force (ETF) or in the voluntary sector (VS). Importantly, access to further benefits is restricted to those who participate in one of these options. As Wells (2000) puts it, 'in return for the rights of a comprehensive, individually based service young people aged 18-24 unemployed for six months or more have the responsibility to take up the help. They are not allowed to remain on benefit.'

In its first two full years, 457 thousand young people joined and 329 thousand left the NDYP.[2] The number of leavers represents a little over 1 per cent of the working population in the UK, but around 10 per cent of the employed population in the target group. Of the leavers, 41 per cent had moved into unsubsidised jobs, 12 per cent had moved to other benefits, 19 per cent had gone into other known destinations (such as a training programme) and 28 per cent had moved to unknown destinations.[3] During this period, unemployment among 18 to 24 year-olds fell by 81 thousand to 263 thousand in April 2000. Within this total, the number who had been unemployed for over two years fell by 15.4 thousand to 0.7 thousand, while the number unemployed between one and two years fell by 28.1 thousand to 5.6 thousand.

Riley and Young (2001) estimate the direct impact of the NDYP by modelling outflows of young people from unemployment compared to other age groups, using a standard matching function approach. Their estimates suggest that the programme reduced long-term youth unemployment by around 45 thousand and raised short-term youth unemployment by around 10 thousand in its first two years. The latter increase caused in part by people leaving options and moving back into unemployment. They also estimate an increase in regular employment of young people relative to other groups of around 15 thousand. Clearly, the reduction in measured long-term unemployment among young people has not been matched by a similar increase in conventional employment. Some of the beneficiaries have moved onto NDYP options where they are not counted as unemployed or have moved back onto short-term unemployment.

While these estimates provide an account of the direct impact of the NDYP on the labour market, they are based on identifying assumptions about the behaviour of either a control group or the economy more generally. A full analysis of the impact of

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[1] It was intended to deliver one of the Labour government's five key pledges in the 1997 general election campaign to move 250 thousand young people from long-term unemployment into work.
[2] DfEE Statistical First Release 24/2000
[3] Findings from a survey of leavers to unknown destinations are summarised in Hales & Collins (1999).

the programme requires an assessment of the indirect, general equilibrium effects of these changes. The important question is whether intervention to reduce the duration of youth unemployment has had any effect on wage setting and so led to the creation of new jobs. This is discussed in the next section.

2. The effect of the NDYP on wage pressure

We use a conventional bargaining framework to assess the empirical impact of the NDYP on wage pressure.[4] Equation (1) shows the long run solution to a typical wage equation where w is wages, P is a price index, $PROD$ is productivity, U^L/U is the share of long-term unemployment in total unemployment, N is the population of working age and E is employment:

$$\ln w_t = \ln P_t + \ln PROD_t - \alpha \ln\left(\frac{N_t - E_t}{N_t}\right) + \beta \frac{U_t^L}{U_t} \qquad (1)$$

Underlying this relationship is the view that the bargaining power of workers is lower when there is a lot of slack in the labour market, here represented by the proportion of the population of working age who are not working (that is, *(N-E)/N)*. In addition, the bargaining power of workers is also lower when there are more short-term unemployed in the unemployment stock (captured in the U^L/U term). This occurs when the short-term unemployed are more competitive job-seekers than the long-term unemployed.

Using equation (1) and assuming that prices are determined in the long run as a constant mark-up on unit labour costs suggests the following relationship between the equilibrium non-employment rate and the ratio of long-term to short-term unemployment:

$$\Delta \ln\left[\frac{N_t - E_t}{N_t}\right] \approx \gamma \Delta \frac{U_t^L}{U_t} \qquad (2)$$

This indicates that the non-employment rate necessary to sustain a given labour share is increasing in the share of long-term unemployment. The relationship is governed by the size of $\gamma = \beta/\alpha$, the semi-elasticity of the non-employment rate with respect to the share of long-term in total unemployment. Within this framework, the effect of the NDYP on wage setting is measured through its effect on long-term unemployment.

[4] Layard, Nickell and Jackman (1991).

But if the measured fall in long-term unemployment is merely cosmetic, with those affected being re-labelled, or if the presence of the composition of unemployment in the wage equation is spurious, then, taking into account other factors affecting wage pressure, wage pressure will be greater than the equation suggests when the policy is in operation. This is examined below.

2.1. Evidence from aggregate wages

Table 1 shows empirical wage equations for the UK, where p is the GDP deflator at basic prices adjusted for productivity, w is average earnings, $\Delta \ln_{t-1}\hat{p}_{t+3}$ is forecast annual CPI inflation adjusted for productivity, three quarters hence, *Udens* is union density, *MM* is an indicator of industrial mismatch defined as the magnitude of the annual change in the production share of employment, $\Delta \ln WEDGE$ is the growth in the wedge between producer and consumer prices, U^L/U is the share of long-term unemployment (greater than 6 months) in total unemployment, N is the population of working age and E is employment.[5] The variable *NDYP* is defined as the number of NDYP participants as a share of the claimant count; it equals zero before the introduction of the programme, reaches a maximum value of 0.084 in the third quarter of 1999 and averages 0.065 when the programme is in operation.[6] The equations also include seasonal dummies and zero-one dummies for the third quarter of 1974 and the first three quarters of 1975 when incomes policies were in force. The equations were estimated over the period 1972q1 to 2000q2.

The estimated equations are well-specified and explain the development in real wages in terms of the expected acceleration in inflation, union density, the non-employment rate, the composition of unemployment, changes in industrial mismatch and changes in the wedge between the producer and consumer wage. The benefit-replacement ratio was initially included in estimation, but was found to have a significant negative sign and omitted.

The U^L/U term is clearly significant in equations I-III.A&B. But the inclusion of an additional lag in the non-employment rate in equation III raises the standard errors of both the level and composition terms in unemployment. This partially bears out the doubts of Machin and Manning (1999) concerning the amount of independent variation in duration structure and changes in unemployment. Nevertheless, the U^L/U term remains highly significant. The exclusion of the U^L/U term in equation IV leads to a poorer specification of wage determination in terms of the standard error of the

[5] The term $\Delta \ln_{t-1}\hat{p}_{t+3}$ is the National Institute of Economic and Social Research forecast of annual inflation in the consumer price index (CPI) three quarters hence, published in the *National Institute Economic Review*. Forecast CPI inflation is used as a proxy for forecast inflation in the GDP deflator, which is used to measure expected inflation.

regression and the regression diagnostics, suggesting that the composition of unemployment is an important determinant of wage pressure.

Table 1
Aggregate wage equations

Dependent variable: Δ ln(w/p)$_t$								
	I.A *(OLS)*	II.A *(2SLS)*	III.A *(2SLS)*	IV.A *(2SLS)*	I.B *(OLS)*	II.B *(2SLS)*	III.B *(2SLS)*	IV.B *(2SLS)*
Constant	.758	.753	.662	.489	.769	.764	.688	.505
	[5.36]	[5.31]	[3.61]	[2.53]	[5.31]	[5.26]	[3.70]	[2.58]
$\Delta(\ln p^e_{t+3})_{t-1} - \Delta\ln p_t$	.619	.626	.632	.640	.622	.629	.634	.641
	[12.43]	[11.89]	[11.83]	[11.07]	[12.35]	[11.82]	[11.72]	[11.08]
$\Delta\ln UDens_{t-1}$	-.558	-.555	-.567	-.608	-.536	-.533	-.541	-.593
	[5.03]	[4.98]	[5.04]	[5.00]	[4.81]	[4.77]	[4.80]	[5.00]
$\ln UDens_{t-1}$	.014	.014	.014	.007	.012	.012	.012	.006
	[3.38]	[3.37]	[3.38]	[1.71]	[3.00]	[2.99]	[2.97]	[1.51]
ΔMM_t	1.175	1.172	1.201	1.18	1.167	1.163	1.188	1.182
	[4.99]	[4.97]	[5.03]	[4.57]	[4.90]	[4.88]	[4.91]	[4.56]
ΔMM_{t-1}	1.016	1.021	1.040	.960	1.037	1.043	1.060	.970
	[4.08]	[4.10]	[4.14]	[3.54]	[4.13]	[4.14]	[4.17]	[3.58]
$\Delta\ln WEDGE_{t-3}$	.097	.096	.098	.096	.097	.096	.098	.096
	[3.22]	[3.17]	[3.22]	[2.91]	[3.20]	[3.15]	[3.19]	[2.91]
$\ln(w/p)_{t-1}$	-.165	-.164	-.147	-.104	-.165	-.164	-.150	-.106
	[6.46]	[6.41]	[4.38]	[3.00]	[6.33]	[6.27]	[4.39]	[3.03]
$(U^L/U)_{t-1}$	.042	.042	.038		.039	.039	.036	
	[5.42]	[5.43]	[4.20]		[5.15]	[5.16]	[3.96]	
$\ln((N-E)/N)_{t-1}$	-.075	-.075	-.117	-.219	-.075	-.075	-.110	-.214
	[9.76]	[9.77]	[2.23]	[4.34]	[9.59]	[9.56]	[2.08]	[4.27]
$\ln((N-E)/N)_{t-2}$			.045	.167			.038	.162
			[0.80]	[3.24]			[0.67]	[3.15]
$NDYP_t$	.067	.067	.066	.017	.159	.159	.154	-.002
	[1.99]	[1.98]	[1.97]	[0.50]	[1.35]	[1.35]	[1.27]	[0.02]
$NDYP_{t-1}$					-.133	-.133	-.131	.002
					[-]	[-]	[-]	[-]
Standard Error	.0052	.0052	.0052	.0056	.0052	.0052	.0052	.0056
λ^{LR} *: Long-run coefficient on NDYP*								
	.407	.407	.453	.166	.159	.159	.154	-.002
	[1.90]	[1.89]	[1.80]	[0.49]	[1.35]	[1.35]	[1.27]	[0.02]
Wald tests								
$\lambda^{LR} = \lambda^{SR}$	3.48	3.46	3.06	0.24	2.01	1.99	2.17	0.42
	[.062]	[.063]	[.080]	[.628]	[.157]	[.158]	[.141]	[.516]
Diagnostics								
Serial correlation $\chi^2(4)$ =	3.54	3.97	3.63	8.09	4.61	5.16	4.69	8.86
	[.472]	[.410]	[.459]	[.088]	[.329]	[.272]	[.320]	[.065]
Functional form $\chi^2(1)$ =	1.30	1.26	1.73	2.27	1.29	1.26	1.64	2.26
	[.254]	[.261]	[.189]	[.132]	[.255]	[.262]	[.200]	[.133]
Normality $\chi^2(2)$ =	0.61	0.63	0.70	1.20	1.56	1.60	1.74	1.26
	[.737]	[.729]	[.705]	[.549]	[.458]	[.450]	[.419]	[.533]
Heteroscedasticity $\chi^2(1)$ =	0.07	0.06	0.08	0.47	0.07	0.06	0.08	0.44
	[.791]	[.800]	[.772]	[.494]	[.799]	[.810]	[.781]	[.506]
Sargan's $\chi^2(4)$ =		3.72	4.10	11.41		5.63	6.16	11.94
		[.445]	[.392]	[.022]		[.228]	[.188]	[.018]

Notes: sample period 1972q1- 2000q2; United Kingdom; |t - statistics| or p-value of χ^2 - statistic in brackets; two-stage least squares estimates using lagged inflation expectations, the growth in foreign prices and the growth in narrow money to instrument for inflation expectations; [-] implies restricted coefficient estimate; seasonal dummies and zero-one dummies for the third quarter of 1974 and the first three quarters of 1975 included.

[6] This includes the 3 month pilot period before the programme was implemented nationally in April 1998. At the time the pilot areas represented 11 per cent of UK claimant unemployment.

According to these estimates, changes in the composition of unemployment have an economically important effect on wage setting and equilibrium unemployment, with the semi-elasticity (γ) equal to 0.55. On this basis, a permanent shift in the ratio of long-term to total unemployment from 0.42 to 0.40, similar to the change over the first two years of the NDYP, would reduce the equilibrium non-employment rate by 1.1 per cent: from 25 per cent to 24.7 per cent, equivalent to about 100 thousand people.

As noted earlier, the main impact of the NDYP on wage setting is captured through its effect on the composition of unemployment. To the extent that this effect is just cosmetic would be captured here by a positive coefficient on the variable *NDYP*, capturing an exogenous rise in wage pressure when the programme is in operation. There is evidence for this in equations I-III.A, where the coefficient is put at +0.067 with a *t*-statistic of 1.98, and in equations I-III.B, where the coefficients on *NDYP* are constrained so that its impact effect is equal to its long run effect. In the latter case the short- and long-run coefficient on *NDYP* is around 0.159 with a t-statistic of 1.35.[7] This could suggest that the reduction in long-term youth unemployment since the NDYP was introduced has *not* had the predicted depressing effect on wage pressure. This is further supported in equations IV.A and IV.B where the U^L/U term is excluded. Here the estimated coefficient on the *NDYP* is insignificantly different from zero, suggesting that the positive coefficient on *NDYP* in equations I-III is due to a breakdown of the relationship between wage pressure and the composition variable.

To identify the effect of NDYP on wage setting we need to take into account all factors affecting wage setting. While the equations reported in table 1 take into account its main historical determinants, the obvious omission obscuring the impact of NDYP is the introduction of the National Minimum Wage (NMW) in April 1999, which is likely to have caused an exogenous one-off shift in the level of wages. The results in table 1 provide evidence of an exogenous increase in wage setting in the late 1990s, however, because of the close timing of the introduction of the NDYP and NMW, it is difficult to separate the effects of the two policies.

The measured effect is too large to be compensating for a false composition effect due to the introduction of NDYP. The long-run coefficient on the variable *NDYP* in equation II.A is +.407 with a *t*-statistic of 1.89, suggesting that the NDYP has raised wage pressure by around 2.7 per cent. But this is almost five times as large as the wage pressure effect of the change in the long-term unemployment ratio that Riley and Young (2001) estimate has been caused by the NDYP. The estimated shift in wage pressure in equations I-III.B, implies a one-off shift in wage pressure of

[7] Significantly greater than zero at the ten percent level.

around 1 per cent. Using the Labour Force Survey from the year before the introduction of NMW, we estimate that average weekly wages would need to rise by 1.1 per cent if everyone was paid up to the level of the NMW.[8] Other estimates of the initial rise in the wage bill due to NMW are slightly smaller at approximately 0.7 percentage points (Riley and Young, 1998) and 0.6 per cent (Metcalf, 1999). These estimates of the rise in the wage bill due to NMW are consistent with the estimated shift in wage pressure in equations I-III.B, suggesting strongly that the estimated effect on wages of the NDYP variable is actually picking up the effects of the NMW. This hypothesis is confirmed by the investigation of recent change in wage setting relationships disaggregated by age and region in the next sections.

2.2 Evidence from age specific wages

Table 2 shows the results of re-estimating the aggregate wage equation in table 1, II.A and B, for a number of different age groups.[9] Annual data on earnings was derived from the New Earnings Survey and interpolated to produce comparable quarterly series. These equations fit best when aggregate rather than age-specific measures of the non-employment rate are included. This suggests a lack of labour market segmentation on age grounds and is consistent with there being a fairly high degree of substitution between workers of different ages.[10]

The equations display a well-determined response of wages of different age groups to labour market conditions. The ratio of the absolute coefficients on unemployment composition to the non-employment rate, γ, is monotonically increasing in age, rising from 0.291 for 18 to 24 year olds to 0.749 for over 50s in equation II.A. The wage-share weighted average is 0.68, broadly in line with the aggregate evidence. A Wald test that γ is the same for all age groups is rejected except when the 18-24 year old group is excluded. This suggests that the composition of unemployment has less effect on the wages of young workers, consistent with there being less state dependence in unemployment occurrence for young people than for other age groups.

As in table 1, models II.A and II.B are identically specified except for the inclusion of an additional lag in the *NDYP* variable and the equality restriction on the short and long run coefficients on *NDYP*. Again, the positive coefficient on *NDYP*

[8] In this calculation the NMW is corrected for normal annual wage growth of 4.5 per cent (the level seen as consistent with the inflation target and long-run productivity growth) to £2.87 for 18-21 year olds and £3.44 for people aged over 22.

[9] Additional dynamic terms in age-specific and aggregate wages are needed to maintain well specified equations.

[10] When age specific measures are included in addition to the aggregate measures they are either insignificant or, in the case of the over 50s, have a positive sign.

suggests an exogenous increase in wage setting in the late 1990s, especially for the youngest and oldest age groups.

Table 2

Age specific wage equations

Dependent variable: $\Delta \ln(w/p)_{it}$								
	II.A				II.B			
	18-24	*25-29*	*30-49*	*50-ret*	*18-24*	*25-29*	*30-49*	*50-ret*
$\Delta \ln(w/p)_{i,t-1}$	.405	.339	.685	.270	.408	.339	.670	.265
	[6.75]	[5.75]	[5.40]	[3.39]	[6.65]	[5.66]	[5.35]	[3.31]
$\Delta \ln(w/p)_{t-1}$	-.095	.050	-.579	-.431	-.096	.042	-.593	-.417
	[0.86]	[0.34]	[4.10]	[2.54]	[0.87]	[0.28]	[4.12]	[2.46]
Constant	.126	.208	.276	.758	.113	.185	.269	.758
	[2.84]	[2.82]	[4.40]	[6.35]	[2.53]	[2.50]	[4.22]	[6.32]
$\Delta(\ln p^{e}_{t+3})_{t-1} - \Delta \ln p_t$	.754	.870	.691	.463	.755	.867	.692	.468
	[8.84]	[6.82]	[11.74]	[3.52]	[8.80]	[6.80]	[11.75]	[3.57]
$\Delta \ln UDens_{t-1}$	-.423	-.039	-.568	-1.165	-.422	-.059	-.569	-1.138
	[2.35]	[0.16]	[4.57]	[4.62]	[2.31]	[0.24]	[4.58]	[4.54]
$\ln UDens_{t-1}$	.098	.035	.012	.051	.099	.038	.013	.049
	[7.80]	[3.21]	[2.70]	[4.76]	[7.70]	[3.52]	[2.84]	[4.63]
ΔMM_t	.418	.526	1.140	1.132	.454	.517	1.158	1.190
	[0.81]	[0.68]	[3.18]	[1.41]	[0.88]	[0.67]	[3.23]	[1.49]
ΔMM_{t-1}	.812	.689	.907	1.408	.893	.693	.931	1.494
	[1.44]	[0.81]	[2.34]	[1.61]	[1.58]	[0.82]	[2.41]	[1.72]
$\Delta \ln WEDGE_{t-3}$	.104	.099	.078	.098	.108	.098	.079	.104
	[1.97]	[1.25]	[2.14]	[1.20]	[2.04]	[1.24]	[2.18]	[1.27]
$\ln(w/p)_{i,t-1}$	-.224	-.143	-.136	-.340	-.220	-.140	-.135	-.337
	[8.79]	[6.15]	[7.12]	[8.88]	[8.45]	[5.88]	[6.98]	[8.76]
$(U^L/U)_{t-1}$	.027	.037	.055	.062	.030	.042	.057	.060
	[2.13]	[2.00]	[6.49]	[3.21]	[2.36]	[2.23]	[6.57]	[3.13]
$\ln((N-E)/N)_{t-1}$	-.091	-.071	-.075	-.082	-.091	-.071	-.075	-.081
	[6.98]	[3.76]	[8.40]	[4.32]	[6.91]	[3.78]	[8.40]	[4.27]
$NDYP_t$	.150	-.003	.037	.206	.440	.179	.146	.334
	[2.26]	[0.03]	[0.80]	[1.99]	[2.83]	[0.70]	[1.11]	[1.74]
$NDYP_{t-1}$					-.343	-.154	-.126	-.222
					[-]	[-]	[-]	[-]
Standard Error	.0081	.0124	.0055	.0126	.0082	.0124	.0055	.0126
γ_i : *Coefficient on* U^L/U *relative to ln* $((N-E)/N)$								
	.291	.525	.743	.749	.327	.584	.757	.738
	[2.28]	[2.19]	[7.17]	[3.52]	[2.52]	[2.41]	[7.17]	[3.43]
Wald tests								
$\gamma_i = \gamma \quad \forall i$	$\chi^2(3) =$	25.30	[.000]		$\chi^2(3) =$	22.08	[.000]	
$\gamma_{18\text{-}24} = \gamma_{25\text{-}29}$	$\chi^2(1) =$	2.48	[.115]		$\chi^2(1) =$	2.81	[.094]	
$\gamma_{18\text{-}24} = \gamma_{25\text{-}29}$ & $\gamma_{30\text{-}49} = \gamma_{50\text{-}ret}$	$\chi^2(2) =$	6.96	[.030]		$\chi^2(2) =$	6.57	[.037]	
$\gamma_i = \gamma \quad \forall i \neq$ 18-24	$\chi^2(2) =$	2.40	[.302]		$\chi^2(2) =$	1.83	[.400]	
λ_i^{LR} : *Long-run coefficient on NDYP*								
	.672	-.022	.270	.604	.440	.179	.146	.334
	[2.26]	[0.03]	[0.79]	[1.99]	[2.83]	[0.70]	[1.11]	[1.74]
Wald tests								
$\lambda_i^{LR} = \lambda_i^{SR} \quad \forall i$	$\chi^2(4) =$	25.49	[.000]		$\chi^2(4) =$	4.25	[.373]	
$\lambda_i^{LR} = \lambda^{LR} \quad \forall i$	$\chi^2(3) =$	10.74	[.013]		$\chi^2(3) =$	12.54	[.006]	
$\lambda_i^{LR} = \lambda^{LR} \quad \forall i \neq$ 18-24	$\chi^2(2) =$	0.65	[.723]		$\chi^2(2) =$	2.08	[.354]	
$\lambda_i^{LR} = \lambda^{LR} \quad \forall i \neq$ 50-ret	$\chi^2(2) =$	6.41	[.040]		$\chi^2(2) =$	12.52	[.002]	
Diagnostics								
Serial correlation $\chi^2(16) =$	22.79	[.119]			22.01	[.143]		

Notes: sample period 1973q3- 1999q2; United Kingdom; |t - statistics| or p-value of χ^2 - statistic in brackets; three-stage least squares estimates using lagged inflation expectations, the growth in foreign prices and the growth in narrow money instrument for inflation expectations; [-] implies restricted coefficient estimate; subscript *i* denotes age group; seasonal dummies and zero-one dummies for the third quarter of 1974 and the first three quarters of 1975 included.

Closer inspection suggests that equal *NDYP* coefficients can be imposed on all age groups apart from the 18-24 year olds (as shown by the Wald tests in the bottom panel of table 2). When this restriction is imposed in model II.B, the estimated coefficient on *NDYP* and t-statistic is 0.476 (4.18) for 18-24 year olds and 0.251 (2.34) for everyone else (not reported in table 2), implying shifts in wage pressure of 2.65 and 1.40 per cent for the respective age groups.

This could be interpreted as evidence that the NDYP has generated a cosmetic fall in youth long-term unemployment that has not brought about a reduction in wage pressure. Alternatively, the extra wage pressure due to the NDYP variable can be accounted for by the effect of the NMW. As before we use the Labour Force Survey to estimate how much wages would rise if everyone was paid according to the statutory minimum. We find that average weekly wages would need to rise by 2.64 per cent for 18-24 year olds and by 1.01 per cent for everyone else, exactly in line with the over-prediction in the estimated equations.[11] This casts doubt on the argument that the NDYP has led to a breakdown in the relation between the composition of unemployment and pay pressure, implicating instead the NMW as the cause of the observed shift in wages.

2.3 Evidence from regional wages

The separate contributions of NDYP and NMW to the rise in wage pressure might also be disentangled by their different effects on regional pay. While they are both national policies, there is likely to be some independent variation in their effects on wage pressure across regions. The NMW is likely to cause a greater upward shift in wages in regions of widespread low pay. Similarly, the greatest reductions in long-term unemployment are likely to be in regions of high unemployment.

Fig. 1 illustrates the correlation between low pay and the share of NDYP participants in ILO unemployment across ten regions (average 1998-2000). In the left panel, low pay is measured by the rise in regional wages that would occur if everyone was paid up to the statutory minimum.[12] The right panel shows the share of employees paid below the NMW in each region in spring 1998. While there is some evidence of a positive regional correlation between low pay and the strength of NDYP treatment, the remaining variation helps to identify the separate wage effects of NMW and NDYP.

Table 3 shows equations for male earnings in ten standard statistical regions covering the years from 1986 to 2000.[13] The basic structure is as before with

[11] 1.16, 0.92, and 1.16 per cent for the age groups 25-29, 30-49 and 50+ respectively.
[12] This repeats the calculation in previous sections based on the Labour Force Survey.
[13] Greater London is excluded due to the lack of historical data and Northern Ireland is excluded due to the lack of measures of NDYP.

differences reflecting the use of annual data and the lack of readily available information on some right hand side variables. Both aggregate and regional measures of the composition of unemployment and the non-employment rate are included, as well as aggregate measures of union density. As in Manning (1994) the regional earnings equations suggest that the composition of regional unemployment has a positive effect on earnings. However, the impact of regional labour market variables is not well determined as these series vary substantially over time reflecting national trends. The equations include significant regional fixed effects and are estimated by two-stage least squares using the second lag of regional wages to instrument for the first lag of regional wages.[14]

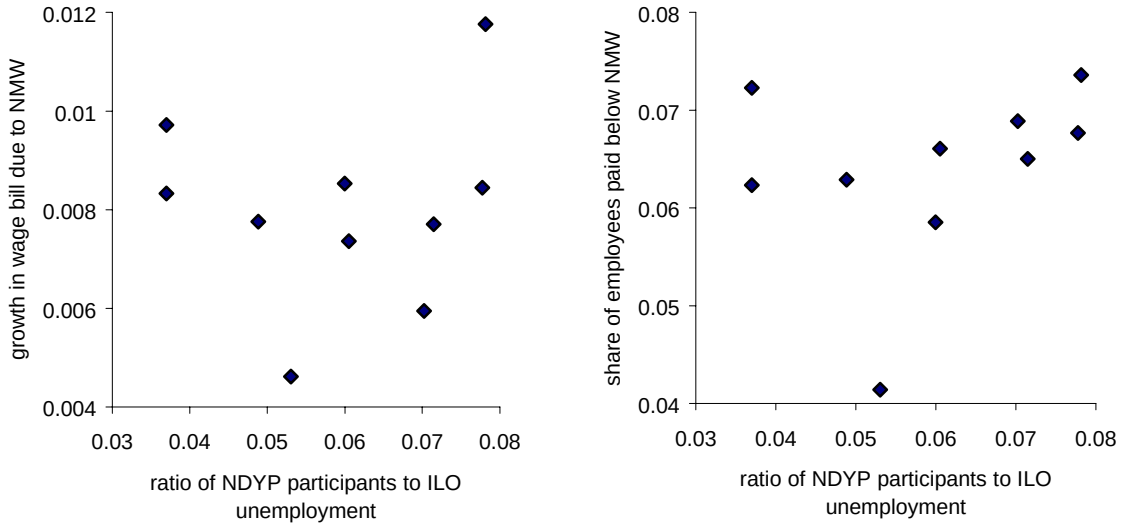

Fig. 1.: *Regional correlation between NDYP and NMW indicators (average 1998-2000)*

The regional equations include additional variables measuring the strength of NDYP and the NMW. The variable $NDYP_{it}$ is now measured at the regional level. The variable NMW_{it} measures the rise in low pay that would occur if everyone was paid at least the NMW and is plotted against $NDYP_{it}$ in the left panel in Fig. 1. The variable $NMWS_{it}$ measures the share of employees paid below NMW in spring 1998 and is plotted against $NDYP_{it}$ in the right panel in Fig. 1. Both NMW variables are zero before 1999 and constant thereafter varying only across regions.

The first column in table 3 excludes any NMW variables and suggests that the NDYP variable is associated with upward pressure on pay. However, in the second column, the inclusion of the share of employees paid below the minimum wage,

[14] OLS would produce biased estimates due to the relatively short sample period (see Nickell, 1981). The estimator used here is a version of the widely used Anderson – Hsiao IV estimator (Anderson and Hsiao, 1981) which produces unbiased estimates in short samples.

$NMWS_{it}$, causes the coefficient on $NDYP_{it}$ to fall sharply. Now the upward pressure on pay is associated with the proportion of low pay in the region just before the NMW is introduced. In the third column when NMW_{it} is included, the coefficient on $NDYP_{it}$ is also reduced suggesting again that the excess pay pressure is associated with the introduction of NMW. It is possible that the coefficient on NMW_{it} is biased downwards if the initial rise in pay due to the introduction of NMW is negatively related with wage pressure in the following year. In the fourth column we instrument NMW_{it} with its ranking across regions. This raises the coefficient on NMW_{it} and it becomes more significant.

Table 3

Regional wage equations

Dependent variable: Δ ln(w/p)$_{it}$					
	1	2	3	4	5
ln$(w/p)_{i,t-1}$	-.301 [4.84]	-.326 [5.19]	-.315 [5.06]	-.322 [5.10]	-.268 [4.67]
$(U^L/U)_{i,t-1}$	.062 [1.51]	.048 [1.15]	.055 [1.32]	.051 [1.22]	.053 [1.35]
ln$(N-E)/N)_{i,t-1}$	-.010 [0.63]	-.007 [0.40]	-.009 [0.55]	-.008 [0.51]	-.010 [0.67]
$(U^L/U)_{t-1}$	.001 [1.69]	.001 [2.18]	.001 [2.04]	.001 [2.21]	.001 [2.21]
ln$(N-E)/N)_{t-1}$	-.154 [6.64]	-.168 [6.88]	-.162 [6.82]	-.166 [6.89]	-.154 [6.53]
Δln$UDens_{t-1}$	-.249 [2.51]	-.318 [2.96]	-.299 [2.85]	-.322 [3.02]	-.369 [3.06]
ln$UDens_{t-1}$	.028 [2.37]	.028 [2.31]	.027 [2.29]	.027 [2.24]	.040 [3.23]
$NDYP_{it}$	.127 [1.40]	-.038 [0.30]	.017 [0.15]	-.033 [0.27]	
NMW_{it}			.928 [1.49]	1.354 [1.94]	
$NMWS_{it}$		.167 [1.75]			
T1998					.013 [3.02]
T1999					.020 [2.45]
T2000					.023 [2.28]
Standard Error	.0104	.0104	.0104	.0104	.0100
Diagnostics					
Serial correlation $\chi^2(1)$ =	3.71 [.054]	3.08 [.079]	3.13 [.077]	2.91 [.088]	2.17 [.141]
Heterogeneity $X^2(9k)$ =	42.47 [.998]	43.72 [1.000]	43.90 [1.000]		

Notes: sample period 1986-2000; N=10, t=15; |t - statistics| or p-value of χ^2 - statistic in brackets; *k* equals no. of slope parameters; two-stage least squares estimates using ln$(w/p)_{i,t-2}$ to instrument for ln$(w/p)_{i,t-1}$; subscript *i* denotes region; regions included are: North (North-East), Yorkshire and Humberside, East Midlands, East Anglia (East), South East, South West, West Midlands, North West, Wales, Scotland; regional ranking of NMW_t instruments for NMW_t in model 4; male earnings is measured by total pay of full time men (Source: Regional Trends and New Earnings Survey, table A19.3); regional fixed effects included; *(N-E)/N* is the male non-employment rate in each region, Spring Quarter (Source: Labour Force Survey Historical Supplement, 1984-1998, Labour Market Trends A.4); U^L/U is the share of long-term (greater than 6 months) unemployment in total male unemployment (Source: Regional Trends, Labour Market Trends, C.13); zero-one dummies for Yorkshire & Humberside in 1989 and 1990, and for East Anglia and the South East in 1996.

The regional evidence suggests that additional wage pressure is associated with the introduction of the NMW rather than a breakdown in the relationship between the duration structure of unemployment and wage pressure. However, the high correlation over *time* between the NDYP and NMW variables means that it is difficult to distinguish between the two effects. A further check is to exclude these variables from the wage equation and regress the resulting average error terms on the average value of the NDYP and NMW variables, avoiding the problem of collinearity over time. Column 5 shows estimates of the regional wage equation with positive and

significant macro time dummies for the years since NDYP and NMW were introduced. Table 4 then shows the result of regressing the equation errors on the average values of $NDYP_{it}$, NMW_{it} , and $NMWS_{it}$. Again it appears that the upward pressure on pay in recent years is due to the introduction of the National Minimum Wage.

Table 4

Cross-sectional errors 1998-2000 in the regional wage equation

Dependent variable: $\bar{e}_i$				
	1		2	
Constant	-.009	[0.58]	-.033	[1.85]
$ndyp_i$	-.111	[0.57]	-.185	[1.15]
nmw_i	1.994	[1.30]		
$nmws_i$			.684	[2.52]
R^2	.210		.486	

Notes: subscript *i* denotes region; $\bar{e}_i = \sum_{t=1998}^{2000} \frac{1}{3} e_{it}$, where the e_{it} are the errors from regional wage equation 5 in table 3;

$ndyp_i = \sum_{t=1998}^{2000} \frac{1}{3} NDYP_{it}$, $nmw_i = \sum_{t=1998}^{2000} \frac{1}{3} NMW_{it}$, $nmws_i = \sum_{t=1998}^{2000} \frac{1}{3} NMWS_{it}$; N=10; |t – statistics| in brackets; least squares estimates.

2.4 Summary

The impact of NDYP on aggregate wages has been clouded by the introduction of the NMW at around the same time as the NDYP. But the rise in wage pressure fits the distribution of low pay across age groups and regions and, in aggregate and for different age groups, the magnitude of the rise matches the expected rise in wages due to NMW. This suggests that the NDYP itself has contributed to a reduction in wage pressure consistent with its impact on long-term unemployment.

3. The effect of the NDYP on the economy as a whole

In order to evaluate fully the effects of the NDYP, it is necessary to use a model that takes account of the way that it affects the wider economy. For this purpose we use the National Institute model of the UK economy. This estimated model is used extensively for forecasting and policy analysis and has been evaluated using a wide range of techniques (Blake and Young, 2001). A key property of the model is that in the long run, employment and unemployment are determined by supply side factors.

According to the model, policies like the NDYP affect the economy in the long run only to the extent that they shift the wage setting relationship. The aggregate time-series evidence suggests that the elasticity of equilibrium unemployment with respect to its composition is just under 0.6. But other evidence indicates that the effect may vary according to age, with the elasticity being larger for older age groups. In the

following simulations, we have taken the long run value of the key parameter γ to be 0.25 for young people. This is in line with the estimated effects in age specific equations in table 2 in the previous section, adjusted in line with the aggregate evidence in table 1.

Fig. 2.: *The aggregate effect of lower wage pressure due to a change in the composition of unemployment*

Fig. 2 illustrates the impact on aggregate employment and unemployment in the model of a *permanent* change in the composition of unemployment, with 30 thousand long-term young unemployed being switched into short-term unemployment. This shifts the sustainable rate of unemployment downwards allowing aggregate demand to expand without putting upward pressure on prices. The increase in employment comes about gradually, but after ten years is about 60 thousand higher than it would otherwise have been. There is a smaller fall in unemployment reflecting the fact that some of the extra jobs will be taken by people moving into the labour force. Fig. 2 also contains lines showing the effect of a temporary change in the unemployment composition. However, the effect is so small that the lines are hardly visible, emphasising the importance of sustained increases in job search in generating the extra jobs.

3.1. Simulation results

In addition to the effect on wages, the NDYP affects the economy by changing the productivity of those participating in it[15] and increasing the demand for labour across

[15] Based on the size of the programme we assume it takes eight years to add 0.1 per cent to the quality of the labour force, represented in the model by a change in labour augmenting technical progress. This assumption about the effect of option participation on productivity or employability

the main UK industries, as a consequence of job subsidies and direct employment measures. Some extra labour demand also arises from the need to deliver the programme by providing NDYP advisers, trainers and options supervisors.

The wider impact of the NDYP is estimated by model simulation. Comparisons are made against a counterfactual case measuring the state of the economy in the absence of the NDYP. This exercise involves making a number of assumptions about how policy would have reacted to different circumstances, as well as believing that the model itself provides an accurate description of macroeconomic behaviour in the UK.[16]

Table 5

Impact of NDYP on the labour market

	difference from counterfactual (thousands)			
	1999q1	2000q1	2001q1	2002q1
Youth labour market				
short-term unemployment	+3	+7	+6	+6
long-term unemployment	-47	-46	-46	-46
employment	+13	+16	+16	+16
government supported training	+14	+14	+14	+14
Aggregate labour market				
short-term unemployment	+1	+5	+3	+3
long-term unemployment	-48	-49	-47	-48
employment	+19	+25	+27	+28
government supported training	+14	+14	+14	+14

Notes: difference between the simulated case with the policy against a counterfactual without the policy; short-term unemployment is unemployment lasting less than six months; long-term unemployment is unemployment lasting more than 6 months; employment includes those on the NDYP employer option, but excludes government supported trainees.

Table 5 shows the simulated impact of the NDYP on the labour market. The beneficial impact of the policy is focused on the youth labour market. By the beginning of 2000, youth employment is up by around 15 thousand (subsidised and unsubsidised jobs) with a further 14 thousand in the ETF and VS options. Long-term unemployment among young people is reduced by around 45 thousand, although short-term unemployment is about 5 thousand higher. Most of these effects are in line with the direct estimates of Riley and Young (2001) indicating that any second round effects on youth employment from the expansion of the overall economy are small.

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mainly has a long-term impact on the macroeconomy. For the purposes of short-term analysis, the effect is sufficiently small that it could be ignored altogether.

[16] For example, monetary policy is assumed to target the inflation rate. Tax rates are assumed to be fixed at actual values and public spending, other than on the NDYP, is assumed fixed at actual levels in money terms. It is also assumed that the workplace training places provided under the Voluntary Sector (VS) and Environment Task Force (ETF) options would not otherwise have been made available by the government.

The downward pressure on pay due to the NDYP increases employment opportunities for the rest of the population, generating about 25 thousand extra jobs (including subsidised jobs) by the first half of 2000. Of these, around 10 thousand went to people outside the NDYP target group.

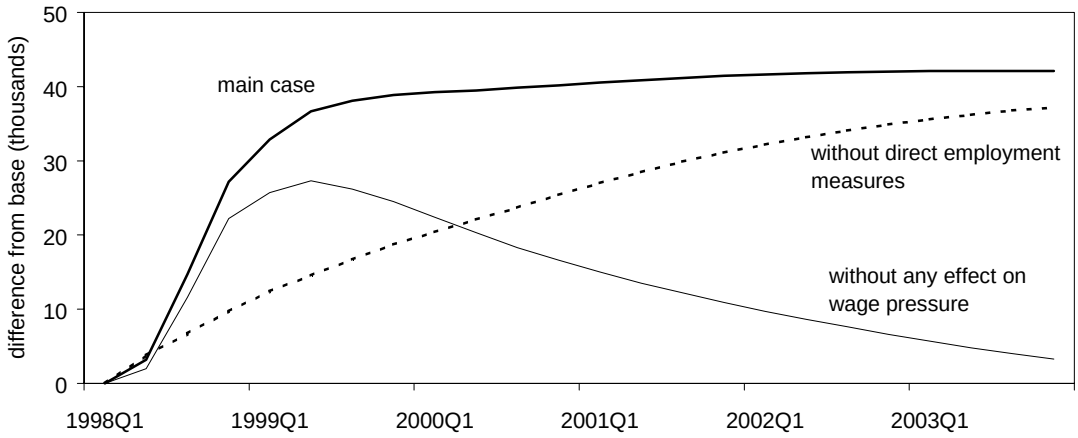

Fig. 3.: *The response of employment to NDYP*

Fig. 3 shows the extra employment generated in the main case simulation alongside estimates of how the NDYP would have worked without the direct employment effect of the NDYP options and without any effect on wage pressure. The importance of the NDYP options in moving employment more quickly into line with the change that can be sustained by lower wage pressure is illustrated by comparing the main case with the dashed line in Fig. 3. By around 2004 the employment effect of the NDYP would be similar with or without the direct job effect of the NDYP options, since by then extra search activity would in itself have generated the necessary extra jobs. The importance of the wage pressure effect of NDYP is illustrated by comparing the main case with the thin solid line in Fig.3. This shows that job subsidies and other job creation measures are ineffective in the long-run unless they are backed up by measures to prevent them being offset by rising wage pressure.

Fig. 4. shows the percentage rise in GDP and private consumption due to NDYP. The reduction in wage pressure allows the economy to expand by a little under 0.1 per cent per annum relative to what it would otherwise have been. This is slightly less than the rise in employment of just over 0.1 per cent. Importantly, household consumption is also higher.[17] Thus the NDYP is associated with an

[17] The initial boom in consumption reflects the effect on the saving rate of the fall in unemployment which makes people feel more secure about their job prospects and encourages them to save less.

aggregate welfare gain, as those who gain from the programme could in theory compensate those who lose and still be better off.[18]

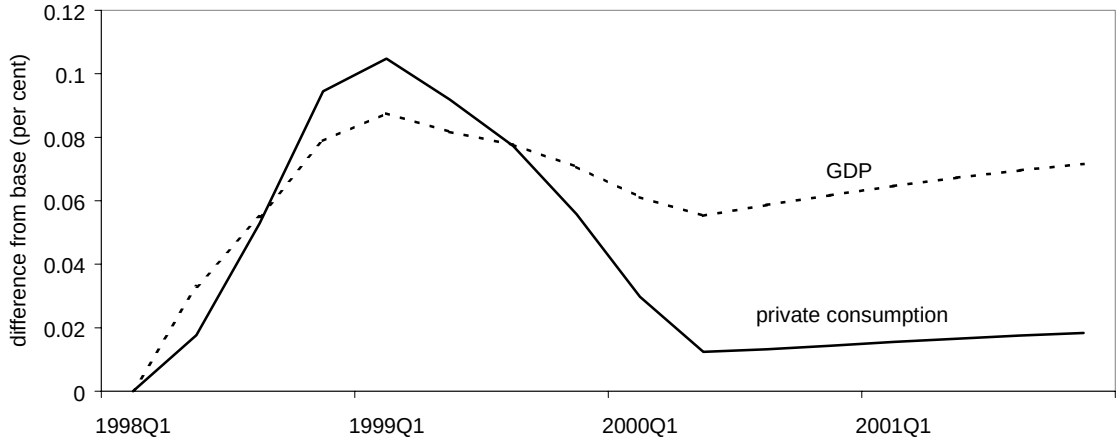

Fig. 4.: *The response of output and consumption*

Table 6 shows detailed calculations of the impact of the NDYP on the public finances derived from official figures and the estimated effect on the overall economy. Up to and including the financial year 1999-2000, £668 million had been spent in delivering the NDYP. The second year's spending represents about 0.1 per cent of that year's total spending by the government, around 0.04 per cent of GDP at market prices. Further effects on the public finances arise out of the programme's effect on sustainable employment and national income. In what follows we illustrate how tax revenues would have changed if the economy responded to the NDYP broadly in the way illustrated above.

In its first two full years, it is estimated that the extra tax receipts due to the NDYP were almost sufficient to pay for expenditure on the programme with an outlay of over £600 million resulting in a net drain on the public finances of only a little over £100 million. Much of the extra revenue is estimated to have been generated by higher indirect tax payments reflecting an increase in household spending.

The estimated increase in direct taxes is entirely due to higher income tax payments caused by the greater level of national income in the UK economy. Some of the additional income tax will have been paid by those who would have been out of work without the NDYP, but this is likely to be a relatively small part of the overall total reflecting the low pay of those participating in the NDYP.

[18] These measures of welfare gain do not take into account possible social benefits due to the programme or benefits and costs to individuals in work due to the programme accruing from e.g. an improvement in self-esteem or loss of leisure.

Table 6

Impact of NDYP on the public finances

	difference from counterfactual (£million)				
	1998-99	1999-00	2000-01	2001-02	average
Receipts					
Indirect Taxes	+77	+99	+29	+27	+58
Direct Taxes	+40	+72	+70	+74	+64
Expenditure					
Social Benefits	-108	-121	-144	-168	-135
Gross NDYP Spending	+252	+352	+360	+370	+334
Net Cost					
Net Exchequer Cost*	+29	+80	+187	+194	+140
Cost per Job (£)	+4800	+3300	+7200	+7200	+7000

* The net exchequer cost is equal to the increase in expenditure less the increase in receipts. Total receipts and expenditure include further items not shown in the table. These are debt interest payments, profits on government trading, spending on fixed investment and social contributions paid to government.
Notes: difference between the simulated case with the policy against a counterfactual without the policy; financial years; jobs include those on the NDYP employer option, but exclude government supported trainees; additional spending of £35.4 million for 1997-8 and DfEE/DSS spending of £28 million not allocated to individual years but included in average net exchequer cost; social benefits include JSA saving.

For future years, spending in real terms is assumed to remain at around 1999-2000 levels. A much smaller gain in indirect tax payments is expected as household spending wanes after an initial surge induced by the fall in unemployment. The saving on social benefits increases as the aggregate employment effects of the NDYP build up, but these are not sufficient to offset the slackening in the effect on indirect taxes.

Over the four-year period considered here, additional spending on the NDYP of £1.3 billion results in increased net borrowing of only about £0.5 billion. This suggests that the cost per job is in the region of £7000 per annum. If those working on the ETF and VS options are included, then average cost per job is around £4000 per annum.

4. Conclusions

The purpose of this paper has been to evaluate the economic effects of the NDYP, asking what effect it has had on the labour market and at what cost. A proper assessment of the success or failure of the policy depends crucially on estimates of its macroeconomic impact. This depends largely on how it affects wages. We have assessed the impact of the NDYP on wage setting by testing whether its effect on the duration structure of youth unemployment has affected wage setting in line with predictions based on historical wage setting relationships, taking into account the introduction of the National Minimum Wage in April 1999. If the changing duration structure of youth unemployment due to NDYP is merely cosmetic, then there will be

no downward pressure on wages and wages would be higher than previous experience would indicate. However, we found little evidence to suggest that this was the case.

The implications of the change in wage pressure for the sustainable rate of unemployment and the economy more generally were derived by model simulation taking account of the second round of changes in wages on aggregate demand and supply throughout the economy. The general equilibrium effects were found to amplify the impact of the programme on employment and unemployment by around 30 per cent. Still the aggregate effect of the programme on employment is modest, raising employment by a little more than 0.1 per cent. It was also shown that a sustained improvement of this order is only possible if the programme leads to a permanent improvement in search activity due to a permanent increase in the effective labour supply.

It is important to emphasise the uncertainties surrounding the estimates presented in this paper. Experience suggests that relatively small changes in assumptions or model parameters can have an observable effect on the calculated impact of policy. As such they are intended to demonstrate the importance of taking into account the wider effects of policy and to give an indication of their magnitude.

It is the government's intention for the programme to become permanent. Our overall findings suggest that this is worthwhile. Despite the relatively modest effect of the programme on the labour market, estimates of its cost taking into account its wider economy effects suggest both a rise in national income and private consumption as a consequence of the programme's effect on wage pressure. This suggests a welfare gain to the economy as a whole and to consumers. Also, the reduction in the numbers on unemployment benefit and the increase in tax receipts due to the rise in national income imply that the net cost to the public purse is relatively low at around 40 per cent of total spending on the programme.

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