

Labour Supply Estimation Project - Briefing Note

MODEL APPLICATION – EMPLOYMENT EFFECTS OF REFORMS BETWEEN 1997-2002

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1. Introduction.

This briefing note presents results from an application of the IFS dynamic labour supply model developed for the HMT and the DWP. The reports from the project (Reports 1-3) presented the background to the final model, its components and the methods of estimation used. In Report 3 we presented the estimated model and results of applying the model to simulate labour market behaviour following a 2p cut in the basic rate of income tax.

Below, we model the overall effect of a package of tax and benefit reforms: the reforms introduced between 1997 and 2002, i.e. in the first six years of the Labour government. The reforms we model include all the major changes directly affecting the disposable incomes of households.

Section 2 of this briefing note introduces the changes to the tax and benefit system between 1997 and 2002 which we model in the simulation. Results of the simulation are presented in section 3. Section 4 concludes.

2. Reforms between 1997/98 and 2002/3.

The simulation includes all major reforms to the UK tax and benefit system which directly affected households' disposable incomes. We model changes to income taxes, national insurance and benefits.

We only model reforms up to and including those which took effect in the 2002/03 tax year. Of course it would be interesting also to include the reforms introduced in 2003/04. However, as we argued in Reports 2 and 3, because the introduction of the NTCs presents methodological difficulties regarding take-up, as explained in Report 2 Section 8.1, it is difficult to model incomes in the 2003/04 system consistently with the methodologies applied to previous years.

The package of reforms which we simulate here includes the reforms to income taxation, national insurance, income support and child benefit. The major reforms which are modelled in our simulation are:¹

- 1) Income tax:
 - a. Introduction of the 10p lower band
 - b. Cut in the basic rate from 23% to 22%
 - c. Changes in company car fuel tax charges
 - d. Abolishing of the Married Couples Allowance
 - e. Introduction of the children's tax credit
 - f. Abolition of MIRAS
- 2) National Insurance:

¹ The reforms have been described in detail for example in Myck (2000) or in Clark, et al. (2001).

- a. Abolishing of the 'entry fee'
- b. Changes to earnings thresholds
- 3) In-work benefits:
 - a. Introduction of WFTC
 - b. Subsequent increases in generosity of WFTC
- 4) Income Support:²
 - a. Increases in the level of child related premiums
 - b. Increases in the earnings disregard
- 5) Child Benefit:
 - a. Increases in the level of the benefit

3. Simulating the effect of the 1997-2002 reform package.

Between 1997-2002 employment rates changed for several reasons, including the overall performance of the economy, demographic trends and changes in the incentive structure affecting people's labour supply. A simulation of the kind presented in this briefing note should allow to isolate the labour supply incentive effect from the other effects, in order to give us an estimated effect of tax and benefit reforms alone on employment.

The simulation is based on the final version of the labour supply model presented in Report 3. It is conducted using specification 3 of the entry and exit equations for singles (Tables 3: 3.2 and 3.3)³ and specification 2 of the models for couples (Tables 3: 3.4-3.7). Net incomes calculated using the updated April 1997/98 tax and benefit system are used as the base to the simulation and we examine the employment effect of introducing the April 2002/03 system.⁴ The updated April 1997/98 system represents a tax and benefit regime as if the government did nothing since April 1997 apart from updating the rates and thresholds in the system according to the rules of statutory indexation.

3.1. Short and long run effects.

Table 1 presents results of the simulations for singles and couples. The Table includes short and long term employment effects of the reform package. While the short run changes can be understood as an 'immediate response' in labour supply following the introduction of the reformed system, the long run effects represent the impact of the reform package on the 'equilibrium' level of

² The 1997/98 – 2002/03 period saw significant changes affecting disposable incomes of pensioners. Because our sample is limited to people aged 20-55 these reforms would not have affected the behaviour individuals in the sample.

³ References to sections report 3 are given here using the notation (3: x.y) for section (or table) x.y from Report 3.

⁴ As in the final model all incomes are expressed in 2002 prices (second quarter).

employment. Equilibrium is defined as a state in which the number of people leaving and entering employment is the same. We model singles and couples separately and thus the equilibriums are defined separately for singles and couples. Because the equilibrium is defined on the basis of the number of people changing employment states, it is possible to give separate long run effects for men and women in couples. This is because if we know how many couples are in each of the four employment states (see 2: 4.2), we know how many men and how many women are employed. The same can't be done for singles, since knowing the number of singles in each of the two employment states (see 2: 4.1) tells us nothing about people's gender.

In Table 1 short run effects are split between people with and without children. A similar distinction would also be possible for long-run effects but we would then have to accept a separate definition of equilibrium for people with children and people without children, which from the point of view of labour market theory would be somewhat peculiar.⁵ Having said this, in section 3.2 below we demonstrate what the path of convergence to such 'separated equilibria' looks like, in order to illustrate the relative effects of the reform package on people with and without children.

Table 1. Short run effect on employment of the 1997-2002 reform package.

	Short-run			Long-run
	All	People without children	People with children	All
Couples:				
Men	-2,800	1,200	-4,000	-3,200
Women	-600	2,300	-3,000	1,300
Total	-3,400	3,500	-6,900	-1,800
Singles:				
Men	23,600	23,100	500	-
Women	32,200	5,500	26,800	-
Total	55,900	28,600	27,200	127,000
Overall:	52,500	32,100	20,300	125,200

Numbers might not add up due to rounding (to nearest 100). Based on FRS grossing factors (see section (3:4.2)).

Table 1 shows that the overall reform package modelled here has a small negative employment effect on people in couples and a relatively high positive impact on employment of single individuals. Looking at the short run effects, the reforms negatively affect employment of individuals in couples with children, and have a small positive effect on employment of those without kids. Among single individuals the overall short run employment effect amounts to over 55,000 individuals, with the increase made up mainly of childless men and single mothers.

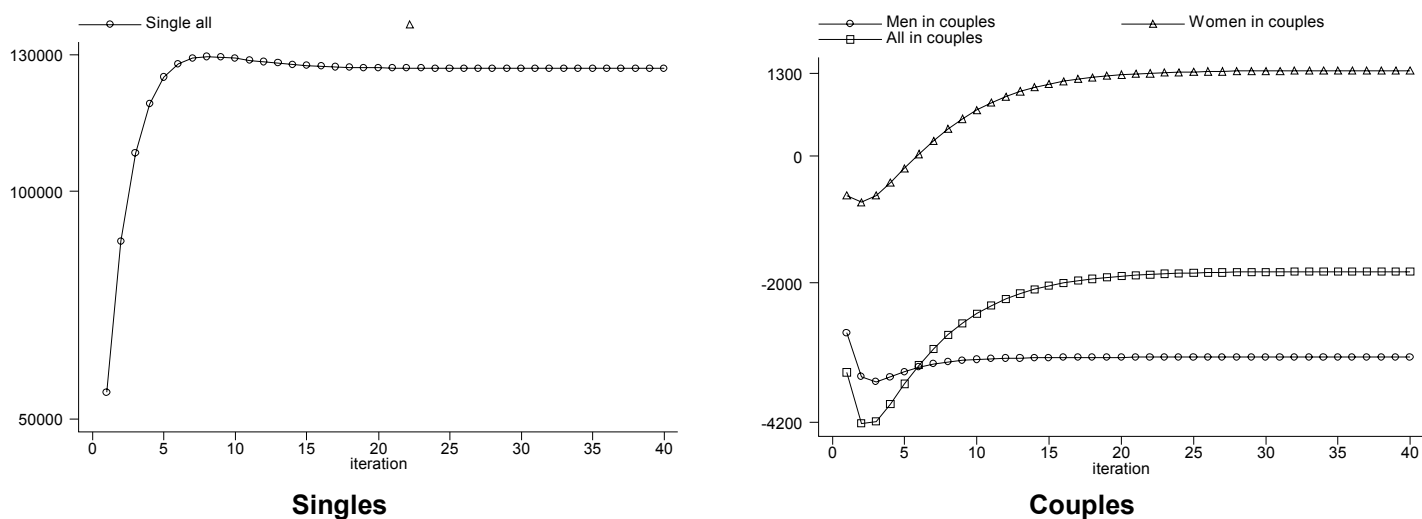
⁵ Similarly, one might already have objections to separate definitions of equilibrium for singles and couples.

In the long run we estimate that the reforms lead to an increase in employment of almost 130,000 single individuals. By contrast, among people in couples there is very little long run reaction to the overall reform package. It seems that among couples the changes in the tax and benefit structure which might influence work incentives positively and negatively are roughly balancing each other out. We return to this issue in section 3.2 below.

3.2. Convergence from short to long run effects.

Figure 1 shows the convergence from short to long run effects using the methodology presented in section 2: 7.5. The most intuitive interpretation of a single iteration is an annual employment effect, although depending on our perception of the actual labour market convergence to equilibrium it may also be less (or more) than this. We can see that for singles the equilibrium in the market is achieved relatively quickly, after about 8 iterations. For couples it takes almost twice as many iterations for the market to converge following the introduction of the reforms. We examine the case of couples in more detail in Figure 2 where we present convergence to equilibrium separately for people with and without children.

Figure 1. Convergence to long-run effects – couples and singles.

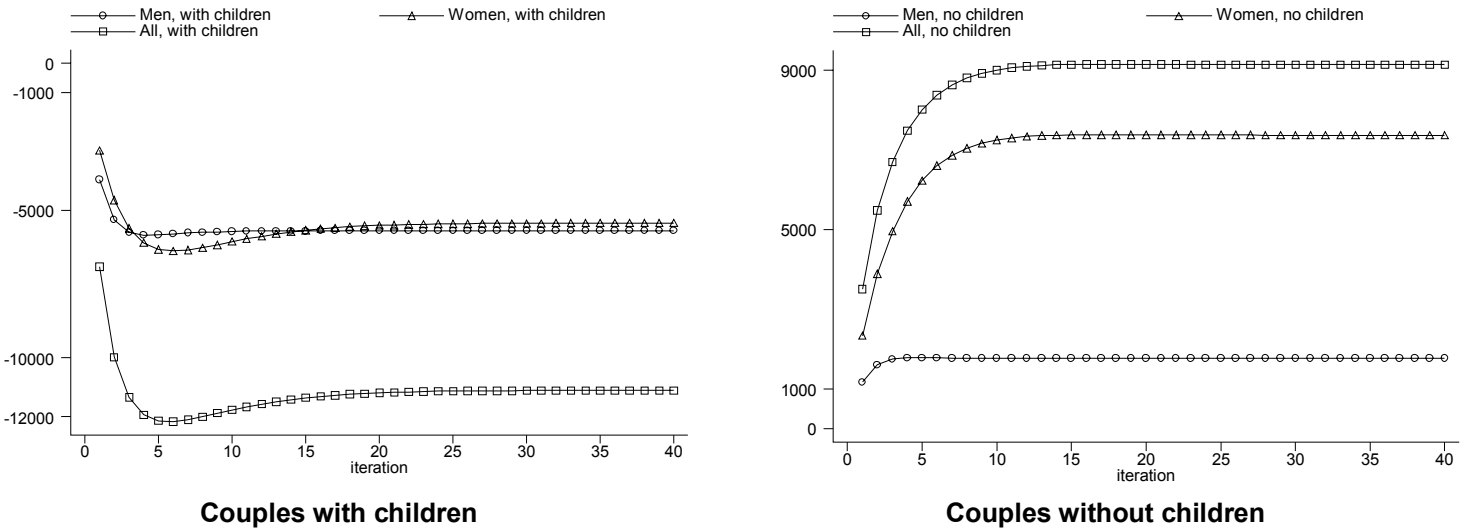


As noted above in section 3.1 this definition of equilibrium is in some ways peculiar, but as Figure 2 demonstrates it can give us an indication what underlies the overall employment effect for individuals in couples. The 1997-2002 reform package seems to have a positive effect on employment of people in couples without children (both men and women), while it negatively affects employment among couples with children.

In a simulation which combines the effects of so many reforms it may be difficult to specify what drives these effects. This is especially the case for

couples where a tax cut, for example, may lead to an increase or a reduction in employment.⁶ However, looking at the results in Figure 2, it seems that the income tax and NI reforms which have an overall positive effect on people without children, are outweighed for couples with children by the negative employment effects of changes in benefits and in-work support. The fact that employment effects for people with and without children go in opposite direction explains the overall minimal impact of the reform package.

Figure 2. Convergence to long-run effects – couples with and without children.



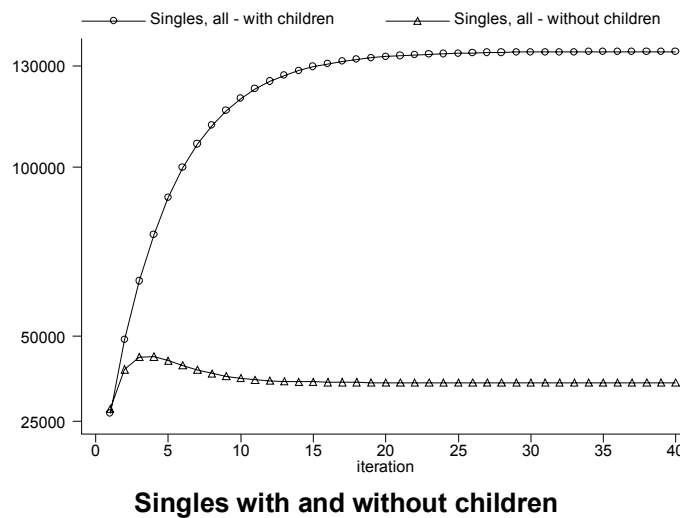
Notes: simulations by family type: long run effects for the figures above based on the definition of equilibrium as a state in which the same number of people with (or without) children enter and exit employment.

A similar exercise, where we derive convergence paths separately for individuals with and without children, is presented in Figure 3 for single people. Note first of all that because we define the equilibriums separately for those with and without children, the combined employment effects do not sum to the total presented in Table 1 where equilibrium is defined jointly for all single individuals. However, these separate convergence paths are again helpful for interpretation of the overall employment effect on singles.

It seems that the reforms have had a very strong positive employment effect on single parents, for whom various tax reforms as well as the WFTC have made work much more attractive. Having said this, employment of single individuals without children increases quite substantially too, although while in the short run employment of those with and without children rises by a comparable amount, the reforms have a much stronger effect on those with children in the long run.

⁶ The reduction may come from the fact that the tax cut increases the couple's income in states (1,0) and (0,1), which may induce second earners to leave employment.

Figure 3. Convergence to long-run effects – singles with and without children.



Notes: simulations by family type: long run effects for the figures above based on the definition of equilibrium as a state in which the same number of people with (or without) children enter and exit employment.

4. Conclusion.

In this briefing note we have demonstrated an application of the IFS dynamic labour supply model and simulated employment effects of reforms introduced between 1997/98 and 2002/03. The estimations suggest that the reforms have had a strong positive effect on employment for single individuals, especially among those with children. Changes in employment levels among individuals in couples are modestly negative. The overall effect among couples is a combination of employment increases among couples without children and falls in employment among those with children.

References

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