

Working Families' Tax Credit: A Review of the Evidence, Issues and Prospects for Further Research

By Richard Blundell and Ian Walker

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Working Families' Tax Credit

A Review of the Evidence, Issues and Prospects for
Further Research

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and

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1. Background

The traditional policy dilemma in the design of welfare systems is to balance the desire to raise the living standards of low-income households with that of encouraging self-sufficiency through the promotion of work incentives, and reducing government expenditure. One policy which aims to overcome this dilemma is an in-work transfer programme.

In-work benefits, or earned income tax credits, are typically motivated as a method of alleviating poverty that does not create adverse work incentives and may create positive incentives. They do this by targeting low-income families with an income supplement that is contingent on work. Typically, eligibility is based on family income and requires the presence of children, reflecting in part the higher (out-of-work) welfare benefits for families with children and partly their higher costs of working (childcare). Consequently these benefits are most heavily targeted toward single parents and low income couples with children. Increasingly, they are also being proposed for low-income workers with or without children.¹ However, family income based eligibility rules and the interaction with other aspects of the tax and benefit system make the analysis of the impact on work incentives and the impact on overall income distribution more complex than they may first appear.

In-work benefits have a long history in both the UK and the US. In the UK, Family Income Supplement (FIS), which provided an earnings supplement for those families with at least one full-time worker, was introduced in 1971. The Earned Income Tax Credit (EITC) in the US was also introduced in the 1970s as a way of introducing a negative income tax for low-income working families. However, the two systems operated rather differently. The differences are important for understanding the different impact that the reforms have had on work incentives and the distribution of income. For example, FIS had a full-time work requirement with a 50% benefit reduction (or phase-out) rate whereas the EITC provided a tax credit supplement to all earnings, with a phase-in until a maximum credit or maximum income limit was reached, then a low phase-out rate.

¹ See the proposed employment tax credit, HM Treasury (2000).

In the 1970s and early 1980s the lowest deciles of the income distribution in the UK were occupied by the retired. This changed dramatically in the mid 1980s with growing numbers of families of working age, and especially single parents, taking over the lower deciles of the income distribution. In the US, with the falling real wages of the low educated over the 1980s, and the increasing level of welfare dependency among certain demographic groups, the EITC took on a new role in welfare policy as a mechanism for encouraging work by supplementing the working wage for low wage workers. In-work benefits consequently began to gain in significance in the policy reform debate and were central to the tax and benefit reforms in both countries in the mid to late 1980s.

The UK benefit system was extensively changed in the 1988 tax and benefit reform. The changing composition of low-income households and the decreasing labour market attachment of certain family types refocused the policy debate onto the implicit tax on income faced by such low-income families from the combined tax and benefit systems. For example, by the mid-eighties the combined effect of the 50% FIS benefit reduction rate together with the impact of Housing Benefit (HB), tax and National Insurance Contributions (NICs) in the UK resulted in implicit tax rates in excess of 100% for many workers. The 1988 reforms replaced FIS with Family Credit (FC) and significantly changed the structure of HB and Income Support (IS). As we describe further below, FC was an extended version of FIS with a benefit reduction rate increased to 70%. Despite the higher benefit reduction rate in FC and in HB, the reformed system treated each benefit sequentially and considered the tax and benefit systems together so that the implicit tax rates in excess of 100% that characterised the earlier system were eliminated.

The eligibility rules for Family Credit in 1988 still required full time work, defined as at least 24 hours per week. Unlike the EITC in the US there was no phase-in range. Family Credit's 24 hour rule was clearly a hurdle for many lone parents with young children and in April 1992 FC was again reformed so that a family with one parent working 16 hours a week or more was entitled to FC. FC provided a significant supplement to earnings for eligible low-income families. As we document below there is strong evidence that this reform increased participation among lone mothers with children, especially those with lower educational qualifications.

However, it also reduced overall hours of work among eligible families. The lowering of hours worked in recipient families was clearly a motivation for the 1995 reform to FC which added an additional credit payable when one parent worked 30 hours a week or more.

In the USA, EITC was expanded in 1987, 1993 and 1996, and a modest version of EITC was introduced for childless couples from 1994. Seven states have introduced supplementary (to the federal EITC) in-work transfer programmes either following the Clinton reforms of 1996, or under earlier waivers of the older AFDC rules. In Canada, Workers Income Supplement (WIS) was introduced in 1993 and then abolished in a major reform in 1998, but the Self Sufficiency Program (SSP), an experimental programme in British Columbia and New Brunswick, has been running since 1992. These reforms have been the focus of a number of ex-post evaluation studies that we discuss briefly below.

Reforms to FIS and FC in the UK provide some basis for ex-post evaluation of in-work benefit reform in the UK. As will become clear in the discussion below it is important to emphasise that in-work benefits are just a part of the welfare and tax system. As highlighted in the recent studies by Ellwood (1998) and Blank, Card and Robins (1999), only a partial view of the underlying financial incentives created by in-work benefit reforms is revealed by analysing them in isolation. This turns out to be especially so in the UK where, since the introduction of Family Credit, in-work benefits have, been counted as income in the computation of other welfare benefits. In particular, the interaction with IS, Council Tax Credit and Housing Benefit is crucial in understanding the overall impact of any reform in the UK.

The ability of in-work benefits to shift income towards low-income families and to influence working decisions was already recognised in FC but became a major focus of the UK reform of 1999 when FC was replaced by the Working Families Tax Credit. WFTC significantly increased the generosity of FC through the extensive childcare tax credit and the reduction in the rate at which support was reduced from 70% to 55%. Although the take-up of FC increased over that achieved by FIS, it fell short of the 80% levels achieved by EITC in the US. The UK 1999 reform also acknowledged the potential importance of take-up by administering the credit, as in the case of the US EITC, through the tax system rather than the welfare system.

It is clear from this brief history that the policy debate has largely been about work incentives. However, there are good theoretical reasons for suggesting that in-work transfers have wider effects. Thus, a complete evaluation of WFTC ought to consider not only the effects on labour supply via its effects on net incomes, but also its effect on *gross* hourly wages that arises because the reform affects the demand side as well as the supply side of the labour market. Moreover, since WFTC provides support for childcare costs we ought to be concerned with its effects on childcare use and the hourly cost of childcare.

A further focus of this paper is to broaden the debate from simple work incentive issues to embrace wider questions that are raised by WFTC – including questions associated with the change in the default payee. These wider effects include: intra-household distributional effects (and their consequences for labour market behaviour); the relationship between child outcomes and parental resources; the incentives to take-up the programme; inter-temporal incentive effects; and the incentives to parent and to partner. Thus, here we aim to go beyond the narrow concerns of evaluating the move from FC to WFTC to see what can be learned that may improve the operation of WFTC and/or tax credits in the future.

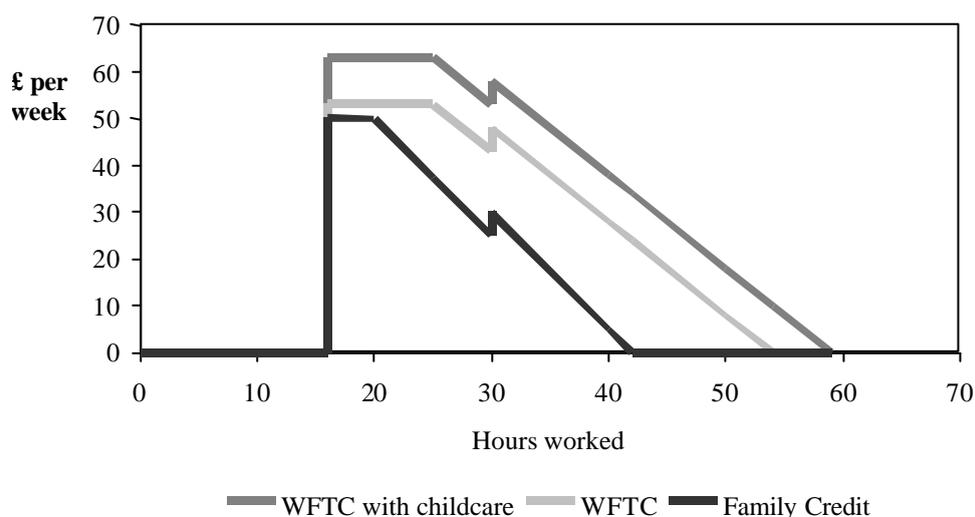
The evidence from existing reforms across a number of countries suggests that careful design of these programs can significantly increase the incomes of low-income families while still providing reasonable incentives for parents to work. Since these programs are generally based on family income, a careful analysis of the different sources of family income and how they are affected by the receipt of in-work benefit income is essential to model incentives correctly. This not only relates to work incentives but is also critical to our understanding of a wider set of incentive questions. For example, means testing against family income will generally imply that the incentive to parent is increased and the incentive to partner is decreased. Moreover if households fail to pool their resources then the effects of welfare programmes that are means tested against family income are likely to be different than would be the case if pooling did occur. A final neglected issue is the dynamic pay-off of in-work welfare. The incentives for training and human capital investment for low skilled workers are likely to be reduced by in-work benefits.

2. WFTC Questions for Research

The WFTC is illustrated in Figure 1 together with FC. WFTC provides larger entitlements than FC; the rate of withdrawal at 55% is significantly lower than the 70% rate under FC; all maintenance income is disregarded under WFTC; and the WFTC childcare tax credit replaces FC's less generous childcare disregard. WFTC is paid to either partner at the agreement of both partners. Exceptionally, if a couple cannot agree who should receive the payment, then WFTC will be paid to the partner who mainly cares for the child(ren). In contrast, FC was, by default, paid to the mother who could veto payment to the partner.

It is worth emphasising that in-work benefits are just one part of the welfare and tax system and should not be analysed in isolation. As highlighted in section 4, the interaction between in-work benefits and other benefits, in particular housing benefit, is crucial in understanding the overall impact of any reform. Similarly the overall impact of any reform will depend on the interactions with other benefits and taxes as well as other concurrent reforms. For example, in the UK the introduction of the National Minimum Wage and changes to National Insurance Contributions are both likely to have an impact.²

Figure 1 The UK WFTC Reform



² Gregg, Johnson and Reed (1999) emphasise this point.

The distinctive features of WFTC are that: it is more generous than FC and extends further up the income distribution, it provides a much larger subsidy for childcare than FC; and it is more transparent than FC. For all three reasons it is likely to have larger take-up. Moreover, there is a potential reduction in stigma from payment as a benefit through to payment being made via employers in the wage packet.

Traditionally the impact of welfare programmes on work incentives have been considered within a static context. However, dynamic issues are likely to be crucial for the long-term effects of such programmes: time limited welfare is likely to have very different dynamic incentive effects than unlimited programmes; non-convexities in the relationship between current incomes and current entitlements give rise to incentives for intertemporal substitution so as to capitalise from the programme.

The important questions for research are:

- ◆ To what extent does WFTC promote work incentives?
- ◆ How effectively does WFTC promote redistribution and child welfare?
- ◆ To what extent does WFTC affect other aspects of decision making: the incentives to use childcare, to partner, to parent, and to declare income and hours (take-up, avoidance and fraud)?
- ◆ To what extent is WFTC likely to affect dynamic incentives – such as the incentive to invest in “wage progression” either through the incentive to take a job with a steep earnings profile, or to invest in human capital through pre-work formal education or through on-the-job training?
- ◆ A further important issue is the “general equilibrium” effects of WFTC on wages and childcare prices – that is, to what extent does this wage and childcare subsidy affect the gross wages and prices in these markets?

These issues help shape the questions on the detailed design issues such as:

- ◆ What are the effects of the entitlement level (determined by the credits for children and the family) and the extent to which it is targeted (i.e. the magnitude of the “phase-out” taper)?
- ◆ Does the design of WFTC promote take-up?
- ◆ How does an hours “notch” (16 hours in the case of WFTC) compare to a “phase-in” range over which some (negative) taper applies (as in EITC)?

Finally, a number of administrative questions also require careful consideration:

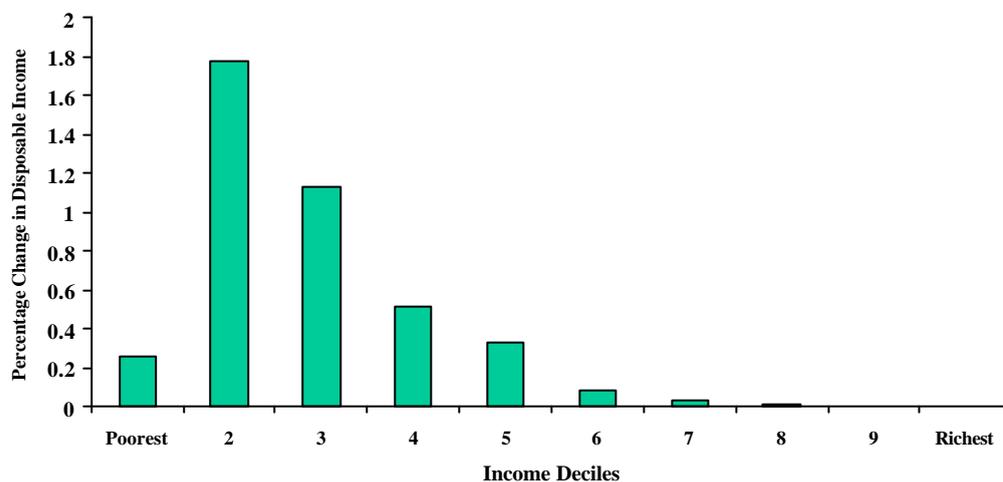
- ◆ What are the effects of a payment via a tax credit (as in WFTC)?
- ◆ How does the nature and period of assessment and the timing of payments for WFTC affect outcomes compared to different options such as “receive-as-you-earn” or payment at the end of the tax year (as in EITC)?
- ◆ Are there advantages in WFTC interacting with other transfer programmes? In the UK HB is computed after WFTC so WFTC is counted as income in determining HB entitlements and hence overall income, whereas in the US EITC is not counted for the purpose of computing other welfare entitlements.

3. The Distributional Impact of the WFTC

3.1 Existing research

The distributional effects between households of replacing FC by WFTC are explored in Giles, Johnson and McCrae (1997), using FRS data, and the results can be summarised in Figure 2 drawn from that paper. The figure confirms the analysis in HM Treasury (2000) that WFTC is relatively effective at targeting resources at lower deciles (with the obvious exception of the lowest where workerless households are heavily concentrated).

Figure 2 The Effect of WFTC on Household Disposable Incomes



While existing work depicts the simulated effects it typically does so under the presumption of no changes in behaviour. This is singularly inappropriate for evaluating a mechanism designed to change labour market and take-up behaviour. While there are a wide variety of possible behavioural effects, the most immediate are the effects on labour supply and on take-up. WFTC is clearly designed to change both, and these changes will have second round effects on net incomes that will need to be taken into account. Thus, the robustness of the existing work will need to be tested by evaluating the distributional effects under different assumptions about take-up rates and labour supply effects.³ Moreover, this existing distributional work will

³ See Paull *et al* (2000) for similar work for child support reform.

need to be replicated on new data, as it becomes available, and the effects should be compared with the possible effects of alternative policies.

3.2 *A life-cycle dimension*

Most existing analysis of in-work benefit reforms in the UK and in North America work has been based on analysing the effects on current net incomes. It would seem important to supplement this by work based on longer term measures of welfare. This would allow the analysis to reflect the effects of the strategies that welfare recipients might use to smooth their living standards in the face of fluctuations in their short-term net incomes.

One direct measure of longer term welfare is consumption. The idea is that consumption measures permanent income (see Blundell and Preston (1998), for example). The Family Expenditure Survey (FES) is the natural vehicle for such analysis since it contains a range of consumer expenditures. However, for a more general analysis, panel data is desirable. There is much room for analysing existing data sets, such as the British Household Panel Survey (BHPS), alongside any specialised data base in this regard.

Apart from smoothing issues there are wider intertemporal effects that need to be incorporated: the wage progression and human capital incentives alluded to above and explained in more detail in section 6 below.

3.3 *Intra-household issues*

The issue of who in the household receives the WFTC arises for couples. Under WFTC, the tax credit award is paid to the applicant and it is anticipated that it will be paid mainly to the earner through the pay-packet while, in the past, FC has been paid to the mother either directly to a bank account, through an order book (of vouchers that can be cashed at a Post Office), or as a girocheque. Thus, there is an important question about the distributional effects *within* households for couples (but not for single parents). There is little evidence available that allows us to predict the effects of such a potential transfer of resources from “purse to wallet”. The late 1970s UK child benefit reform was a “wallet to purse” transfer and this has been shown to

have increased the share of children's and mother's clothing in household expenditures (see Lundberg, Pollak and Wales (1995)). However, payment via the employer does not necessarily mean that money is transferred from the purse to wallet.

3.4 Agency issues

Finally, while we have extensive evidence on the effect of growing up in poverty on long-term outcomes for children, we have almost no evidence that child welfare and/or child outcomes are improved by giving poor parents greater financial resources (see Currie (1995)). However the existing work in this area⁴ says little about the effects of programmes that individuals are likely to be on for some time, such as FC/WFTC. Thus, there is much to be learned that will have importance for other policies aimed at promoting child welfare.

3.5 Issues for research

Thus, two important areas of WFTC research will be:

- ◆ To extend what we already know about inter-household distributional effects to account for the intra-household redistribution implied by WFTC.
- ◆ To uncover the impact of the higher parental incomes implied by WFTC on (at least some) child outcomes of interest.

A corollary of these intra-household concerns is that labour supply decisions of households are NOT made in a way which is consistent with the idea that household members “pool” their resources when making decisions. This has ramifications for the effects of WFTC on the behaviour of married couples: the effect of the reform will depend on what happens to the distribution of resources within the

⁴ See Shae (1997) and Duflo (1999). The agency problems that arise when attempting to improve child welfare by increasing the net incomes of their parents may suggest that direct intervention that circumvents the parents may be appropriate. There have been a number of attempts to do precisely this. Currie (1995) gives extensive details of US programmes and Bingley and Walker (1999) analyses the effects of the UK free school meal, day-care milk and welfare milk programmes that aim to improve child nutrition. The UK SureStart programme is a variety of treatments designed to either improve the parents ability to act as agents for their children or to improve child quality directly. However, there has yet to be any evaluation of the programme.

household as well as the total resources⁵. Thus, a third issue that will require attention will be:

- ◆ To model the way in which household members behave in the labour market if they do not “pool” their resources.

These are some of the most difficult questions that confront policy analysis in any area of programme design so it is not surprising that there is a dearth of convincing evidence on these issues. This seems likely to be due to the lack of informative data. Data to address this set of issues would be informative if they featured some “natural” variation in resources across household and across individuals within households.

⁵ See Chiappori (1988) and Apps and Rees (1999).

4. In-Work Benefits, Budget Constraints and Work Incentives

In-work benefits are designed to counter the low potential wages and the high implicit tax rates faced by those individuals on out-of-work welfare. The idea is to modify the incentive structure so that a larger fraction of out-of-work welfare recipients take jobs and leave out-of-work welfare. The programs, from around the world, discussed here all share very similar characteristics and aims. They are designed with slightly different labour markets and slightly different target groups in mind, but nonetheless they have very strong similarities.

4.1 The Early UK Reforms

4.1.1 Family Income Supplement

Family Income Supplement was introduced in 1971. It was a non-contributory benefit payable to low-income families with children, provided the head of the family was in full-time paid work (defined as 30 hours per week, or 24 if the individual concerned was a single parent). Entitlement depended on the family's income being below a certain limit. The amount payable was half the difference between the family's income and the relevant limit. The limits in 1983 were £85.50 per week for a one-child family with £9.50 for each subsequent child with a maximum payment of £22 per week.

In addition to entitlement to FIS automatically conferred a number of 'passport' benefits that were also available to those on Supplementary Benefit – the income assistance programme for those not in full time work, including free school milk and meals, free prescriptions and dental treatment (see Dilnot, Kay and Morris (1985), for further details).

Although FIS clearly provided some financial incentive to work, the combined effect of the 50% FIS benefit reduction rate together with the impact of HB, and personal tax rates and NICs in the UK resulted in implicit tax rates in excess of 100%. This is displayed in Table 1(a) and (b).

Table 1(a) Marginal “Tax” Rates and the 1986 Reform to Family Credit

	1985 System	1995 System
Income Tax	25	25
NIC	7	7
FIS/FC	50	48
HB	23	17
Total	105	97

Notes: Withdrawal rate (%) per additional £ of gross income. Source: Dilnot and Webb (1989)

Table 1(b) The 1995 UK Tax and Benefit System

	Old System: £ per week			New System: £ per week		
Wage	70.00	115.00	145.00	70.00	115.00	145.00
- Tax	1.07	14.57	23.57	1.07	14.57	23.57
- NI	4.90	10.35	13.05	4.90	10.35	13.05
+ FIS/FC	19.50	-	-	29.23	10.99	-
+ CB	14.00	14.00	14.00	14.00	14.00	14.00
+ HB	19.89	10.36	-	6.01	1.33	-
Net Inc.	117.42	114.44	122.38	113.27	116.40	122.38

Notes: Married man with non-working wife, two children (aged 5 and 10), rent of £20 p.w. and rates of £6 p.w.

Source: Dilnot and Stark (1989)

4.1.2 The introduction of Family Credit

Introduced in 1988, Family Credit was an extension of FIS and shares many of the central features of the EITC in the US. It was designed to provide support for low income families with children. An unusual feature of the FC system is the minimum weekly hours eligibility criterion. A family with children needs to have one adult working 16 hours or more per week to qualify for FC. At its introduction this was set at 24 hours but then reduced to 16 in April 1992 to encourage part-time work by lone parents with young children. To partially offset any adverse incentive effects on full-time work, a further supplementary credit at 30 hours per week was introduced in

Figure 3(a) Before the 1992 Hours Reform to FC: Single Parent in 1991

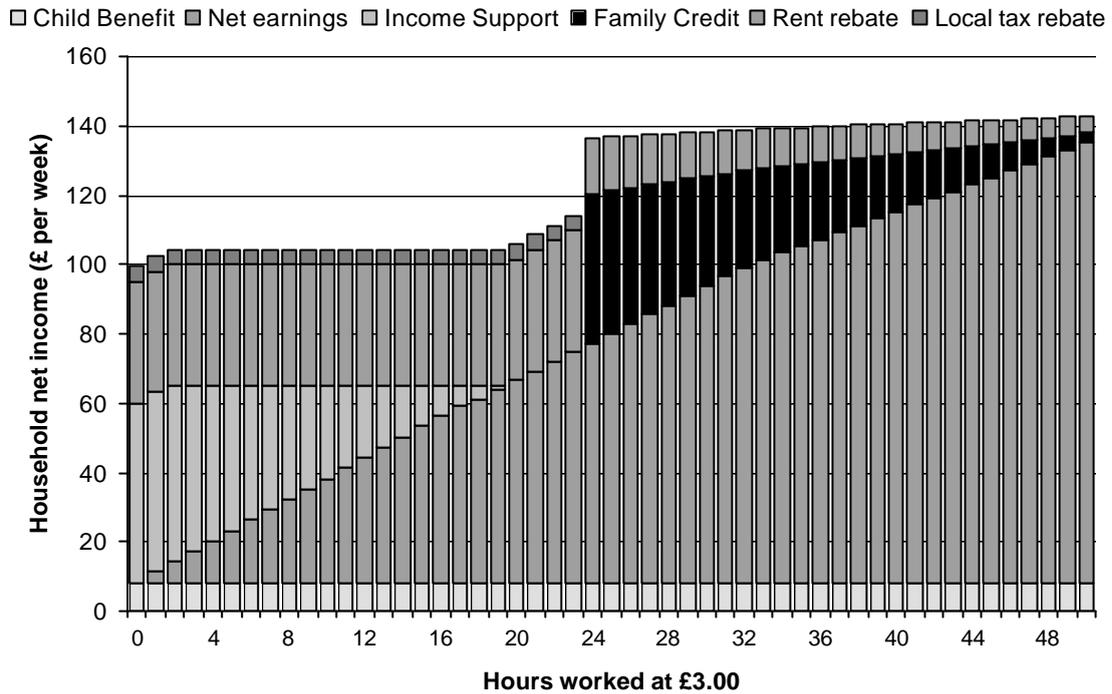
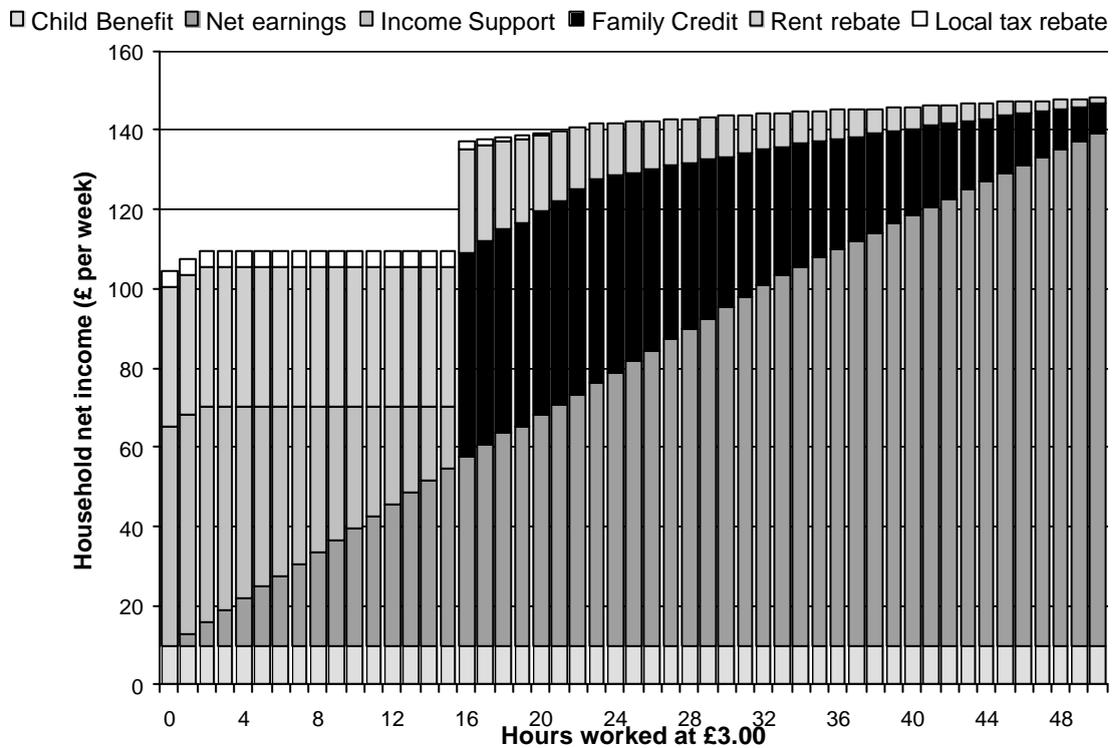


Figure 3(a) After the 1992 Hours Reform to FC: Single Parent in 1992



April 1995. These Family Credit reforms are interesting in their own right, but we will be particularly interested in them as a basis for evaluating the reliability of assessment of the impact of the WFTC proposals.

In the FC system each eligible family was paid a credit up to a maximum amount dependant on the number of children. There was also a smaller addition if at least one parent worked 30 hours or more. For every £1 of net household income above £79.00 p.w in 98/99 FC was withdrawn at a rate of 70%. In 1996 average payments were around £57 a week and take-up rates stood at 69% of eligible individuals and 82% of the potential expenditure.

4.1.3 The 16 hour reform to Family Credit

The 16-hour reform became effective in April 1992 and moved the hours eligibility rule from 24 hours per week to 16 (see Dilnot and Duncan (1994) for a detailed description of this reform). Figures 3(a) and 3(b) show the impact on the budget constraint of a typical eligible single parent and highlights the interaction of Family Credit with other benefits and taxes. The reform was designed to make working more financially attractive, but may have also encouraged full-time workers to reduce their hours of work.

Nonetheless, a comparison of Figures 3(a) and 3(b) shows that the in the weekly hours eligibility limit from 24 to 16 considerably improved the incentive to work and take a part-time job. This incentive effect at 16 hours per week is clearly evident in the histogram of weekly hours worked for eligible single parents, as we discuss further in section 8 below.

4.2 The WFTC

WFTC replaced FC from October 1999. It increased the generosity of in-work support relative to the FC system in four ways: by increasing the credit for younger children, by increasing the threshold above which the tax credit was withdrawn by reducing the withdrawal rate from 70% to 55%, and by incorporating a new childcare credit of 70% of eligible childcare costs up to a limit of £100 (£150 for two children)

compared to FC's more modest childcare disregard (of £60 for first child and £100 for two children).

The target group for WFTC is low-income working families with children, whether headed by a lone parent or a couple. As we will see the reform is quite well targeted but, just as in the case of most tax or benefit reforms, there are unintentional effects. Table 2 shows that the gainers are concentrated in middle and top of the hours distribution for single parent households and at the bottom of the hours distribution for women with working partners. It is this increased generosity at the middle of the hours distribution and above for single parents that is one of the three important features of the FC to WFTC reform.

The WFTC budget constraint of a single parent before and after the WFTC reform is shown in Figures 4(a) and 4(b). Similarly, the before and after FC to WFTC impact for a typical male worker in a couple is presented in Figures 5(a) and 5(b) respectively. This highlights the second important feature of the reform: other benefits, especially Housing Benefit (rent rebate), can strongly offset the effectiveness of the increased generosity of WFTC.

4.2.1 The Childcare element of WFTC

The childcare tax credit component of WFTC could clearly have an important impact on labour supply behaviour – both through increasing the incentive to participate and, through changing the balance of desirability between part-time and full-time work. This credit increases the maximum amount of WFTC by 70% of childcare costs up to a maximum of £100 per week for those with one child or £150 per week for those with two or more children. The childcare tax credit is available to lone parents, and to couples where both partners work more than 16 hours per week. This is the third important feature of the reform.

Table 3 gives the distribution of existing childcare usage from the Family Resources Survey. The corresponding distribution of childcare costs for couples and single parents, at different hours of work, is provided in Tables 4(a) and 4(b). This makes it clear that the marginal cost of childcare rises with hours of work as parents exhaust the cheaper forms of care first. Lone parents use relatives and friends more

intensively than married couples since the absence of a partner implies that parental care (measured here as no care reported) is less available.

In ex-ante simulations of the WFTC reform⁶ this data is used to compute the potential childcare costs of new labour market entrants assuming that they will “look like” existing childcare costs for those currently in work. Since existing non-participants may not have access to childcare at such favourable terms as participants this may considerably underestimate the take-up of the credit and underestimate its impact on labour supply. New data for WFTC evaluation will have to be carefully designed to capture any changes in costs and usage of childcare.

Table 2: *Proportion of Gainers from WFTC*

	<i>Hours of Work (banded)</i>					
	<i>0</i>	<i>1-10</i>	<i>11-20</i>	<i>21-30</i>	<i>31-40</i>	<i>41+</i>
<i>Lone parents</i>						
No pre-school children	.	.	62.1%	74.0%	52.2%	51.1%
One or more pre-school children	.	.	75.0%	87.9%	61.5%	61.5%
All	.	.	65.2%	78.2%	53.8%	53.4%
<i>Married, partner working</i>						
No pre-school children	30.6%	19.0%	10.2%	4.9%	3.6%	3.1%
One or more pre-school children	35.9%	12.7%	11.7%	5.3%	4.4%	4.1%
All	33.9%	16.2%	10.9%	5.0%	3.9%	3.4%
<i>Married, partner not working</i>						
No pre-school children	.	.	38.6%	53.3%	36.7%	66.7%
One or more pre-school children	.	.	73.1%	80.0%	45.0%	33.3%
All	.	.	51.4%	60.0%	39.1%	61.9%

Source: IFS TAXBEN, based on 1995-6 Family Resources Survey. Notes: Data are grouped according to observed hours of work for all household members and conditioned on observed childcare expenditure patterns.

⁶ See Blundell, Duncan, McCrea and Meghir (1999).

Figure 4(a): Before and After the 1999 WFTC Reform (April 19797 system uprated to April 2000): Single Mother before WFTC

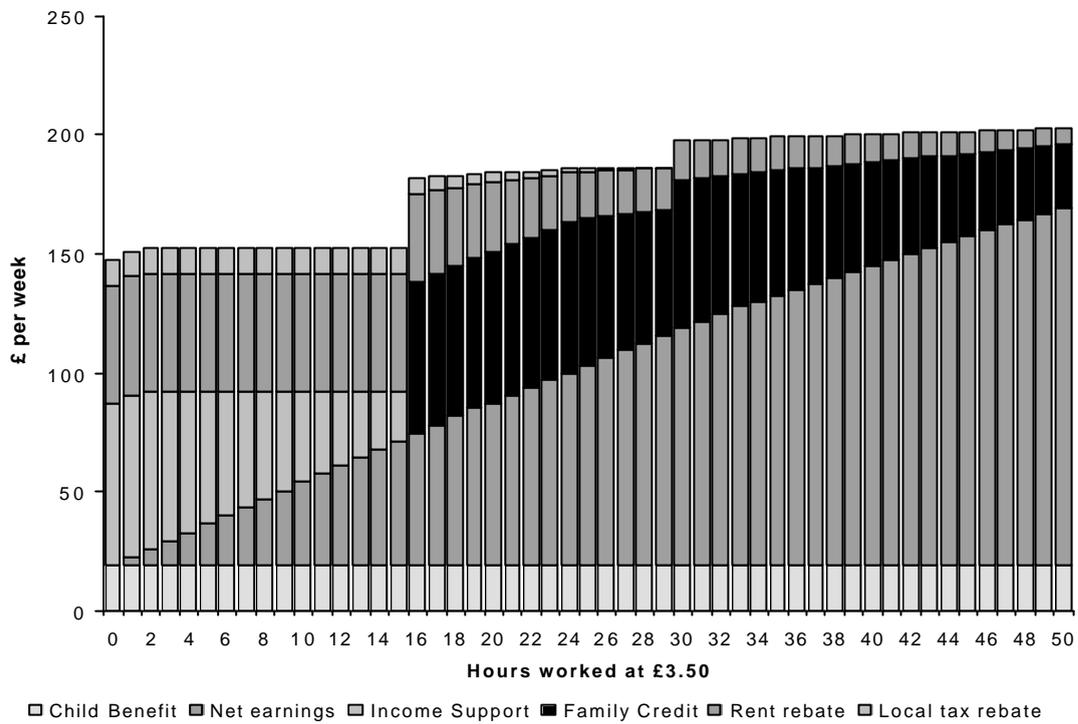


Figure 4(b): Before and After the 1999 WFTC Reform (April 19797 system uprated to April 2000): Single Mother with WFTC

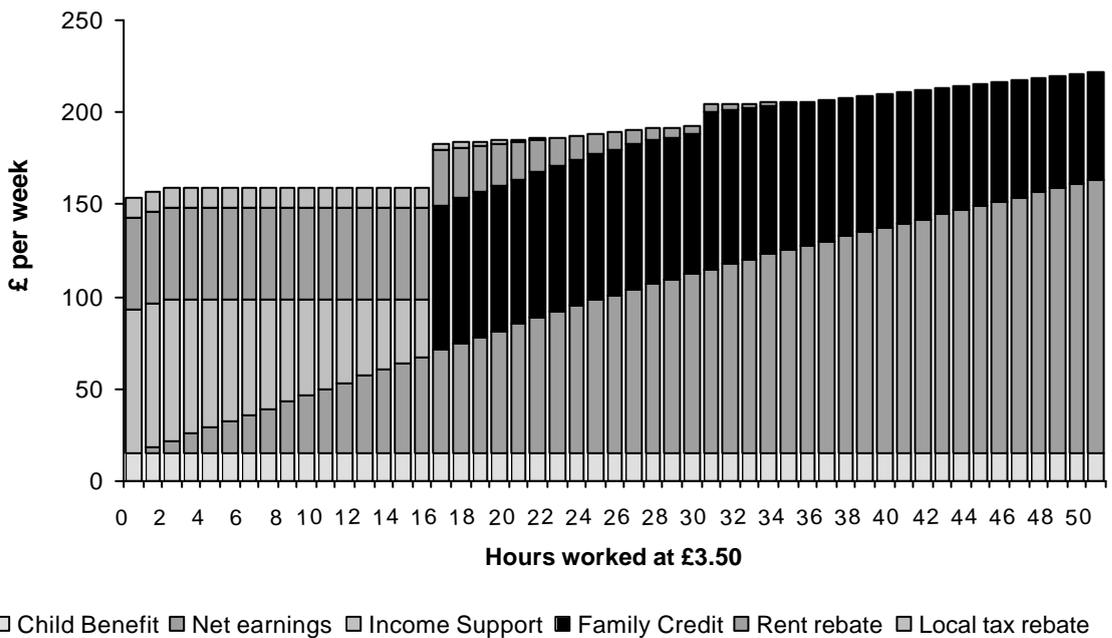


Figure 5(a) Before and After the WFTC Reform (April 1997 system uprated to April 2000): Married Couple before WFTC



□ Child Benefit □ Net earnings □ Income Support ■ Family Credit □ Rent rebate □ Local tax rebate

Figure 5 (b): Before and After the WFTC Reform (April 1997 system uprated to April 2000): Married Couple after WFTC



□ Child Benefit □ Net earnings □ Income Support ■ Family Credit □ Rent rebate □ Local tax rebate

Table 3: Type of childcare usage where youngest child under 5

Type of Care	Couples	Lone parents	All
No care reported	35.4%	9.3%	32.9%
Relatives only	28.7%	44.0%	30.1%
Relatives and friends combined	1.1%	4.4%	1.4%
Friends only	3.0%	9.8%	3.6%
Childminders only	11.2%	11.1%	11.2%
Nursery care only	7.1%	6.7%	7.1%
Childminders & informal combined	2.5%	3.4%	2.6%
Nursery care & informal combined	4.3%	7.5%	4.6%
Multiple formal care	3.4%	1.0%	3.1%
other forms of care	3.3%	2.6%	3.3%
Total	100.0%	100.0%	100.0%

Source: Family Resources Survey, 1994/5 and 1995/96

Table 4(a): Weekly childcare expenditure by hours of mother and type of care - couples

Type of Care	Hours of Work (banded)					Total
	1-10	11-20	21-30	31-40	>40	
Relatives only	1.25	2.50	6.20	13.41	15.26	7.00
Relatives and friends combined	15.00	5.17	9.39	25.82	.	13.06
friends only	5.91	14.78	14.50	32.91	23.33	17.43
Childminders only	17.21	35.62	54.21	72.70	72.16	59.33
Nursery care only	40.57	47.53	60.58	82.81	66.58	67.56
Childminders & informal combined	15.33	29.05	41.41	53.85	55.00	41.36
Nursery care & informal combined	12.81	27.96	30.80	48.09	46.87	34.10
Multiple formal care	34.61	49.30	67.18	100.90	88.36	70.23
other forms of care	35.00	64.69	83.27	124.19	119.69	108.85
Total	3.09	10.74	22.63	41.11	33.82	22.51

Source: Family Resources Survey, 1994/5 and 1995/96.

Note: Some cell sizes are too small for reliable figures to be produced

Table 4(b): Weekly childcare expenditure by hours of mother and type of care – lone parents

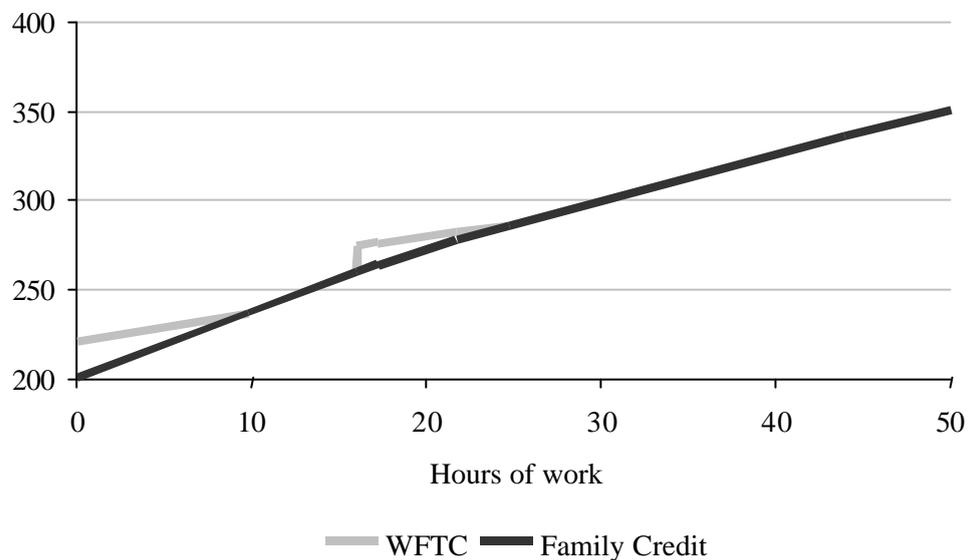
Type of Care	Hours of Work (banded)					Total
	1-10	11-20	21-30	31-40	>40	
Relatives only	0.82	2.34	5.27	15.94	9.00	5.75
Relatives and friends combined	3.33	6.33	18.00	50.00	.	16.94
friends only	6.09	7.86	15.42	30.45	0.00	14.46
Childminders only	.	36.87	42.33	65.13	110.23	61.66
Nursery care only	15.75	9.67	48.03	64.53	66.50	48.39
Childminders & informal combined	.	34.13	13.67	55.60	48.00	40.38
Nursery care & informal combined	8.67	8.57	18.45	60.52	0.00	30.37
Multiple formal care	.	48.00	.	69.92	.	64.44
other forms of care	0.00	42.50	71.00	57.50	138.00	60.85
Total	1.88	8.18	17.11	37.70	35.55	19.65

Source: Family Resources Survey, 1994/5 and 1995/96

Note: Some cell sizes are too small for reliable figures to be produced

Finally, it is worth noting the combined effect of childcare tax credit and WFTC on a mother with a low paid employed partner. Figure 6 provides a typical budget constraint for a married women with employed partner. Note that, if we assume behaviour is driven by the simple household model of labour supply, the reform suggests that secondary workers in such households will be less likely to work under WFTC than under FC. However, since receipt of childcare credit is conditional on both parents working at least 16 hours the incentive structure in Figure 6 could induce some partners to stay in work or even enter employment to take advantage of the childcare credit.

Figure 6: Budget constraint for example woman in couple – with childcare



Notes: Spouse working 40 hours at £5.87 per hour, 1 child aged under 11, Hourly wage £3.72 (25th percentile for women in couples with children), Rent £41.10p.w. (median for social renters with children), Childcare at £1.96 per hour

5. Quantifying Work Incentives

Abstracting from childcare considerations, the largest gains from WFTC go to those people who were just at the end of the FC taper. It follows that WFTC will have less impact on income at low hours, and so we should expect only modest effects on participation rates for those for whom part-time work is most attractive. The lower WFTC taper implies that the incentive to work full-time as opposed to part-time is improved under WFTC so we should expect to see a shift in the composition of employment towards full-time work.

A possibly unanticipated effect of the WFTC reform concerns the position for mothers with low-income spouses. Because WFTC (and FC before it) is means tested against benefit unit (i.e. the couples') income, the secondary worker in the household faces higher income levels at low hours relative to high hours. Consequently their incentive to work is diminished. This potentially detrimental effect on the labour supply behaviour of married mothers was a feature of the empirical work by Eissa and Hoynes (1998) where the EITC expansion between 1984 and 1996 was estimated to have *decreased* participation by 1%+ for married mothers.

To simulate the impact of a reform like WFTC we need a model that allows us to measure the changes in participation and hours from a change in the shape of the budget constraint facing these various target groups. Such a model is developed in Blundell, Duncan, McCrae and Meghir (1999). This builds on earlier work on structural simulation by Keane and Moffitt (1998) and Hoynes (1996), and provides a similar framework to Bingley and Walker (1997) and Preston and Walker (1999), see Blundell and MaCurdy (1999) for an extensive review. In particular, it allows for childcare demands to vary with hours worked. It also allows for fixed costs of work and stigma which are found to be important.

As we have seen, WFTC is designed to influence the work incentives of those with low potential returns to work in the labour market. It does this via the increased generosity of in-work means-tested benefits. For single parents the WFTC does unambiguously increase the incentive to work. For secondary workers in couples, however, the incentives created by the WFTC lead to *lower* participation in the labour market – at least, if we adopt the model of labour supply which assumes

that couples pool their resources. There are also financial incentives to participation for a male in a married couple where the partner does not work. For such couples where neither parent is working the incentives are unambiguously to move into work. Indeed the gains are far larger than for our lone parent example, as the largest cash gains from the WFTC reform accrue to those at the end of the current taper. The incentives to change hours of work are ambiguous. But one interesting point is the marked increase in the effective marginal tax rate for those who become eligible to WFTC as a result of the reform. This group face an increase in their marginal tax rates from 33%, produced by income tax and National Insurance, to just under 70%, produced by the interaction of the 55% WFTC taper on post-tax income. In the example the marginal tax rate rises from 33% to just under 70% above 40 hours of work.

There are a number of important conceptual problems with analysing labour supply effects that need to be addressed.

Firstly, WFTC raises net incomes on average as well as raising the marginal wage rate so the reform has corresponding “income” and “substitution” effects. Income effects on labour supply are negative and WFTC implies higher incomes than FC. So the WFTC effect on compensated labour supply is larger than that on uncompensated labour supply. Moreover, if the policy concern is to increase uncompensated labour supply because the goal is to promote the “culture of work” then we are using the wrong model. That is, if work is (at least, partly) culturally determined then preferences are interdependent – that is, the behaviour of one individual affects the behaviour of others. If this is true then this severely undermines the whole basis of all of our evaluation methods. For example, it would undermine the experimental method because the control group would be affected by the behaviour of the treatment group. Structural modelling would also be problematic since we would need to define the way in which one individual affected others within a reference group and we have no satisfactory way of defining such a group⁷.

⁷ There is little existing research to indicate the quantitative importance of this conceptually important point. Recent work by Neumark and Postlewaite (1998) looks at the impact of the hours of work of sisters-in-law on the labour supply of married women and finds large effects. However, it is unclear how general this phenomenon might be.

A second issue is the effect of the childcare tax credit on both childcare use and expenditure (which is of interest in its own right but, in any event, is information required to cost the reform) as well as on labour supply. The literature that considers the joint modelling of both childcare and labour supply is thin⁸ and examples that allow for there to be unobservables that are correlated with both are even fewer⁹. Indeed, it is common to regard childcare as a constraint on behaviour rather than a commodity that people choose although empirically it is difficult to distinguish between the two. US research that is informative on the issue suggests that the cross-price elasticity of the effect of childcare price on labour supply is small and the own price effect on childcare use is large (see the excellent survey of the childcare literature by Anderson and Levine (1999)).

Increasingly research on the effects of welfare on labour supply allows for non-take-up by incorporating welfare stigma following on from Keane and Moffitt (1998)¹⁰. However, whether or not take-up is an issue, there remains a third conceptual difficulty – that there may be differential effects on different forms of income on labour supply. For example, child support may be regarded as unreliable income and therefore labour supply may be relatively insensitive to child support entitlements. In the context of welfare programme operation, there may be some misperception (or even, simply, some uncertainty) about the levels of entitlement, especially in labour market states different from the observed state – for example, non-workers may not be aware of their Housing Benefit (or FC) entitlements when in-work. Bingley and Walker (1996, 2000) investigate this issue in the context of a labour supply model and find evidence of both stigma and misperceptions for some welfare programmes¹¹.

The fourth difficulty relates to the “incidence” of a wage subsidy. In the simulations of the WFTC reform reported below, it is assumed that the labour market will be unaffected by the reform. That is, we will assume that the prices of different

⁸ See Blundell *et al* (2000) for a UK example.

⁹ See Ribar (1995) for a US example.

¹⁰ Introducing a stigma costs to participation in WFTC allows the simulation model to predict a low probability of take-up among those with low eligibility. Something found in earlier studies of welfare programme take-up. Moreover, it suggests a higher take-up of WFTC (in contrast to FC) for those whose eligible amount of credit has increased as a result of the WFTC reform. In addition to stigma, compliance costs of securing the credit may be an issue.

types of labour remain at their levels reigning under the FC. This is an important assumption that implies that the subsidy is incident on the supply side of the labour market. There is little previous research on the effects of wage subsidies/taxes on gross wages¹². Bingley and Lanot (1999) looks at the incidence of local income taxes on wage rates exploiting inter and intra firm wage and labour supply variations to show that the incidence of the tax on gross wages is approximately 50% (i.e. a half of the tax is shifted to the employer in the form of higher wages), while Gruber (1996) exploits a natural experiment in the Chilean social security tax to suggest that the incidence of the tax is entirely borne by the worker and none is shifted to the firm). It could be that the minimum wage prevents employers in imperfectly competitive labour markets, from capturing the benefits of the WFTC programme but it is far from clear. Moreover, since the minimum wage was imposed close to the implementation of WFTC it may, if there is an incidence issue, be difficult to sort out the effects of the reform arising from gross wage changes from those arising from net wage changes. In addition, wage subsidies which vary by household type and only apply at certain income levels will have different effects from more general subsidies.

Fifthly, conceptually similar problems of incidence arise in the context of childcare subsidies.

Sixth, the analysis is typically conducted excluding the self-employed. It is common for data on hours of work, and even on earnings, to be censored by self-employment. However, the self-employed are an important proportion of the labour force and are disproportionately entitled to in-work transfer programmes because of the high variance in the earnings. Estimates of take-up depend crucially on whether the self-employed are included. Moreover, the analysis of their behaviour should incorporate the potential for their earnings to be under-recorded by comparing their recorded income with their expenditure patterns in FES data.

Seventh, the effects of WFTC on the labour supply of secondary workers depend crucially on how households are assumed to behave. If households do not pool resources then the labour supply decisions of the secondary workers will depend on

¹¹ See also Yelowitz (1995) for an example of the effects of a in-kind transfer on labour supply.

their own incomes ignoring the impact of their behaviour on family incomes. In this case, we might expect women married to low wage employed men to be unaffected by FC and WFTC.

Finally, one aspect of behaviour that ought to be taken into account is the interactions between the welfare system and child support (CS) payments. CS counts as income for the purposes of computing IS, FC and HB. The introduction of the Child Support Agency and the associated CS reform was accompanied by the introduction of a disregard of £15 into the FC and HB systems (but not IS). The implementation of the proposed CS reforms have been delayed but will interact with WFTC in important ways, not least because ALL of CS will be disregarded by WFTC (but not by HB) so modelling will need to take into account child support including non-compliance difficulties (see Paull *et al* (2000)).

Thus, the important issues/questions for future research are:

- ◆ To what extent should policy be concerned with labour supply as opposed to deadweight loss effects.
- ◆ How should the modelling take into account the possibility of cultural effects arising from interdependent preferences?
- ◆ Modelling childcare use and labour supply jointly allowing for a correlation between the unobservable determinants of each.
- ◆ Estimation should allow for fixed costs, non-take-up, and differences in sensitivity of behaviour to different forms of income.
- ◆ Modelling of labour supply should incorporate the possibility that household members do not pool their resources.
- ◆ Modelling should allow for child support payments to interact with WFTC.
- ◆ The labour market behaviour of the self-employed requires analysis. As an important client group for in-work welfare they deserve greater attention than

¹² The issue is not even considered in Lemke *et al* (2000) which is otherwise a thorough investigation

they have received to date. They are of particular interest because of their ability to self-validate their hours. Capturing the incidence of wage taxation/subsidies will require that the wages of different types of workers to be monitored closely as the wage subsidy is imposed/extended. The interaction with the minimum wage may be important. Moreover, if a wage subsidy increases gross wages then there will be further labour supply implications.

- ◆ The incidence of childcare subsidies requires similar analysis and FRS, and the DfEE Baseline Childcare Survey and its follow-ups should be used to complement WFTC evaluation data.

of the impact of childcare subsidies in Massachusetts.

6. Intertemporal Incentives

There are wider incentive issues that relate to intertemporal considerations which deserve some consideration. There are two broad issues here. First there is the assessment and payment period question. Secondly there are the effects that wage subsidies have on *relative* wages across time – that is, on the wage now relative to the wage in the future.

6.1 *The Assessment Period*

The assessment period is the length of time over which individuals have to demonstrate their entitlement to the programme. The shorter the assessment period the more effective in promoting transitions from welfare to work we might expect the programme to be. The payment period is the period over which the transfer is payable without a further assessment being required.¹³ The longer the payment period the greater the incentive individuals have to move into work and onto the programme. This is especially important when jobs may last for limited periods of time: FC/WFTC will be more effective in encouraging individuals into taking temporary or uncertain wage work if the payment period is long since the programme acts like insurance against the risk of the wage falling or the job ceasing to exist.

However, a long payment period and short assessment period gives rise for incentives to engage in intertemporal substitution: manipulating hours of work (or the wage) to increase entitlements to the transfer payment. Individuals could choose the level of hours of work that maximised their entitlement to the transfer which, after the assessment period would continue irrespective of changes in hours of work – the recipient could choose, for example to not work at all, or to work longer hours. The literature has not considered this issue at all. The simplest example are married mothers with employed low wage partners: here, FC, between assessment/reassessment periods, might be regarded as lump sum transfer and the income effect may then reduce the probability of participation (relative to no FC system). However, during the assessment period there is the additional disincentive associated with the lower marginal wage that arises because higher earnings in this

period reduces entitlement levels in all periods. Thus, this lower marginal wage has a negative substitution effect that reinforces the negative income effect on the probability of working. The FRS is suggestive: since the data records duration of FC receipt we can isolate periods when assessment/reassessment is likely to occur. We find that the participation rate is 28% for married women with employed partners between assessments and 21% during assessment/reassessment periods and this is consistent with our feeling that between assessment periods the negative substitution effect is suppressed so participation is higher. The self-employed may also have greater potential for engaging in intertemporal substitution and they demand attention in such research.

- ◆ Future research needs to consider the possibility that welfare programmes may have more complex effects on behaviour than the simple static model would suggest. Moreover, such research needs to address the question of what is the most appropriate way of structuring programmes given the possible trade-off between intertemporal substitution and the long term effects.

6.2 Wage Progression

Wage progression can arise for a number of reasons. Most obviously because individuals can increase their wage over time by taking a job with “prospects” (which features some on-the-job training, learning by doing, or firm specific human capital acquisition, all of which may give the firm the incentive to offer some delayed compensation mechanism to reduce quit rates); or because individuals can increase their wage by investing in their own human capital outside of the job market – through improving their health while in work or by improving their education before ever starting work.

A wage subsidy reduces the returns to any form of future wage enhancing investment – say, through participating in some training programme. Thus, individuals are more likely to remain on low wages, and hence require the wage subsidy to be inclined to work, than would otherwise be the case. Thus, in-work transfer programmes that are means tested may well encourage work, but may

¹³ See Brewer (2001) for an in depth study of these rules for both the UK and the US systems of in-

encourage participation in work where the opportunities for wage progression are limited. Of course, if there are 'passive' on the job learning effects then simply improving the incentive to move into work can have a pay-off in terms of wage progression.

The most reliable evidence on wage progressions comes out of the Canadian Self Sufficiency experiment. This data¹⁴ shows that individuals who enter work because of the in-work benefit programme tend to take lower wage jobs and do not experience much in the way of wage progression. Indeed, for all participants in this programme there is little evidence of wage progression. Moreover, time limited programmes are very likely to have quite different intertemporal incentive effects (see Heckman *et al* (1999)) – a time limited wage subsidy is likely to increase the incentive to invest in human capital, take a job with prospects, etc. since recipients might realise that they will have to survive without the subsidy in due course.

This clearly has important implications for WFTC and it is important that any data collected to evaluate the WFTC contain sufficient information on hourly wages, preferably before, during and after spells of receipt, to be able to investigate this issue more thoroughly. This is especially so if the programme were to be extended to a wider population and implemented in a time limited way (just as the New Deal for Unemployed Youths offers a temporary wage subsidy).

- ◆ Future work needs to consider the effects of welfare programmes on wage progression incentives by investigating the types of jobs that welfare recipients take relative to low skilled workers who are not eligible.

Finally, it is worth mentioning that with credit constraints, a wage subsidy can allow workers to take low paid training jobs to finance the cost of training. Of course, with a permanent wage subsidy the payoff is not clear but there may well be some beneficial effects in this for capital constrained low income families.

work benefits.

7. Incentives to Parent and to Partner

Programmes that increase the return to having children (i.e. where programme entitlement may be positively related to having children) have, at least in theory, a positive effect on fertility behaviour. Moreover, programmes that decrease the return to having a partner (because programme entitlement is negatively related to partners' earnings) have, in theory at least, a negative effect on the incentive to partner (i.e it discourages partnership formation and encourages partnership dissolution).

Thus, in addition to the usual work incentive issues there are a wider set of behavioural questions that WFTC raises and these are to do with the incentive to parent and the incentive to partner. WFTC is more generous, for any given number of children, than FC and hence increases the incentive to parent because the "return" to parenting offered by the tax and benefit system is larger. Similarly just as with FC, WFTC offers a disincentive to partner.

US evidence on the effects of welfare on these wider issues have recently been reviewed in Blackburn (2000)¹⁵ and Eissa Hoynes (1999) explicitly investigates the effects of EITC on the incentive to marry¹⁶ and exploits the fact that EITC provides positive incentives in the phase-in range and negative incentives in the phase-out range. The evidence on marriage in Eissa and Hoynes (1999) does suggest some statistically significant effects but the evidence in Blackburn (2000) and the earlier review by Moffitt (1990) seems less conclusive.

The UK evidence on the effects of welfare on human capital accumulation is non-quantitative. Such a relationship might be partly responsible for the observed correlation between education participation and early motherhood. In BHPS data we find that of those women who were mothers by 17, 82% left school by age 16, while those who were mothers after 20 just 56% left school at the minimum. This correlation between human capital and teenage motherhood exacerbates the problem of welfare dependency relative to a situation where they were uncorrelated. The effects of the welfare system on separation, divorce and marriage have not been the

¹⁴ For reports on SSP, see <http://www.srdc.org/publications.htm>

¹⁵ See also Moffitt (1990, 1998), Ellwood (1998)

subject of extensive quantitative research: in contrast to the way in which the correlation between early motherhood and education may contribute to welfare dependency, the BHPS data on mothers who have ever divorced or cohabited (the groups most “at risk” of falling into welfare) have somewhat higher average education – divorced mothers have an average school leaving age of 16.9, and cohabiting mothers have 17.5, compared to 16.5 for married mothers.

- ◆ Some research effort needs to be expended on modelling the effects of welfare programmes on fertility and partnership decisions.

¹⁶ EITC only counts the income of married partners not unmarried ones. Thus, in the phase-in range there is an incentive to formalise cohabiting partnerships, and the opposite in the phase out region.

8. Evaluation Methods and Some Existing Evaluation Results

8.1 *Randomised Social Experiments*

In many ways the most convincing method of evaluation is a *randomised social experiment* in which there is a control (or comparison) group that is a randomised subset of the eligible population. Such is the design of the Self Sufficiency Project (SSP) in Canada, and recent work by Card and Robbins (1998) has used the experimental nature of this reform to assess its effectiveness in inducing welfare recipients into work.

Of course, experiments have their own drawbacks. Firstly, they are rare and typically expensive to implement. Secondly, they are not amenable to extrapolation. That is they cannot easily be used in the *ex-ante* analysis of policy reform *proposals*. Rather, they can only be used to evaluate policies that have actually been implemented. Thus, if they tell us that a policy has failed in some way, then the results tell us nothing about how the world works that would allow us to infer what may have succeeded. Finally, they require the control group to be completely unaffected by the reform typically ruling out spillover, substitution and general equilibrium effects on wages etc.¹⁷

Nonetheless they have much to offer in enhancing our knowledge of the possible impact of such reform. As an experimental reform the Self-Sufficiency Program in Canada is an ideal basis for evaluating the impact of targeted in-work benefits. The initial results from this program are thoroughly discussed and analysed in Card and Robbins (1998).

The SSP is available to a single parent with twelve months of welfare history who finds a job of 30 hours a week (averaged over a month, calculated on a monthly rolling basis). The minimum hours criterion is interesting as the UK system also has a minimum hours eligibility rule. SSP is a generous system and does not change the income assistance level; so it is not, for example, causing more individuals who do

¹⁷ See Blundell and Costa-Dias (2001) for a review of the pros and cons of alternative evaluation methods.

not find employment to be on lower incomes. Rather it is giving a supplement to those who move into work. This program has been evaluated by social experiment. This entailed following 6,000 families for 5 years starting in 1993. One-half of the group of 6,000 eligible single parents on welfare were offered the program and the others were not - they are the controls. The ones that are on the program are the treatments - and we can compare those two groups.

Figure 7: The Canadian Self-Sufficiency Programme

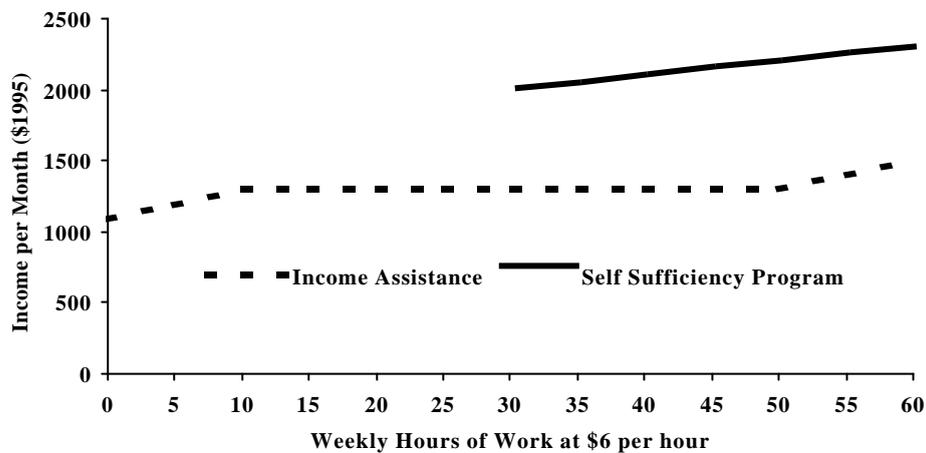


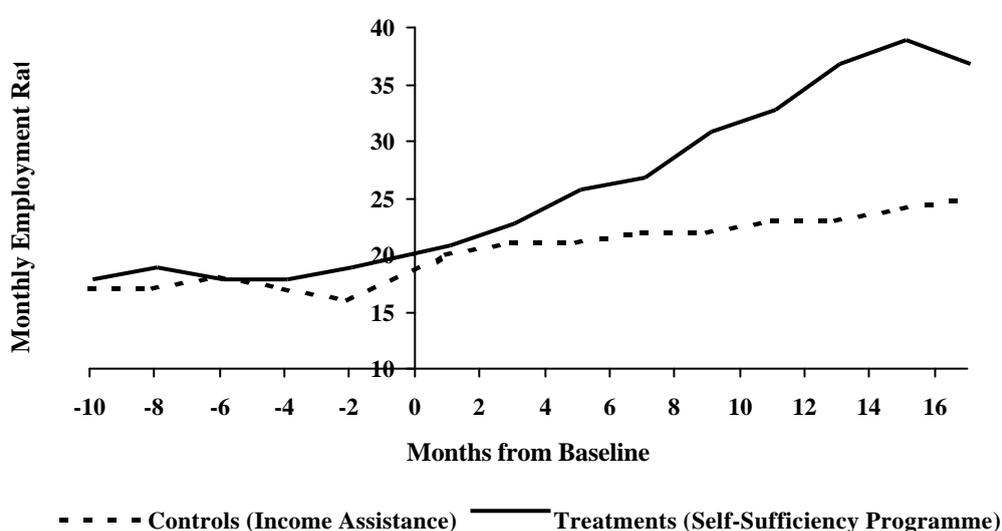
Figure 7 shows a typical budget constraint for a Canadian welfare recipient. The broken line gives the budget set that an individual, not on SSP, would face if they were earning the minimum wage in British Columbia, which was \$6 an hour in 1993. Taking a job at a few hours a week exploits an earnings disregard, thereafter all earned income is effectively lost in a dollar-for-dollar transfer back to the income assistance program. So, until income assistance is exhausted - that is working nearly 50 hours a week - they would get no return, with an implicit tax rate of 100% on their earnings. The solid line shows the effects of SSP.

SSP is a very well designed social experiment. The control and the treatment groups look very similar before the experiment takes place. That means that effectively the controls are really quite a good match for the treatment group. There is almost a doubling in employment for the treatment group. This is displayed in Figure 8, the left hand side of which shows the close relationship between employment rates across the control and treatment group before the experiment began, while the right

hand side shows how these grow apart as the SSP treatment group enters work earlier than the controls.

Card and Robbins (1998) report many such results. The impact on hours and employment is very similar. These are low hour working individuals. The criterion is that they work at least one week of the month for 30 hours. The treatment group increased its hours of work, more or less, twofold relative to the control group. So it is having quite a large effect on the hours of work chosen by these individuals.

Figure 8: The Impact of the Self-Sufficiency Programme on Employment Rates



Although this is a very specific target group and a program with many individual idiosyncrasies, these are all single parents on welfare and it may be considered somewhat of a surprise that there is such an effect of financial incentives for those individuals. This type of experimental evidence certainly suggests that in-work benefits can have quite significant effects on labour market behaviour even among lone parents – one of the central target groups for the UK and US reforms.

8.2 Natural Experiments

Another popular method of evaluation is the *natural experiment* approach. This considers the reform itself as an experiment and tries to find naturally occurring comparison groups that can mimic the properties of the control group in the properly designed experimental context. This method is also often labelled “difference-in-

differences” since it is usually implemented by comparing the difference in average behaviour before and after the reform for the eligible group with the before and after contrast for the comparison group. In the absence of a randomised experiment, this approach can be seen to recover the average treatment effect on the treated by removing unobservable individual effects and common macro effects.

8.2.1 *EITC*

The impact of the EITC reforms in the US, which have been very influential in shaping recent reforms in the UK, have been studied extensively by this method. In particular, the important studies by Eissa and Liebman (1996) and Eissa and Hoynes (1998) purport to show important impacts of the reforms on the labour market.

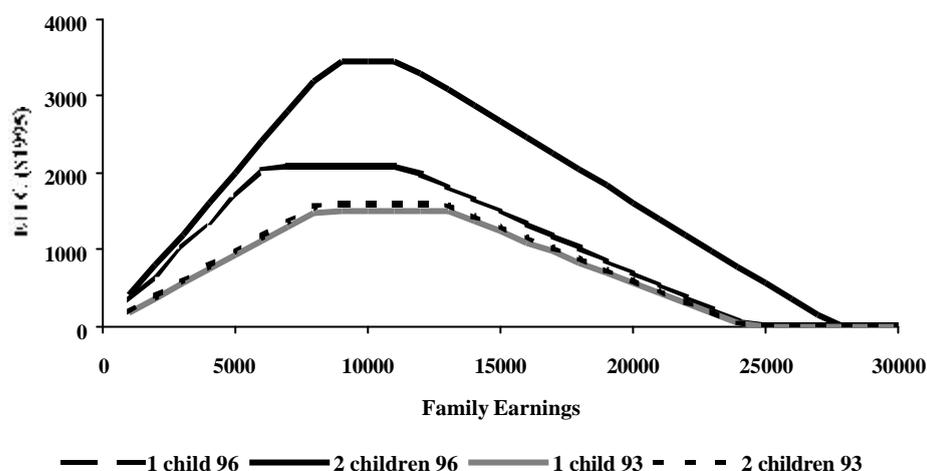
The EITC began in 1975 as a modest program aimed at offsetting the social security payroll tax for low-income families with children.¹⁸ After major expansions in 1986, 1990 and 1993, federal spending on the EITC (including both tax expenditures and outlays) is projected to be 1.7 times as large as federal spending on Temporary Assistance for Needy Families (TANF) in 1996.

A taxpayer’s eligibility for the EITC depends on the taxpayer’s earned income (or in some cases adjusted gross income), and the number of qualifying children who meet certain age, relationship and residency tests. First, the taxpayer must have positive earned income, defined as wage and salary income, business self-employment and earned income below a specified amount (in 1996, maximum allowable income for a taxpayer with two or more children was \$28,495). Second, a taxpayer must have a qualifying child, who must be under age 19.¹⁹ The amount of the credit to which a taxpayer is entitled depends on the taxpayer’s earned income, adjusted gross income and, since 1991, the number of EITC-eligible children in the household. There are three regions in the credit schedule. These are presented in Figure 9 which provides a description of the EITC in 1993 and 1996.

¹⁸ The discussion in this section draws heavily on the excellent review by Eissa and Hoynes (1998) where further details can be found.

¹⁹ See Eissa and Liebman (1996) for a more extensive discussion of EITC rules.

Figure 9: The 1993 EITC Expansion for 1 and 2 Children



The initial phase-in region transfers an amount equal to the subsidy rate times their earnings. In the flat region, the family receives the maximum credit. In the phase-out region, the credit is phased out at some given benefit reduction rate. In 1993, a family with two or more children could receive a maximum credit of \$1,511, \$777 more than a family with one child. The post-1993 expansion of the EITC, phased in between 1994 and 1996, led to an increase in the subsidy rate from 19.5 percent to 40 percent (18.5 to 34 percent) and an increase in the maximum credit from \$1,511 to \$3,556 (\$1,434 to \$2,152) for taxpayers with two or more children (taxpayers with one child). This expansion was substantially larger for those with two or more children. The phase-out rate was also raised, from 14 percent to 21 percent for taxpayers with two or more children (13 to 16 percent for taxpayers with one child). Overall, the range of the phase-out was expanded dramatically, such that by 1996 a couple with two children would still be eligible with income levels of almost \$30,000.

These policy reforms are useful in providing a “before and after” assessment of their effectiveness in changing labour market behaviour. The idea of this “natural experiment” or “difference-in-differences” approach is to formalise this before and after contrast by finding a comparison group, not affected by the reform, which is likely to have shared a similar macro environment. This approach removes any common time effects in participation across the groups. Consequently it strips out the

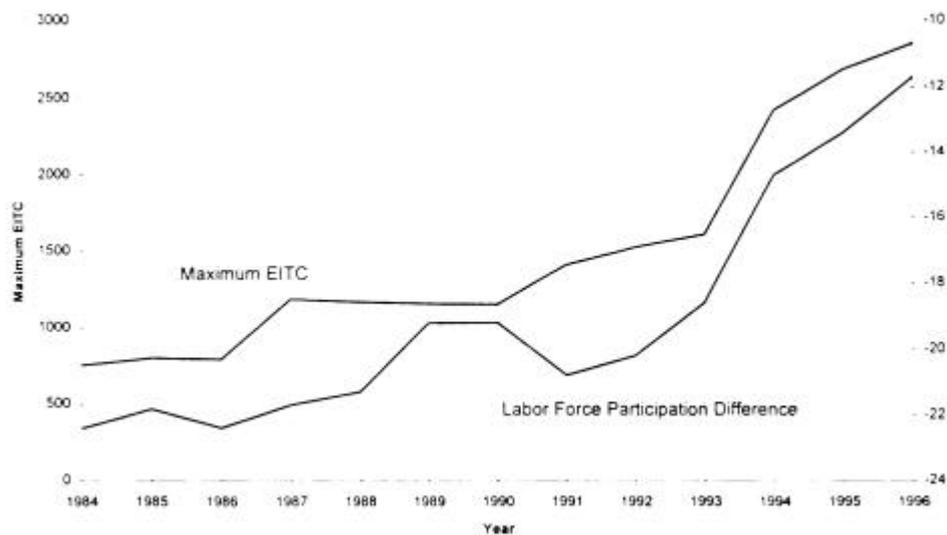
effect of any common macro shocks that would otherwise be spuriously attributed to the reform.

It does, however, rest on strong assumptions and, again, cannot easily be used to extrapolate from an implemented policy to another proposed policy. The two most important assumptions²⁰ are: common time effects across the target and comparison groups; and no composition changes within each group over time. Choosing a comparison group that satisfies these two assumptions is difficult. In their evaluation of the EITC policy reforms in the US, Eissa and Liebman (1996) consider two contrasts from the repeated cross sections of the Current Population Survey data. For the impact of the reform on single mothers, either the whole group of single women with children are used with single women without children as controls, or the group of low education single with children are used with the low education single women without children as controls.

The former control group can be criticised for not capturing the common macro effects. In particular, this control group is already working to a very high level of participation in the US labour market (around 95%) and therefore cannot be expected to increase its level of participation in response to the economy coming out of a recession. In this case all the expansion in labour market participation in the group of single women with children will be attributed to the reform itself. The later group is therefore more appropriate as it targets better those single parents who are likely to be eligible to EITC and the control group has a participation rate of about 70%. With these caveats in mind, there remain some relatively strong results on participation effects that come from the Eissa and Liebman study. For single parents there is evidence of a reasonable movement in to work. An idea of the size can be had from inspection of Figure 10, from Leibman (1999), which shows how the relative participation rates of the target (single mother) and comparison (single women with no children) groups have changed and the EITC maximum (a measure of the overall generosity of the treatment).

²⁰ See Blundell, Duncan and Meghir (1998) for the precise derivation of these conditions.

Figure 10: EITC and the Difference in Labour Force Participation Rates for Lone Mothers and Single Women without Children



Source: Leibman (1999)

There is also some evidence of negative effect on hours for those in work but this is rather small. In subsequent work, Eissa and Hoynes (1998) estimate that 63% of the increase in employment of single mothers from 1984 to 1996 was due to the EITC expansion.

A more recent study, Eissa and Hoynes (1999), has considered the impact on married couples and find some evidence of negative “income” effect reducing the labour supply of married women. This is precisely the adverse effect that can be expected when a work contingent tax credit is based on a family income and will also be found in evaluations of the likely impact of the WFTC in the UK.

These studies of the EITC reforms in the US therefore point to a reasonably strong positive effect on participation of single parents with offsetting effects on the labour supply of married women.

8.2.2 The Impact of the Earlier Reforms Family Credit

FC was introduced in 1988 to replace Family Income Supplement (FIS) and shares some of the central features of the EITC in the US. It was designed to provide support for low-wage families with children. An unusual feature of the Family Credit (retained in the WFTC system) system is the minimum weekly hours eligibility

criterion. A family with children needs to have one adult working 16 hours or more per week to qualify for FC. At its introduction this was set at 24 hours but then reduced to 16 in April 1992 to encourage part-time work by lone parents with young children. To partially offset any adverse incentive effects for full time work, a further supplementary credit at 30 hours per week was introduced in April 1995. These Family Credit reforms are interesting in their own right, but we will be particularly interested in them as a basis for evaluating the reliability of assessment of the impact of the WFTC proposals.

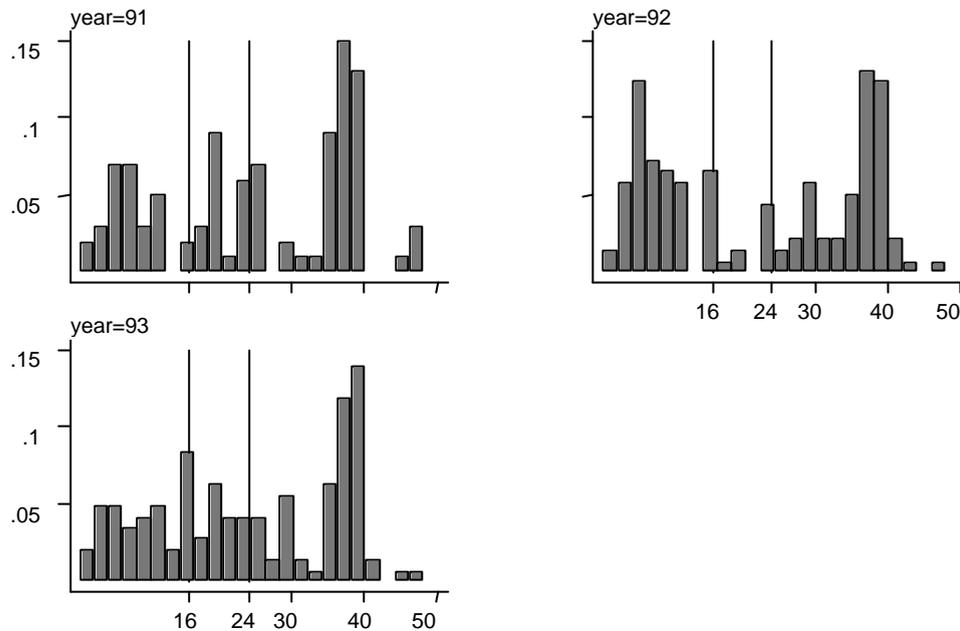
In the FC system the amount each eligible family receives depends on the number of children in the family, their income and the hours worked: there is a small addition if they work 30 hours or more. As incomes rise the credit is withdrawn at a rate of 70%. In 1996 average payments were around £57 a week and take-up rates stand at 69% of eligible individuals and 82% of the potential expenditure.

The 16-hour reform took place in 1992. To examine the behaviour of hours and participation before and after this reform we use the Family Expenditure Survey data, a cross section survey of some 7000 British households per year. The data has been re-organised according to fiscal years to coincide with the reforms to the Family Credit system. The larger FRS data source, covering some 50,000 British households, which is used for the ex-ante evaluation of the WFTC reform below is only available for the 1994-1997 period and so is not useful in studying the impact of the 1992 budget reform. Both data sources collect sufficient income and earnings information to accurately trace out the budget constraint facing individual families.

The 1992 reform to Family Credit moved the hours eligibility rule from 24 hours per week to 16. A picture of the hours changes before and after the 1992 reform is presented in Figure 11. This figure relates to a lower educated sample of lone mothers from the Family Expenditure Survey. The first histogram gives the distribution of hours of work for the fiscal year 1991 - before the reform. Notice that for single parents the spike at 24 hours tends to disappear and a spike at 16 hours becomes more pronounced. In Blundell, Duncan, McCrea and Meghir (1999) a similar analysis is provided for participation where there is a notable increase in the relative employment of lower education women with children after the reform. The results suggest a 6.5 percentage point increase in employment from the 1992 reform.

But they also point to a lower average hours worked among those eligible women in employment.

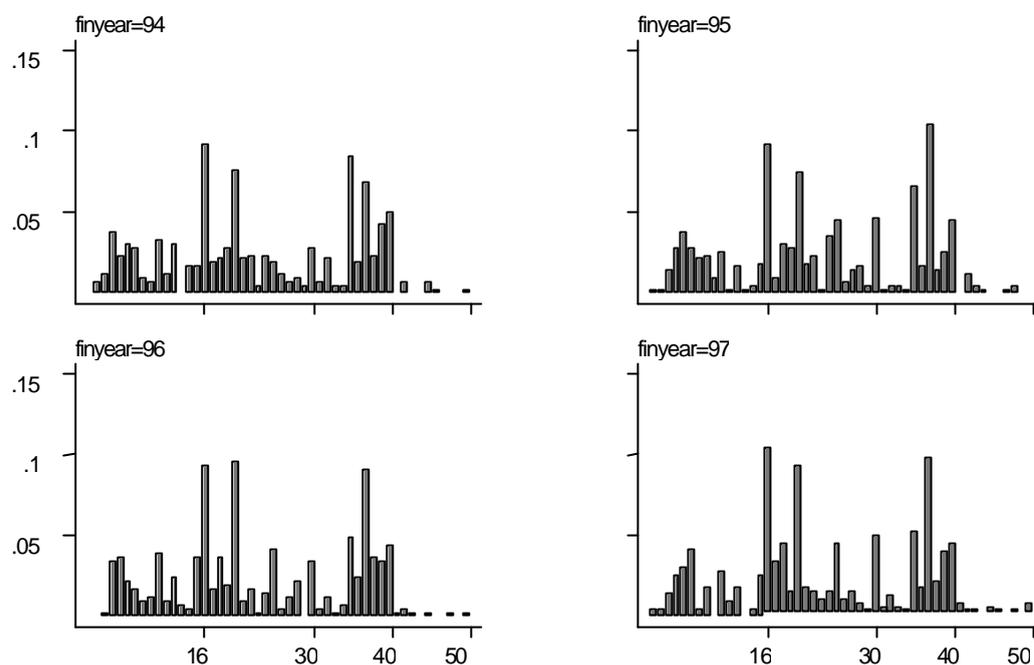
Figure 11 The Distribution of Weekly Hours of Work and the Effect of the 16 Hour 1992 Reform to Family Credit: Single Mothers, Lower Education. UK FES



The analysis of the 1992 reforms therefore gives some support for positive employment effects and lower average hours worked resulting from such in-work benefit reforms.

Some further support for financial incentive effects on employment and hours worked can be seen from the 1995 reform. This second reform to Family Credit added a further small credit at 30 hours. The larger FRS sample can be used to analyse hours of work before and after this reform and in Figure 12 the hours of work among lower educated working single parents is presented for each of the four financial years available in the FRS. Notice the pronounced spike in the hours distribution at 16 hours for single parents and the pronounced spike at 30 hours, something that is not apparent in other groups.

Figure 12: *The Distribution of Weekly Hours Worked and the 1995 30 hour reform to Family Credit: Single Mothers, Low education. FRS*



8.3 *Ex-Ante Evaluation and Structural Models*

Reforms to FC provide some basis for ex-post evaluation of in-work benefit reform in the UK and below some evidence is presented on labour supply responses in the UK using these past reforms. However, to evaluate new reform proposals such as the WFTC requires an *ex-ante evaluation*. Although we can draw on the quasi-experimental and natural experiment findings, the evaluation of WFTC requires a *structural model* of the counterfactual that allows us to simulate the choices of individuals as their earnings opportunities in work change. For this we draw on the recent WFTC evaluation study by Blundell, Duncan, McCrae and Meghir (2000) as well as structural modelling of labour market behaviour that is available in the wider literature - such as Preston and Walker (1999) which has been used for simulating WFTC effects in Paull *et al* (2000). Such an approach develops a statistical simulation model of labour supply behaviour based on individual survey data and incorporates a complete description of budget constraints (and, in the case of Blundell *et al* (2000), childcare availability). To do this requires an accurate description of the budget

constraint for each individual whether they currently work or not. In turn this requires an assessment of their likely market wage for individuals who may now enter work.²¹

However, once the programme has been in place for some time the natural experiment method could be applied using data that records the behaviour of individuals before and after the reform to assess the robustness of the ex-ante approaches.

- ◆ Since experimental and structural methods each have their drawbacks it will be important for future research to pursue both approaches.

8.4 Some Existing UK Evaluation Studies

There are several attempts at modelling labour supply that have either been directly designed with the evaluation of UK in-work transfer programmes or have particular relevance for it. We briefly review what these studies have to say and attempt to isolate what might be the most important features of a more comprehensive evaluation of WFTC. Thus, below, we explain the modelling that has been done on the impact of the UK welfare system on work incentives.

8.4.1 The Gregg, Johnson and Reed study (IFS 1999)

This work exploits the panel element of the Quarterly Labour Force Survey (QLFS) of 1994/5 to explain who moves into work as a function of the expected gains from work and the level of out-of-work income. Thus, rather than explain labour force status, their model explains a particular transition from one status to another. Like others studies that we describe here, this research depends on being able to model the wage that individuals might reasonably expect to earn, from which WFTC entitlements can then be calculated, and the resulting expected in-work income can then be compared with observed out-of-work income.

²¹ Gregg, Johnson and Reed (1999) consider a number of alternative methods for “imputing” the wage for new entrants. Their preferred method is to use the wages of recent entrants in the UK Labour Force Survey. As one might expect, these are often quite below the wages of similar individuals in work, and suggest that the use of wages of workers without correction could lead to a biased assessment of a policy reform. However, for lone parents at least, they report little difference between entry wages and the average of wages for all those in work. The standard reform simulation approach, as used in the figures reported in section 4 below, uses wages adjusted for selection. These will also typically be

The authors then estimate the relationship between the probability of an individual making the transition to work and the gains from working, which they find to be significantly positive.

To compute the effect of WFTC on the level of employment one needs both estimates of the effect of the gains from work on the flow into work but also some assumption about the flow out of work. This study did not attempt to model exits and therefore possibly the most reasonable assumption is that the outflow “rate” (i.e. the proportion of the stock of employees that leaves employment in any year) is constant. This is used in the results from the GJR study reported in Blundell and Reed (2000)²². The estimates imply that the net effect of WFTC on participation of lone mothers is an increase of 1.9%; for married mothers with an employed partner participation is predicted to fall by 0.8%; for married mothers with an unemployed partner participation is predicted to rise by 1.8%; and for married fathers with a non-employed partner, participation is predicted to rise by 0.5%.

8.4.2 *The Bingley and Walker study (1997)*

This paper, following earlier work (Bingley *et al* (1995)), used a random utility model (see Hausman and Wise (1977)) whereby the probability of choosing a particular labour market state (say, part-time work) depended on the differences in income levels between this choice and other available choices. The essence of the discrete choice methodology is that individuals are assumed to choose between one of a finite number of possible labour market states. The simplest UK example of this kind of work is Bingley, Lanot, Symons and Walker (1994) which was concerned with the behaviour of lone mothers in the UK and was used to simulate the impact of child support reform.

The gross income levels are used to compute the net income corresponding to each state via a tax-benefit routine. Take-up can be treated as an endogenous variable in this analysis: the probability of take-up can be allowed to depend on the level of

lower than the observed wages for those currently in work (see Blundell, Duncan, McCrea and Meghir (2000)).

entitlement and other variables that also determine hours of work, and one can allow for a correlation between the unobservable determinants of take-up and hours.

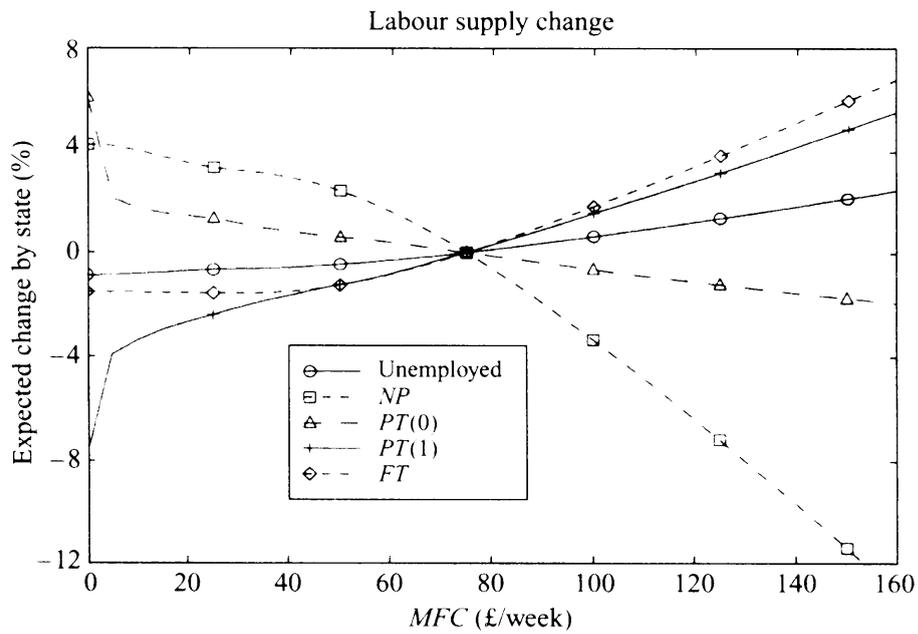
The results in Bingley and Walker (1997) were applied directly to the problem of FC design to show how variations in the FC maximum affects work incentives and government revenue. The modelling distinguished between two “part-time” states – PT(0) which was 16 hours and PT(1) which was 30 hours. Figure 13 quantifies precisely to what extent each state is affected by simulating for every individual in a large sample of lone mothers drawn from the pooled FES data: non-participation falls by 4% points as the maximum varies from zero (i.e. no FC system) to reigning level (an FC maximum of approximately £80 pw), and then falls by a further 12% points as the FC maximum is doubled the sample’s actual maximum. The full-time (FT) probability rises correspondingly fast.

Figure 14 shows the effects of this hypothetical “experiment” on FC programme expenditure and on total government revenue (tax and NI minus welfare programmes expenditures (IS, HB and FC)) *for this sample*. Notice that FC expenditure increases monotonically with the generosity of the maximum. However, total government revenue is maximised at an FC maximum of about £20 per week, because of the reduced IS expenditure, and then falls. Thus a modest FC programme would be self-financing according to these estimates.

Subsequent work using this methodology attempted to estimate separate effects for HB, IS, FC and earned incomes in Bingley and Walker (2000). In that paper the estimated effect of HB variation on labour market status was estimated to be not significantly different from zero, while the effect of earned income variation was large. FC and IS effects were somewhere in-between.

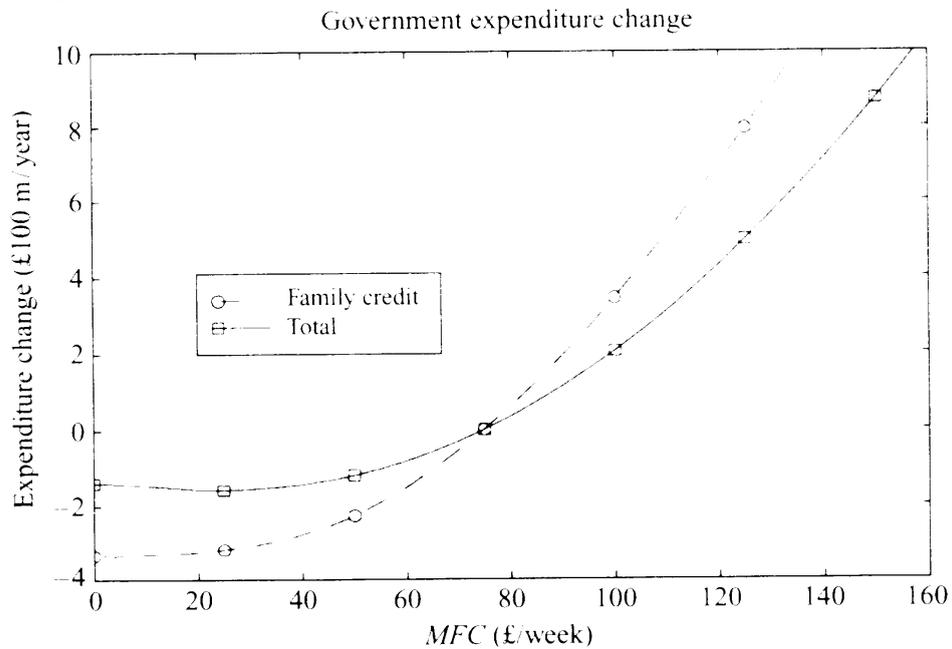
²² See http://www.ifs.org.uk/research/labour/wftc_bn.pdf.

Figure 13 The Effect of the FC Maximum on the Probabilities of being in Each Labour Market State



MFC=Maximum FC (£/week), NP=Non-participation, FT=Full-time participation
 PT(0)=Part-time without FC taken-up, PT(1)=Part-time with FC taken-up

Figure 14 The Effect of the FC Maximum on FC Expenditure and (Minus) Total Government Revenue from Tax and National Insurance net of welfare payments



The results of this line of research suggest that:

- ◆ It will be important to accommodate partial take-up and imperfect perceptions of transfers in the modelling of the effectiveness of programmes.

8.4.3 *The Preston and Walker (1999) and Paull et al (2000) studies*

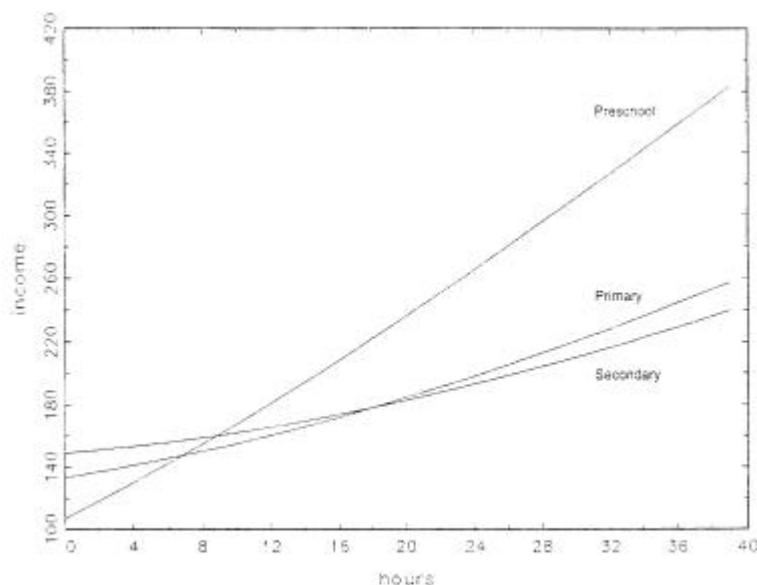
Preston and Walker (1999) adopts an explicit functional form for labour supply “preferences” rather than simply assuming that the probability is some arbitrary function of income differences between states. The form used was that corresponding to a labour supply model where hours of work are assumed to be a linear function of both the wage rate and the level of unearned income. The modelling was simple and did not incorporate important complications such as fixed costs of work, childcare costs, and non-take-up.

The estimates, obtained using data on FES lone mothers, implied that the indifference curves were as illustrated in Figure 15. Those for mothers with school aged children are both shallow and have little curvature which implies that the effect of changes in wages have large effects on behaviour. For example, the median mother with a young child would be indifferent between not working and working full-time with approximately an additional £280 per week, while the median mother with a secondary school aged child would only require approximately an additional £100 to be so indifferent. The wage and income effects behind these estimates were significant and somewhat larger than the typical UK estimates, reflecting the assumptions of no fixed costs and no childcare. Nevertheless these simple estimates are useful for predicting the effects of reforms although they are likely to be more optimistic than more typical estimates would imply.

Paull *et al* (2000) use these estimates to simulate the effects of proposed child support reforms using FRS 1997 data. Since these reforms would be implemented after the advent of WFTC the paper also simulated the effect of WFTC. The results of this exercise depend on what is being assumed about the take-up probability of FC and the compliance rate for child support payments but a typical result would have the pre-reform, i.e. FC, (post-reform, i.e. WFTC,) estimated probabilities of non-participation, part-time work and full-time work as 58.5% (55.4%), 15.3% (20.7%) and 26.2% (24.9%) respectively. Thus, the model implies that WFTC would lead to a

3.1% expansion in participation for lone mothers - which is close to the predicted increase from the more complex modelling in Blundell *et al* (2000) outlined below.

Figure 15 Estimated Indifference Curves for Single Mothers

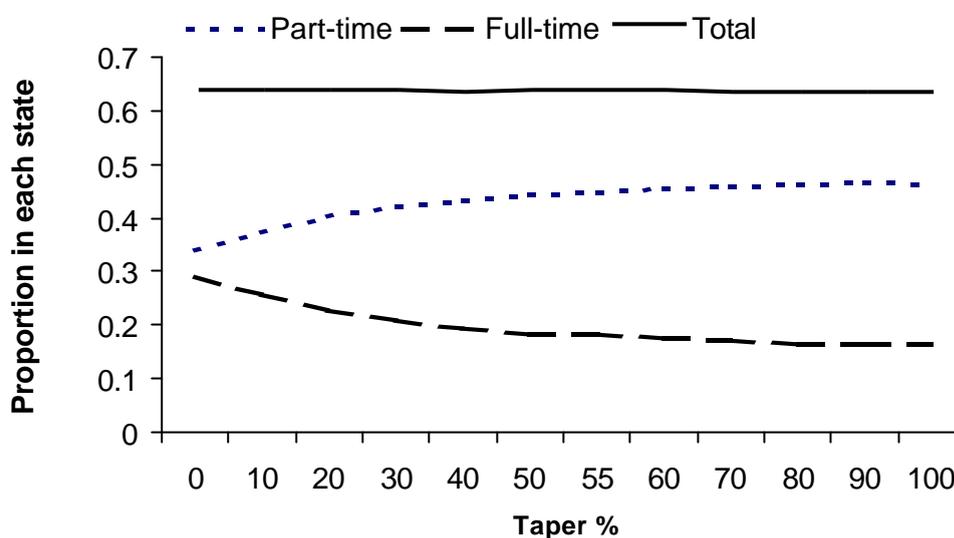


Despite the naïve assumptions, the Preston/Walker model is helpful in illustrating the issues that would still arise in any more complicated WFTC evaluation research. In Figure 16 we show the effect of changing the size of the WFTC taper from zero (where WFTC would simply be a lump-sum transfer to anyone working at least 16 hours) to 100% (where WFTC would imply a “spike” at 16 hours). The level of entitlement at 16 hours is left unchanged in this scenario and this effectively means that the participation rate remains unchanged – all this experiment does is change the full-time/part-time composition of participants. This is an important design point: the taper only affects the composition of participants and not the level of participation (except if there are significant fixed costs of work when the lower taper may tempt some to start to work).

This experiment also raises the question of whether we want to include the “income effect” into our consideration of the labour supply effects as well as the pure wage (or “substitution”) effect. When the taper is zero, WFTC simply has income effects on behaviour that imply lower hours of work (i.e. a greater part-time rate) than without WFTC. But as the taper rises this reduction in labour supply due to the

income effect is reinforced by the adverse effect of a lower marginal wage from the higher taper. Thus the part-time (full-time) rate should rise (fall) as the taper rises.

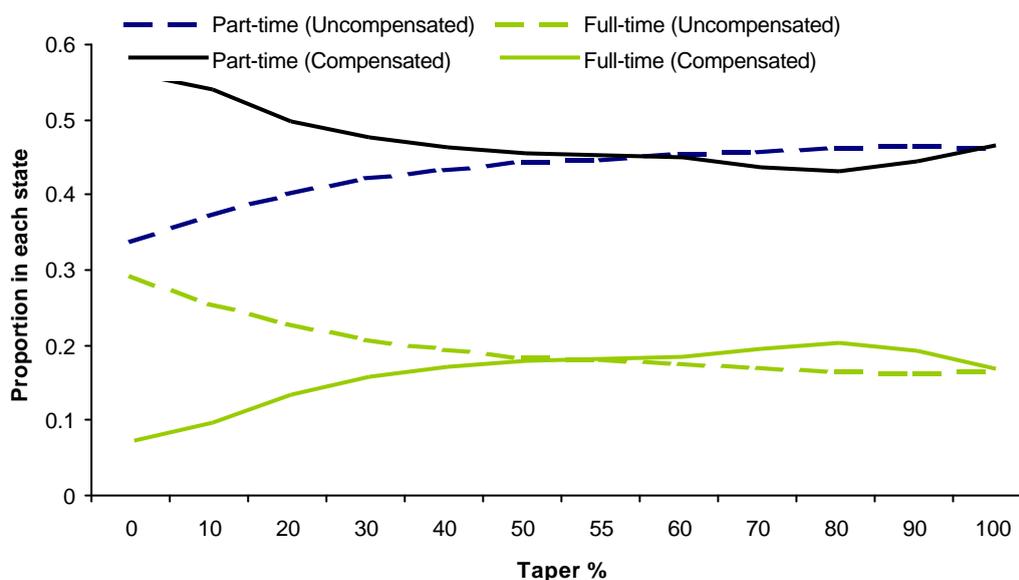
Figure 16 Predicted Effect of Changes in the WFTC Taper on Labour Supply



The distinction between income and substitution effects is an important one since empirically reforms can have very different effects when income effects are ignored. For example, Figure 17 shows the effects of the taper on labour supply (i.e. the part-time and full-time participation rates) as in the earlier figures, as the dashed lines, together with the effects on “compensated” labour supply where we strip out the income effect. That is, we calculate the money gain (or loss) for each individual and then hypothetically take away (give them back) that sum to leave just the effect of the reform on behaviour that works through marginal wages.

Just as we can use the analysis to simulate the effects of hypothetical reforms we can also use them to simulate the effects of actual reforms. For example, the introduction of the £10 FC bonus for working 30+ hours would, with these estimates, imply that the percentage of lone mothers working 30+ hours would rise from 18% to 25%. Similarly, the reduction in the 24 hours rule to 16 hours implies that the percentage of lone mothers predicted to work rises from 43% to 63% but there would be large reductions in the hours of work of the workers so that average hours, over the whole sample, fall from average of 15.6 to 14.3. Of course 16 may not be the only possible choice and we can simulate the effect of other possibilities.

Figure 17 *Compensated and Uncompensated Labour Supply Effects of the WFTC Taper*



8.4.4 *The Blundell et al (2000) Study*

This study uses a discrete choice structural approach to allow the simulation of the WFTC reforms in the UK. In estimation and simulation, lone parents and couples with children are treated separately. This is to reflect that they may have different preferences and may face different market opportunities and childcare options. However, the underlying form of the models used across both groups is similar. Both allow for quite flexible preferences over hours of work and net incomes. Both account for fixed costs of work and both allow childcare costs to vary with hours of work and to differ by the age and number of children. An important feature of the models used is that they allow preference heterogeneity across household types. That is, preferences and costs are allowed to vary with observable factors such as age and demographic composition. Moreover, they are also allowed to depend on unobservable characteristics.

These unobservable terms generate a distribution of outcomes for each observation (household) in the data. Each observation represents the population with the equivalent observable characteristics. The distribution of outcomes then implies a probability that a person of such an observed type will participate or work a certain number of hours. This probability should be interpreted as the proportion of people in the population with these characteristics that carry out the action being evaluated (e.g. participation in the labour market). Simulating the effects of the reform involves

estimating the changes in these probabilities (proportions) as a result of the policy being introduced.

For each working individual from the sample of lone parents, and for each pair of working adults in the sample of couples with children, the FRS data together with the IFS TAXBEN model allows a net income figure to be calculated for each hours of work point. For non-workers additional information on their hourly wage rate is required to complete the net income calculations. These hourly wages are calculated from the predictions of a log hourly wage regression. This regression includes education, age, demographic and regional dummy variables and is estimated using the FRS data.

Thus, for each individual in our sample the net income that would be associated with any choice of hours of work can be predicted. Given the budget constraint facing each individual, the approach taken is to describe choices over a number of possible labour market states. For couples, the model is extended to allow two hours dimensions – for the husband and for the mother. However, male hours of work are simply allowed to be at full-time or zero, reflecting the very low incidence of part-time work for men in couple households with children.

The model is a variation on the multinomial discrete choice preference model but is not sufficient to adequately describe the observed outcomes in the data. For that two additional features are required: a model of childcare costs and usage, and a model of additional fixed costs of work. To account for childcare the information on childcare costs presented earlier was used. In particular, for each type of childcare used for the two groups the hourly cost is taken as given. Then the relationship between hourly childcare costs and various demographic characteristics was estimated so as to associate with each household type a probability of choosing the relevant type of childcare. A regression relationship between the amount of childcare used and the level of hours worked was also estimated. Hence for each possible hours choice and each household type the probability of using each type of childcare and the amount of care could be predicted. This formed an input into the construction of the likelihood function of the data for estimating the unknown preference parameters.

Specifically, even though there are a number of childcare types available, no attempt to model the choice between types of childcare was made, and the model was run for each type of childcare. Then the weighted average of the relevant outcomes using the calculated probabilities was taken.

Finally it is important to emphasise that the method allowed for childcare use even when not working. This is an important feature of the data and not taking it into account could seriously distort the estimated incentives.

Fixed costs are the costs that an individual has to pay to get to work. For many families they are made up in part by the childcare costs already covered above. In particular in our model childcare induces both fixed and variable costs that effectively act as a marginal tax rate. However, there are additional costs, e.g. transport, which will vary by household type and by region. These are modelled as a once off weekly cost. In the model they are subtracted directly from net income for any choices that involve work. They are modelled in a similar way to preferences, in terms of a set of observable factors and an unobservable heterogeneity variable. These terms will now enter the utility comparisons for each individual in their work/non-work choice. Consequently, they will also enter the probability terms described above. To calculate the probability of any observed hours point, the heterogeneity term in the fixed costs equation is integrated out in estimation along with the heterogeneity in preferences, and the parameters of the observable variables that determine fixed costs adds to the list of parameters to be estimated.

For couples there are, in principle, two such fixed costs. However, in estimation we can only really identify the fixed costs of the secondary earner, since for the primary (typically male) earner the data suggest only two labour market states (full-time work at around 37-40 hours or 0 hours).

Table 5 reports a summary of the simulation results for single parent households; women with employed partners; and women with unemployed partners, and the impact on male employment. Overall the effects on participation across the two groups of men roughly cancel out each other leaving the major impact operating through the effects on women, mainly single parents. However, if we consider the impact on workerless households alone, then such offsetting effects cover up

important effects and the impact on men and women in couples where neither is working is much more substantial.

Table 5: WFTC Simulation Results: Summary Table

<i>Group</i>	Number	%
Single Parents	34,000	2.20
Married Women (Partner not working)	11,000	1.32
Married Women (Partner working)	-20,000	-0.57
Married men, partner not working	13,000	0.37
Married men, partner working	-10,500	0.30
Total Effect	27,500	
Decrease in Workerless Families	57,000	

Source: Blundell, Duncan, Meghir and McCrae (2000)

9. Disability and Work Incentives

The existing research on work incentives and the disabled is almost exclusively US. However, Madden and Walker (1998) estimate a labour supply model for the UK that incorporates both the impact of disability on (own) labour supply but also the impact on the caring and labour supply of others. This finds that own ill health has a negative effect on wages for men but not women; being a carer has a negative effect on wages for women but not men; and that unobservables associated with caring are positively correlated with wages for men but not for women. It also finds that own ill health has a strong negative effect on the labour supply of both men and women and a negative effect on their supply of caring; and that hours caring are responsive to wages for women.

The way in which welfare programmes enter this complex set of decisions is not modelled but Haveman *et al* (1991) provide some US evidence which suggests that (out-of-work) welfare transfers that relate to the disabled have a significant work disincentive effect. In the UK, the Disability Working Allowance is a programme that ran parallel to Family Credit with similar work requirements. However the take-up rate was very low and the move to Disabled Persons' Tax Credit (the equivalent to WFTC) may well promote take-up. The difficulty in modelling the impact of this is twofold: the small sample sizes involved and the potential relation between disability and unobservables that affect hours of work and affect wages. This is especially acute using self-reported disability as in the FRS data. However the 1997 FRS had a follow-up of the disabled that contains detailed information about the nature of the disability. We would suggest, to complement qualitative research, that:

- ◆ Further research be conducted, especially using FRS and the disability follow-up, on the relationship between welfare, disability, work and care.

10. New Research Possibilities and the Case for Extending SOLIF

WFTC raises a long list of varied research questions that are explained above. Most of the questions are inherently quantitative ones – what matters for policy is how large an effect is and to what extent correlations in the real world imply causation. Answering these questions will inevitably rely heavily on the statistical analysis of large survey datasets.

Existing data is useful for many of the questions raised: especially LFS, FRS and FES, partly because they cover a history of events from which one might hope to isolate natural experiments that illuminate current policy concerns. However, being able to monitor the effects of a policy on a particular group of people over time has some considerable advantages and DSS and IR are collecting new data that will allow researchers to do this.

This “SOLIF” data is a sample of approximately 5000 households selected so that it contains households that are likely to be eligible for Family Credit and subsequently for WFTC – the wave 1 income limit was set at 35% above the point where FC eligibility is exhausted. It is planned to develop SOLIF into a 3-wave panel. While the aim of the work is to evaluate the effectiveness of in-work transfers on work incentives, SOLIF is useful for many of the much broader set of questions that are relevant to the wider policy issues.

Wave 1 contains FRS-like data on income and hours, travel to work costs, and some childcare data. Hours and income data is recorded for the self-employed. There are some limitations in the data. In wave 1 the childcare data is censored by employment in the last two years, and while it contains extensive and helpful information about the childcare type, reliability, alternatives and expenditure, an important deficiency is that it does not contain information on hours of care or the prices of care by type – although Wave 2 will go some way towards rectifying this.

There is some fertility and partnership history, some job tenure/history data, and some absent father information but not enough to compute interaction with the child support system.

SOLIF contains education years and education qualifications and some training data. The data on welfare includes FC spell length, repeated spells since 1996, awareness/perception of FC/WFTC and their interaction with other welfare programmes. The way in which FC is paid, and to who it is paid, is recorded and comparing this with how WFTC is paid and to who, and how these relate to work hours, will be invaluable in uncovering the extent to which households pool their resources and hence in revealing how labour supply should be modelled.

There is limited information that could be used to address child outcomes associated with variation in parental income. There is some child health data and there is some information about how the main respondent feels about hardship and its affect on the children, but this is not asked of both parents. This later omission might be important since differential attitudes to how the children are affected by household resources it might have provided some evidence about the extent of intra-household altruism that determines the extent to which resources are pooled.

The timing of WFTC relative to New Deals and the National Minimum Wage (NMW) imply that it may be difficult to unravel wage progression in the current job from minimum wage effects, but respondents are asked if they think that their wages were affected by the NMW..

SOLIF can be used in two ways: to provide before and after comparison when a second wave is available; and as data, even as just a single wave, for the structural modelling of behaviour. Both uses are important since each method has its drawbacks. The immediate agenda for SOLIF Wave 1 should therefore be to:

- ◆ Check it against other sources (especially FRS and LFS) to establish the extent to which it suffers from non-random response problems – however, FRS/LFS for 1999/2000 will not be available until some time after SOLIF 1 become available for analysis. It will be especially important to compare the childcare data with the DfEE Baseline Survey and FRS childcare data.
- ◆ Develop the methodology to overcome the endogenous sampling that was used to construct SOLIF – that is, observations were selected according to earnings, which itself is affected by labour supply decisions; Estimate labour supply, take-up and childcare models following Blundell *et al* (2000).

- ◆ Construct a TAXBEN for the data to allow the modelling of take-up and labour supply.
- ◆ Take-up should be checked against FRS, and some modelling of its relationship with client characteristics and level of entitlement; Joint modelling of who FC is paid to, conditional on take-up, should be undertaken.
- ◆ Model hardship variables as a function of FC income and its allocation and other sources of income, allowing for endogenous allocation of FC. Evaluate the importance of FC paid to fathers relative to mothers (and relative to other forms of income) for reducing hardship. Model child health similarly.
- ◆ Detailed analysis of the self-employed who, in FRS, appear to have large entitlements but have low apparent take-up rates – perhaps misleadingly so because their incomes are under-recorded.
- ◆ Investigate the impact of FC on recent wage growth (SOLIF has some recall wage data as well as current wage information), controlling for a minimum wage effect.
- ◆ SOLIF fertility and partnership formation should be compared to non-WFTC eligibles (in FRS and/or BHPS). Similarly child health should be compared.

When Wave 2 becomes available there are further research issues that can be addressed:

- ◆ Comparisons of actual wave 2 behaviour with wave 1 structural model predictions.
- ◆ Comparisons of wave 2 behaviour and wave 1 behaviour by FC and WFTC entitlement and take-up conditional on entitlement.
- ◆ Comparisons of wave 2 behaviour, hardship and child health with wave 1 by allocation of FC and WFTC.
- ◆ Analysis of the allocation of WFTC relative to FC and its relationship to behaviour and hardship.

- ◆ Comparisons of childcare costs and wage rates by FC and WFTC entitlement and take-up conditional on entitlement.

In all of these cases attention will need to be given to controlling for: the effects of children ageing, a changing labour market, non-random attrition (for example, it will be important to follow-up those that become too rich to be in Wave 1 SOLIF). A third wave would permit further extension of analysis, with data becoming available for two years of WFTC.

In addition to these issues that SOLIF seems reasonably well adapted to address the extensive agenda outlined throughout earlier sections that required further analysis of FRS and other datasets. It will be important that quantitative research proceeds on both fronts since there are trade-offs involved.

In the long-run there will be considerable benefits to following up SOLIF participants so as to be able to compare the effectiveness of parental cash via WFTC as a way of dealing with poor child outcomes with direct interventions through SureStart treatments. Thus, attention should be given to either merging external sources of information such as medical histories and educational outcomes or collecting this through subsequent follow-up surveys. Similarly, long term outcomes for the parents will require either that administrative records be merged of, say, NICs to look at employment and earnings, or follow-up surveys be conducted. In addition where child support is an issue, merging information about the absent parent's circumstances would add considerably to the richness of the analysis that could be supported.

11. Summary and Recommendations

This review has considered some of the research issues surrounding measuring the impact of in-work benefit reforms. Such programs are designed to target income to relatively poor families that suffer from low returns to work. The evidence from existing reforms across a number of countries suggests that careful design of these programs can significantly increase the incomes of low-income families while providing reasonable incentives for parents to work. The paper has considered evaluations from the quasi-experiments in Canada, from the before and after analysis of past reforms to the EITC in the US and to the FC in the UK. All these different pieces of evidence tend to support this general conclusion. This evidence also points to the important characteristics of the design of any data set that is being developed to evaluate in-work benefit programmes.

Section 10 has summarised the main implications of this review for the extension of existing UK data sources and development of new evaluation studies. We have argued that since these programs are generally based on family income, a careful analysis of the different sources of family income and how they are effected by the receipt of in-work benefit income is essential in modelling incentives correctly. This not only relates to labour supply incentives but is also critical to our understanding of a wider set of incentive questions. For example, means testing against family income will generally imply that the incentive to parent is increased and the incentive to partner is decreased. WFTC exacerbates this relative to FC since it enhances both the payments for children and reduces the penalty of family income (the phase-out taper). The very nature of the decision-making within the household is critical. If households fail to pool their resources then the effects of welfare programmes that are means tested against family income are likely to be different than would be the case if pooling did occur.

One further area in which we should have more to say, but for which there is little rigorous existing information, concerns the longer run pay-off to labour market attachment for individuals of the type eligible for the WFTC. One might hope that through the progression of wages and general increases in employability associated with longer job tenure, workers move themselves out of the low-income group and onto a reasonable earnings level, and are then less likely to be dependent on any form

of welfare including tax credits. However, if this dynamic pay-off is relatively low, then these individuals are likely to remain dependent on this in-work credit system. Indeed, as we have argued, the incentives for training and human capital investment for low skilled workers can be reduced by in-work benefits. Thus an important dynamic trade-off is inherent, over and above any static equity-efficiency trade-off. Providing the measurements necessary for the evaluation of this dynamic trade-off will form an important element of any future research on the impact of in-work benefits like the WFTC and reforms to them.

REFERENCES

- Anderson, P. and Levine, P. (1999), *Childcare and Mothers Employment Decisions*, NBER Working Paper 7058.
- Apps, P.A. and Rees, R. (1997), *Collective Labor Supply and Household Production*, **Journal of Political Economy** 105, 178-190.
- Bingley, P. and Lanot, G. (1999), *The Incidence of Taxation and the Elasticity of Labour Supply*, Arhus WP.
- Bingley, P., Symons, E.J. and Walker, I. (1994), *Child Support, Income Support and Lone Mothers*, **Fiscal Studies**, 15,81-98.
- Bingley, P., Lanot, G., Symons, E.J. and Walker, I. (1995), *Child Support Reform and the Labour Supply of Lone Mothers in the UK*, **Journal of Human Resources**, 30, 256-79.
- Bingley, P. and Walker, I. (1996), *Labour Supply with In-work and In-kind Transfers*, Keele Economics Working Paper 96/21.
- Bingley, P. and Walker, I. (1997), *The Labour Supply, Unemployment and Participation of Lone Mothers in In-work Transfer Programmes*, **Economic Journal**, 107, 1375-1390.
- Bingley, P. and Walker, I. (1999), *There's No Such Thing as a Free Lunch: Evidence from the Effect of In-Kind Transfers*, Arhus Economics Working Paper 99/03.
- Bingley, P. and Walker, I. (2000), *Household Unemployment and the Labour Supply of Married Women*, **Economica** (forthcoming).
- Blackburn, McKinley L. (2000), *Welfare Effects on the Marital Decisions of Never-Married Mothers*, **Journal of Human Resources**, 35, 116-142.
- Blank, Rebecca M., David Card and Philip K. Robins (1999), "Financial Incentives for Increasing Work and Income Among Low-Income Families", NBER Working Paper No. 6998. Cambridge, MA: National Bureau of Economic Research.
- Blundell, R. W. (2001), *Welfare Reform for Low Income Workers*, Hicks Lecture 1999, **Oxford Economic Papers** (53), 18-214.
- Blundell, R. and M. Costa Dias (2000), *Evaluation Methods for Non-Experimental Data*, **Fiscal Studies**, March.
- Blundell, R. W, Duncan, A.S., and Meghir, C. (1992), *Taxation and Empirical Labour Supply Models: Lone Parents in the UK*, **Economic Journal**, 102, 265-78.
- Blundell, R. W, Duncan, A.S., and Meghir, C. (1998), *Estimating Labour Supply Responses using Tax Policy Reforms*, **Econometrica**, 66, 827-861.

- Blundell, R. W, Duncan, A.S., McCrae, J. and Meghir, C. (1999), *Evaluating In-Work Benefit Reform: the Working Families Tax Credit in the UK*, paper presented at the Institute for Poverty Research Conference, North Western University, November 1999.
- Blundell, R. W, Duncan, A.S., McCrae, J. and Meghir, C. (2000), *The Labour Market Impact of the Working Families Tax Credit*, **Fiscal Studies**, 21, 65-74.
- Blundell, R.W. and P. Johnson (1998), *Labor Force Participation and the UK Pension System*, **American Economic Review (Papers and Proceedings)**, May.
- Blundell, R.W. and MaCurdy, T. (1999), "Labor Supply: A Review of Alternative Approaches", in O. Ashenfelter and D. Card (eds), **Handbook of Labor Economics Vol III**, Elsevier North-Holland.
- Blundell, R.W. and I. Preston, (1998), "Consumption Inequality and Income Uncertainty" **Quarterly Journal of Economics**, May, 603-640.
- Blundell, R.W and Reed, H. (2000), The WFTC and Labour Supply, IFS Briefing Note No. 6, IFS Website.
- Brewer, M. (2001), *Comparing in-work benefits and financial work incentives for low-income families in the US and the UK*, **Fiscal Studies**, 22(1), 41-77.
- Card, D. and Robins, P.K. (1998), *Do Financial Incentives Encourage Welfare Recipients To Work?*, **Research in Labour Economics**, 17, 1-56.
- Chiappori, P-A. (1998), *Rational household labour supply*, **Econometrica**, 56, 63-89.
- Currie, J. (1995), **Welfare and the Well-Being of Children**, Chur, Switzerland, Harwood Academic Press.
- Dickert, S., Houser, S. and Scholtz, J.K. (1995), *The Earned Income Tax Credit and Transfer program: A Study of Labour Market and Program Participation*, in James Poterba, (ed.) **Tax Policy and the Economy**, Cambridge, MIT Press.
- DSS (1997), **Income Related Benefits. Estimates of Take-up in 1993/4**, HMSO.
- Dickert, S. and Houser, S. (1998), *Taxes and Transfers: A New Look at the Marriage Penalty*, **National Tax Journal**, 51, 175-217.
- Dilnot, A. and Duncan, A.S. (1992), *Lone Mothers, Family Credit and Paid Work*, **Fiscal Studies**, 13, 1-21.
- Dilnot, Andrew, John Kay and Chris Morris (1984), **The Reform of Social Security**, Oxford: Oxford University Press.
- Dilnot, A. and Stark, G. (1989), *The Poverty Trap, Tax Cuts and the Reform of Social Security*, in A. Dilnot and I. Walker (eds), **The Economics of Social Security**, Oxford University Press, Oxford and New York.

- Dilnot, A. and Walker, I. (1989), The Economics of Social Security, Oxford University Press, Oxford and New York.
- Dilnot, A. and Webb, S. (1989), "The 1988 Social Security Reforms" in Dilnot and Walker (eds), The Economics of Social Security, Oxford University Press, Oxford and New York.
- DSS (1997), *Income Related Benefits. Estimates of Take-up in 1993/4*, HMSO.
- Duncan, Alan and Christopher Giles (1997), "Should We Subsidise Childcare, and If So How?", *Fiscal Studies*, 17, pp.39-61.
- Duflo, E. (1999), *Grandmothers and Granddaughters: the Effects of Old Age Pension on Child Health in South Africa*, (mimeo) MIT.
- Eissa, N. and Hoynes, H.W. (1998), *The Earned Income Tax Credit and the Labour Supply of Married Couples*, National Bureau of Economic Research, Working Paper 6856, December.
- Eissa, N. and Hoynes, H.W. (1999), *Good News for Low Income Families? Tax-Transfer Schemes and Marriage*, (mimeo) Berkley, CA .
- Eissa, N. and Liebman, J. (1996), *Labour Supply Response to the Earned Income Tax Credit*, **Quarterly Journal of Economics**, 41, 605-637.
- Ellwood, D. T. (1998), *The Impact of EITC and other Social Programs on Work and Marriage in the United States*, mimeo, John F. Kennedy School of Government, Harvard University.
- Giles, C., Johnson, P. and McCrae, J. (1997), *Housing Benefit and the Financial Returns to Employment for Tenants in the Social Sector*, **Fiscal Studies**, 18, 49-72.
- Gregg, P., Johnson, P. and Reed, H. (1999), **Entering Work and the British Tax and Benefit System**, IFS, London.
- Gruber, J. (1997), *The Incidence of Payroll Taxation: Evidence from Chile*, **Journal of Labor Economics**, 15, S72-S101
- Hausman, J. and Wise, D.A. (1977), *A Conditional Probit Model for Qualitative Choice: Discrete Decisions Recognising Independence and Heterogeneous Preferences*, **Econometrica**, 46, 403-26.
- Haveman, R., de Jong, P. and Wolfe, B. (1991), *Disability Transfers and the Work Decision of Older Men*, **Quarterly Journal of Economics**, 106, 939-949.
- Heckman, J. (1990), *Varieties of Selection Bias*, **American Economic Review (Papers and Proceedings)**, 80, 313-18.
- H.M. Treasury (1999), *Support Children through the Tax and Benefit System*, The Modernisation of Britain's Tax and Benefit System, Number 5, November.

- H.M. Treasury (2000), *Tackling Poverty and Making Work Pay*, The Modernisation of Britain's Tax and Benefit System, Number xx, March.
- Hoynes, H. (1996), *Welfare Transfers in Two-Parent Families: the Case of AFDC-UP*, **Econometrica**, 64, 295-332.
- Keane, M.P. and Moffitt, R. (1998), *A Structural Model of Multiple Welfare Program Participation and Labour Supply*, **International Economic Review** 39 553-589.
- Lemke, R.J., Witte, A.D, Queralt, M. and Witt R. (2000), *Childcare and the Welfare to Work Transition*, NBER Working Paper 7583.
- Liebmann, J.B. (1998), *The Impact of EITC on Incentives and Income Distribution*, in J.M. Poterba (ed.), **Tax Policy and the Economy**, Vol 12, NBER, MIT Press.
- Lundberg, S., Pollak, R. and Wales, T. (1995), *Do Husbands and Wives Pool their Resources? Evidence from the UK Child Benefit?*, **Journal of Human Resources** 32, 463-480.
- Madden, D. and Walker, I. (1998) *Labour Supply, Health and Caring*, UCD WP.
- Meyer, B. and Rosenbaum, D. (1998), *Welfare, the Earned Income Tax Credit and the Labor Supply of Single Mothers*, mimeo, Northwestern University.
- Michalopolous, C., Robins, P.K. and Card, D. (1999) . *When Financial Incentives Pay for Themselves*, SRDC WP May.
- Moffitt, R. and Kehrer, K. (1981), *The Effect of Tax and Transfer Programmes on Labour Supply: Evidence from the Income Maintenance Experiments*, in R.G. Ehrenberg, (ed.) **Research in Labour Economics**, 4, 103-150. Greenwich, Connecticut: JAI Press.
- Moffitt, R. (1984), *The Estimation of a Joint Wage-Hours Model*, **Journal of Labor Economics**, 2, 550-66.
- Moffitt, R. (1990), *The Effects of the US Welfare System on Marital Status*, **Journal of Public Economics**,1, 101-124.
- Moffitt, R. (1998), *The Effect of Welfare on Marriage and Fertility*, in R. Moffitt, (ed.), **Welfare, the Family and Reproductive Behaviour**. National Research Council, National Academy of Sciences, Washington, D.C. NA Press.
- Neumark, D. and Postlewaite, A. (1998), *Relative income concerns and the rise in married women's employment*, **Journal of Public Economics** 70, 157-183
- Neumark, D. and Wascher, W. (1996), *The Effects of Minimum Wages on Teenage Employment and Enrollment: Evidence from Matched CPS Surveys*, NBER Working Paper 5902.

- Neumark, D. and Wascher, W. (2000), *Using the EITC to Help Poor Families: New Evidence and a Comparison with the Minimum Wage*, NBER Working Paper 7599.
- Paull, G, Walker, I. and Zhu, Y. (2000), *Child Support Reform: Some Analysis of the 1999 White Paper*, **Fiscal Studies**, 21, 105-140.
- Preston, I.P. and Walker, I. (1999), *The Measurement of Living Standards in Labour Supply Models with Nonlinear Budget Constraints*, **Journal of Population Economics**.
- Ribar, M. (1995), *A Structural Model of Childcare and the Labor Supply of Married Women*, **Journal of Labor Economics**, 13, 558-97.
- Scholz, J.K. (1996), *In-Work Benefits in the United States: The Earned Income Tax Credit*, **Economic Journal**, 106, 156-169.
- Shea, J. (1997), *Does Parents' Money Matter?*, NBER Working Paper 6026.
- van Soest, A. (1995), *Structural Models of Family Labour Supply: A Discrete Choice Approach*, **Journal of Human Resources**, 30, 63-88.
- Yelowitz, A. S. (1995), *The Medicaid Notch, Labour Supply, and Welfare Participation: Evidence from Eligibility Expansions*, **Quarterly Journal of Economics**, 110, 909-39.