

# THE EFFECT OF THE WORKING FAMILIES' TAX CREDIT ON LABOUR MARKET PARTICIPATION

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## Summary

Working families' tax credit (WFTC) was introduced in October 1999 to replace family credit (FC) as the main form of support for low-income working families with children. It aimed to help reduce child poverty both by attracting parents from previously workless families into the labour market and by directing additional support to those already working but living in families with a low income.

WFTC was considerably more generous than FC: the credit amount was higher, there was more support for childcare and the rate of credit withdrawal was lower. Because WFTC was only available to families where someone was working, these changes would make it financially more attractive to have one adult in a family work 16 or more hours a week; we would therefore expect some parents in previously workless households to decide to work. Some low-income families with two workers, however, received a windfall gain from this reform, and we might expect that, in some of these families, one of the adults might decide that they no longer needed to work.

This Briefing Note compares five recent studies that have examined the labour market impact of WFTC. There is a consensus that WFTC increased the proportion of lone mothers who work but seems to have had little effect overall on the proportion of adults in couples with children who work. If anything, WFTC increased the number of hours worked by adults in families with dependent children, largely because the reform was of particular help to those working full-time. Overall, it seems likely that WFTC increased the employment rate, because the number of adults in previously workless families who moved into work probably outweighed the number of adults in previously two-worker families who decided not to work.

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## 1. Introduction

There has been a considerable amount of research on the labour market impact of the working families' tax credit. WFTC was introduced in October 1999 to replace family credit as the main form of state support for low-income working families with children, and was more generous than FC in several ways, outlined below. As well as merely providing a way of redistributing money to low-income families with children, the government hoped that this increased generosity would help 'make work pay' for many workless families and hence increase labour market participation among parents. For that reason, this note focuses on the labour market impact of WFTC, but research has also examined other aspects of WFTC.<sup>1</sup>

Several studies have used different methods to examine whether WFTC has been effective in achieving the government's aim. In this note, we will compare the results from five studies, by the following people:

- Paul Gregg and Susan Harkness of the University of Bristol, funded by the Leverhulme Trust (Gregg and Harkness, 2003; hereafter GH);
- Marco Francesconi and Wilbert Van der Klaauw of the Institute for Social and Economic Research, funded by the Economic and Social Research Council and the University of Essex (Francesconi and Van der Klaauw, 2004; hereafter FK);
- Andrew Leigh of the Australian National University (Leigh, 2005; hereafter L);
- Richard Blundell (UCL and IFS), Mike Brewer (IFS) and Andrew Shephard (IFS), funded by the ESRC-funded Centre for Public Policy Research at the Institute for Fiscal Studies, the Inland Revenue and the Bank of England (Blundell, Brewer and Shephard, 2005; hereafter BBS);
- Mike Brewer (IFS), Alan Duncan (University of Nottingham and IFS), Andrew Shephard (IFS) and María José Suárez (University of Oviedo), funded by the Inland Revenue (Brewer et al., 2005; hereafter BDSS).

Within these five papers, there are two general approaches:

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<sup>1</sup> Other research on WFTC, funded by HM Revenue and Customs, can be found at <http://www.hmrc.gov.uk/research/>, and many of the reports commissioned by the Department for Work and Pensions that investigate the Families and Children Survey (FACS) are informative about the impact of WFTC and the impressions held about WFTC by adults in low-income working families (see [http://www.dwp.gov.uk/asd/asd5/facs/facs\\_publication.asp](http://www.dwp.gov.uk/asd/asd5/facs/facs_publication.asp)). A previous IFS Briefing Note (Blundell and Reed, 2000) compared three studies that predicted the impact of WFTC; these are not reviewed here. In March 2003, there was a more radical change to the structure of credits paid to families with children, with WFTC being replaced by a new child tax credit; this is not discussed here.

- The first is to compare various outcomes for affected and unaffected groups before and after the introduction of WFTC. If there were a change in the difference in outcomes between parents and non-parents, this would be a result of WFTC. We can say this because parents would have been affected by WFTC as well as by other changes in the tax and benefit system, whereas non-parents would only have been affected by these other changes. Therefore, by looking at the change in the difference in outcomes, it would be possible to isolate the effect of WFTC. This is known as a difference-in-difference approach, and variants of this are used by the first four papers listed above.
- The second approach, used by BDSS, is to predict how families with children would react to WFTC. These predictions are made using a model of people's preferences for working and income; this model is estimated with data from household surveys, controlling for family circumstances.

This note proceeds as follows. We begin in Section 2 by describing the reform, other changes to the tax and benefit system and other welfare reforms that occurred at the same time. We then examine what happened to employment patterns after the reform in Section 3. Each of the five studies uses a different methodology, which we discuss in Section 4, where we also report their conclusions. Section 5 concludes.

## **2. Changes to taxes and benefits, and other welfare reforms, 1999–2002**

This section first describes working families' tax credit and how it differed from its predecessor, family credit. It then outlines the other changes to the tax and benefit system affecting adults with dependent children that took place around the time that WFTC was introduced. Finally, it discusses the other welfare reforms that took place at this time that might have affected the employment rates of parents.

These other changes, particularly those that only affect adults with dependent children, present a difficulty for estimates of the impact of WFTC made using the difference-in-difference approach. For that approach to be able to evaluate the impact of WFTC on labour market outcomes, WFTC must be the only new programme that affects those with dependent children and that does not affect childless adults. If this is not the case, the difference-in-difference estimator will be informative about the impact of all these changes together (a structural model, though, will be able to simulate the effects of each individual reform). We discuss in Section 4 how the studies have dealt with this issue.

### **2.1 Working families' tax credit**

WFTC and FC (which it replaced) were very similar in many respects:

- both required recipients to work for at least 16 hours per week to be eligible, with an extra credit given to those working more than 30 hours;

- earnings above a threshold reduced the credit by a certain proportion;
- definitions of income, and capital rules, were very similar (except for child maintenance; see below).

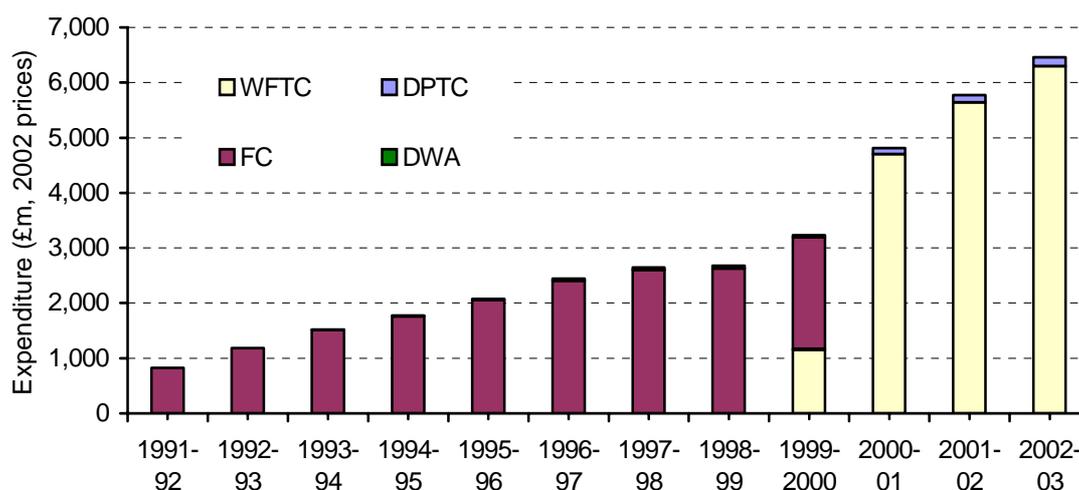
But there were significant differences, most notably in the generosity of the credit and the payment mechanism. WFTC was more generous than its predecessor in five ways:

- Credits were higher, particularly for those with younger children.
- Families could earn more before the credit began to be withdrawn (£90 per week rather than £70).
- The rate at which the credit was withdrawn was lower (55% rather than 70%).
- Support for formal childcare was more generous. Under FC, childcare costs up to £60 (£100) a week for families with one child (two children) could be disregarded before the credit was phased out, so only families earning more than the earnings threshold could benefit from the support for childcare costs. Under WFTC, however, there was a childcare tax credit providing a 70% subsidy to the parent on costs of up to £150 a week, in addition to WFTC. (For couples, this could only be claimed if both worked for 16 or more hours a week.)
- FC treated child support or maintenance above £15 a week as income, whereas WFTC disregarded all child maintenance when calculating awards.

The change in the payment mechanism was that, while FC was paid direct as a cash benefit, WFTC was paid through the wage packet by the employer, who was then compensated by the Inland Revenue, unless a couple decided that the non-working adult should apply for and receive WFTC.

The increase in the generosity of the tax credit inevitably increased its cost. Figure 2.1 shows that expenditure on employment tax credits almost doubled between 1998–99 and 2000–01, going from £2.68 billion to £4.81 billion in constant 2002 prices. There was a further substantial increase by 2002, to £6.46 billion. We may wish to consider whether the increase in employment resulting from the change justified this level of expenditure. However, we should take two further points into account. First, if there were an increase in employment as a result of the introduction of WFTC, there may have been a decrease in the level of expenditure on out-of-work benefits such as jobseeker's allowance or income support. As a result, the true cost to the public purse may well have been lower than the increase in expenditure on employment tax credits. Second, the aim of introducing WFTC was not only to increase employment but also to lower poverty. Therefore the higher level of redistribution of income may be seen as a worthwhile end in itself.

**Figure 2.1. Expenditure on FC/WFTC**



DPTC – disabled person’s tax credit. DWA – disability working allowance.

*Note:* WFTC replaced FC in October 1999, so there was expenditure on both of them during the 1999–2000 tax year.

*Source:* HM Treasury, Budget 2005.

Economic theory suggests that these changes would have different effects on different groups of parents:

- For adults in workless families – where no adult was currently participating in the labour market – there would be a greater incentive to work 16 or more hours per week as a result of the increased generosity of the credit. We would therefore expect some currently workless families to participate as a result of this reform, and also some parents currently working less than 16 hours per week to move over the threshold. However, the extra generosity of WFTC would also lead to a reduction in the number of two-worker families, when two-worker families found they needed to work a little less hard in order to achieve their pre-reform standard of living (this is known as an income effect away from work).
- The lower taper rate would also have different effects on adults in different families depending on their income. For those previously claiming FC, there would be an increase in the returns to an extra hour’s work as a result of the lower withdrawal rate, leading to an increase in the number of hours worked (this is known as a substitution effect towards work). On the other hand, those who previously earned too much to claim FC but who were now eligible for WFTC would experience both an income and a substitution effect away from work.

## 2.2 Other tax and benefit changes

One problem in identifying the effect of WFTC on parents’ employment decisions is that the tax and transfer system affecting low-income families with children has

experienced almost continual change since April 1999. The most important of these changes were:

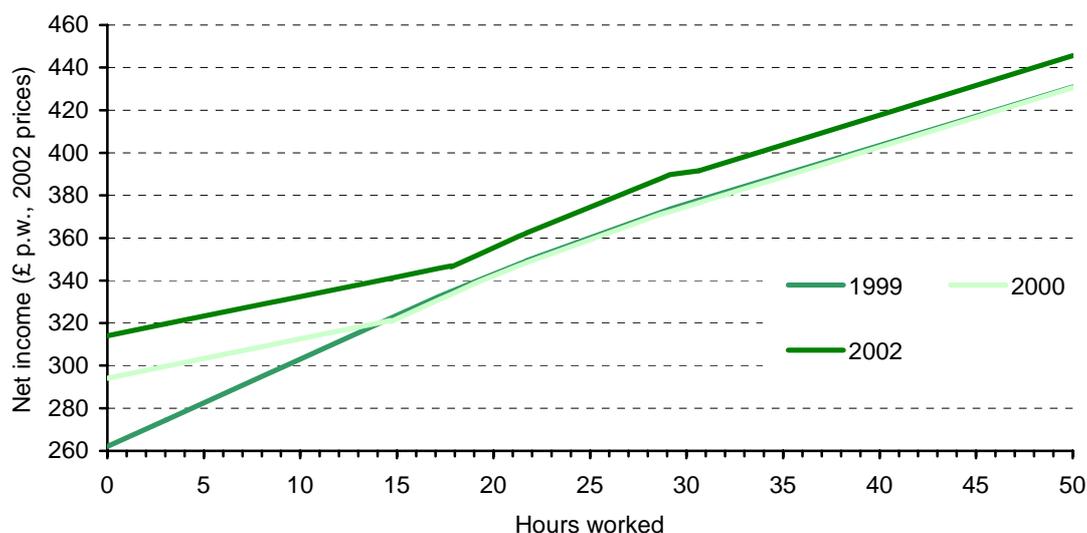
- a cut in the basic rate of income tax from 23% to 22%;
- an increase in the primary threshold, which is the point at which National Insurance contributions (payroll tax) are payable by employees;
- abolition of the mortgage interest subsidy programme (MIRAS);
- abolition (in April 2000) of the married couple's allowance and additional personal allowance for the under-65s, which together provided a non-refundable tax credit to married couples and parents; replaced (in April 2001) by a more generous tax credit for parents of children aged under 16 (known as the children's tax credit);
- increases in entitlements to WFTC, through real increases in the basic credit, the extra amounts paid for children and the maximum value of the childcare tax credit;
- increases in income support, income-related jobseeker's allowance and associated benefits for families with children, particularly for those with children under 11;
- increases in support available to parents of children under 12 months through a lump-sum grant paid to families on low incomes and (from April 2002) an additional non-refundable tax credit for income-tax-paying parents.

**Figure 2.2. Change in the budget constraint for a lone parent with two children under 5, April 1999 to April 2002**



*Note:* Assumes hourly wage of £4.10, no housing costs or council tax liability, no entitlement to child support and no childcare costs.

**Figure 2.3. Change in the budget constraint for mother in couple with two children under 5, April 1999 to April 2002**



*Notes:* Assumes hourly wage of £4.10, no housing costs or council tax liability and no childcare costs. The first earner in the couple is assumed to earn £300 per week in 2002 prices.

Figures 2.2 and 2.3 show the effect of the tax and benefit changes between April 1999 and April 2002 on the budget constraints faced by a lone parent and by a mother in a couple respectively, both with two children aged under 5 and earning the 2002 minimum wage. Figure 2.2 makes clear that the income available to a lone parent who was not working increased substantially over this period, although by slightly less than the income available to a low-earning working lone parent. Figure 2.3 shows that the income available to the family when the second earner does not work increased substantially, but the income available to the family when both adults worked increased by much less. (The first earner in the couple is assumed to earn £300 per week in 2002 prices.)

### 2.3 Other welfare reforms

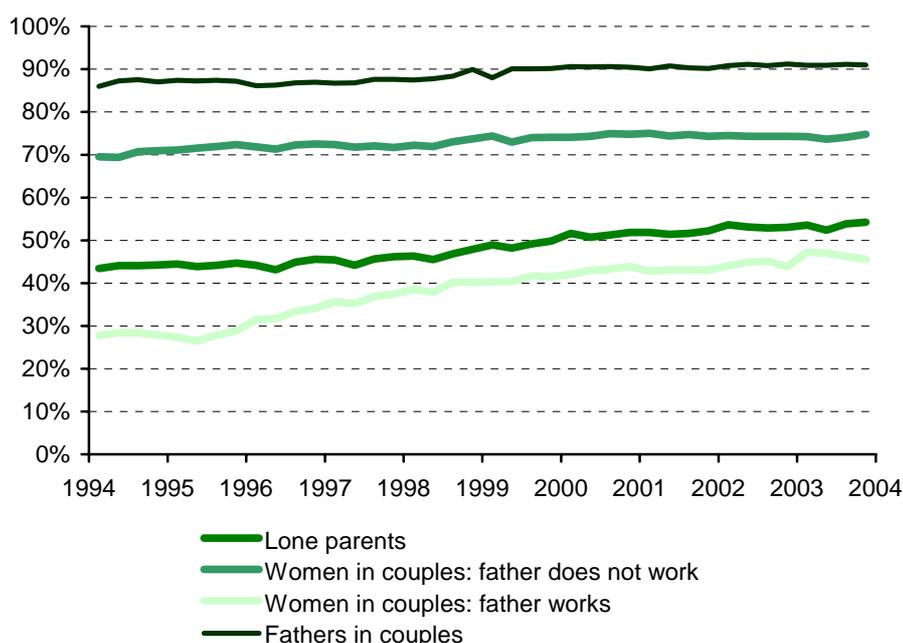
We should also mention two other changes that occurred at around the same time as the introduction of WFTC that may cause problems for the difference-in-difference approach. In April 1999, a national minimum wage (NMW) was introduced in Britain for the first time. We would expect this to increase the gap between in-work and out-of-work incomes for low-skilled groups, and so induce an increase in labour supply. It may also, however, reduce the demand for labour. If it took some time for the NMW to have a positive impact on labour supply – in particular, if not all of the impact was felt until after the introduction of WFTC in the October of the same year – some of the increase in employment attributed to WFTC by a difference-in-difference estimator would in fact have been caused by the introduction of a minimum wage. But this is unlikely to have been much of a problem, as Dickens and Manning (2002) find that virtually all of the impact of the NMW occurred within the first two months of its introduction, and the impact was in any case small (see, for example, Machin and Wilson (2004) or Stewart (2004)).

The second change that we need to be aware of is the introduction of the New Deals for lone parents, young people and over-25s. These would affect both lone parents and single childless people, but given the differences between the two programmes, the effects may have been different for the two groups. The New Deal for Lone Parents was introduced in 1998 and at that time consisted of voluntary attendance at Work-Focused Interviews under the Jobcentre Plus programme. It may therefore have led to an increase in the employment of lone parents as a result of improved job search. While the New Deal was introduced before WFTC, it may have taken some time for its effects to be fully felt. If this were the case, some of the increase in employment attributed to WFTC may have been a result of this job-search programme. By contrast, the New Deals for young people and the over-25s were much tougher programmes that forced participants to take one of various options, such as a subsidised job placement or a place on a full-time course of education or training after a period of intensive job search known as the Gateway period. We might therefore expect these programmes to be more successful at increasing employment than the New Deal for Lone Parents. This may cause the difference-in-difference estimator to give an underestimate of the true effect of WFTC. However, GH point out that only a tiny fraction of single childless people were affected by the New Deal and so any bias resulting from this is likely to be small.

### 3. Trends in employment of parents before and after reform

Figure 3.1 shows that there was an upward trend in the employment rate of parents before WFTC was introduced in October 1999, and that there was a considerable increase in participation when it was introduced.

**Figure 3.1. Employment rates of parents**



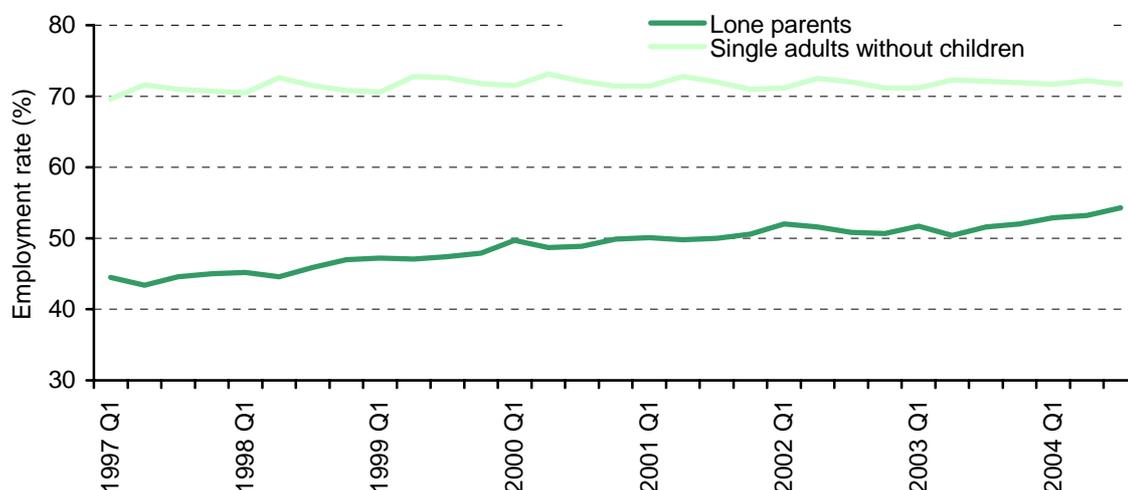
*Source:* Brewer and Shephard (2004), based on quarterly Labour Force Survey data.

This could have happened for a number of reasons though, not least the state of the economy (which was particularly strong at that time) and the other changes to the tax and benefit system mentioned in the previous section. In order to isolate the effect of WFTC, we need to find what happened to a group that was unaffected by WFTC but that was affected by all other changes (in the economy or the tax and benefit system) at that time (called a ‘control group’). This is the motivation behind the difference-in-difference approach.

The control group chosen by all of the studies reviewed in Section 4 that use the difference-in-difference approach is childless adults. Figure 3.2 compares employment rates of single adults with and without dependent children, and shows that there is a narrowing of the gap in employment rates between lone parents and single adults without children around the time of WFTC’s introduction. However, there also seems to have been some convergence in employment rates before the reform. This earlier convergence could create difficulties for the difference-in-difference approach, because it could be argued that such convergence in employment rates would have continued after 1999 even if WFTC had not been introduced. We shall see later how different papers deal with this problem.

A key motivation of WFTC was to reduce the proportion of children who live in families where no adult works. Figure 3.3 shows that there was a significant reduction in this proportion immediately after the reform, although, as in Figure 3.2, there seems to have been a downward trend before the reform as well.

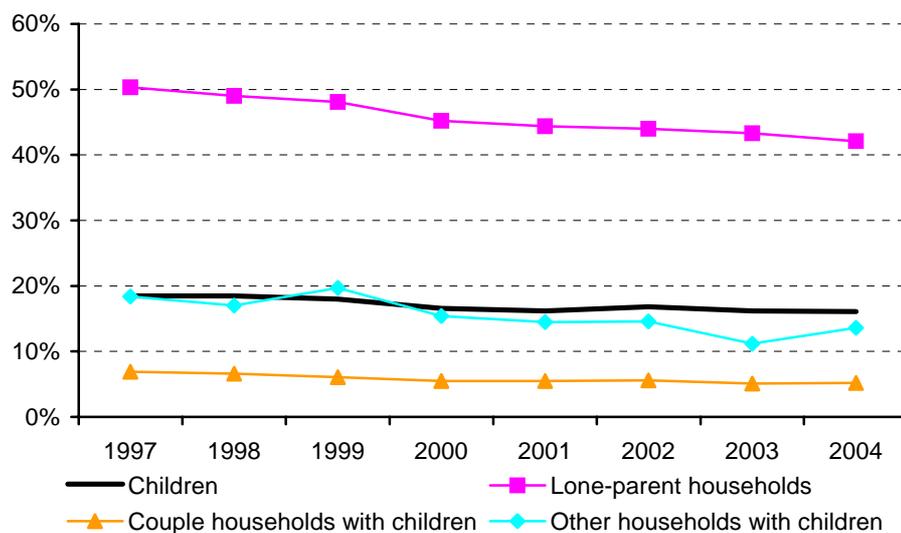
**Figure 3.2. Employment rates of single adults by parental status**



*Notes:* Not seasonally adjusted. The employment rate is calculated as the percentage of the population of working age (16–59 for women and 16–64 for men) who are in employment (working at least one hour in the reference week or temporarily away from a job).

*Source:* Brewer and Shephard (2005), based on Labour Force Survey data, various years.

**Figure 3.3. Worklessness rates in households with dependent children, and the proportion of children living in workless households**



*Source:* Brewer and Shephard (2004) using Office for National Statistics (2004, tables 1(ii) and 3(ii)), based on Labour Force Survey data. The series are not consistent: the base for ‘lone parent households’, ‘couple households with children’ and ‘other households with children’ is all households of that type with dependent children; the base for ‘children’ series is children under 16 only. A workless household is a working-age household where no one aged 16 or over is in employment.

#### **4. Comparison of methodology and results of the five papers**

Full details of the five studies can be found in Tables 1–3 at the end of this Briefing Note. At a glance, the estimates of the impact of WFTC on various outcomes seem to vary substantially. However, on closer inspection, what is being measured, and how it is measured, is often quite different, as we shall see in Section 4.1.

Once these differences are understood, we conclude that there is broad agreement that WFTC increased the proportion of lone mothers who were in work, the proportion who worked at least 16 hours and the proportion who worked more than 30 hours. There is less consensus, though, on the impact on adults in couples with dependent children, probably because WFTC had little or no impact, on average, on this group.

We give more detail in Section 4.2, which compares the estimated impact of WFTC on five different labour market outcomes in turn.

##### **4.1 Differences in approach**

There are a number of important differences between the studies.

### *Methodology*

As stated in Section 1, two different methodologies are used:

- GH, FK, BBS and L use a difference-in-difference approach;
- BDSS use a structural model of labour supply.

### *Time period and population under study*

There are small differences in the time period and the population that are studied:

- L and BDSS compare lone mothers and parents in couples in 1999 and 2000.
- GH compare lone parents in 1998 and 2002.
- BDSS compare lone mothers and parents in couples in 1999 and 2002.
- BBS compare the average of 1996 to 1999 with the average of 2000 to 2002. They look at both lone mothers and fathers and parents in couples; however, as none of the other papers studies lone fathers, these results are not reported here.
- FK compare lone mothers in 1997 and each of the four years from 1998 to 2001.

These differences are important because WFTC was expanded further between 2000 and 2002, and this means that we would expect the effect of WFTC to be larger in 2002, for example, than it was in 2000, just after its introduction. (There were also further changes to other aspects of the tax and benefit system affecting families, whose impacts are less predictable in advance.) We are happy to compare the results for lone mothers with those in GH for lone parents because we do not consider the exclusion of lone fathers to be important as they represent a tiny minority of lone parents. Also, the results in BBS for lone fathers suggest that lone fathers did not respond in a radically different way from lone mothers (the increase in employment was 4.6ppts compared with 3.6ppts for lone mothers).

### *Accounting for the pre-1999 convergence in employment rates between lone parents and single adults without dependent children*

Amongst the four studies that use difference-in-differences to look at the impact of WFTC on lone mothers, there are differences in how they take account of the fact that the employment rate of lone parents began to converge with that of single adults without children before WFTC was introduced:

- BBS and L assume that the convergence was temporary and would not have continued after 1998.<sup>2</sup>
- FK attribute the convergence in 1998 to an ‘anticipation effect’. However, it is open to question whether this anticipation effect actually existed. There certainly was a great deal of publicity about WFTC during 1998 (its main features were outlined in the government’s 1998 Budget), but it is hard to see why lone mothers would decide to move into work in anticipation of extra income 12 months distant.
- GH assume that the employment rates of lone parents and single adults with no children would continue to converge at the same rate as they did between 1992 and 1998, even if WFTC (or any other reform) had not been introduced.<sup>3</sup>

*What is causing the changes in employment?*

There is a difference in what the studies claim to be estimating the impact of:

- BDSS, using a structural model, are able to estimate separately the impact of WFTC alone, and the impact of WFTC and all other tax and benefit changes. But they do not attempt to estimate the impact of non-tax-and-benefit changes affecting parents.
- GH, using difference-in-differences with adults without children as a control group, acknowledge that they are estimating the impact not just of WFTC, but also of all other tax and benefit changes that affected parents differently from adults without dependent children, and also of welfare reforms that affected parents differently from adults without dependent children. BBS also acknowledge this (but the title of their paper is rather misleading).
- FK and L, like GH and BBS, use difference-in-differences with adults without children as a control group. This means that they too are estimating the impact not just of WFTC, but also of all other tax and benefit changes that affected parents differently from adults without dependent children, and also of welfare reforms that affected parents differently from adults without dependent children. But this is not acknowledged in their papers. However, because the study in L covers a very short time period in which the introduction of WFTC was easily the most important reform, it could be claimed that the estimates in L do relate to WFTC alone.

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<sup>2</sup> This assumption has minimal implications in L, because that study focuses on a very short time period – the changes between 1999 and 2000 – and any underlying convergence would have had very little effect over such a short period.

<sup>3</sup> GH also try applying trends from 1995 to 1998, but they do not find that this changes their results significantly.

## 4.2 Differences in results

### *Lone mothers: labour market participation*

Headline estimates of the effect of WFTC on the labour market participation of lone mothers range from no significant effect (in L) to 7ppts (in FK).<sup>4</sup> Much of this difference, though, can be explained when one investigates the details of the studies.

One simple difference is that not all the papers measure the same thing: the largest estimate (FK) relates to the change in the proportion of lone mothers working 16 or more hours per week; but all other papers report the increase in participation (i.e. working any number of hours a week) overall. Given that WFTC encouraged lone parents to work 16 hours or more, we would expect FK's estimate to be larger than those of the other studies. Indeed, GH estimate both that overall labour market participation by lone parents increased by 5ppts and that the proportion working 16 or more hours per week increased by 7.2ppts. Having appreciated this point, the FK estimate does not appear so implausibly high.

As discussed in Section 4.1, the studies have different approaches to the pre-1999 convergence in employment rates. GH assume that this convergence would have continued after 1999 even without WFTC; if this is correct, then the estimated effects found by L, FK and BBS are all biased upwards (although the bias affecting the estimate in L will be small, because the data in L cover a very short period). Indeed, FK report that the estimated effect of WFTC without the anticipation effect (i.e. between 1999 and 2000 only) was 4.5ppts, not much larger than estimates covering the same period from BDSS (3.66ppts) and consistent with the GH effect for 1998 to 2002.

L has a much lower estimate of the impact of WFTC than the other studies. Estimates from a pooled regression featuring all adults with children as the treatment group and all childless adults as the control group suggest that WFTC did increase participation on average by 0.9ppts. But when the effect of WFTC on the proportion of lone mothers in work is estimated separately from that on couples, the estimated impact on lone mothers is +0.6ppts and not statistically different from zero. The small effect may be due to the fact that L uses data from just before and just after the introduction of WFTC: this means that his estimated effect will not reflect delayed changes to labour market participation, nor the effects of changes to WFTC between 2000 and 2002. Furthermore, he cannot investigate the possibility of an anticipation effect in 1998 or early 1999, since that period corresponds to the pre-reform period in his study.

BBS estimate an increase in employment amongst lone mothers (not lone parents) of 3.6ppts, using 2000 to 2002 as the post-reform period. However, the precise

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<sup>4</sup> Estimates of the employment rate in 1998 lie between 40% and 45%, depending on the dataset used.

choice of the periods being compared makes it difficult to compare these results directly with estimates from the other studies. Nevertheless, this estimate is virtually identical to the effect estimated by BDSS for the impact of WFTC in 2000, and their estimated effect of all the tax and benefit reforms between 1999 and 2002 (this would be the correct comparison if the control group of non-parents were not affected by any of the reforms between 1999 and 2002). Given that there were some reforms (such as an increase in the level of income support given to lone parents) that induced an income effect away from work only among lone parents, we would expect the difference-in-difference estimates to be an underestimate of the true effect of WFTC.

#### *Lone mothers: full-time work*

We have already seen that WFTC led to a large increase in the proportion of lone mothers working at least 16 hours per week in order to be eligible for the credit. It may be reasonable therefore to expect there to be a similarly large effect on the proportion working more than 30 hours per week in order to claim the additional credit available. This is investigated by three of the papers.

FK estimate that the proportion increased by 9ppts, whereas BDSS estimate that the effect was 3.4ppts and L estimates it to be 4.3ppts, although this last estimate is not significantly different from zero. The large estimate in FK is likely to be the result of the ‘anticipation effect’, discussed above.

#### *Lone mothers: hours worked*

There is more of a consensus about the effect of WFTC on hours worked.

The change in overall average hours worked (i.e. including zeros for those who do not participate) is estimated by GH and BDSS, while the change in the average hours worked by those who work is estimated by these and L.

Between 1998 and 2002, GH estimate that there was an increase of 2.5hrs/week and BDSS estimate the increase was 1.78hrs/week. Estimates of the change in hours worked by workers in 2000 are 0.43hrs/week (BDSS) and (statistically insignificant) 1.7hrs/week (L).<sup>5</sup> Estimates of the change in hours worked by workers by 2002 are 1.2hrs/week (GH) and 0.75hrs/week (BDSS). These estimates are broadly consistent when we make careful like-for-like comparisons.

#### *Adults in couples with children: labour market participation*

There is again a substantial difference in the headline estimates in the three papers that study the impact of WFTC on labour market participation of adults in couples with children. BBS find that WFTC increased the labour market participation of

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<sup>5</sup> Although this may seem to be a large difference between BDSS and L, it is not statistically significant.

mothers in couples by between 2.6 and 4.3ppts, L finds an increase of 1.6ppts and BDSS estimate a slight reduction ( $-0.32$ ppts by 2000 and  $-0.57$ ppts by 2002).

However, BBS suggest that their results be treated with caution, because they find evidence that there are systematic differences in the trends in labour market participation of adults in couples with and without children. By using the solution proposed by GH (for single adults) – assuming a time-invariant rate of convergence in the absence of any policy – BBS estimate that WFTC reduced participation among women whose partner works by 1.2ppts and increased it by 0.4ppts for those whose partner did not work; for men, the equivalent figures were  $-1.6$ ppts and  $-0.3$ ppts respectively. These changes bring the estimates more into line with those of BDSS for the effect of all the changes between 1999 and 2002 on participation.

L estimates that the change in participation is  $+1.6$ ppts for women and  $+0.6$ ppts for men, but neither is statistically significant. It is again possible, given that he uses a difference-in-difference methodology, that his results are biased upwards in the same way as those of BBS.

#### *Adults in couples with children: hours worked*

The only comparison to make here is between L and BDSS, both of which estimate the increase in hours worked among workers between 1999 and 2000. The difference is rather large: BDSS predict no change, but L finds that women in couples with dependent children increased hours worked by 1.7hrs/week, on average. Given the proportion of women in couples with dependent children who were receiving WFTC at that time, L's estimate seems very high. On the other hand, there is no evidence that WFTC has significantly reduced hours worked amongst workers in couples with dependent children.

## **5. Conclusions**

WFTC seems to have had the positive impacts on labour market participation from previously workless families that we would expect from economic theory. Furthermore, large negative effects on the labour market participation of second earners do not seem to have materialised.

The increased generosity of the in-work credit system seems to have induced lone mothers to increase their participation in the labour market by around 5ppts between 1999 and 2002, and by a little less than this between 1999 and 2000. Much of this shift seems to have been into full-time work, and there also seems to have been a considerable shift among lone mothers from part-time to full-time work.

Among adults in couples with dependent children, there is some evidence that WFTC reduced the proportions of two-earner households and of workless households, just as we would expect from economic theory, but with little overall effect on the proportion of adults in these households who work.

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## Key results from each of the five papers

**Table 1. Key findings of each paper on the labour market outcomes of lone mothers**

<i>Study</i>	<i>Effect on participation</i>	<i>Effect on hours worked</i>	<i>Effect on earnings</i>
<b><i>Difference-in-difference approach</i></b> Gregg and Harkness, 2003	Increased employment by around 5ppts and increased proportion working at least 16hrs/week by 7.2ppts.	Overall average hours worked increased by 2.5hrs/week and workers increased hours by 1.2hrs/week on average.	23% increase in median earnings, mainly due to increased proportion working at least 16 hours per week.
Francesconi and Van der Klaauw, 2004	Increased proportion working at least 16hrs/week by 7ppts by 1999 and proportion working more than 30hrs/week by 9ppts. Found that there was an anticipation effect of the reform in 1998, which accounts for a 4ppt increase in the proportion working at least 16hrs/week and a 3.5ppt increase in those working more than 30hrs/week.	N/A	£62 per month average increase in labour income in 1999, rising to £70 increase by 2001, mainly due to increased participation among mothers with children aged 3–4.
Leigh, 2005	No statistically significant change found.	No statistically significant change found.	No statistically significant change found.
Blundell, Brewer and Shephard, 2005	Using LFS data, employment increased by 3.6ppts, especially among those with children aged over 11. When FRS data was used, effect estimated at 3.7ppts.	N/A	N/A
<b><i>Structural approach</i></b> Brewer et al., 2005	Increased employment by 5.11ppts by 2002; immediate impact (1999–2000) 3.66ppts. Effects highest for those with children aged 3–10 and with two or more children.	Overall average hours worked increased by around 1.78hrs/week and the average for workers only increased by 0.75hrs/week by 2002. Effect in 2000 was to increase overall average hours worked by 0.71hrs and increase it by 0.43hrs among workers.	N/A

*Notes:* LFS is Labour Force Survey; FRS is Family Resources Survey. For more details, see individual papers.

**Table 2. Key findings of each paper on the labour market outcomes of parents in couples**

<i>Study</i>	<i>Effect on participation</i>	<i>Effect on hours worked</i>	<i>Effect on earnings</i>
<b><i>Difference-in-difference approach</i></b>			
Gregg and Harkness, 2003	N/A	N/A	N/A
Francesconi and Van der Klaauw, 2004	N/A	N/A	N/A
Leigh, 2005	WFTC increased the participation of mothers by 1.6ppts and the proportion of fathers working more than 30hrs/week by 2.9ppts, although these changes were only significant at the 10% level.	Increase in hours worked of 1.746hrs/week for working mothers. No significant effect found for fathers.	7.7% increase in pre-tax earnings and 7.5% increase in post-tax earnings for mothers; 4.6% increase in pre-tax earnings for fathers.
Blundell, Brewer and Shephard, 2005	Using LFS (FRS) data, WFTC increased the participation of mothers whose partner was not working by 2.6ppts (4.3ppts). There was no statistically significant change for those whose partner worked. For men, it increased participation by 0.5ppt (1.5ppts) among those whose partners did not work and reduced participation by 1ppt (1.8ppts) among those whose partners did work.	N/A	N/A
<b><i>Structural approach</i></b>			
Brewer et al., 2005	In 2002 (2000), there was a reduction in participation among women in couples of 0.57ppt (0.32ppt) overall as a result of fewer women whose partner works working, and an increase in participation among men of 0.75ppt (0.46ppt) mainly as a result of those whose partner does not work working.	Increase in overall average hours worked among men; reduction among women but only a result of changes in participation. Average hours worked among workers changed little. This is true for both 2000 and 2002.	N/A

*Notes:* LFS is Labour Force Survey; FRS is Family Resources Survey. For more details, see individual papers.

**Table 3. Methodology used in each paper**

<i>Study</i>	<i>Data used</i>	<i>Time period</i>	<i>Methodology</i>
<b><i>Difference-in-difference approach</i></b> Gregg and Harkness, 2003	LFS and GHS	Data: 1979–2002. Effect of changes from 1998 to 2002.	Propensity score matching to find control group among single women without children, then difference-in-differences. There was a trend for the participation rate of lone parents to increase faster than that of single childless adults, so it was assumed that in the absence of any policy changes, this would have continued.
Francesconi and Van der Klaauw, 2004	BHPS	Data: 1991– 2001. Effect of changes in 1998, 1999, 2000 and 2001.	Fixed effects panel model involving lone mothers and single women without children.
Leigh, 2005	LFS	March 1999 – August 1999 compared with December 1999 – May 2000.	Fixed effects panel model involving adults with and without children. Separate regressions for all adults, predicted poor (using demographic characteristics to predict earnings prior to the reform), lone mothers and men and women in couples.
Blundell, Brewer and Shephard, 2005	LFS and FRS	1996–99 compared with 2000–02.	Probit model for labour market participation. Treatment effect estimated by interacting eligibility with whether the policy was on in the period in question. Real GDP, housing tenure type and regional dummies as controls.
<b><i>Structural approach</i></b> Brewer et al., 2005	FRS	Data: 1995–2003. Compared 1999 with both 2000 and 2002.	Structural discrete choice model of labour supply and participation in WFTC to simulate the effects of the policy reforms.

*Notes:* LFS is Labour Force Survey; GHS is General Household Survey; BHPS is British Household Panel Survey; FRS is Family Resources Survey. For more details, see individual papers.