The Impact of a Time-Limited, Targeted In-Work Benefit in the Medium-Term: An Evaluation of In Work Credit

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The impact of a time-limited, targeted in-work benefit in the medium-term: an evaluation of In Work Credit

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Abstract

Conventional in-work benefits or tax credits are now well established as a policy instrument for increasing labour supply and tackling poverty. A different sort of in-work credit is one where the payments are time-limited, conditional on previous receipt of welfare, and, perhaps, not means-tested. Such a design is cheaper, and perhaps better targeted, but potentially less effective. Using administrative data, this paper evaluates one such policy for lone parents in the UK which was piloted in around one third of the country. It finds that the policy did increase flows off welfare and into work, and that these positive effects did not diminish after recipients reached the 12 month time-limit for receiving the supplement. Most of the impact arose by speeding up welfare off-flows: the job retention of programme recipients was good, but this cannot be attributed to the programme itself.

JEL codes

H21, I38.

Keywords

In-work benefits, labour supply, time-limits, welfare, lone parents

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1.   Introduction and motivation

In-work benefits or tax credits are now well established as a policy instrument for increasing labour supply and tackling poverty. Much research has been on the experience of the EITC in the US, and the various in-work credits in the UK, both of which have been aimed principally at families with children, but a wide range of OECD countries have used in-work credits to some extent. A typical in-work credit is available indefinitely, and eligibility depends on current income and family status. But there is a growing trend, at least in the UK, to use a different sort of in-work credit, where the credit is time-limited, conditional on previous receipt of welfare (and with no, or only a limited, means-test, although this is a less important design feature). Such policies lie somewhere in between conventional in-work credits, and a conventional back-to-work bonus (we discuss the relevant literature in Section 2).

For a given level of generosity, a targeted, time-limited in-work credit is clearly cheaper than a conventional in-work credit. By conditioning on previous receipt of welfare, it may be better targeted on low-skill, potential-low-wage, individuals than a conventional credit (where high-wage individuals can cut their hours worked to become entitled to an conventional in-work credit). But, for someone currently on welfare, the encouragement to labour supply provided by a time-limited in-work credit may be lower than a permanent credit of the same weekly or monthly generosity.

This paper provides evidence on a targeted, time-limited, in-work credit from Great Britain (unhelpfully, the policy was called In-Work Credit, so we use "IWC" to refer to the specific policy in the UK, and "in-work credit" to refer to the generic policy). [2] We give more details of the policy and UK policy background in Section 2, but IWC was worth £40 a week, and could be received by lone parents who had previously spent at least a year on welfare if they moved into work of 16 or more hours a week, but with a maximum payment of 52 weeks. The policy was in operation in about a third of Great Britain, starting in different areas at different times. This naturally suggests the use of lone parents in areas where IWC was not in operation as a comparison group. The policy was made nationwide in April 2008, but the data available to us at the time of writing was up to April 2007. Our evaluation was limited to administrative data, limiting the outcomes that can be considered to whether lone parents are receiving welfare, and

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[2] Qualitative research which covers IWC includes Hosain and Breen (2007) and Jenkins (2008).

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whether they are in work (technically: whether their earnings would be liable for income tax). The administrative data, described more in Section 3, has no information on hours worked, and the information on annual earnings proved not to be usable.[3] In section 3, we also provide descriptive data on the take-up of IWC, the sort of lone parents who claimed it, the duration of IWC receipt, and how the labour market behaviour of IWC recipients differ from other lone parents who left welfare.

Section 4 sets out our econometric approach to estimating the additional impact of IWC. We use a model of transitions on and off welfare and IWC, which can provide a rich understanding of the impact of IWC – such as separating its overall impact into that due to encouraging exits from welfare to work, and that due to encouraging job retention[4], and we compare these results to those from a simple difference-in-differences estimator. Both estimates ultimately make use of lone parents in parts of Great Britain where IWC was not operating, as a control group.

The main question, then, is to what extent IWC led to less time on welfare, and more time in work, amongst those who were potentially eligible for it (lone parents are defined as *potentially eligible* for IWC if they have been receiving welfare for at least 12 months, and live in an area where IWC is being piloted; they would be eligible for IWC if they stopped claiming welfare and started a job of at least 16 hours a week). The overall effect of IWC could arise because it encouraged potentially eligible lone parents to leave welfare faster, or because it encouraged its recipients to stay in work and off welfare for longer (as they would lose eligibility for IWC if they stopped work or re-claimed welfare). We provide evidence on this in Section 5. The time-limit naturally raises a follow-up question: how did lone parents respond when they reached the 52 week limit of IWC payments? We address this descriptively in Section 3, and more thoroughly in Section 5. Section 6 concludes.

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[3] The data is known as the Work and Pensions Longitudinal Study (WPLS), help by the UK Department for Work and Pensions. The estimated impacts of IWC reported in this paper would be too small to be detected reliably using household survey data.

[4] Assessing whether IWC reduced the speed at which former welfare recipients re-claim welfare raises selection issues, as noted by Ham and LaLonde (1996), and Eberwein, Ham and Lalonde (1997).

2.   Detail of the In-Work Credit

2.1   In-Work Credit, and how it relates to existing welfare and tax credit policy for lone parents

In-Work Credit was available to lone parents who had been receiving welfare for a continuous period of 12 months or more;[5] and stopped claiming welfare and moved into work of at least 16 hours per week. It was payable at a rate of £40 per week for up to 12 months. Payments stopped after 12 months, or if the lone parent stopped working (very short periods out of work were over-looked), or if the lone parent re-claimed welfare. Lone parents had to provide payslips as evidence that they were still in work; employers had no other role, and would not normally know whether their employees were receiving IWC. The payments were made weekly in arrears, and were not means-tested, nor taxable, nor did they count as income for the purpose of other means-tested welfare benefits or tax credits. Repeat claims of IWC were allowed, but only if a lone parent spent 12 months on welfare to regain potential eligibility.

The government agency which operates welfare-to-work policies divides Great Britain into about 90 districts, and pilots operate at the level of the district ("Jobcentre Plus districts"). By 2007, IWC was operating in about a third of Great Britain, but this reflected a gradual roll-out, with IWC starting in four sets of districts on four different start dates: April 2004, October 2004, April 2005, October 2005.[6] Some of the districts were chosen because they had a relatively high number of lone parents claiming welfare, or because lone parents on welfare had low off-flow rates, but the extension to all of London and the south-east of England was motivated by the fact that the high level of rents and council tax (the local tax), and the associated means-tested rebate schemes (housing benefit and council tax benefit) led to weak incentives to work for lone parents.

IWC is by no means the only form of support for lone parents in the UK. Figure 1 shows the relationship between gross earnings and net income after liability to all direct taxes and entitlement to all welfare payments and tax credits. The figure assumes an hourly wage of £5.05 (which was the national minimum wage roughly halfway through

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[5] We use "welfare" throughout to refer to what are known in the UK as "out-of-work benefits". The relevant benefits were Income Support, Jobseekers Allowance, Incapacity Benefit, Carer's Allowance or Severe Disablement Allowance.

[6] In July 2007, IWC payments were increased to £60 a week in London, and the policy was introduced into the remaining districts in April 2008, but both of these are outside the period covered by our data (which ends in April 2007).

the data covered in this report), and so weekly pre-tax earnings of £80.80 correspond to 16 hours a week work, which is a key threshold in the UK's tax credit and welfare system. The figure shows the relationship with and without IWC for a typical lone parent on welfare, with one child, and who lives alone, paying a modest rent.[7] For reference, it also shows a 45 degree line whose intercept is the value of entitlement to all welfare benefits if the lone parent has no private income (in other words, it corresponds to a 0% participation tax rate). Without IWC, there is already a notch in the budget constraint at earnings levels which correspond to 16 hours work a week: at this point, lone parents lose entitlement to welfare benefit (*income support*), but gain entitlement to (the more generous) in-work tax credits (*working tax credit)*. IWC makes this notch considerably larger, and the PTR on low-earnings work falls to close to zero, which Saez (2001) and Brewer et al (2008) argue may well be optimal given what we know about lone parents' responsiveness to financial payoff to work.[8] Another very important point to note is that lone parents with low private resources had to fulfil extremely weak conditions in order to maintain eligibility for welfare benefits, with no requirement to be working, or even to be looking for work, until their youngest children were aged 16. This extremely – by international standards – generous approach to welfare benefits for lone parents must help explain why the UK relies so much on in-work payments as a way of encouraging lone parents to leave welfare and start work.[9]

IWC is the main focus of this paper, but in some districts, it was introduced alongside other labour market policies also designed to help lone parents into work, and they are detailed in Appendix A.

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[7] The programme that supports renters in the UK, housing benefit, is an entitlement-based programme, which will rebate rents up to locally-determined ceilings. It is also available to those in-work, but it has a very steep withdrawal rate. Brewer et al (2008) identify HB as the single-most important benefit in causing weak incentives to work in the UK. The vast majority of lone parents on welfare are entitled to HB.

[8] The other welfare benefits and tax credit to which these lone parents might be entitled are as follows: (1) a non-means-tested child benefit, worth £17.45 a week for families with 1 child; (2) a means-tested refundable child tax credit, worth £44.42 a week for families with 1 child and an income under £14,155 (and withdrawn at 37% after that); (3) at most one of the following: a means-tested refundable working tax credit, worth up to £63.55 but conditional on working 16 or more hours a week, and withdrawn at 37% for annual earnings above £5,220; a means-tested welfare benefit (income support), worth £57.45 a week, but conditional on working less than 16 hours a week, withdrawn at 100% after a weekly earnings disregard of £15; (4) Housing benefit and council tax benefit (a benefit which offsets liability to the local tax in the UK, which is known as council tax), whose generosity depend upon the rent and council tax liabilities, and which are both withdrawn steeply once entitlement to welfare benefits has been fully withdrawn. All amounts correct for 2006-7, the last year covered by our data. There is more analysis of the financial work incentives facing lone parents in the UK in Brewer et al (2007) and Brewer et al (2008).

[9] Welfare benefits for lone parents have since beoame less generous: by 2011, lone parents whose youngest child is aged 7 or over will have to look for work and accept reasonable job offers as a condition of receiving welfare benefits.

2.2 Previous literature and what might be expected to happen?

A considerable amount is known about conventional in-work credits, and how they affect labour supply, particularly for lone parents in English-speaking countries: see, for example, Brewer, Francesconi et al (2009) and references therein. Such research tells us that lone parents are relatively responsive on the extensive margin, leading some to argue that participation tax rates should be set at levels close to zero, or even negative, for such groups (Saez, 2001; Brewer et al (2008)).

Analysis of US welfare reform can clearly provide insights into the impact of time-limits (ie Grogger and Karoly, 2005), but the nature of the welfare experiments and their inherent incentives are rather different from those produced by IWC: time-limit in the US have tended to refer to time-limits on the whole of welfare payments (ie the AFDC or TANF programmes) relative to a world where those programmes exist with no time-limits, rather than a time-limit on an in-work supplement relative to a world with no in-work supplement.

The most well-known of the targeted, time-limited in-work credits is the Canadian Self-Sufficiency Project, a large-scale demonstration project in the 1990s which made use of random assignment (Card and Hyslop, 2006, and references therein). The design of IWC has some similarities with SSP – both were available only to lone parents who had spent at least a year on welfare, and both programmes required lone parents to leave welfare and move into work to receive the payments. But SSP was conditional on work of 30 hours a week, rather than 16, and could be paid for 3 years, rather than 1. But it also had some features not found in IWC: first, if lone parents did not move into work within a year of being enrolled into the demonstration programme, then they could never receive SSP; second, once lone parents had received their first SSP payment, they would receive it for each of the next 36 months in which they were in full-time work: in periods out-of-work, no SSP was paid, but a lone parent did not need to spend 12 months back on welfare in order to receive more SSP payments.

The other targeted, time-limited in-work credits that have been operated in the UK have not been robustly evaluated. [10]

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[10] The Return to Work credit for people on disability benefits has been evaluated as part of a package of reforms (see Adam et al (2008)), but the evaluation could not isolate the impact of the credit.

Card and Hyslop (2005, 2006) set up a simple search model, and analyse how the SSP affects incentives and behaviour. The changes in incentives induced by IWC are simpler, so the sort of considerations in Card and Hyslop, as well as past evidence from similar programmes suggest the following responses are likely following the introduction of IWC:

i. IWC should make it more likely that a *potentially eligible* lone parent in a district operating IWC leaves welfare and starts a job of at least 16 hours a week.[11]

ii. Having left welfare for a job, IWC should make it more likely that its recipients stay in work of at least 16 hours a week. However, this effect may decline, or cease entirely, when the 52-week time-limit of IWC payments is reached.

iii. The existence of IWC may induce some lone parents who would otherwise have left welfare after less than 12 months to remain on welfare for longer in order to become potentially eligible for IWC. Such responses are known as "anticipation effects". [12] (Card and Hyslop (2006) find evidence of such anticipation effects for lone parents in Canada who were potentially eligible for the Self-Sufficiency Project (SSP) programme if they remained on welfare for 12 months).

iv. A more extreme response is that the existence of IWC may induce some lone parents who would not have claimed welfare at all to claim welfare in order to become potentially eligible for IWC.

Responses (i) to (ii) are investigated in this paper. Some evidence on response (iii) is shown in Brewer et al (2009), but it is not possible to investigate response (iv) with the data available to us, although this seems *a priori* an extreme response.

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[11] Lone parents are defined as *potentially eligible* for IWC if they have been receiving Income Support (IS) / Jobseeker's Allowance (JSA) for at least 12 months and live in a Jobcentre Plus (JCP) district where IWC is being piloted; they would be eligible for IWC if they stopped claiming welfare, started a job of at least 16 hours per week and were living in a JCP district operating IWC at the time (this concept of being "potentially eligible" is fundamental to our evaluation).

[12] The benefits from doing this would be up to £2,080 in IWC payments; assuming it is costless to delay leaving welfare for a job, the only cost would be the net earnings (i.e. net of taxes paid and welfare lost) forgone during the period of delay.

3.   Data, and descriptive analysis

3.1   Data

The focus of this paper is on the impact of In Work Credit on those lone parents who were potentially eligible for it. We make use of administrative data on spells on welfare benefits, payments of IWC, and employment records – known as the Work and Pensions Longitudinal Study (WPLS) – augmented with local-area data which we mapped in using claimants' postcodes (see Appendix B). The data used means we cannot learn about the impact of IWC on the lone parent employment rate nor on the proportion of lone parents claiming IS/JSA: in practice, the small impacts that this paper estimates (discussed in subsequent sections) mean that any impact on the overall employment rate amongst lone parents would be very small.

3.2   Descriptive analysis: who received In Work Credit, and how did their labour market behaviour differ from other lone parents on welfare?

By March 2007, just under 10 per cent of potentially eligible lone parents had received IWC: this provides a theoretical upper bound to the additional impact of IWC on the proportion of lone parents who leave welfare or move into work (see Figure 3.1 in Brewer et al (2010)). Table 1 shows that IWC recipients made up 18–19 per cent of all lone-parent welfare leavers, and 27 per cent of all lone parents who leave welfare after 12 months in the pilot districts. Lone parents leave welfare for reasons other than moving into jobs of at least 16 hours a week, and so this measure of participation should always be lower than 100 per cent. [13]

The majority of IWC recipients (66–67 per cent) claim for at least 11 of the maximum 12 months, 15–17 per cent claim for between six and 11 months and 16–19 per cent claim for less than six months (see Table 2). [14]   Table 3 shows that IWC recipients are slightly less likely to be male and are over a year younger, on average, than other lone parents who left welfare but did not receive IWC); they tend to have fewer children; they have

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[13] To be genuinely entitled to IWC, a lone parent has to be potentially eligible, and then leave welfare and start a job of at least 16 hours per week, so an obvious definition is "Number of new IWC recipients as a percentage of the number of potentially eligible lone parents who left welfare and started a job of at least 16 hours a week over some period." However, Brewer et al (2007) showed that the administrative data on work spells is not accurate enough to withstand an estimate of IWC take-up on this definition.

[14] We use at least 11 months as a proxy for the full 12 months to allow for measurement error in the start and end dates. Brewer et al (2009) shows that using the total amount of IWC received to infer the length of claim makes very little difference to the results.

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spent less of the past 21 months on welfare; they are considerably more likely to have been on NDLP[15] in the three years prior to leaving welfare than non-IWC recipients; they are less likely to have been recorded as receiving a disability benefit in the 18 months before leaving welfare than non-IWC recipients. Essentially, IWC recipients tend to have slightly more of the characteristics that are associated with return to work than other lone parents who leave welfare after at least 12 months in the pilot districts (i.e. than other potentially eligible lone parents). Within IWC recipients, long-claim IWC recipients are slightly less likely to be male than short-claim IWC recipients, are nearly 3 years older than them on average, are significantly less likely to have a child under the age of 3 and significantly more likely to have a child over the age of 7 (Brewer et al (2009), Table 3.7). (For previous research on factors associated with lone parents' return to work, see Yeo (2007), D'Souza *et al* (2008) and La Valle *et al* (2008).)

We would expect IWC recipients to have different labour market behaviour from other lone parents who left welfare, particularly those who left welfare but not for IWC in pilot districts. Figure 2 illustrates the proportions of IWC recipients, and other welfare leavers, who are in work, from two years before to 30 months after leaving welfare (chapter 3 of Brewer et al (2009) shows equivalent Figures for receipt of welfare). There seems to be little change in outcomes for IWC recipients at around the time of the 52 week time-limit, but not all lone parents receive IWC for the full 52 weeks. Figure 3 explores this further by illustrating the welfare and work profiles for IWC recipients split according to the length of their IWC claim. The patterns of employment in the months before receving IWC are similar, but there are clear differences thereafter according to the length of the IWC claim. Unsurprisingly, lone parents who claimed IWC for at least 11 months are the most likely to be in work in the 30 months subsequent to claiming IWC: two-thirds (66 per cent) of IWC recipients whose claim lasted at least 11 months are in work one year after leaving welfare, compared with 35 per cent of IWC recipients whose claim lasted between six and 11 months, and 26 per cent of IWC recipients whose claim lasted less than six months. But even after isolating those lone parents who received IWC for the full 52 weeks, there is no discernible evidence that lone parents stopped work, or re-claimed welfare, when they reached the time-limt for IWC payments.

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[15] NDLP is a voluntary labour market programme for lone parents. It gives the lone parent more frequent contact with a dedicated Personal Advisor, and it gives the Personal Advisor access to a greater range of support, cash grants and training opportunities that he or she can use to help the lone parent enter work.

4. Empirical methods

Ham and Lalonde (1996) considered the impact that a training programme, aimed at welfare recipients, had on the participants' subsequent spells of employment. They note that, even with random assignment of welfare recipients to training programmes, the existence of the training programme alters the nature of those in the treatment group who go on to employment, meaning that those in the control group who go on to employment are not, in general, a valid comparison group. Even with experimental data, they argue, non-experimental methods will be needed.

Our set-up is similar, but without the random assignment. We are interested in the impact that IWC had on inital job entry rates, recipients' job durations, and job exits and/or flow rates back on to welfare. But IWC will in principle alter the nature of lone parents who leave welfare for work, and so lone parents who left welfare for work in our comparison group (which in our case refers to lone parents in different districts, having accounted for district fixed effects by using pre-programme data) are not a valid control group. Accordingly, we follow Ham and Lalonde (1996), and Eberwein et al (1997) to estimate a model of transitions on and off welfare, and how these are affected by IWC.

An ideal model would allow lone parents to be in one of three (exhaustive and mutually-exclusive) states:

1. receiving welfare

2. not receiving welfare, and in work for at least 16 hours per week;

3. not receiving welfare, and working for fewer than 16 hours per week (including not working at all).

In this ideal model, there are six transitions, each of which could be modelled as a function of observable and unobservable characteristics, as well as being potentially eligible for or receiving IWC. However, the data available to us was not sufficient to estimate this ideal model. As discussed in Appendix B (and in more detail in Brewer et al (2007)), the employment data in the Work and Pensions Longitudinal Study (WPLS) does not provide an accurate guide as to whether a lone parent is in work of 16 or more hours per week, with apparent errors in both directions: some lone parents are recorded as being in work when this seems to conflict with the out-of-work welfare benefits that they are receiving, and some lone parents are not recorded in work when it seems highly

likely that they are working for at least 16 hours a week (see also Figure 2 and 3 for an example of this). Adapting a duration model to account for this form of measurement error would be complicated. For this reason, the duration model we estimated does not use the employment data in the WPLS, and that means that, for the vast majority of lone parents who stop receiving an out-of-work welfare benefit, we cannot tell whether they are working, and, if so, for how many hours a week. However, given the programme rules, it is extremely likely that lone parents receiving IWC are working 16 or more hours, and we make use of this information, plus an assumption about full take-up of IWC amongst those eligible to do so, to estimate our model.

The model is based on a standard utility-maximising framework in a discrete time setting where lone parents move from one state to another at time t if the utility gained from doing so is greater than the utility of remaining in the same state. Let the additional utility gained from moving from welfare to work of 16 or more hours at time t be:

$$(1) \quad z_{b,w}(t \mid \theta_{b,w}) = x^t \beta_{b,w} + \theta_{b,w} + \varepsilon_{b,w}^t$$

and the additional utility from moving from welfare to work of fewer than 16 hours (including not working at all) at time t be:

$$(2) \quad z_{b,nw}(t \mid \theta_{b,nw}) = x^t \beta_{b,nw} + \theta_{b,nw} + \varepsilon_{b,nw}^t$$

where x is a vector of observable characteristics such as number of children and age of youngest child (which affect the cost of working and the amount of welfare received out of work), θ is an individual random effect and ε is an error term.

If the error terms take independent and identically-distributed (iid) type 1 extreme value distributions, we can model the transitions using a multinomial logit model; this means that the probability of moving from welfare to work of 16 or more hours is modelled as:

$$(3) \quad \lambda_{b,w}(t \mid \theta_{b,w}) = \frac{\exp(z_{b,w}(t \mid \theta_{b,w}))}{1 + \exp(z_{b,w}(t \mid \theta_{b,w})) + \exp(z_{b,nw}(t \mid \theta_{b,nw}))}$$

and the probability of a lone parent moving from welfare to work of fewer than 16 hours (including zero) is:

$$(4) \quad \lambda_{b,nw}(t \mid \theta_{b,nw}) = \frac{\exp(z_{b,nw}(t \mid \theta_{b,nw}))}{1 + \exp(z_{b,w}(t \mid \theta_{b,w})) + \exp(z_{b,nw}(t \mid \theta_{b,nw}))}$$

and the probability of remaining on welfare is:

$$(5) \quad 1 - \lambda_{b,w}(t \mid \theta_{b,w}) - \lambda_{b,nw}(t \mid \theta_{b,nw}) = \frac{1}{1 + \exp(z_{b,w}(t \mid \theta_{b,w})) + \exp(z_{b,nw}(t \mid \theta_{b,nw}))}.$$

However, it is only possible to distinguish between the first two transitions for lone parents who are potentially eligible for IWC, and then only if it is assumed that there is full take-up of IWC by those who are directly eligible. In particular, it has to be assumed that lone parents who are potentially eligible for IWC and then stop receiving welfare move into work of 16 or more hours if and only if they then claim IWC. For lone parents who are not potentially eligible for IWC, the model simply examines transitions from receiving an out-of-work welfare benefit to not receiving an out-of-work welfare benefit, and it models this transition as the sum of the transition of leaving an out-of-work welfare benefit for work of 16 or more hours and the probability of leaving an out-of-work welfare benefit for work of fewer than 16 hours, or the probability of them leaving welfare is:

$$(6) \quad \lambda_{b,w}(t \mid \theta_{b,w}) + \lambda_{b,nw}(t \mid \theta_{b,nw}) = \frac{\exp(z_{b,w}(t \mid \theta_{b,w})) + \exp(z_{b,nw}(t \mid \theta_{b,nw}))}{1 + \exp(z_{b,w}(t \mid \theta_{b,w})) + \exp(z_{b,nw}(t \mid \theta_{b,nw}))}.$$

For lone parents not on welfare, a similar reasoning leads to the probability of a lone parent starting a welfare claim being expressed as:

$$\lambda_{nb,b}(t \mid \theta_{nb,b}) = \frac{\exp(z_{nb,b}(t \mid \theta_{nb,b}))}{1 + \exp(z_{nb,b}(t \mid \theta_{nb,b}))}$$

and the probability of them remaining off welfare as:

$$1 - \lambda_{nb,b}(t \mid \theta_{nb,b}) = \frac{1}{1 + \exp(z_{nb,b}(t \mid \theta_{nb,b}))}$$

The transitions are, in general, allowed to depend upon unobservable characteristics. In our implementation, the unobserved heterogeneity is assumed to be uncorrelated across individuals, but correlated for a given individual over time and between transitions of different types. This models explicitly the process that gives rise to dynamic selection bias, and therefore allows its effect to be distinguished from that of a genuine impact of IWC. We assume that the unobserved heterogeneity terms in the three equations follow the one factor structure:

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$$(9) \quad \theta_{i,j} = \alpha_{i,j} + c_{i,j}\theta^*$$

where θ^* takes a two mass point discrete distribution and $\alpha_{b,w} = 0$ and $c_{b,w} = 1$.

To allow the model to estimate the impact of IWC, the probability of transiting from receiving an out-of-work welfare benefit to work of 16 or more hours a week depends upon an indicator for being potentially eligible for IWC, and the probability of transiting from work of 16 or more hours a week to receiving an out-of-work welfare benefit depends upon an indicator which is equal to 1 for the 4 quarters after a lone parent first received IWC. Since potential eligibility for IWC depends upon duration on welfare, calendar time and whether a lone parent is in a pilot district or not, these variables are also included as explanatory factors. In principle, then, the impact of being potentially eligible for IWC on the transitions into work of 16 or more hours can be identified in three ways:

- from variation in the transition rates between lone parents in pilot and comparison districts observed at the same time and with the same duration on welfare;

- from variation in the transition rates between lone parents in the same district and with the same duration on welfare but before and after the introduction of IWC (we control for calendar time with a quadratic in the number of quarters elapsed since April 2001);

- from variation in the transition rates among lone parents in the same JCP district observed after the introduction of IWC but with different durations on welfare (we control for duration on welfare with a quadratic in the number of quarters).

To estimate the model, we turn the spell-based WPLS data into discrete-time, quarterly data (we pretended that outcomes are observed only on the 15th of the middle month of the quarter, thereby ignoring transitions in between these dates). The initial state for every lone parent is receiving an out-of-work welfare benefit: we sample all IS and JSA claims starting later than 1 April 2001 where the claimant is a lone parent at some point during that claim, and right-censor all data on 31 March 2007, allowing for repeated claims. This gives a dataset of over 1.4 million lone parents, from which we take a 5 per cent sample, giving us a sample of over 70,000 lone parents and 1.1 million person-quarter observation points. Table 4 shows the distribution of the number of transitions onto and off welfare made by lone parents during the period we observe them in the full population in the WPLS.

A small set of the explanatory variables was used: number of children, age of youngest child, calendar time, duration in current state and indicators for living in each of the pilot phases. The model assumed that there were no effects of IWC on lone parents who were not potentially eligible for it (i.e. that there were no substitution or anticipation effects). The whole model was estimated in Stata using maximum likelihood methods.

As a check on the duration model, estimates were also produced using a standard linear DiD regression. The equation estimated is:

$$y_{igt} = \lambda_t + \alpha_g + x_{gt}\beta + z_{igt}\gamma + u_{igt}.$$

λ_t is a full set of quarterly indicators, α_g is a full set of district effects, and x_{gt} is an indicator for being in a district that is operating IWC at that time; z_{igt} is a set of personal characteristics, and u_{igt} is an iid error term. The sample is all lone parents in all districts in Great Britain not operating other major pilots or demonstration projects affecting lone parents whose claim on IS had reached 12 months, and outcomes are measured at 3 month intervals thereafter. This method provides an estimate of the overall effect of IWC on lone parents who are potentially eligible for IWC, but makes no use of which lone parents actually received IWC (and, as a result, estimates the "intention to treat") and cannot separate the impact of IWC into its impact on benefit exits/job entries and on subsequent benefit claims/job exits. Separate estimates were made of the impact of IWC on the two different outcomes (off welfare and in work), and the outcomes at different durations *d* (the time between first becoming potentially eligible for IWC and the outcome being measured); more details are given in Brewer et al (2009).

The DiD, and, to a lesser extent, the estimates from the duration model, rely on the usual "common trends" assumption: that differences between the districts operating IWC and those not operating IWC can be reflected with a time-invariant constant (contained in α_g). Brewer et al (2009) present analysis based on the linear DiD approach to suggest that non-time-varying area-effects is an appropriate assumption in the period from 2001 to before IWC began, and show that a placebo test using the DiD method returns statistically insignificant estimates of a non-existent policy (implemented a year before the actual IWC policy).

5. The impact of IWC on potentially eligible lone parents

5.1 Coefficients in the duration model

Tables 5 and 6 show the estimated coefficients, including the impact of being potentially eligible for IWC, on the transitions from receiving welfare to work of 16 or more hours, from receiving welfare to work of fewer than 16 hours and from not receiving welfare to receiving welfare, with and without controls for correlated unobserved heterogeneity.

The following variables are associated with more frequent transitions from welfare to work of 16 or more hours:

- having fewer dependent children;

- having older children;

- being in one of the comparison districts rather than one of the Phase 3 districts.

The following variables are associated with more frequent transitions from welfare to work of fewer than 16 hours:

- having older children;

- being in one of the comparison districts rather than a pilot district.

The following variables are associated with less frequent transitions onto welfare (conditional on having previously stopped a claim of welfare):

- having more dependent children;

- having older children;

- being in one of the Phase 3 or 4 districts rather than one of the comparison districts.

Being potentially eligible for IWC is estimated to increase transitions into work of 16 or more hours, and receiving IWC is estimated to reduce transitions onto welfare.

The specification of the unobserved heterogeneity allowed there to be two types of lone parents, with different propensities to leave welfare for work of 16 or more hours, to leave welfare for work of less than 16 hours and to start a welfare claim. In all three models, the fact that the loading factors on the unobserved heterogeneity components are positive in all equations imply that, rather than one of these types being

unambiguously more likely to be off welfare at any point in time, instead one of these types is more likely to make a transition at any point in time; this is the same as was found by similar studies (e.g. Ham and Lalonde, 1996; Zabel *et al*, 2004, 2006). A model with no unobserved heterogeneity is clearly rejected in favour of a model with correlated unobserved heterogeneity (the likelihood ratio test for the baseline model has a value of 778.8).

5.2 Estimates of the impact of IWC on job entry

The duration model can then be used to estimate the impact of IWC by simulating how outcomes would change in the absence of IWC. This is done by using the estimated coefficients and a set of random draws (corresponding to the error terms) to determine whether each transition is simulated to occur. [16] Figure 4 shows the results of such a simulation for all potentially eligible lone parents in the pilot districts, and overlays that with the DiD estimates (themselves taken from Table 7). The estimated impact of IWC on potentially eligible lone parents in the flow sample based on the duration model increases the longer lone parents are potentially eligible, reaching around 2 ppts 12 months after lone parents first became potentially eligible for IWC; after 24 months' exposure, the impact is around 3 ppts. The estimated impacts of IWC derived from the duration model are slightly larger than the DiD estimates (it is not possible to estimate whether the difference is statistically different from zero, as the two estimates are from entirely different models); even so, the differences could exist for a number of reasons:

- The duration model was estimated on a 5 per cent sample of lone parents (over 70,000 lone parents, 1,300 of whom received IWC), whereas the DiD analysis used all potentially eligible lone parents. This means that the estimates from the duration model are subject to a higher margin of error than those based on a DiD estimator.

- The DiD analysis controlled for many more explanatory variables than the duration model, and so it is possible that part of the simulated impact of IWC using the duration model is capturing the impact of a characteristic that has been omitted from the model.

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[16] The random draws were calibrated so that the set of draws is consistent with the observed behaviour under the baseline model. Only 1 draw was used for each transition.

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- The duration model assumes that the effect of IWC on the probability of starting and leaving welfare is the same for the stock and flow samples, and that it is the same for all durations of time spent on welfare, but the DiD estimates relax these assumptions by running different regressions for the stock (not shown) and flow, and at every three-month point after the date on which the lone parent first became potentially eligible for IWC.

Figure 5 shows the result of a similar simulation, but only for IWC recipients in the flow sample. It shows the percentage who are simulated to receive welfare and IWC in each quarter relative to when they actually received IWC. Outcomes are simulated with and without the estimated coefficient on the IWC dummy in (1). The additional impact of IWC, then, is the vertical difference between the fraction off welfare, and the fraction simulated to be off welfare in the absence of IWC. Just over 40 per cent of lone parents in the sample who left welfare for IWC would not have left welfare *at that point in time* if IWC had not been available. However, the additional impact of IWC on the proportion of IWC recipients who are not receiving an out-of-work benefit declines over time to reach 28 per cent after 12 months and 19 per cent after two years. Over the 24 months after first receiving IWC, the average impact on welfare outcomes for its recipients is 29 per cent. In other words, the simulations suggest IWC led to its recipients being 29 per cent more likely to be off welfare over the 2 years following their first receipt of IWC.

There are several reasons for this decline over time. First, some of the 40 per cent of IWC recipients who are estimated to have been induced to leave welfare by IWC would have left welfare anyway in the absence of IWC, but at a later date. Second, some lone parents who leave welfare for IWC later return to welfare. More subtly, the additional lone parents who are induced to leave welfare by IWC return to welfare slightly more quickly than those who would have left anyway: 28 per cent of lone parents who are induced to leave welfare by the existence of IWC return to welfare before the end of the 12 months of IWC, compared with 26 per cent of those who would have left welfare in any event (it is not possible to tell whether these numbers are statistically significantly different from each other).

Deadweight might be defined as the extent to which a programme fails to alter the behaviour of its recipients, or 1 minus the impact amongst its recipients. Under this definition, the estimated deadweight at the moment that lone parents claim IWC is 60 per cent, but it rises over time, just as the estimated impact of IWC on its recipients falls

over time. After 12 months, 19 per cent of the IWC recipients (some of whom are, by this stage, no longer receiving IWC) have returned to welfare, and 54 per cent are not receiving welfare but would have been not receiving welfare anyway in the absence of IWC, with the remaining 28 per cent representing the additional impact of IWC (because they are not receiving welfare but would have been receiving welfare in the absence of IWC). After 24 months, none of the group is receiving IWC. But 34 per cent are back on welfare, and 47 per cent who are not receiving welfare would have left welfare anyway in the absence of IWC, and only the remaining 19 per cent are simulated to have had their labour market state altered by IWC.

5.3   Estimates of the impact of IWC on job retention

The duration model allows the overall additional impact of IWC to be separated into the impact of IWC on encouraging more lone parents to leave welfare and the impact of IWC on encouraging those lone parents who left welfare for work to stay in work and off welfare for longer. This can be done by performing a simulation where entitlement to IWC affects transitions off welfare, but there is no impact on transitions back on to welfare; this can be compared to the baseline simulation which assesses the overall impact of IWC.

The results are presented in Figure 6. The dark grey area shows the additional impact of IWC on IWC recipients that is due to IWC encouraging more lone parents to leave welfare for work; the light grey area shows the additional impact of IWC on IWC recipients that is due to any retention effects, and the sum of the two areas corresponds to the overall impact presented in Figure 5 (in Figure 5, the overall impact is the distance between the actual % off benefit, and the simulated % off benefit in the absence of IWC). In month 0, the simulations suggest that just over 40 per cent of IWC recipients would have left welfare for work at that time, and none of this (by definition) can be due to a retention effect: it is all due to IWC encouraging more lone parents to leave welfare for work. Over time, the retention effect grows, but it remains small: the simulations suggest that the retention effect of IWC leads to 2.6 per cent of IWC recipients remaining off welfare 12 months after they first left welfare for work (and claimed IWC).[17] But these numbers are much smaller than the overall impact of IWC: out of the

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[17] These estimates are close to the estimated impact of IWC on job retention derived from a DiD model, which takes as a sample all lone parents who leave IS and start a job after at least 12 months on welfare, of 2.2 per cent for welfare outcomes (and 1.8 per cent for work outcomes). See Section 8.1 of Brewer et al (2010).

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estimated impact of IWC on its recipients 12 months after they first received IWC, only 9 per cent of the impact can be attributed to a retention effect.

Note that the simulations also suggest that IWC are having an effect on (former) recipients even after IWC recipients have exhausted the 12-month payment period: although there is a decline over time in the estimated impact of IWC on recipients, there is no discernible fall after 12 months. Clearly, though, the data does not yet tell us for how long the overall effect lasts.[18]

This result should be seen alongside the discussion in Section 3 on what happened to IWC recipients when their claim of IWC ended. That showed that, for the majority (around seven in ten) of IWC recipients who claimed IWC for the full 12 months, job retention remained very high even after IWC payments had finished. Combining these two findings about job retention suggests that job retention is high amongst the majority of IWC recipients, although little of this is attributable to IWC.

The results above have assumed that there are no anticipation effects. Brewer et al (2009) reports coefficients from a model that allows for anticipation effects for those whose duration on welfare is less than 12 months but who would become eligible to IWC later, and from a model where the probability of leaving welfare changes in the pilot areas after IWC is introduced for all lone parents, for reasons unconnected to IWC: we refer to this model as one with 'time-varying area effects'): loosely speaking, the 'time-varying area effects' is identified from lone parents whose duration on welfare is less than 12 months, and the impact of IWC comes from a triple difference, comparing the exit rates of lone parents is more than 12 months with those whose duration is less than 12 months, and how this changes over time and across districts.

Anticipation effects are statistically insignificant in both the models with and without unobserved heterogeneity. Time-varying area effects are statistically significant in the model with unobserved heterogeneity. Figure 7 shows the result of a simulation for all those who start a welfare claim after IWC is introduced in their area and includes results from the model variants where we allow for anticipation effects and time-varying area effects. Comparing the results from the baseline model with the models with

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[18] Card and Hyslop (2005, 2006) examine whether the impact of the Self-Sufficiency Project (SSP) in Canada declines after it stops being paid to recipients. For some groups, they find the additional impact of SSP dissipates quickly after SSP payments stop (Card and Hyslop, 2005); but for other groups, they find the additional impact persists (Card and Hyslop, 2006); the two groups roughly correspond to the stock and flow samples examined in this paper.

anticipation effects and time-varying area effects suggests that allowing for anticipation effects makes very little difference to the overall results – the anticipation effects are small and statistically insignificant in both the models with and without unobserved heterogeneity. Allowing for time-varying area effects increases the effect of IWC on the proportion of lone parents off welfare by up to 1 percentage point.

6.   Conclusions

The three main issues posed by this paper are: to what extent IWC led to less time on welfare, and more time in work, amongst those who were potentially eligible for it; how did lone parents respond when they reached the 52 week limit of IWC payments; and were the overall impacts mostly due to faster exits from welfare, or slower returns to welfare from welfare leavers. Our data was not able to tell us whether IWC led to changes in earnings, nor if it had any impact on the number of lone parents claiming welfare or in work overall.

IWC led to statistically significant improvements in work and welfare outcomes. For example, 12 months after first becoming potentially eligible for IWC, just under a fifth (18.2 per cent) of potentially eligible lone parents were no longer receiving an out-of-work benefit, with 1.6 percentage points (ppts) of that 18.2 per cent attributable to IWC. Twelve months after first becoming potentially eligible for IWC, a seventh (14.3 per cent) of potentially eligible lone parents were in work according to the WPLS, with IWC responsible for 1.0 ppts of this 14.3 per cent.

The main impact of IWC has been to encourage more lone parents to leave benefit and start work than would otherwise have done so; the effect of IWC on reducing the benefit re-entry rate of IWC recipients seems to have been very small in comparison. On the other hand, simple data analysis suggests that job retention amongst IWC recipients was high: just under 70 per cent of lone parents who claimed IWC received it for the maximum 12 months, and, for those lone parents, there is no discernible changes to key labour market outcomes when IWC payments stop, and over 80 per cent are still not receiving an out-of-work welfare benefit one year after they stopped receiving IWC. These findings strongly suggest that there are high levels of job retention for the majority of IWC recipients who are able to maintain an IWC claim for the full 12 months, but that these are not particularly caused by IWC.

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How do the estimated impacts compare with those of other Department for Work and Pensions (DWP) programmes for lone parents? Cebulla et al (2008) sought to compare the findings of a number of evaluations and impact assessments of UK government policies designed to encourage lone parents to work: see especially their Table 1 on pages 10–11. The headline result in this paper for the flow sample is that, after 12 months of being potentially eligible for IWC, IWC led to an additional XX ppts of potentially eligible lone parents being off welfare (i.e. not receiving IS, JSA or Incapacity Benefit). After 24 months, the figure was 2.0 ppts. Cebulla et al calculated the impact of NDLP amongst all lone parents on welfare to be 1.7 percentage points after nine months and 1.4 percentage points after two years. They also reported that, after 12 months, the impact of WFIs was 0.8 per cent for lone parents with youngest children aged over 13 and 2.0 per cent for lone parents with youngest children aged 9–12. All three programmes therefore seem to have had impacts on the population of lone parents on welfare that are similar in magnitude (however, the estimated impacts of the three programmes are all for slightly different populations: our estimates are for all lone parents whose welfare claim reaches 12 months in the pilot districts, the NDLP estimate is for all lone parents on welfare in Great Britain and the WFI estimates are for the stock of lone parents on welfare with children of various ages). Dolton et al (2006) estimated that NDLP led to its participants being 14 per cent more likely to be off welfare as a result over the subsequent 2 years, although a later paper highlighted alternative estimates (which were preferred by the same authors) of 5% to 10%. [19] Our equivalent estimate is that the average impact on IWC recipients over the subsequent 2 years is 29 per cent. Ultimately, of course, an impact assessment alone does not provide sufficient evidence to determine whether a policy is cost effective or should be continued: such decisions should be based on a full cost–benefit analysis, fully informed by the estimates in this impact assessment.

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[19] Tables 4, 6 and 7 of Dolton et al (2008).

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Tables

Table 1 Summary of the destinations of lone-parent welfare leavers

	Comparison districts	Pilot districts	
		IWC claim length defined using start and end dates	IWC claim length defined using amount received
Leave welfare after claiming for at least 12 months, of which:	**201,761 (63.0%)**	**66,523 (68.3%)**	**65,937 (68.1%)**
IWC recipients		*18,284 (18.8%)*	*17,698 (18.3%)*
Leave welfare after 12 months but not for IWC		*48,239 (49.5%)*	*48,239 (49.8%)*
Leave welfare after claiming for less than 12 months	**118,583 (37.0%)**	**30,903 (31.7%)**	**30,903 (31.9%)**
Total	**320,344**	**97,426**	**96,840**

Note: Sample is all lone parents who left welfare between the introduction of the pilots and 31 March 2006.

Table 2 Length of IWC claim, by phase

	All phases
	IWC claim length defined using spell start and end dates
At least 11 months	13,609 (67.2%)
6–11 months	3,397 (16.8%)
Less than 6 months	3,238 (16.0%)
Total	20,244
	IWC claim length defined using total amount paid to recipients
At least 11 months	12,841 (65.6%)
6–11 months	2,948 (15.1%)
Less than 6 months	3,794 (19.4%)
Total	19,583

Note: Sample is all lone-parent welfare claimants in pilot districts with an IWC claim starting on or before 31 March 2006.

Table 3 Characteristics of IWC recipients vs. non-IWC recipients

	IWC recipients	Non-IWC recipients	Difference
Percentage male	4.1	7.8	–3.7**
Average age	33.5	35.1	–1.7**
Average age of youngest child	7.3	7.8	–0.6**
Percentage with youngest child aged 0 to 3	21.0	24.8	–3.8**
Percentage with youngest child aged 3 to 7	33.0	27.4	5.7**
Percentage with youngest child aged 7 to 11	21.7	17.0	4.7**
Percentage with youngest child aged 11 plus	24.3	30.8	–6.5**
Percentage with one child	53.9	51.6	2.3**
Percentage with two children	32.3	30.1	2.2**
Percentage with three children	10.7	12.1	–1.4**
Percentage with four children	3.1	6.2	–3.1**
Percentage of 30 months prior to welfare leave date (31 March 2006 for stayers) spent in work	8.8	8.8	0.0
Percentage of months 13 to 21 prior to welfare leave date (31 March 2006 for stayers) spent off welfare	20.0	16.6	3.4**
Percentage ever been on NDLP in the 18 months prior to welfare leave date (31 March 2006 for stayers)	84.2	28.6	55.7**
Percentage ever been disabled in the 18 months prior to welfare leave date (31 March 2006 for stayers)	6.8	14.2	–7.4**
Average claimant count in local area in 2003–04	2.8	2.9	–0.1**
Average job density in local area in 2004	88.1	89.1	–0.9**
Sample size	*18,284*	*48,239*	

Notes: Sample is all lone parents in pilot districts whose welfare claim lasted at least 12 months and who left welfare between when the pilots were introduced and 31 March 2006. * indicates significance at the 5 per cent level; ** indicates significance at the 1 per cent level.

Table 4 Transitions onto and off welfare by lone parents

Number of transitions	Number	Proportion
Zero	151,061	10.4
One	929,339	64.1
Two	29,892	2.1
Three	257,549	17.8
Four	5,026	0.3
Five	61,350	4.2
Six or more (even)	857	0.1
Seven or more (odd)	15,221	1.0
All	1,450,295	100.0%

Notes: Percentages may not sum to 100 per cent due to rounding. Base is all welfare claims starting on or after 1 April 2001 where the claimant was a lone parent at some point during the claim.

Table 5 Coefficient estimates for the transition from receiving welfare to work of 16 or more hours and the transition from receiving welfare to work of fewer than 16 hours: baseline model

	No unobserved heterogeneity		Correlated unobserved heterogeneity	
Dependent variable:	*Stops receiving welfare for work of 16 or more hours*	*Stops receiving welfare for work of fewer than 16 hours (including not working)*	*Stops receiving welfare for work of 16 or more hours*	*Stops receiving welfare for work of fewer than 16 hours (including not working)*
Constant	–4.327	–2.624	N/A	–0.009
	(32.48)***	(103.40)***		(0.02)
Potentially eligible for IWC	0.490	N/A	0.528	N/A
	(4.74)***		(4.49)***	
Number of children	–0.110	0.008	–0.121	0.003
	(5.00)***	(1.28)	(4.86)***	(0.41)
Youngest child aged < 1	–0.920	–0.500	–1.048	–0.507
	(5.70)***	(20.84)***	(5.93)***	(21.77)***
Youngest child aged 1–3	–0.219	–0.407	–0.262	–0.429
	(2.97)***	(19.67)***	(3.30)***	(20.46)***
Youngest child aged 3–5	–0.137	–0.253	–0.197	–0.272
	(1.72)*	(11.31)***	(2.24)**	(12.16)***
Youngest child aged 5–11	–0.036	–0.293	–0.052	–0.301
	(0.52)	(15.19)***	(0.70)	(15.16)***
Time trend	–0.183	0.058	–0.186	0.045
	(9.12)***	(6.20)***	(8.24)***	(4.05)***
Time^2	0.461	–0.161	0.467	–0.135
	(7.02)***	(6.58)***	(6.54)***	(4.91)***
Duration	0.044	–0.159	0.076	–0.137
	(2.32)**	(32.47)***	(3.69)***	(22.80)***
Duration^2	–0.222	0.397	–0.277	0.347
	(3.07)***	(18.72)***	(3.73)***	(14.31)***
In Phase 1 pilot area	–0.191	–0.434	–0.152	–0.447
	(1.54)	(12.79)***	(0.87)	(12.38)***
In Phase 2 pilot area	0.078	–0.178	0.138	–0.189
	(0.73)	(7.49)***	(0.86)	(7.23)***
In Phase 3 pilot area	–0.336	–0.418	–0.305	–0.430
	(2.88)***	(14.42)***	(1.88)*	(13.73)***
In Phase 4 pilot area	0.069	–0.113	0.119	–0.116
	(0.67)	(5.05)***	(0.79)	(4.82)***
Quarter 2 dummy	0.194	–0.110	0.153	–0.097
	(2.16)**	(4.45)***	(1.40)	(3.69)***
Quarter 3 dummy	0.317	0.124	0.331	0.125
	(4.51)***	(7.10)***	(4.52)***	(7.14)***
Quarter 4 dummy	0.208	–0.164	0.180	–0.152

	No unobserved heterogeneity		Correlated unobserved heterogeneity	
Dependent variable:	*Stops receiving welfare for work of 16 or more hours*	*Stops receiving welfare for work of fewer than 16 hours (including not working)*	*Stops receiving welfare for work of 16 or more hours*	*Stops receiving welfare for work of fewer than 16 hours (including not working)*
	(2.53)**	(6.80)***	(1.80)*	(5.68)***
Unobserved heterogeneity mass points:				
Type 1	N/A		−4.807	
			(20.24)***	
Type 2	N/A		−3.573	
			(20.91)***	
Loading factor on unobserved heterogeneity component	N/A		1 (fixed)	0.577 (5.55)***
Proportion of lone parents of type 1	N/A		0.769	
Log likelihood	−283,820.62		−283,431.22	
Sample size	72,439		72,439	
Controls for unobserved heterogeneity	No		Yes	

Notes: * significant at 10 per cent; ** significant at 5 per cent; *** significant at 1 per cent. Absolute value of z statistics in parentheses. Estimated coefficients are based on equations (1) and (2) in the text. Estimates in 'Correlated unobserved heterogeneity' columns include unobserved heterogeneity terms as depicted in equation (9).

Table 6 Coefficient estimates for the transition from not receiving welfare to receiving welfare: baseline model

	No unobserved heterogeneity	*Correlated unobserved heterogeneity*
Dependent variable:	*Not receiving welfare to receiving welfare*	
Constant	−3.004	0.066
	(347.38)***	(0.14)
Receiving IWC	−0.222	−0.160
	(3.08)***	(2.11)**
Number of children	−0.128	−0.133
	(18.16)***	(17.88)***
Youngest child aged < 1	0.785	0.769
	(21.55)***	(20.31)***
Youngest child aged 1–3	0.582	0.574
	(25.25)***	(23.68)***
Youngest child aged 3–5	0.470	0.470
	(19.60)***	(18.83)***
Youngest child aged 5–11	0.486	0.480
	(24.55)***	(23.26)***
Time trend	−0.017	−0.014
	(3.00)***	(2.40)**
Time^2	0.062	0.051
	(3.48)***	(2.79)***
Duration	−0.227	−0.211
	(46.21)***	(39.80)***
Duration^2	0.611	0.567
	(21.96)***	(19.90)***
In Phase 1 pilot area	−0.076	−0.092
	(1.93)*	(2.23)**
In Phase 2 pilot area	−0.020	−0.034
	(0.89)	(1.45)
In Phase 3 pilot area	−0.102	−0.123
	(3.22)***	(3.67)***
In Phase 4 pilot area	−0.087	−0.092
	(4.25)***	(4.25)***
Quarter 2 dummy	0.100	0.103
	(5.09)***	(5.18)***
Quarter 3 dummy	0.018	0.022
	(0.93)	(1.09)
Quarter 4 dummy	−0.079	−0.078
	(3.97)***	(3.90)***
Loading factor on unobserved heterogeneity component	N/A	0.705
		(5.93)***
Log likelihood	−283,820.62	−283,431.22
Sample size	72,439	
Controls for unobserved heterogeneity	No	Yes

Table 7 Estimated impact of IWC on potentially eligible lone parents in the flow sample: all phases and all cohorts

Months since first potentially eligible for IWC	Impact on number off welfare	Impact on number in work		Welfare outcome (percentage off welfare in pilot districts)	Work outcome (percentage in work in pilot districts)	Welfare additionality rate (welfare impact as percentage of gross outcome)	Work additionality rate (work impact as percentage of gross outcome)
	Estimates in ppts (standard errors given in parentheses)						
3	0.5 (0.112)***	0.3 (0.129)**		6.8	10.4	7.4	2.9
6	1.0 (0.154)***	0.7 (0.151)***		11.8	12.0	8.5	5.8
9	1.3 (0.187)***	0.9 (0.174)***		15.3	13.3	8.5	6.8
12	1.6 (0.220)***	1.0 (0.199)***		18.2	14.3	8.8	7.0
15	1.7 (0.260)***	1.1 (0.230)***		20.5	14.9	8.3	7.4
18	1.7 (0.301)***	1.3 (0.265)***		22.5	15.6	7.6	8.3
21	1.8 (0.348)***	1.3 (0.306)***		24.2	16.2	7.4	8.0
24	2.0 (0.419)***	1.4 (0.366)***		25.9	16.7	7.7	8.4
27	1.4 (0.539)**	1.6 (0.469)***		26.4	17.1	5.3	9.4
30	1.2 (0.758)	0.4 (0.650)		27.3	16.6	4.8	2.4
33	1.1 (1.014)	0.3 (0.856)		29.2	17.3	3.8	1.7

Notes: The table reports the estimated impact of IWC based on various ordinary least squares (OLS) regressions on the flow sample (see Appendix B). Sample sizes are shown in Appendix H. Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level. Additionality rate is calculated as '100 × impact / outcome'.
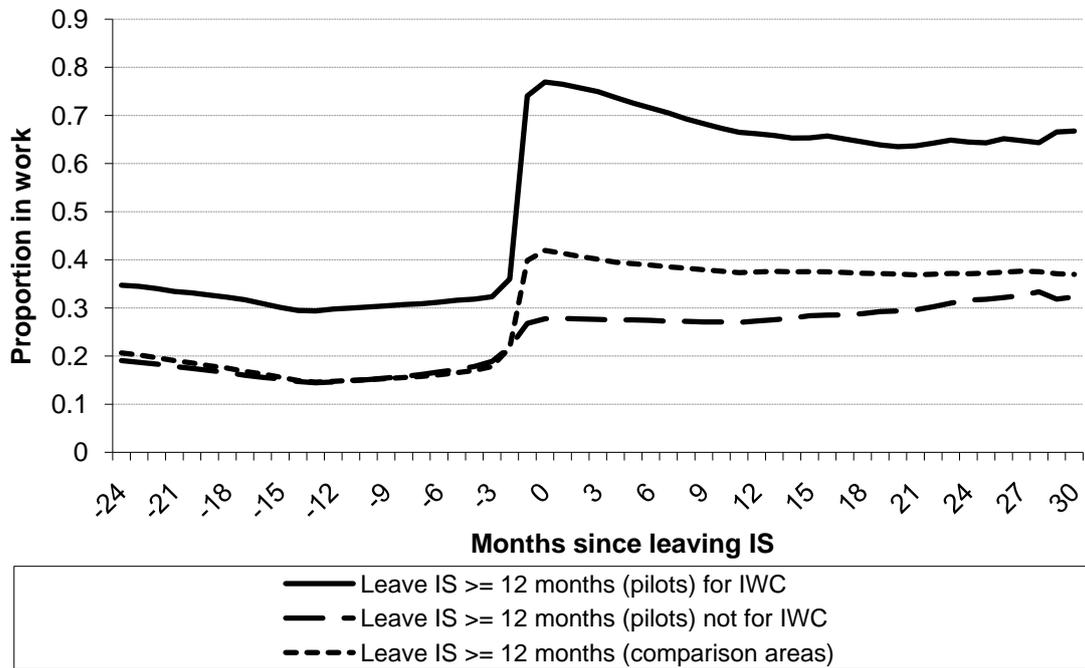
Figures

**Figure 1 budget constraint with and without IWC**

Note: assumes rents of £60 a week that are fully met by Housing Benefit when on welfare

Figure 2 Lone parents who leave welfare after claiming for at least 12 months: proportion in work over time


Note: Sample is all lone parents who left welfare after claiming for at least 12 months in pilot districts (66,523) and comparison districts (201,761) between when the pilots were introduced and 31 March 2006.

**Figure 3 IWC recipients: proportion in work over time**
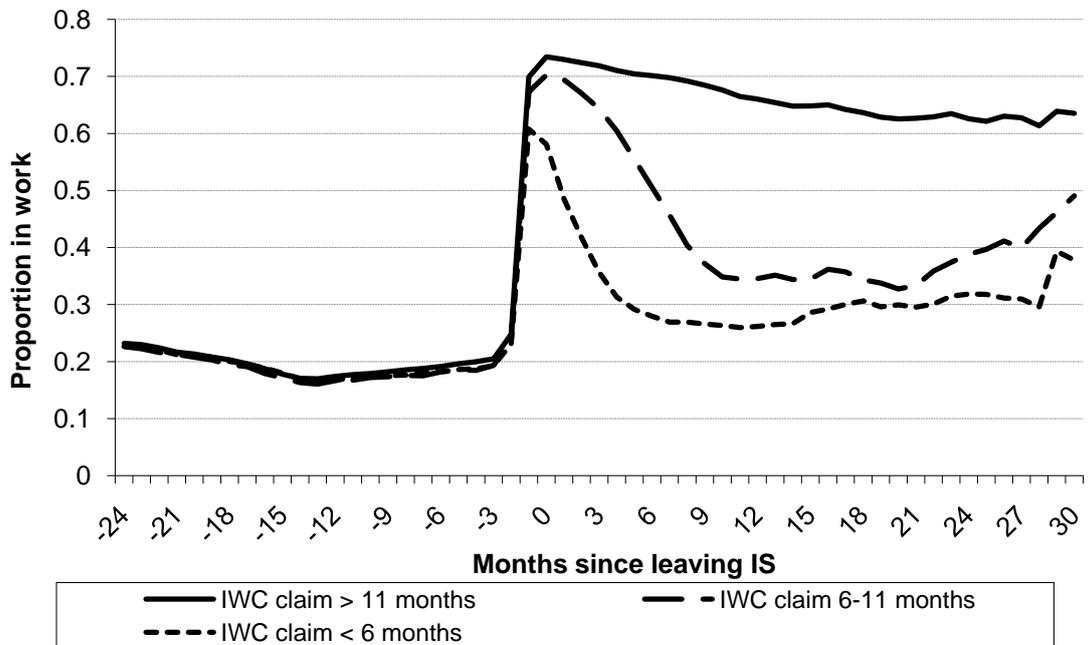
Note: Sample is all lone parents who left welfare for IWC between when the pilots were introduced and 31 March 2006 (18,284).

Figure 4 Simulated effect of IWC on proportion of lone parents off welfare: flow sample
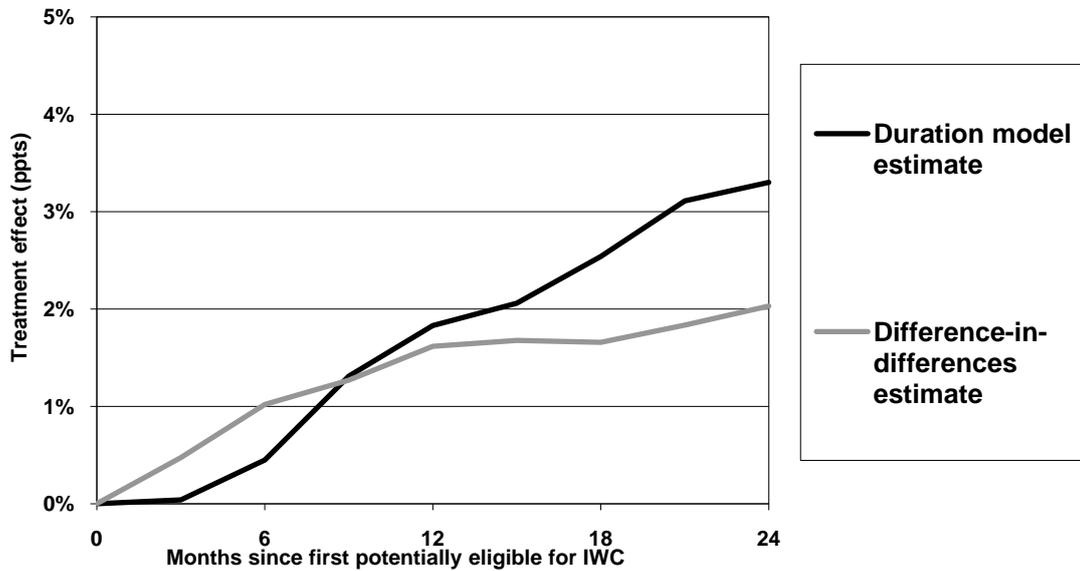

Notes: Base is those who become potentially eligible for IWC after the programme start date.

Figure 5 Simulated outcomes for IWC recipients in the absence of IWC
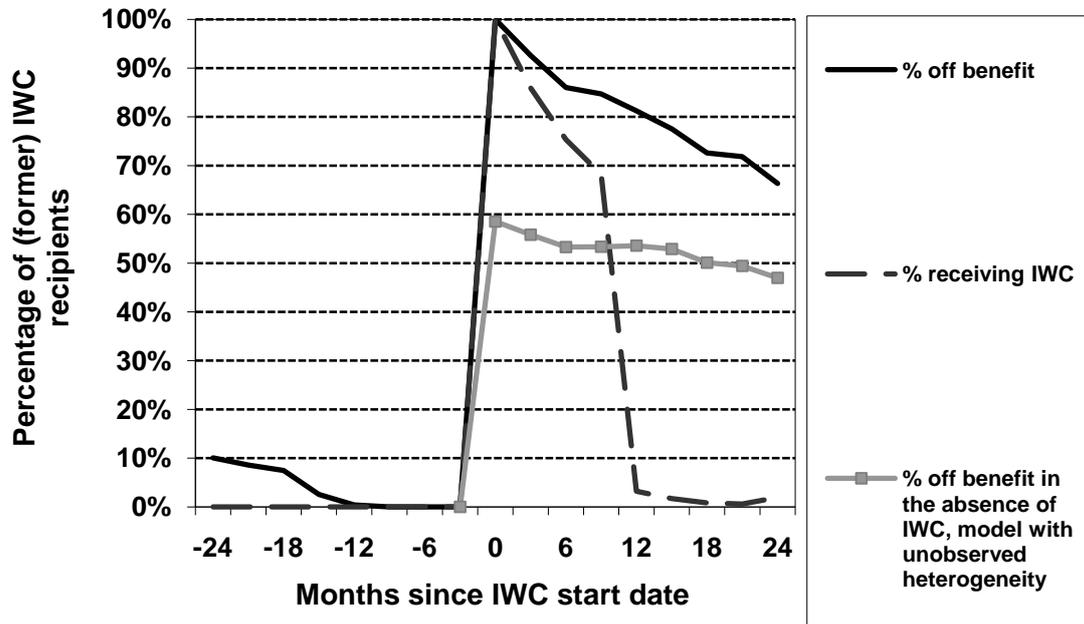

Notes: Actual percentages off welfare and on IWC calculated from the WPLS and IWC administrative data. Simulations using results of baseline model described above. Errors calibrated as described in this section.

Figure 6 Decomposing the additional impact of IWC on IWC recipients
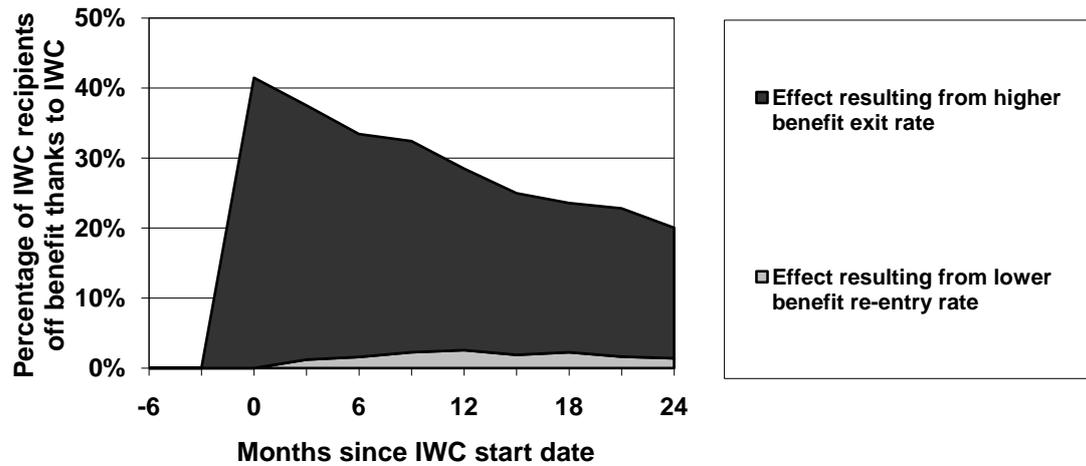
Notes: Based on model results reported in Appendix F with unobserved heterogeneity. Errors calibrated as described in Appendix F. Sample sizes reported in Appendix F.

Figure 7 Impact of IWC on proportion of potentially eligible lone parents off welfare in different models
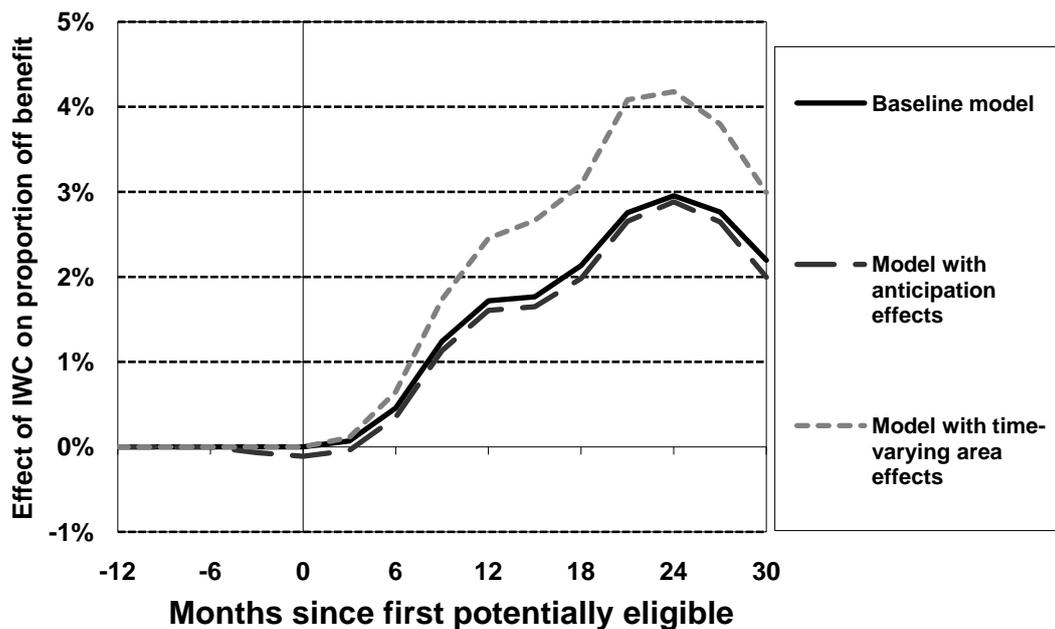
Notes: Simulations using results of models described above without unobserved heterogeneity. Errors calibrated as described in this section.

APPENDIX A. Details of the policies offered in the lone parent pilots

This appendix lists the policies that together formed the lone parent pilots (LPPs). It describes the situation that existed up until 31 March 2007.

The specific policies are:

- In-Work Credit (IWC);
- Work Search Premium (WSP);
- Extended Schools Childcare (ESC);
- Quarterly Work-Focused Interviews (QWFIs) for lone parents in Local Education Authorities (LEAs) in which an ESC pilot is operating, whose youngest child is aged 12 or over (Extended Schools Quarterly Work-Focused Interviews, ESQWFIs);
- New Deal Plus for Lone Parents (ND+fLP).

The LPPs were rolled out in four phases (the names refer to the Jobcentre Plus districts; there are around 90 of these districts in Great Britain)

- Phase 1 (April 2004): Bradford; North London; South-East London.

- Phase 2 (October 2004): Cardiff & Vale; Central London; Dudley & Sandwell; Edinburgh, Lothian & Borders; Lancashire West; Leeds; Leicestershire; Staffordshire; West London.

- Phase 3 (April 2005): Brent, Harrow & Hillingdon; City & East London; Lambeth, Southwark & Wandsworth; South London.

- Phase 4 (October 2005): Bedfordshire & Hertfordshire; Berkshire, Buckinghamshire & Oxfordshire; Essex; Hampshire & the Isle of Wight; Kent; Surrey & Sussex.

Extended Schools Childcare and Childcare Tasters

The Extended Schools Childcare and Childcare Taster pilots (jointly referred to as ESC) were introduced in several Local Education Authorities (LEAs) in Great Britain. They aimed to improve the availability of affordable childcare for working parents. The pilot was intended to help primarily parents of school-age children (i.e. children aged 5 to 14, 16 for children with special needs), but the LEAs' remit also allowed them to provide childcare for younger or older children if that would help lone parents into work. In

addition, although this pilot was mainly aimed at helping lone parents who were ready to move into employment, in practice the services were available to all parents.

Extended Schools Quarterly Work-Focused Interviews (ESQWFIs)

In LEAs in which an ESC pilot was operating, there were mandatory Work-Focused Interviews (WFIs) at quarterly intervals for lone parents whose youngest child was aged 12 or over, and who had been on IS/JSA for 12 months or more (ESQWFIs). From October 2005, mandatory quarterly review meetings were required of lone parents claiming welfare for 12 months or more and with a youngest child aged 14 or 15 years. Since April 2007, Quarterly Work-Focused Interviews (QWFIs) have been introduced in ND+fLP areas for lone parents with a youngest child aged 11–13.

New Deal Plus for Lone Parents (ND+fLP)

At the end of April 2005, five JCP districts started offering ND+fLP: Bradford, North London and South-East London (Phase 1) and Dudley & Sandwell and Leicestershire (Phase 2). From October 2006, Cardiff & Vale and Edinburgh, Lothian & Borders also began to offer ND+fLP services (although these districts do not form part of this report). The aim of ND+fLP was to offer a coherent package of support to lone parents, with the pilots bringing together the main themes of the Work Focus, Work Incentives and Childcare strategies, and building on the lessons learned from the Incapacity Benefit Pathway pilots.

APPENDIX B. Details of the data-sets used

We make use of administrative data on spells on welfare benefits, payments of IWC, and employment records. The data is known as the Work & Pensions Longitudinal Study (WPLS), and combines employment (or, more accurately, income tax) records from Her Majesty's Revenue & Customs, with a range of programme and benefit spells from the Department for Work & Pensions. Appendices A-C of Brewer et al (2007) describe the main steps in "cleaning" these datasets. The administrative data on time spent on welfare is based on the payments made by the government agency, and so should be reliable, but the employment data is less reliable: the employment records in the WPLS are based on employers' returns to the UK tax authority (HMRC) about individuals they are employing who are earning enough to be liable for income tax or national insurance (so-called P45 and P46 returns). This means that the resulting dataset may not include

individuals who are earning below the personal threshold (although the received wisdom is that many, mainly large, employers do report such spells of work), nor other spells of work that have not been declared to HMRC. For this reason, the data may underestimate the amount of time spent in work. On the other hand, the way in which uncertain start and end dates are recorded will lead to an overestimate of the amount of time spent in work if all dates in the WPLS are taken at face value.

Because relatively little information about individual characteristics is available from the WPLS, it is a key feature of the evaluation that local area variables are merged into the final dataset. Some variables are included because they provide information about some aspect of the local labour market that is likely to affect whether lone parents are able to find work and/or leave welfare (for example, the local unemployment rate); others are included to proxy for certain characteristics (for example, highest educational qualification) that are unavailable at the individual level, but that are likely to be important determinants of lone parents' labour market outcomes. This is done by including the average level of the characteristic for all individuals living in a small neighbourhood, typically Super Output Area (SOA) level, comprising approximately 1,500 households. These variables were mapped into the sample of welfare claims (described below) on the basis of the individual's postcode at the time they first became potentially eligible for IWC. The data included: key Statistics from the 2001 UK Census, plus a bespoke tabulation, courtesy of the Office for National Statistics (Census); Ofsted data on registered child-carers in England (Ofsted); the 2004 Index of Multiple Deprivation (IMD) containing data from 2002; and Travel-to-Work Area data on unemployment and vacancy rates from NOMIS.