Lone parents, time-limited in-work benefits and the dynamics of work and welfare

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Results are preliminary; please bear this in mind if citing this version

Abstract

With rich administrative data on welfare spells and time in employment, and a multi-spell, multi-state duration model, this paper assesses the impact of two time-limited in-work benefits ("In-Work Credit" and the "Employment Retention and Advancement Demonstration") that were aimed at lone parents and were piloted in different parts of Great Britain during the 2000s. Our results suggest that both policies got more lone parents off welfare and into work, and that conditioning on weekly hours worked is important: conditioning the policy on part-time hours allowed some people to cut back from full-time hours, and conditioning on full-time hours encouraged part-time workers to work more. We separate the overall impact into that due to higher welfare exits, and that due to higher job retention, finding that the latter was particularly important for ERA. On the other hand, there was little fallback in employment amongst (former) recipients when payments stopped.

Keywords: In-work benefits, labour supply, time-limits, welfare, lone parents, multi-spell duration models

JEL Classification: H21, I38

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1 Introduction

In-work benefits or tax credits are well established as a policy instrument for increasing labour supply and tackling poverty. Much research has examined the experience of the EITC in the US, and the various in-work credits in the UK, which have been aimed principally at families with children, and a wide range of OECD countries have now used in-work credits to some extent. For a typical in-work credit, eligibility depends on current income and current family status and, conditional on those, can last indefinitely. But there is a another sort of in-work credit, where the credit is time-limited and 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). 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 way be less than a permanent credit of the same weekly or monthly generosity.

This paper provides evidence on the impact of two targeted, time-limited, in-work benefits from the UK. For a given level of generosity, a targeted, time-limited in-work credit is clearly cheaper than a conventional in-work credit. The two specific policies in Great Britain had, usefully, different eligibility conditions. One was called "In-Work Credit" (we use "IWC" to refer to the specific policy in the UK, and "in-work credit" to refer to the generic policy), and the other was the Employment, Retention and Advancement Demonstration (ERA). 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. A maximum of 52 weeks of payments could be made. The policy was introduced gradually across Great Britain (GB) over a four year period, rolled out by geographical areas, which naturally suggests the use of lone parents in areas where IWC was not in operation as a form of comparison group. The ERA demonstration was a randomised intervention piloted in a few areas of Great Britain which, amongst other groups, targeted lone parents on and offered a payment worth £400 every 17 weeks to those who moved into work of 30 or more hours a week.

With rich administrative data on welfare spells and time in employment, we assess both IWC and ERA within a common empirical framework. This involves selecting a group of lone parents on welfare from all areas of Great Britain who would have met the eligibility conditions for ERA, and estimating on this sample a multi-spell, multi-state, discrete time duration model that accounts for the way that the incentives inherent in the two programmes change over time for an individual (in a similar way to Card and Hyslop (2005)'s analysis of the Canadian SSP programme), and allows us to estimate the impact on part-time and full-time work separately. We identify the impact of the two programmes with a difference-in-differences style design, making use of the fact that IWC spread gradually across the country over a 4 year period, and that ERA was a demonstration project which ran in a few areas of Great Britain, and then stopped, giving us data on lone parents not eligible to ERA from the same geographical areas both before, after and (because of the explicit control group) at the same time as its actual

recipients.

Our results suggest that both IWC and ERA increased the probability that potentially eligible lone parents left welfare, with ERA having a larger impact. We find the hours rules to be particularly important to understanding the programmes' impact. All the additional spells of work induced by IWC (which was conditional on working 16 or more hours a week) were part-time, with the programme slowing down moves from part-time to full-time work, and part of the rise in lone parents working full-time due to the ERA programme (which was conditional on working 30 or more hours a week) comes from a fall in the number working part-time. In principle, both programmes increase the fraction of time spent in work (or spent not receiving welfare benefits) both by increasing flows off welfare, and by reducing flows out of work: we find that the latter was particularly important for ERA. On the other hand, there was little fallback in employment amongst (former) recipients when payments stopped.

The rest of the paper is arranged as follows. Section 2 explains in full how these policies operated and what impact we would expect them to have on work and welfare dynamics, Section 3 sets out the model we estimate, and Section 4 discusses our administrative data and provides some data descriptives. Our results are in Section 5, and we conclude in Section 6. Appendices contain additional policy details, supplementary data tables, and coefficient estimates.

2 Policy detail, and the expected impact of the programmes

IWC and ERA were both piloted initially in the middle of the 2000s. In this section, we explain how the two policies operated, and then show how the policies affected financial incentives to work. A very important point, though, is that lone parents receiving welfare benefits in most of the years spanned by our data had to fulfil extremely weak conditions in order to maintain eligibility, with no requirement to be working, or even to be looking for work, until their youngest children were aged 16. [1]

2.1 Details of the IWC and ERA programmes

In Work Credit (IWC) was available to lone parents in the UK who had been receiving welfare for a continuous period of 12 months or more;[2] and stopped claiming welfare (and, most likely, begin to claim tax credits, as described later in this Section) 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 (from July 2007, £60 a week in London). 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 benefits. 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 a further 12 months on welfare to regain potential eligibility. Over a four year period – starting in 2004 – and in six steps, IWC was gradually rolled out across all of Great Britain.[3][4]

The Employment, Retention and Advancement (ERA) demonstration was a randomised intervention which aimed to deliver the 'next step' in welfare-to-work policy.[5] It had three target groups: unemployed lone parents who were on *Income Support* (IS) and then volunteered for the New Deal for Lone Parents (NDLP; this was a voluntary programme that provided greater access to Personal Advisors, and access to some discretionary funds to assist in job search[6]),

[1] These rules were changed towards the end of the period covered by our data, and we deliberately right-censor observations a year before they are affected by this change; see Avram et al. (2013) for evidence of this reform's impact.

[2] We use "welfare" throughout to refer to what are known in the UK as "out-of-work benefits". The relevant benefits were Income Support, Jobseeker's Allowance, Incapacity Benefit, Employment and Support Allowance, Carer's Allowance and Severe Disablement Allowance. Although precise details vary, entitlement to these benefits requires claimants NOT to be working (or to be working only a handful of hours a week) and to have a low family income. For more details on the UK benefit and tax credit system, see Browne and Hood (2012).

[3] Appendix A gives full details. Additionally, Appendix Table 10 shows that the areas operating the ERA programme were run and in which the IWC policies were first introduced had higher unemployment rates, on average, than the rest of Great Britain; it also shows that unemployment rates rise at the end of the period covered by our data as the 2008 financial crisis hits. However, these differences are not especially large, and we allow for the local area unemployment rate to affect all transitions. Neither IWC nor ERA programme was introduced in Northern Ireland.

[4] An initial quantitative assessment of the impact of IWC was Brewer et al. (2009a), with qualitative research covering IWC to be found in Hosain and Breen (2007) and Jenkins (2008).

[5] The main results from the experimental evaluation of ERA can be found at Dorsett et al. (2007). See also Dorsett (2013) who takes a similar approach to this paper but looks at the long-term unemployed without children.

[6] See Dolton et al. (2006) for details and for an evaluation of its impact.

lone parents working part-time and receiving *Working Tax Credit*, and long-term unemployed individuals over the age of 25. It is the first of these client groups that is of interest here, as it is similar to the client group targeted by IWC. The two differences are that ERA additionally required lone parents to have joined the NDLP programme, something which tended to be done by those lone parents who were keen to move into work soon, as they got access to additional support from a personal adviser, and that ERA did not require lone parents to have been on welfare for a year.

ERA specifically targeted retention by way of a retention bonus: a payment of £400 in each 17-week period, paid to clients in the programme group if they worked full-time (30 hours or more) for at least 13 weeks in the 17 week period. Participants could receive at most six such payments, which would cover a maximum period of two years. Payments also stopped when the individual ceased to be part of the ERA programme, which occured 33 months after randomisation. Inflow into the ERA programme took place between 2003 and 2005.

IWC and ERA are by no means the only form of support for lone parents in the UK. The other welfare benefits and tax credit to which these lone parents might be entitled are as follows:[7]

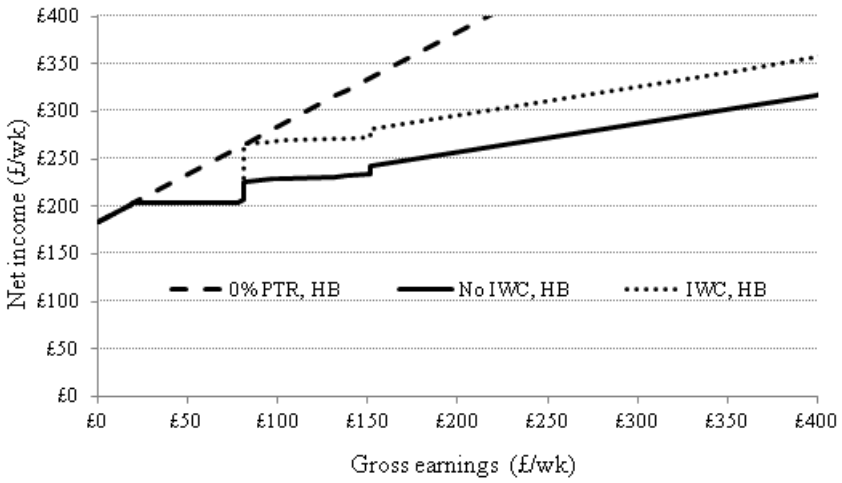
1. A non-means-tested *child benefit*, worth £17.45 a week for families with 1 child;
2. A means-tested refundable *child tax credit*, worth £44.42 a week for families with 1 child and an income under £14,155 (and withdrawn at 37% after that);
3. At most one of the following:
   (i) A means-tested refundable *working tax credit*, worth up to £63.55 a week but conditional on working 16 or more hours a week, and withdrawn at 37% for annual earnings above £5,220;
   (ii) 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. Cash benefits which rebate spending on rent, and liabilities to local tax (the former is known as *Housing benefit*, and the latter is *council tax benefit*); these programmes are both withdrawn steeply once entitlement to welfare benefits has been fully withdrawn.

Figure 1 shows the relationship between gross earnings and net income after subtracting liability to all direct taxes and adding 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 the data covered in this paper), 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 lone parent with one child, and who lives alone, paying and receiving a means-tested rebate on a modest rent. Without IWC, there is already a notch in the budget constraint at earnings levels which correspond to 16 hours work

[7] All amounts for 2006-07; there is more analysis of the financial work incentives facing lone parents in the UK in Brewer et al. (2007) and Brewer et al. (2009a)

a week: at this point, lone parents lose entitlement to welfare benefits, but gain entitlement to (the more generous) regular in-work tax credits (*working tax credit*). IWC makes this notch considerably larger, bringing the average effective tax rate on low-earnings work close to zero, which Saez (2001) and Brewer et al. (2010) argue may well be optimal given what we know about lone parents' responsiveness to the financial payoff to work.

Figure 1: Budget constraint with and without In-Work Credit



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

2.2 The expected impact of IWC and ERA on flows between welfare and work

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 et al. (2009b) 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. (2010)) [8]

Analysis of US welfare reform can clearly provide insights into the impact of time-limits (e.g. Grogger and Karoly (2005)), but the nature of the welfare experiments and their inherent incentives are rather different from those produced by IWC: debates about time-limits in the US have tended to be about the merits of time-limits on the whole of welfare payments (ie the AFDC or TANF programmes; see Moffitt (2003)) 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 word with no in-work supplement.

The most well-known of the targeted, time-limited, in-work credits is the Canadian Self-Sufficiency Project (SSP), a large-scale demonstration project in the 1990s which made use of

[8]The few other targeted, time-limited in-work credits that have been operated in the UK have not been robustly evaluated. 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. For previous UK research on factors associated with lone parents' return to work, see Yeo (2007), D'Souza et al. (2008) and LaValle et al. (2008)

random assignment (Card and Hyslop (2005, 2009) 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 three years, rather than one. 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: with periods out-of-work not disqualifying lone parents from receiving SSP again when they were back in full-time work.

Card and Hyslop (2005, 2009) set up a simple search model, and analyse how the SSP affects incentives and behaviour. The changes in incentives induced by IWC and ERA are slightly simpler, but, based on the considerations in Card and Hyslop's papers, as well as past evidence from similar programmes, the following responses to IWC and ERA are likely:

(i) IWC should make it more likely that a *potentially eligible*[9] lone parent in a district operating IWC leaves welfare and starts a job of at least 16 hours a week. An income effect might reduce the gross earnings of such jobs or reduce the number of hours worked (but not below 16).

(ii) ERA should make it more likely that a potentially eligible lone parent leaves welfare and starts a job of at least 30 hours a week. An income effect might reduce the gross earnings of such jobs or reduce the number of hours worked (but not below 30).

(iii) 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, but might (through an income effect) reduce moves to higher-earning jobs. This effect may decline gradually throughout the 52 week period of receipt, and may cease entirely when the 52-week time-limit of IWC payments is reached.

(iv) Having begun to receive ERA payments, ERA should make it more likely that its recipients stay in work of at least 30 hours a week. This effect may cease entirely when the 6 payments have all been made or the individual ceases to be part of the ERA programme, which occurs after 33 months.

(v) Having begun to receive ERA payments, ERA should make it more likely that a former ERA recipient who is currently not in work of 30 or more hours moves into work of at least 30 hours a week (provided not all 6 ERA payments have been made and the individual is still part of the ERA programme).

(vi) The existence of IWC or ERA may induce some lone parents who would otherwise have left welfare to remain on welfare for longer in order to become potentially eligible for IWC or ERA. We call such responses "anticipation effects". For a lone parent who has been on welfare for less than 12 months and is considering delaying his exit from welfare in order to

[9] We define that a lone parent is potentially eligible for IWC (ERA) if they have been receiving welfare benefits for at least 12 months and lived in an area where IWC (ERA) is being piloted; they would be eligible for IWC (ERA) if they stopped claiming welfare and started a job of at least 16 (30) hours per week.

obtain eligibility for IWC, then the benefits would be the discounted value of up to £2,080 in IWC payments, and the direct costs would be the discounted value of the earnings (i.e. net of taxes paid and welfare lost) forgone during the period of delay. A more extreme response is that the existence of IWC or ERA may induce some lone parents who would not have claimed welfare at all to claim welfare in order to become potentially eligible for IWC or ERA.

Responses (i) to (v) are investigated in this paper; at this stage, we do not allow for the anticipation effects discussed in (vi).[10]

[10]Card and Hyslop (2009) 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.

3 Empirical model

We estimate a model of transitions on and off welfare, and how these are affected by IWC and ERA Accordingly, we follow Ham and Lalonde (1996), Eberwein et al. (1997) to . We are interested in the impact that IWC and ERA had on initial job entry rates, moves between part-time and full-time employment, and job exits and/or flow rates back on to welfare.

In our model, we allow lone parents to be in one of 4 (exhaustive and mutually-exclusive) states:

(i) Receiving out of work welfare benefits ("On welfare")

(ii) In work of between 16 and 29 hours per week ("In part-time work")

(iii) In work of 30 or more hours per week ("In full-time work")

(iv) Neither receiving welfare nor in work of at least 16 hours per week ("None of the above")

In the absence of unobserved heterogeneity, we specify the probability of making a transition from state i to state j at time t as:

$$Pr(s_{t+1} = j | s_t = i) = \frac{U_{ijt}}{\sum_k U_{ikt}} \tag{1}$$

This is subject to the normalisation that $\beta_{ii} = 0$ for all i and where:

$$U_{ijt} = exp(X'_{ijt}\beta_{ij}). \tag{2}$$

Given a sequence of states, the log-likelihood for an individual is:

$$logL = \sum_t \sum_{i,j} \mathbf{1}[s_{t+1} = j, s_t = i] log((Pr(s_{t+1} = j | s_t = i))) \tag{3}$$

All individuals are initially observed in the middle of a welfare spell (we sample individuals at the point that they volunteer for the NDLP programme, which could occur at any point in their welfare spell), and so we treat the initial, "interrupted, welfare spell as a separate state to any subsequent "fresh" welfare spells (Eberwein et al. (1997)). This gives us 5 "origin" states, each of which has 3 other possible "destination" states.

As is standard in these models, the transitions are allowed to depend upon random effects. We assume this random effect, v, a vector of dimension 15 (one for each possible transition), takes a discrete distribution, and so we can think of individuals as being one of M types where such that $Pr(v = v^m) = \pi^m$ and$\sum_{m=1}^{M} \pi^m = 1$. With unobserved heterogeneity, equation (2) is modified to:

$$U_{ijt} | v = v^m = exp(X'_{ijt}\beta_{ij}) + v^m_{ij}, \quad \beta_{ii} = 0, v_{ii} = 0 \ \forall i. \tag{4}$$

Alternatively, we can say that, conditional on being in state i at time t, each state j is associated with a level of net utility,

$$V_{ijt} | v = v^m \ = \ U_{ijt} + v^m_{ij} + \varepsilon_{ijt}, \tag{5}$$

where ε_{ijt} are Type-I extreme value errors, and where each individual moves from the origin state i to the destination state j with the highest value of net utility; we use this formulation explicitly when simulating (see Section 4.3).

Either way, the log-likelihood contribution for an individual becomes:

$$logL = log\left\{\sum_m \pi_m \prod_t \prod_{i,j} (Pr(s_{t+1} = j | s_t = i, v = v^m)^{\mathbf{1}[s_{t+1}=j, s_t=i]})\right\} \tag{6}$$

X_{ijt} are explanatory factors. As is discussed in Section 4, we had access to only a small set of explanatory variables: number of children, age of youngest child, adult's age, calendar time, indicators for living in each of the pilot phases, and local unemployment rates. We used the same set of explanatory factors in every transition equation. When the origin state is "on welfare", these variables are allowed to change over time; when the origin state was anything else than "on welfare", only "calendar time" and "duration" were time-varying: others were held fixed at the characteristics when the lone parent was last observed on welfare. We also allow for the following policy effects to be included in the vector X_{ijt}:

(i) the probability of transiting *from* a spell of welfare *to* work of 16 or more hours a week depends upon an indicator for being potentially eligible for IWC

(ii) the probability of transiting *from* a spell of welfare *to* work of 30 or more hours a week depends upon indicators for being potentially eligible for IWC or being in the ERA treatment group

(iii) the probability of transiting *from* work of 16 or more hours a week *to* any other state depends on an indicator for receipt of IWC

(iv) the probability of transiting *from* work of 30 or more hours a week *to* any other state depends on an indicator for receipt of IWC or ERA

(v) the probability of transiting *from* any other state *to* work of 30 or more hours depends upon an indicator for being a former ERA recipient who is still eligible for further ERA payments.

All effects of IWC are allowed to be different for those in London from July 2007, when payments increased to £60.

Since potential eligibility for IWC and ERA depend upon calendar time, whether a lone parent is living a district operating IWC or ERA, and (for IWC) duration on welfare, these variables are also included as explanatory factors. This gives us a difference-in-difference style design, with three sorts of variation contributing to identification approach of the impact of the policies:

- from variation in the transition rates between lone parents in pilot and non-pilot 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 at different points in calendar time (so that one is observed when IWC or ERA are in operation, and one is not);

- for IWC only: from variation in the transition rates among lone parents in the same area 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 months, with a separate indicator for the first month of a spell, and for having a duration greater than or equal to 12 months).
- for ERA only: from variation in the transition rates among lone parents in the same area observed after the introduction of ERA but who are randomised into treatment and control groups.[11]

[11] Note that we do not estimate the impact of ERA experimentally; instead, we pool the experimental control group with other non-ERA recipients, who are informative about the impact of ERA under the usual common trends assumption required in difference-in-differences designs.

4 Data and descriptive analysis

4.1 Data

The focus of this paper is on the impact of IWC and ERA on lone parents formerly on welfare. We make use of administrative data owned by the UK Department for Work and Pensions known as the Work and Pensions Longitudinal Study (WPLS). This consists of spells on welfare benefits and payments of IWC and ERA, along with self-reported measures of hours worked per week that were reported to HM Revenue and Customs by lone parents who claim a tax credit. For those individuals who claim a welfare benefit, we observe a limited number of their characteristics. In particular, we observe, the number of children they have, the age of their youngest child, their date of birth (so we know their age), and from the benefit records, we can observe whether they were claiming an disability benefit[12] at the point they joined the sample, or in the three years previous to that. From 2004 onwards, we are able to map in the unemployment rate of their local labour market.[13]

To estimate the model, we turn the spell-based WPLS data into monthly, discrete-time data, by measuring the economic activity on the first day of each month. We use a set of simple rules to resolve inconsistencies and ensure that, in every month, each individual is in one and only one of the states listed.

Our population of interest is every lone parent who, since 1 May 2003 and whilst on welfare, volunteered to participate in the New Deal for Lone Parents (NDLP)programme and lived in Great Britain.[14] We restrict the analysis to lone parents who participated in NDLP because this was the eligibility condition for participation in the ERA programme: the restriction means that our analysis sample is those lone parents who would have been eligible for the ERA demonstration (had it operated in their district at that time).

We then follow these individuals until the earliest of the following: the lone parent's youngest child turns 15; 12 months before the lone parent had to undertake job search as a condition of receiving benefits[15]; December 2009.

4.2 Descriptives

We drew a sample of 10,000 individuals on which to estimate the model, over-sampling participants in the ERA programme and from areas that operated IWC before the national roll-out. This sample of over 10,000 lone parents gives us 395,629 person-month observation points. Table 1 shows the number of transitions for individuals in our sample. Just over a third (36.1%) of the individuals have no observed transitions (meaning that they remain in their initial interrupted

[12]Either Incapacity Benefit, Employment and Support Allowance or Severe Disablement Allowance

[13]The level of geography that we map in local unemployment at is called the "Travel to Work Area" and the data is publicly available at www.nomisweb.co.uk.

[14]Neither IWC nor ERA operated in Northern Ireland. The choice of May 2003 is forced upon us because our measure of employment and hours worked is available only after April 2003, the date of a significant reform to the UK tax credit system.

[15]A reform from late 2007 meant that lone parents could no longer claim Income Support as a lone parent, and instead had to claim a different benefit to which job search conditions applied. In the period covered by our data, the reform affected lone parents whose youngest child was born before 2000. See Appendix A of Avram et al. (2013) for details on the exact point that lone parents are no longer eligible for Income Support; we right-censor observations 12 months before they are due to be affected by the job search requirements.

spell of welfare), but just over 40% have 2 or more transitions.

Table 1: Number of observed transitions

Number of transitions	*Number*	*Proportion*
0	3,601	36.01%
1	2,371	23.71%
2	1,319	13.19%
3	1,029	10.29%
4	577	5.77%
5	404	4.04%
6 or more	699	6.99%
Total	10,000	100.00%

Appendix Table 8 compares the observed characteristics of individuals who are eligible for IWC and do not move into work of 16 or more hours, with those who are eligible for IWC and do move into work. Those who move into work have, on average, been on welfare for fewer months, are older, have an older youngest child and live in an area with a lower unemployment rate. Appendix Table 8 is the equivalent for the ERA programme.

4.3 Estimation and simulation

We estimated the model given in equation (6) using the E-M algorithm, weighting to correct for the unequal sampling probabilities. We currently set M, the number of unobserved types, to 2. Standard errors on the estimated coefficients were obtained using the method in Louis (1982).

Having obtained coefficient estimates, we use simulation methods to produce estimates of the impact of the 2 programmes on more meaningful outcomes, such as the fraction of lone parents on welfare or in work at a given point in time or within some window. The principle behind using simulation methods is as follows: given a vector of coefficient estimates $\hat{\beta} = \left\{\hat{\beta_{ij}}\right\}$ and observed values for $\{X_{ijt}\}$, then a set of errors $\{\varepsilon_{ijt}\}$ drawn from a Type-I extreme value distribution will, by equation (5), be sufficient to determine the transition made at each t. We can in this way produce a complete simulated "history" for each individual.

To simulate the impact of IWC and ERA, we modify this process in two ways.

1. For each individual, we draw a set of $\{\varepsilon_{ijt}\}$ from an appropriately truncated Type-I extreme value distribution which, having applied the simulation method described above, replicates the actual sequence of transitions chosen (this is sometimes referred to as drawing calibrated errors). Of course, this method produces calibrated errors $\{\varepsilon_{ijt}\}$ only if the individual was in origin state i at time t; for the error draws corresponding to other origin states at time t, we draw uncalibrated errors from a Type-I extreme value distribution.

2. holding these calibrated error draws constant, we simulate two histories for each individual, one in which we hold all policy dummies equal to their actual values, and another where we set all policy dummies to zero.

By construction, the first of these simulated histories is identical to the actual sequence of transitions, and the second represents a counter-factual sequence of transitions that would be

made in the absence of the IWC and ERA policy, and so the difference between these two sequences of transitions represents the impact of the policies. We can then take the difference in any outcome (e.g. proportion on welfare) with and without the policy in place, at any point we are interested (e.g. 6 months after first being potentially eligible), and this produces an estimate of the impact of the policy on those who received it.

To reflect unobserved heterogeneity, we further do this separately for each "type", drawing a different set of calibrated $\{\varepsilon_{ijt}\}$ for each type v^m, and use a (weighted) average over the M types. Finally, we repeat these simulations 100 times, using a different set of calibrated errors in each simulation, and what we report is the average impact of the policies across the 100 simulations.

A variant to this process allows us to decompose the overall impact of the policies into that due to a *welfare-leaving* effect, and that due to a *job retention* effect. To implement these, we simulate a counter-factual set of transitions having set to zero only those policy dummies that affect transitions *from* part-time or *from* full-time work states. That is, we allow IWC and ERA to alter flows from welfare into part-time and full-time work, but we "turn off" any impact they have on flows out of part-time or full-time work. A comparison between the actual transitions chosen and these simulated transitions having turned off any impact of the policies on flows from work states gives the *welfare-leaving* effect, and the difference between the overall impact and the welfare-leaving effect is defined as the *job retention* effect.

To put confidence intervals around all of these simulated policy effects, we follow Ham and Woutersen (2013). This involves the following additional process:

1. we draw 100 random coefficient vectors, $\tilde{\beta}$, from a joint normal distribution whose mean is given by the model's estimated coefficient vector, $\hat{\beta}$, and whose variance is given by the estimated covariance matrix of the model's coefficients.

2. for each of these 100 coefficient vectors, we simulate the impact of the policies on some outcome of interest, as described above.

3. the $(1-\alpha)\%$ confidence interval of policy impacts is defined as the set of simulated policy impacts corresponding to those random coefficient vectors, $\tilde{\beta}$, which fall within the $(1-\alpha)\%$ confidence interval of the coefficient vector.

5 Results

Estimated coefficients are shown in Appendix Table 11. Examining the coefficients on the policy indicators show that:

- IWC potential eligibility makes transitions from welfare to part-time or full-time work more likely
- IWC receipt makes transitions from part-time or full-time work less likely
- IWC receipt make transitions from part-time work to full-time work less likely
- ERA potential eligibility makes transitions from welfare to full-time work more likely
- ERA potential eligibility makes transitions from part-time work to full-time work more likely
- ERA receipt makes transitions from full-time work to any other state less likely

These all accord with the financial incentives inherent in the programmes. Amongst the non-policy variables, lone parents are more likely to leave welfare for work (of any kind), and to stay in work, when their youngest child is older, they have fewer children, and there is a lower local unemployment rate.

5.1 Estimates of the impact of IWC

We begin by examining the impact of IWC on those lone parents in our sample who were ever potentially eligible for it (this is akin to an "intention to treat" effect). As background, Figure 5 shows the economic status of individuals who are potentially eligible for IWC, from the first month that they are potentially eligible for the credit. All individuals are, by definition, on welfare at the point they become potentially eligible for IWC, but this fraction has fallen to 75% 12 months later, at which point 13% are in part-time work and 5% in full-time work (the remaining 7% are in "None of the above"). The fraction on welfare continues to decline over time.[16]

Table 2 shows the total simulated impact that the In Work Credit has on the proportion of individuals in each economic status, at different number of months after first becoming potentially eligible for IWC.[17] We show whether these policy impacts are statistically significant at conventional significance levels, following **?**, and as described in Section 4.3. The Table shows that the impact of IWC on employment is small, but statistically significant. IWC increases the proportion of potentially eligible individuals who are in part-time work by 2.4 percentage points measured 12 months after first being potential eligible, rising to 3.3 percentage points measured after 24 months. There is very little impact of IWC on the proportion in full-time work: the fact that IWC is conditional on being in work of at least 16 hours per week manages to encourage lone parents into part-time work but not full-time work.

[16] Note that the figure makes no correction for sample selection or attrition; as described in Section **??**, individuals are right-censored either on December 2009, or at a date which is a function of the date of birth of their youngest child.

[17] We omit the change in the proportion in "None of the above".

Figure 2: Economic activity since first potentially eligible for IWC

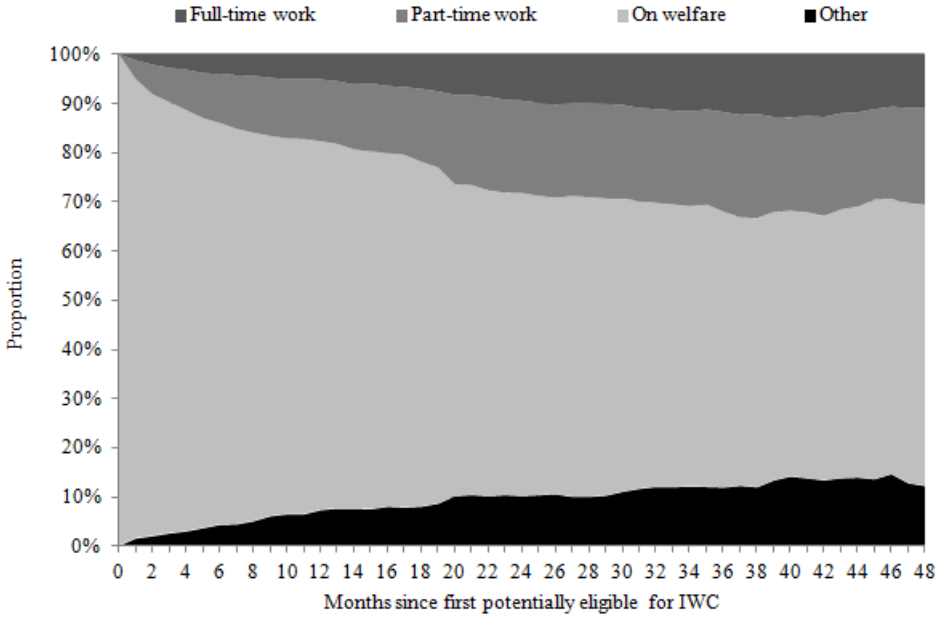


Table 2: Impact of IWC for those potentially eligible on probability of being on welfare or in work

Number of months since first potentially eligible for IWC	Impact of IWC (ppt) on probability of being		
	On welfare	In part-time work	In full-time work
6	-0.021^{***}	0.019^{***}	0.004
12	-0.025^{***}	0.024^{***}	0.004
18	-0.029^{***}	0.026^{***}	0.008
24	-0.031	0.033^{***}	0.005
36	-0.031	0.035^{***}	0.006
48	-0.030	0.032	0.003

Notes: *** denotes that the impact is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level.

Table 3 splits the estimated impacts that we showed in Table 1 into two separate effects. The left panel of the table shows the impact IWC had by encouraging lone parents to leave welfare, and the right panel the impact of IWC on encouraging lone parents to stay in work. Six months after first being potentially eligible, the welfare-leaving effect reduced the proportion of lone parents on welfare by 1.9 percentage points, whereas (unsurprisingly) there was essentially no impact of the retention effect. However, over time, the retention effect becomes larger; 24 months after first potential eligibility, the retention effect increases the proportion of lone parents in part-time work by 1.0 percentage points, accounting for just under a third of the total impact.

Table 3: Impact of IWC for those potentially eligible on probability of being on welfare or in work: detail

Months since first potent. eligible for IWC	Impact of IWC (ppt) on economic activity					
	Welfare leaving effect			Retention effect		
	On welfare	In PT work	In FT work	On welfare	In PT work	In FT work
6	-0.019^{***}	0.016^{***}	0.003	-0.002^{***}	0.003	0.000
12	-0.020	0.018	0.004	-0.005^{***}	0.006	0.000
18	-0.023	0.019	0.006	-0.006	0.007	0.001
24	-0.024	0.023	0.005	-0.007^{***}	0.010^{***}	0.000
36	-0.023	0.025	0.005	-0.008	0.010^{***}	0.001
48	-0.020	0.024	0.003	-0.010	0.008	0.001

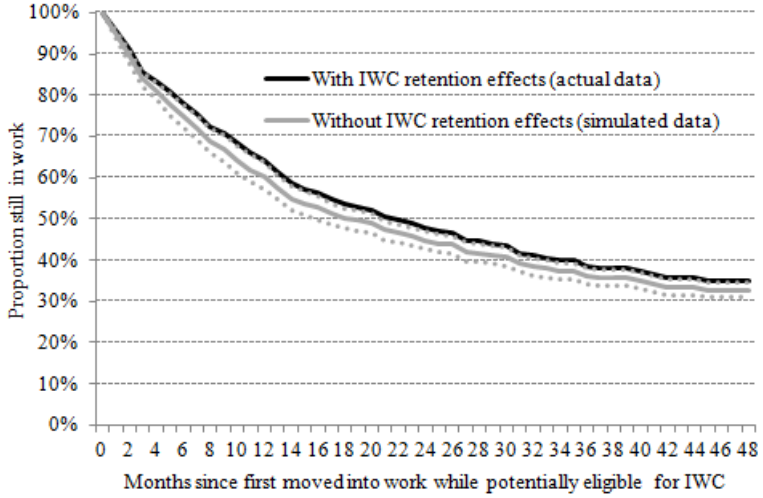
Notes: *** denotes that the impact is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level.

The impact of IWC on job durations can be seen in Figure 3, which shows a survival graph for being in work (16 hours or more) for those individuals who entered work while eligible for IWC (i.e. those individuals who actually receive IWC payments). It also shows the (simulated) estimate of the survival probability of being in work without the retention effects of IWC, along with the 95% confidence interval. In the data, 6 months after moving into work of at least 16 hours and starting to receive IWC, 76.7% of individuals are still in work; in the absence of IWC, only 73.9% are simulated to be in work. After 12 months the equivalent percentages are 63.5% (with IWC) and 59.9% (in absence of IWC payments). Importantly, though, the difference between the two series does not fall to zero after 12 months: that is retention effects remain after the end of the period during which lone parents are receive IWC payments.

An alternative way to look at the impact of IWC is to track the economic status of those who receive IWC payments from the point they first receive them, and simulate how that would differ in absence of the policies. Figure 4 shows the actual economic status of these individuals as a stacked area graph, measured relative to the the time they first moved into work (and began to receive a IWC payment); the counterfactual outcomes in the absence of IWC are shown by a stacked line graph superimposed on the figure. The differences in the outcomes at different points in time are summarised in Table 4.

The first row shows that, in the absence of IWC, 17.6% of those who in fact left welfare and moved into work with IWC in a given month would have stayed on welfare. This provides us with a measure of additionality (or the opposite: deadweight): at the time when these individuals left welfare for work, 82.4% would have left welfare even without IWC (which is a

Figure 3: Retention effect of IWC: proportion still in work 16+ hours with and without IWC



measure of deadweight), with the remaining 17.6% representing additionality.

The simulations suggest that, after 6 months, 12.5% of those who actually left welfare for work and IWC would have still been on welfare in the absence of IWC. The fact that the apparent impact of IWC on reducing the fraction on welfare has fallen over these 6 months represents two factors: first, some of the 17.6% initially induced into work by IWC have left work and returned to welfare by 6 months. Second, some of those who, in the absence of IWC, are simulated not to have left welfare for work at month 0 are simulated to have moved into work at some point in the following 6 months. Importantly, although the estimated impact of IWC on its recipients diminishes over time, it does not return to zero after 12 months, meaning the policy had impacts on its recipients after the payments were no longer being made. This can also be seen in Figures 3 and 4, as there is no sharp drop in the proportion in work after 12 months of first moving into work and receiving IWC.

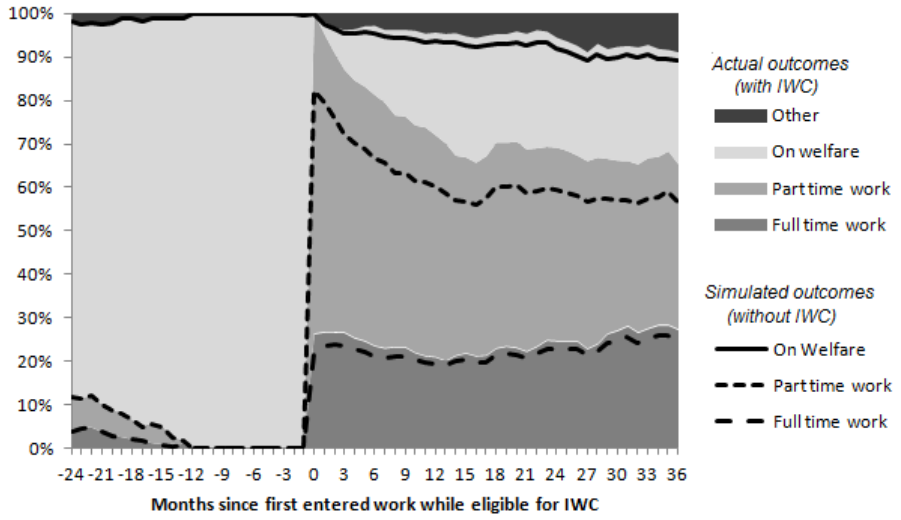
Finally, as also shown in Table 3, IWC had little impact on the fraction of its recipients working full-time, with the large majority of the additional employment coming from work of less than 30 hours a week.

Table 4: Impact of IWC on individuals who receive IWC payments

Number of months since first moved into work	Impact of IWC (ppt) on probability of being:		
	On welfare	In part-time work	In full-time work
0	-0.176^{***}	0.135^{***}	0.043
6	-0.125^{***}	0.118^{***}	0.024
12	-0.098^{***}	0.104^{***}	0.014
18	-0.076^{***}	0.083^{***}	0.016
24	-0.069^{***}	0.077^{***}	0.018
36	-0.065^{***}	0.061^{***}	0.024

Notes: *** denotes that the impact is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level.

Figure 4: Economic activity of individuals who receive IWC payments, with (and in absence of) IWC



5.2 Estimates of the impact of ERA

We also simulate outcomes in the absence of the ERA programme. Figure 5 shows, amongst those who are potentially eligible for ERA, the proportion of individuals in each economic status since they are first potentially eligible for ERA. 18 months after the first month of potential eligibility for ERA, 18% of the potentially eligible population were in full-time work, a considerably higher value than for the population potential eligibility for IWC.

Table 5 shows the simulated impact of ERA for those potentially eligible for it. Within 6 months of being first potentially eligible, the ERA programme increased full-time work by 6.1 percentage points, and it reduced the proportion in part-time work by 0.9 percentage points: it therefore not only encouraged lone parents to leave welfare for full-time work, but moved some lone parents from part-time work to full-time work. The impact of the programme initally rises over time, peaking 24 months after lone parents became eligible to it (recall the ERA payments ended after 24 months of receipt, or 33 months after randomisation), and then falling. The impact of ERA is larger than of IWC, despite the lower value (in weekly terms) of the ERA retention payments than IWC (although ERA is available for up to 24 months, whereas IWC payments are paid for at most 12 months).[18]

Table 6 splits the overall impact into welfare-leaving and job retention effects. Unsurprisingly, the initial impact of ERA can be mostly attributed to the welfare-leaving effect. Over time, the importance of the welfare-leaving effect falls, and the importance of the job retention effect rises. If we look at the impact of ERA on the fraction in full-time work, we can see that, 18 months after being eligible for ERA, the job retention is quantitatively more inportant than the welfare-leaving effect, and remains so at longer durations. The table also shows that the job retention impact of ERA reduces the probability of being in part-time work by 1.5 per-

[18]The different structure of the programmes may also encourage a larger initial response to ERA than IWC , because ERA payments had to stop when the demonstration programme ended, 33 months after joining the programme. Therefore, to get the full amount of payments, lone parents would need to enter full-time work within 9 months of becoming potentially eligible. For IWC, there was no such restriction.

Figure 5: Economic activity since first potentially eligible for ERA

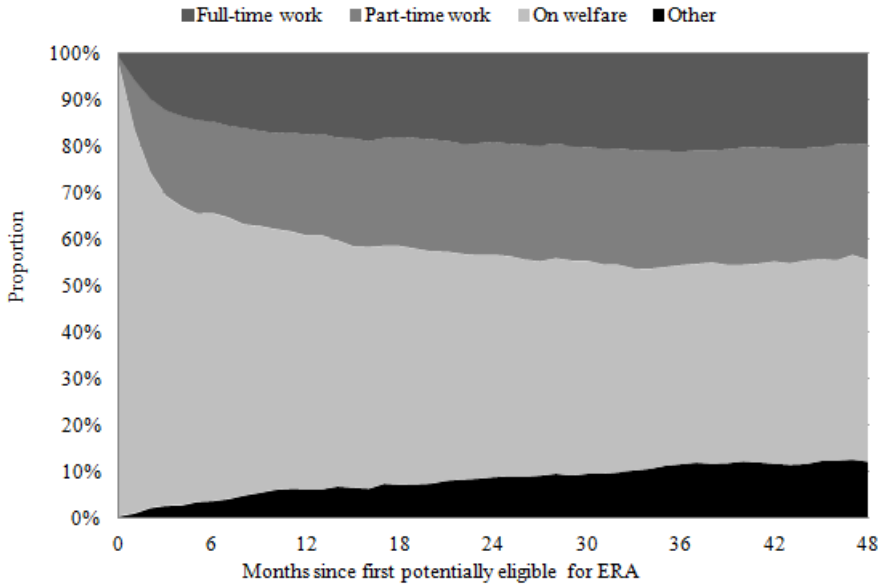
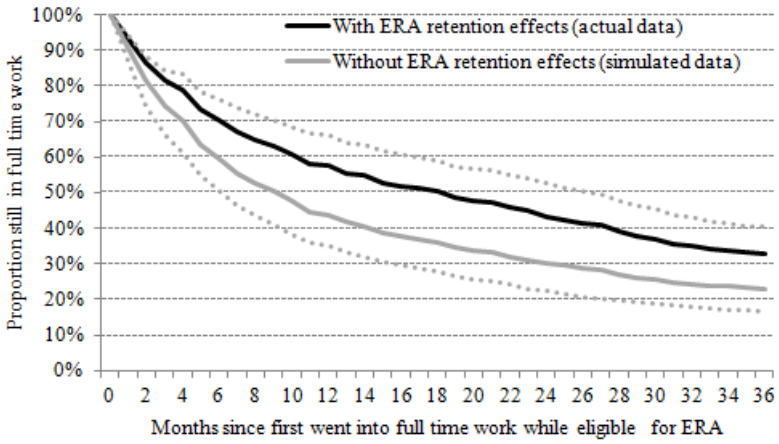


Table 5: Impact of ERA for those potentially eligible on probability of being on welfare or in work

Number of months since first potentially eligible for ERA	Impact of ERA (ppt) on probability of being		
	On welfare	In part-time work	In full-time work
6	−0.048	−0.009	0.061
12	−0.051	−0.018	0.072
18	−0.053	−0.020	0.075
24	−0.058	−0.022	0.080
36	−0.052	−0.018	0.073
48	−0.032	−0.013	0.052

Notes: *** denotes that the effect is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level.

Figure 6: Retention effect on those who moved into full time work while potentially eligible for ERA



centage points after 24 months, implying that the ERA payments discourage lone parents from moving from full- to part time jobs. These retention effects persist, such that 36 months after first becoming potentially eligible (at which point the lone parent is no longer eligible for ERA payments), the retention effects of ERA have increased the proportion in full-time work by 4.1 percentage points.

Table 6: Impact of ERA on economic activity for those potentially eligible

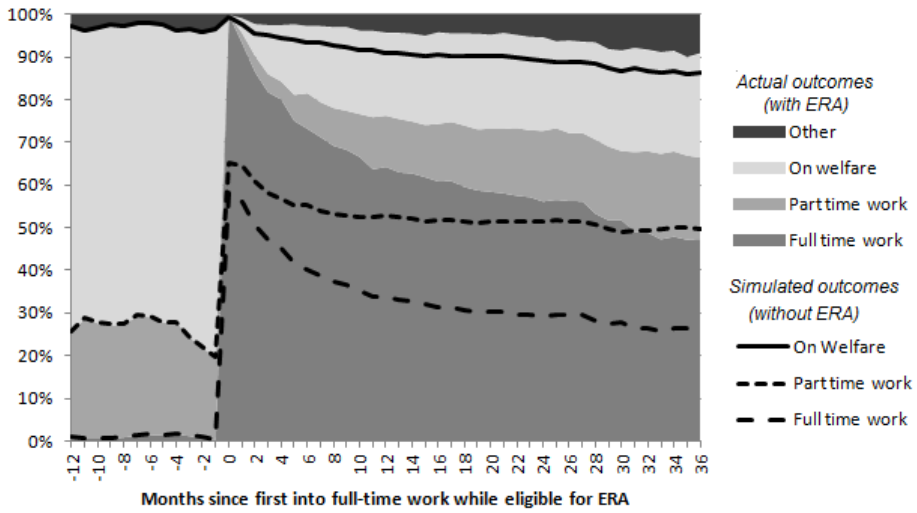
Months since first potent. eligible for ERA	Impact of ERA on economic activity (ppt)					
	Welfare leaving effect			Retention effect		
	On welfare	In PT work	In FT work	On welfare	In PT work	In FT work
6	−0.041	−0.004	0.046	−0.007	−0.005	0.015
12	−0.038	−0.008	0.043	−0.013	−0.010	0.029
18	−0.036	−0.006	0.037	−0.017	−0.013	0.038
24	−0.038	−0.006	0.037	−0.020	−0.015	0.044
36	−0.033	−0.005	0.032	−0.020	−0.013	0.041
48	−0.018	−0.003	0.022	−0.013	−0.009	0.030

Notes: *** denotes that the impact is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level.

The sizeable retention effects of the ERA programme are explored further in Figure 6. 12 months after having moved into work, 59% of those who moved into full-time work while potentially eligible for ERA were still in work. Our results suggest that in absence of the ERA payments, 11 percent fewer of these lone parents would still be in full-time work. This gap between the proportion persists even after 24 months since initially moving into work, which is the longest time that ERA payments could be claimed for. As with IWC, this shows that ERA has a beneficial impact on work outcomes beyond the period that the in-work benefits are payable.

Figure 7 shows the impact of ERA on those individuals who moved into full-time work while potentially eligible for ERA, showing actual outcomes as a stacked area graph, and simulated outcomes in the absence of ERA as a stacked line chart on top. The differences in outcomes - the estimated impact of ERA on its recipients - are summarised in Table 7. This shows that,

Figure 7: Economic activity since moving into full-time work of individuals who received ERA payments



at the point when ERA recipients moved into full-time work (the first row, labelled "0 months" in the Table), almost 42% of them are simulated to have *not* moved into work at that point in the absence of ERA: this is another way of showing that potential eligibility for ERA had a substantial additional impact on flows from welfare to full-time work. As with IWC, the total impact of ERA on its recipients diminishes over time, partly because some of the 42% simulated to have *not* moved into work in the absence of ERA *are* simulated go to move into work later, even without ERA; and partly because some of the 42% induced into work by ERA do not remain in work. Once again, though, there is clear evidence that the positive impact of the programme persisted after payments ceased being paid, remaining large and positive 36 months after ERA recipients first moved into work.

Table 7: Impact of ERA on the economic activity of individuals who receive ERA payments

Number of months since first moved into full-time work	Impact of ERA (ppt) on probability of being:		
	On welfare	In part-time work	In full-time work
0	−0.344***	−0.067***	0.416***
6	−0.224	−0.067	0.329***
12	−0.187	−0.069	0.304
18	−0.173	−0.063	0.289
24	−0.160	−0.056	0.269
36	−0.123	−0.040	0.208

Notes: *** denotes that the impact is significantly different from zero at the 1% level, ** at the 5% level, * at the 10% level.

6 Discussion and conclusion

Much research has examined the experience of conventional in-work benefits which, conditional on current income and family status, can last indefinitely. But there is a another sort of in-work credit, where the credit is time-limited. Such policies lie somewhere in between conventional in-work credits, and a conventional back-to-work bonus. 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 way be less than a permanent credit of the same weekly or monthly generosity.

This paper has evaluated the effect of two time-limited in-work benefits which were introduced in the UK in the 2000s, assessing their impact on the economic activity of lone parents initially on welfare. These two benefits, known as "In-Work Credit" (IWC) and "Employment, Retention and Advancement Demonstration" (ERA) differed in both their generosity, and the number of hours needed in order to qualify to receive them. Importantly, ERA was only paid upon moving into full-time work (of at least 30 hours per week), while IWC was payable conditional on working at least 16 hours per week.

Using rich administrative data on welfare spells, time in employment and whether working part-time or full-time, we assess both IWC and ERA within a common empirical framework. We use a discrete time, multi-spell, multi-state duration model (similar to Ham and Lalonde (1996) and Eberwein et al. (1997)) to understand how both policies affect transitions into and out of work. We find that IWC does lead to fewer lone parents on welfare and more in work, but the effects are small in magnitude. Most of this impact comes from increasing flows off welfare; there are some impacts of IWC on job retention, but these are rather less unimportant. However, a corollary is that there was no discernible fallback in employment amongst (former) recipients when payments stopped.

Compared to IWC policy, the impacts of ERA on time on welfare and in work are large. Amongst those who were potentially eligible for it, ERA increased the proportion in full-time work by 6 percentage points within 6 months, an impact which rose until 24 months after lone parents first became potentially eligible. Unlike IWC, a significant fraction of the overall effect comes from ERA increasing retention in full-time jobs for those who receive the payments. Moreover, ERA payments lowered the probability that individuals would be in part-time work, implying that the fact that the payment was conditional on working 30 hours or more per week led to some lone parents moving into (and staying in) full time work instead of part-time work.

The policy conclusions from this work so far are that time-limited in-work benefits can be effective at increasing employment, that their impacts do not necessary fade away when the payments stop, and that conditioning on part-time or full-time work can have important effects on hours worked, and transitions between part-time and full-time work.

References

Adam, S., Bozio, A., Emmerson, C., Greenberg, D., Knight, G., 2008. A cost-benefit analysis of pathways to work for new and repeat incapacity benefits claimants. Research Report 498, Department for Work and Pensions.

Avram, S., Brewer, M., Salvartori, A., 2013. Lone parent obligations: an impact assessment. Research Report 845, Department for Work and Pensions.

Brewer, M., Browne, J., Chowdry, H., Crawford, C., 2009a. The lone parent pilots after 24 - 36 months: the final impact assessment of in-work credit, work search premium, extended schools childcare, quarterly work focused interviews and new deal plus for lone parents. Research Report 506, Department for Work and Pensions.

Brewer, M., Browne, J., Chowdry, H., Crawford, C., Knight, G., 2007. The lone parent pilots after 12 to 24 months: an impact assessment of in-work credit, work search premium, extended schools childcare, quarterly work focused interviews and new deal plus for lone parents. Research Report 415, Department for Work and Pensions.

Brewer, M., Francesconi, M., Gregg, P., Grogger, J., 2009b. Feature: In-work benefit reform in a cross-national perspective - introduction. Economic Journal 119.

Brewer, M., Saez, E., Shephard, A., 2010. Means-testing and tax rates on earnings. In: Dimensions of Tax Design. Oxford University Press.

Browne, J., Hood, A., 2012. A survey of the uk benefit system. Briefing Note 13, Institute for Fiscal Studies.

Card, D., Hyslop, D., 2005. Estimating the effects of a time-limited earnings subsidy for welfare-leavers. Econometrica 63 (6).

Card, D., Hyslop, D., 2009. Dynamic effects of an earnings subsidy for long-term welfare recipients: evidence from the ssp applicant experiment. Journal of Econometrics 153 (1).

Dolton, P., Azevedo, J., Smith, J., 2006. The econometric evaluation of the new deal for lone parents.

Dorsett, R., 2013. The effect of temporary in-work support on employment retention: evidence from a field experiment. Discussion Paper 411, National Institute for Economic and Social Research.

Dorsett, R., Campbell-Barr, V., Hamilton, G., Hoggart, L., Marsh, A., Miller, C., Phillips, J., Ray, K., Riccio, J., Rich, S., Vegeris, S., 2007. Implementation and first-year impacts of the uk employment retention and advancement (era) demonstration. Research Report 412, Department for Work and Pensions.

D'Souza, J., Conolly, A., Purdon, S., 2008. Analysis of the choices and constraints questions on the families and children study. Research Report 481, Department for Work and Pensions.

Eberwein, C., Ham, J., LaLonde, R., 1997. The impact of being offered and receiving classroom training on the employment histories of disadvantaged women: Evidence from experimental data. Review of Economic Studies 64 (4).

Grogger, J., Karoly, L., 2005. Welfare Reform: Effects of a Decade of Change. Harvard University Press, Cambridge, MA.

Ham, J., Lalonde, R., 1996. The effect of sample selection and initial conditions in duration models: evidence from experimental data on training. Econometrica 64 (1).

Ham, J., Woutersen, T., 2013. Calculating confidence intervals for continuous and discontinuous functions of parameters. Working Paper CWP23/13, cemmap.

Hosain, M., Breen, E., 2007. New deal plus for lone parents qualitative evaluation. Research Report 426, Department for Work and Pensions.

Jenkins, S., 2008. Extension of the new deal plus for lone parents pilot to scotland and wales: qualitative evaluation. Research Report 499, Department for Work and Pensions.

LaValle, I., Clery, E., Huerta, M., 2008. Maternity rights and mothers' employment decisions. Research Report 496, Department for Work and Pensions.

Moffitt, R., 2003. The temporary assistance for needy families program. In: Moffitt, R. A. (Ed.), Means-Tested Transfer Programs in the United States. University of Chicago Press.

Saez, E., 2001. Using elasticities to derive optimal income tax rates. Review of Economic Studies 68 (1).

Yeo, A., 2007. Experience of work and job retention among lone parents: an evidence review. Working Paper 37, Department for Work and Pensions.

A Appendix

A.1 Further details of the IWC and ERA policies

In-Work Credit was rolled out in 6 phases, as listed below (the names refer to the Jobcentre Plus districts; there are around 90 of these districts in Great Britain, and most pilots of welfare-to-work policies operate at the level of the district).

- 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.
- Phase 5 (January 2008): North East London, Birmingham and Solihull.
- National roll-out (April 2008): all other parts of Great Britain.

In July 2007, IWC payments were increased to £60 a week in London.

The ERA programme was introduced in 6 Jobcentre Plus Districts: South East Wales, Derbyshire, East London, Gateshead, Manchester and Renfrewshire. Randomisation into the ERA programme occurred between December 2003 and January 2005.

A.2 Supplementary tables

Table 8: Characteristics of IWC potentially eligible individuals who do and do not move into work, measured at period of first potential eligibility

	Eligible for IWC, **not move** into PT/ FT work		Eligible for IWC, **move** into PT/ FT work	
Characteristic	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
Months in current spell of welfare	52.44	48.14	39.59	37.75
Age	31.88	7.90	31.22	7.48
Age of youngest child	5.70	3.67	5.19	3.45
Local unemp. rate	6.96	1.97	6.26	1.84
Number of children	1.79	0.98	1.68	0.87
IWC Phase area 1	0.07	0.26	0.09	0.29
IWC Phase area 2	0.13	0.34	0.19	0.39
IWC Phase area 3	0.09	0.28	0.10	0.30
IWC Phase area 4	0.17	0.38	0.24	0.42
IWC Phase are 5	0.12	0.33	0.06	0.24
IWC area: national roll out	0.42	0.49	0.32	0.47
Number of individuals	4165		1553	

Table 9: Characteristics of ERA potentially eligible individuals who do and do not move into FT work, measured at period of first potential eligibility

	Eligible for ERA, **not move** into FT work		Eligible for ERA, **move** into FT work	
Characteristic	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
Months in current spell of welfare	43.06	46.01	31.29	41.56
Age	30.82	8.11	31.65	7.69
Age of youngest child	5.38	3.88	5.71	4.10
Unemployment rate	5.62	1.10	5.41	1.61
Number of children	1.65	0.87	1.66	0.84
Number of individuals	998		486	

Table 10: Local Unemployment rates in areas where IWC/ERA policies were introduced

Policy stage	Dates	Unemployment rate in eligible areas	Unemployment rate in whole of GB
Prior to IWC programme	May 2003 - Mar 2004	N/A	5.57%
IWC in phase area 1	Apr 2004- Sep 2004	6.35%	5.08%
IWC in phase area 1-2	Oct 2004 - Mar 2005	5.72%	5.14%
IWC in phase areas 1-3	Apr 2005- Sep 2005	6.43%	5.56%
IWC in phase areas 1-4	Oct 2005 - Dec 2007	5.74%	5.66%
IWC in phase areas 1-5	Jan 2008 - Mar 2008	6.32%	6.18%
IWC available in all GB	April 2008 - Dec 2009	N/A	7.79%
ERA programme	Oct 2003 - Jan 2005	5.78%	5.18%

Table 11: Results from multi-state multi-spell duration model

	Coefficient	Standard Error
Welfare to part-time work (interrupted)		
Potentially eligible for IWC next month	0.1682	0.0577
Potentially eligible for IWC next month (in London post July 07)	-0.2048	0.1094
Duration in current spell	-0.0144	0.0016
Duration squared	0.0000	0.0000
First period in current spell	-0.0900	0.0578
Age	0.0021	0.0031
Number of children	-0.0235	0.0203
Age of youngest child	0.0180	0.0064
Local unemployment rate	-0.0469	0.0119
Constant: Type A	-3.2951	0.2555
Constant: Type B	-1.2356	0.2547
Welfare to full-time work (interrupted)		
Potentially eligible for IWC next month	0.0838	0.0916
Potentially eligible for IWC next month (in London post July 07)	-0.1765	0.1590
Potentially eligible for ERA next month	0.5415	0.3718
Duration in current spell	-0.0178	0.0029
Duration squared	0.0000	0.0000
First period in current spell	-0.3188	0.0897
Age	-0.0061	0.0048
Number of children	-0.0690	0.0333
Age of youngest child	0.0800	0.0094
Local unemployment rate	-0.0370	0.0195
Constant: Type A	-2.0830	0.3984
Constant: Type B	-0.1360	0.3976
Welfare to "None of the above" (interrupted)		
Duration in current spell	-0.0131	0.0022
Duration squared	0.0000	0.0000
First period in current spell	-0.1310	0.0811
Age	-0.0206	0.0045
Number of children	0.1344	0.0260
Age of youngest child	0.0067	0.0094
Local unemployment rate	-0.0033	0.0162
Constant: Type A	-3.1010	0.3708
Constant: Type B	-4.2870	0.3802

	Coefficient	Standard Error
Welfare to part-time work (fresh)		
Potentially eligible for IWC next month	0.3349	0.1153
Potentially eligible for IWC next month (in London post July 07)	0.2286	0.2432
Duration in current spell	-0.0290	0.0140
Duration squared	-0.0001	0.0003
First period in current spell	-0.6943	0.1372
Duration ¿= 12 months	-0.1135	0.1372
Age	0.0080	0.0050
Number of children	-0.2971	0.0406
Age of youngest child	0.0230	0.0106
Local unemployment rate	-0.0519	0.0190
Constant: Type A	-2.4980	0.5343
Constant: Type B	-1.5376	0.5336
Welfare to full-time work (fresh)		
Potentially eligible for IWC next month	0.1236	0.1792
Potentially eligible for IWC next month (in London post July 07)	0.2348	0.3707
Potentially eligible for ERA next month	0.4078	0.6634
Duration in current spell	-0.0606	0.0184
Duration squared	0.0007	0.0004
First period in current spell	-0.6182	0.1687
Duration ¿= 12 months	-0.3301	0.2029
Age	-0.0099	0.0073
Number of children	-0.0820	0.0525
Age of youngest child	0.0340	0.0147
Local unemployment rate	-0.0312	0.0262
Constant: Type A	-4.2494	1.1566
Constant: Type B	-2.9777	1.1552
Welfare to "None of the above" (fresh)		
Duration in current spell	-0.0208	0.0161
Duration squared	0.0003	0.0003
First period in current spell	-0.6878	0.1731
Duration ¿= 12 months	-0.2755	0.1624
Age	-0.0121	0.0066
Number of children	-0.1521	0.0439
Age of youngest child	0.0058	0.0141
Local unemployment rate	0.0024	0.0227
Constant: Type A	-2.5272	0.5452
Constant: Type B	-4.9658	0.5602

	Coefficient	Standard Error
Part-time work to welfare		
In receipt of IWC	-0.1288	0.0913
In receipt of IWC (in London post July 07)	-0.0972	0.2518
Duration in current spell	-0.0598	0.0077
Duration squared	0.0005	0.0002
First period in current spell	0.1244	0.0875
Age	-0.0066	0.0048
Number of children	-0.1010	0.0338
Age of youngest child	-0.0337	0.0099
Local unemployment rate	0.0221	0.0158
Constant: Type A	-3.6688	0.4034
Constant: Type B	-3.6652	0.4020
Part-time work to full-time work		
In receipt of IWC	-0.4204	0.1437
In receipt of IWC (in London post July 07)	-0.0361	0.3566
Potentially eligible for ERA next month	0.3178	0.5946
Duration in current spell	-0.0383	0.0097
Duration squared	0.0004	0.0002
First period in current spell	0.0065	0.1400
Age	-0.0001	0.0065
Number of children	-0.0870	0.0466
Age of youngest child	0.0180	0.0135
Local unemployment rate	-0.0118	0.0224
Constant: Type A	-3.1236	0.6537
Constant: Type B	-2.8655	0.6512
Part-time work to "None of the above"		
In receipt of IWC	-0.0497	0.1006
In receipt of IWC (in London post July 07)	-0.0547	0.2630
Duration in current spell	-0.0342	0.0088
Duration squared	0.0000	0.0002
First period in current spell	0.1749	0.0978
Age	-0.0223	0.0054
Number of children	-0.0850	0.0374
Age of youngest child	0.0005	0.0107
Local unemployment rate	-0.0198	0.0173
Constant: Type A	-0.8376	0.4329
Constant: Type B	-1.3169	0.4321

	Coefficient	Standard Error
Full-time work to welfare		
In receipt of IWC	-0.4216	0.1497
In receipt of IWC (in London post July 07)	0.3397	0.3357
In receipt of ERA	-0.6368	0.7975
Duration in current spell	-0.1054	0.0108
Duration squared	0.0015	0.0002
First period in current spell	-0.0049	0.1188
Age	0.0121	0.0068
Number of children	-0.0708	0.0489
Age of youngest child	-0.0865	0.0132
Local unemployment rate	0.0349	0.0241
Constant: Type A	-4.1007	0.5982
Constant: Type B	-3.8962	0.5971
Full-time work to part-time work		
In receipt of IWC	-0.0171	0.1660
In receipt of IWC (in London post July 07)	0.0899	0.3962
In receipt of ERA	-0.9452	1.0455
Duration in current spell	-0.0490	0.0119
Duration squared	0.0005	0.0003
First period in current spell	-0.1560	0.1662
Age	-0.0005	0.0082
Number of children	-0.0712	0.0582
Age of youngest child	-0.0392	0.0158
Local unemployment rate	0.0767	0.0274
Constant: Type A	-1.7951	0.7913
Constant: Type B	-1.4271	0.7893
Full-time work to "None of the above"		
In receipt of IWC	-0.2320	0.1725
In receipt of IWC (in London post July 07)	0.1172	0.3624
In receipt of ERA	-0.6443	0.9983
Duration in current spell	-0.0588	0.0147
Duration squared	0.0002	0.0004
First period in current spell	0.0220	0.1603
Age	-0.0077	0.0086
Number of children	-0.0370	0.0613
Age of youngest child	-0.0408	0.0166
Local unemployment rate	-0.0294	0.0285
Constant: Type A	-2.8914	0.8447
Constant: Type B	-3.1310	0.8442

	Coefficient	Standard Error
"None of the above" to welfare		
Duration in current spell	-0.0835	0.0095
Duration squared	0.0010	0.0003
First period in current spell	0.9146	0.0690
Age	0.0140	0.0045
Number of children	-0.1682	0.0312
Age of youngest child	-0.0897	0.0092
Local unemployment rate	-0.0023	0.0155
Constant: Type A	-1.1407	0.4277
Constant: Type B	0.9735	0.4316
"None of the above" to part-time work		
Duration in current spell	-0.0035	0.0149
Duration squared	-0.0003	0.0004
First period in current spell	0.6163	0.1115
Age	0.0076	0.0071
Number of children	-0.1088	0.0481
Age of youngest child	-0.0375	0.0139
Local unemployment rate	-0.0211	0.0249
Constant: Type A	-4.3900	0.6393
Constant: Type B	-1.4398	0.6411
"None of the above" to full-time work		
Potentially eligible for ERA payments next month	-0.4598	1.0989
Duration in current spell	-0.0794	0.0231
Duration squared	0.0013	0.0006
First period in current spell	0.0708	0.1544
Age	0.0280	0.0103
Number of children	-0.1151	0.0699
Age of youngest child	-0.0208	0.0207
Local unemployment rate	-0.0095	0.0406
Constant: Type A	-4.3026	0.9903
Constant: Type B	-0.8066	0.9894
Probability of Type A:	0.602	
Probability of Type B:	0.398	

Regressors included in estimation but omitted from the table are: area dummies for each phase area, dummy for being in the ERA area but not in the ERA treatment or control groups, calendar time (linear and quadratic terms), and time dummies for each phase area