**Department for Work and Pensions**

**Research Report No 606**

# 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

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# Glossary of terms

| | |
|---|---|
| Cohort | Group of lone parents who first became potentially eligible for In-Work Credit (IWC) in a particular six-month period. |
| 'Common trends' assumption | A statistical assumption that, in the hypothetical absence of the lone parent pilots, the underlying labour market outcomes would have evolved in the same manner in both pilot and comparison districts over the time period following introduction of the lone parent pilots. |
| Comparison district | A Jobcentre Plus district not operating one of the lone parent pilots, nor the Employment Retention and Advancement (ERA) demonstration. |
| Flow sample | Lone parents who become potentially eligible for IWC after its first day of operation in their Jobcentre Plus district. |
| Linear time trend | A time trend where the dependent variable increases or decreases over time at a constant rate. |
| P14 | The name of a form completed by employers and sent to Her Majesty's Revenue Customs (HMRC) giving details of the earnings of each employee and of the tax that has been deducted. |
| Phase | A set of Jobcentre Plus districts which began operating the lone parent pilots (LPPs) or IWC on the same date. There were four phases. |

| | |
|---|---|
| Pilot district | A Jobcentre Plus district operating one of the LPPs. |
| Potentially eligible | Describes a lone parent who has been claiming Income Support (IS) or Jobseeker's Allowance (JSA) for at least 12 months, and who would therefore be entitled to claim IWC if they left IS for work of 16 or more hours and IWC was operating in that district at that time. |
| Quadratic time trend | A time trend that allows the dependent variable to depend upon time and time squared (where time is measured in months or days since some date). |
| Stock sample | Lone parents who become potentially eligible for IWC on its first day of operation in their Jobcentre Plus district. |

# Abbreviations

| | |
|---|---|
| CTB | Council Tax Benefit |
| DiD | Difference-in-differences |
| DWP | Department for Work and Pensions |
| ERA | Employment Retention and Advancement |
| ESC | Extended Schools Childcare and Childcare Tasters |
| ESQWFI | Extended Schools Quarterly Work Focused Interview |
| FRS | Family Resources Survey |
| FILM | Fully interacted linear matching |
| HB | Housing Benefit |
| HMRC | Her Majesty's Revenue & Customs |
| IB | Incapacity Benefit |
| IFS | Institute for Fiscal Studies |
| iid | Independent and identically-distributed |
| IMD | Index of Multiple Deprivation |
| IS | Income Support |
| IWC | In-Work Credit |
| JSA | Jobseeker's Allowance |
| LEA | Local Education Authority |
| LFS | Labour Force Survey |

| | |
|---|---|
| LPP | Lone parent pilot |
| NBD | National Benefits Database |
| ND+fLP | New Deal Plus for Lone Parents |
| NDLP | New Deal for Lone Parents |
| NINO | National Insurance number |
| OA | Output Area |
| Ofsted | Office for Standards in Education, Children's Services and Skills |
| OLS | Ordinary least squares |
| PA | Personal Adviser |
| ppt | Percentage point |
| PSM | Propensity score matching |
| QWFI | Quarterly Work Focused Interview |
| RR 415 | DWP Research Report 415 |
| SDA | Severe Disablement Allowance |
| SOA | Super Output Area |
| SSP | Self-Sufficiency Project |
| WFI | Work Focused Interview |
| WFTC | Working Families' Tax Credit |
| WPLS | Work and Pensions Longitudinal Study |
| WSP | Work Search Premium |
| WTC | Working Tax Credit |

# Key findings

## Background

Since April 2004, a set of Government policies designed to help lone parents into work have been piloted in various combinations in selected Jobcentre Plus districts in Great Britain. The five policies are In-Work Credit (IWC), Work Search Premium (WSP), Extended Schools Childcare and Childcare Tasters (ESC), Quarterly Work Focused Interviews (QWFI) for lone parents whose youngest child is aged 12 or over in Local Education Authorities (LEAs) in which an ESC pilot is operating (Extended Schools Quarterly Work Focused Interviews (ESQWFIs)) and New Deal Plus for Lone Parents (ND+fLP), hereafter collectively referred to as 'the lone parent pilots' (LPPs or 'the pilots'). The pilots operated in four sets of Jobcentre Plus districts (hereafter referred to as phases) starting in April 2004 (Phase 1), October 2004 (Phase 2), April 2005 (Phase 3) and October 2005 (Phase 4). Data was available up to 31 March 2007, covering the first 18 months (Phase 4 districts) to the first 36 months (Phase 1 districts) of the pilots' operation. IWC was rolled out to the whole of Great Britain in April 2008, after the period covered by this report.

This report estimates the impact of the LPPs on the benefit and work outcomes of lone parents who had been receiving Income Support (IS) or Jobseeker's Allowance (JSA). Lone parents who were eligible for the LPPs because they had been claiming Incapacity Benefit (IB), Carer's Allowance or Severe Disability Allowance (SDA) were not included in this analysis. It makes use of two empirical methods – difference-in-differences (DiD) and a duration (or survivor) model – both of which use lone parents in Jobcentre Plus districts not operating an LPP as a comparison group.

The report provides estimates of the overall impact of the LPPs, including the impact of ESQWFIs and ND+fLP. Much of the analysis focuses on those lone parents who were 'potentially eligible' for IWC: this refers to lone parents in pilot districts who had been receiving IS or JSA for at least 12 months, and so would have been eligible to claim IWC had they left IS/JSA and started a job of 16 or more hours per week. If they had entered work of 16 or more hours, such lone parents could have been paid IWC of £40 per week while they were in work, for a maximum of 12 months. Formally, then, this report estimates the impact of the LPPs on lone parents who were potentially eligible for IWC.

## Results

It is not possible to estimate accurately the take-up rate of IWC amongst those lone parents who met all the eligibility criteria, as the available administrative data does not record accurately whether a lone parent is in work of 16 or more hours. However, by 31 March 2007, just under ten per cent of all potentially eligible lone parents had received IWC and just under 33 per cent of all potentially eligible lone parents who left IS had received IWC; the other 67 per cent who left IS may have left because they were no longer a lone parent or left to claim IB or left to work fewer than 16 hours a week or were unaware of IWC. Compared with potentially eligible lone parents who did not receive IWC, IWC recipients are less likely to have a child under the age of three, have fewer children on average, are more likely to have been on New Deal for Lone Parents (NDLP) and are less likely to be disabled. However, IWC recipients do not differ substantially from other potentially eligible lone parents in their work histories.

Just under 70 per cent of lone parents who received IWC did so for the full 12 months. These lone parents were very likely to remain in work, and very unlikely to re-claim out-of-work benefits, after their IWC claim had finished. However, the 30 per cent of IWC recipients who did not receive IWC for the full 12 months were highly likely to stop work and return to benefit when they stopped receiving IWC. IWC recipients who claimed for the full 12 months are more likely to have an older child, more likely to have been on NDLP and less likely to be disabled than IWC recipients who claimed for less than six months.

The main aim of this impact assessment is to estimate how many lone parents stopped receiving out-of-work benefits and started work purely as a result of the LPPs, and how long these effects lasted. Such estimates of additionality can be expressed in two ways: as a proportion of all **potentially eligible lone parents** or as a proportion of those **potentially eligible lone parents who left IS**. Overall, the LPPs had positive impacts that increased the proportion of potentially eligible lone parents who were in work and reduced the number who were receiving an out-of-work benefit. The main estimates are that 1.6 percentage points (ppts) more potentially eligible lone parents were no longer receiving an out-of-work benefit after 12 months' exposure to the pilots (from a base of 16.6 per cent). Based on Phases 1 and 2 (which cover a longer period than the other phases), it is estimated that 2.0 ppts more lone parents were no longer receiving an out-of-work benefit after 24 months' exposure (from a base of 23.9 per cent). The equivalent estimates for being in work are 1.0 ppts from a base of 13.3 per cent and 1.4 ppts from a base of 15.3 per cent. The size of these impacts is similar to the estimated impacts of NDLP and Work Focused Interviews (WFIs) on all lone parents on IS, as reported in Cebulla *et al.* (2008).[1]

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[1] Cebulla, A. and Flore, G. with Greenberg, D. (2008). *The New Deal for Lone Parents, Lone Parent Work Focused Interviews and Working Families' Tax Credit: A review of impacts*. The Department for Work and Pensions (DWP) Research Report No. 484, http://research.dwp.gov.uk/asd/asd5/rports2007-2008/rrep484.pdf

There is no robust evidence that the impact of the LPPs was any greater in pilot districts where ND+fLP was in place, or for lone parents subject to ESQWFIs. There is some evidence that the LPPs had a greater impact on lone parents who had previously been on NDLP than those who had not, particularly those who were potentially eligible for IWC when it first became available (known as the stock sample). It is not possible to tell whether this is genuinely caused by NDLP – which might happen if, for example, lone parents on NDLP were more likely to find out about IWC – or whether it is because lone parents who join NDLP are more work-ready and therefore, more likely to respond to an increased incentive to work, than those who do not, or whether there is some sort of beneficial interaction between the two policies.

IWC recipients do not seem to have been encouraged to remain in work and off benefit for much longer than they would have done in the absence of the pilots, so by far the most important impact of IWC has been to encourage more potentially eligible lone parents to leave out-of-work benefits and start work: only nine per cent of the overall impact of the LPPs a year after first receiving IWC was attributable to a retention impact.

The fact that the impact estimates are small relative to the number of IWC recipients implies that, two years after first receiving IWC, only one out of every five IWC recipients is not receiving IS thanks to the LPPs: the remaining four in five have either returned to claiming IS, or would have left IS and started work without the LPPs. This estimate of 'deadweight' is similar to that implied by previous evaluations of the Working Families' Tax Credit (WFTC), another in-work financial incentive programme and the NDLP.

There is evidence that lone parents in LPP districts who have been on IS for less than 12 months – and who are, therefore, not yet potentially eligible for IWC – stayed on IS for longer after the LPPs began. If these effects are caused by the LPPs – perhaps through anticipation effects – then the headline results presented earlier will slightly **overstate** the true impact of the LPPs on all lone parents. If, though, the effects instead reflect a deterioration of the underlying state of the labour market in the districts operating the LPPs relative to other districts, then the headline results will slightly **understate** the overall impact of the LPPs. The data available to the research team was insufficient to distinguish between these hypotheses. It would be possible to learn more through qualitative research with lone parents in their first year of receipt of IS. In theory, if there were anticipation effects, then an estimate of the overall impact of IWC that allowed for such effects should be smaller (less positive) than the headline estimate reported earlier; in fact, when such an estimate was produced, it was very similar to the headline estimate reported earlier.

These estimates supersede those in Department for Work and Pensions (DWP) Research Report No. 415 (RR 415).[2] In general, the estimated impact of the LPPs in this report is higher than that in RR 415. This is partly because the impact of the LPPs seems to rise over time, and partly because the empirical strategy has been refined slightly to account for inaccuracies in the administrative data and for the differing start dates of the four phases.

[2] Brewer, M., Browne, J., Crawford, C. and 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*. DWP Research Report No. 415, http://research.dwp.gov.uk/asd/asd5/rports2007-2008/rrep415.pdf

# Summary

## Overview

This is the second published report from a project designed to estimate the labour market impact of a set of five Government policies designed to help lone parents into work. These policies are being piloted in different combinations in Jobcentre Plus districts in Great Britain. The five policies in question are In-Work Credit (IWC), Work Search Premium (WSP), Extended Schools Childcare and Childcare Tasters (ESC), Quarterly Work Focused Interviews (QWFIs) for lone parents whose youngest child is aged 12 or over in Local Education Authorities (LEAs) in which an ESC pilot is operating (Extended Schools Quarterly Work Focused Interviews (ESQWFI)) and New Deal Plus for Lone Parents (ND+fLP). These are collectively referred to as 'the lone parent pilots' (LPPs or 'the pilots').

The pilots were introduced in four phases: Phase 1 (April 2004), Phase 2 (October 2004), Phase 3 (April 2005) and Phase 4 (October 2005) in certain Jobcentre Plus districts. Phase 2 included districts throughout Great Britain but the other phases included districts from England only. Separately commissioned qualitative evaluations of the LPPs and of ND+fLP were published in spring 2007 (Hosain and Breen, 2007; Jenkins, 2008). This report assesses the quantitative impact of the LPPs up to 31 March 2007, covering the first 36 months of operation of the pilots in Phase 1, 30 months in Phase 2, 24 months in Phase 3 and 18 months in Phase 4. ESC stopped in March 2006 and WSP stopped in September 2006 but the ND+fLP and IWC were continued, and IWC was rolled out nationwide in April 2008, outside the period covered by this report.

The report provides estimates of the overall impact of the LPPs. Much of the analysis focuses on those lone parents who were 'potentially eligible' for IWC: this refers to lone parents in pilot districts who had been receiving Income Support (IS) or Jobseeker's Allowance (JSA) for at least 12 months and so would have been eligible to claim IWC had they left IS/JSA and started a job of 16 or more hours per week. If they had entered work of 16 or more hours, such lone parents could have been paid IWC of £40 per week while they were in work, for a maximum of 12 months. Formally, then, this report calculates the impact of the LPPs on lone parents who were potentially eligible for IWC.

## Methodology

The main aim of this impact assessment is to estimate how many lone parents stopped receiving out-of-work benefits and started work as a result of the LPPs, and how long these effects lasted. The report also features descriptive analysis of the labour market outcomes and background characteristics of IWC recipients. The population of interest is limited to lone parents who at one stage claimed IS or JSA and who live in the pilot districts. Lone parents who were potentially eligible for the LPPs because they had been claiming Incapacity Benefit (IB), Carer's Allowance or Severe Disablement Allowance (SDA) were not included in this analysis.

The main empirical method used to produce estimates of the impact of the LPPs is a difference-in-differences (DiD) estimator. This tries to learn about the impact of the LPPs by comparing the behaviour of lone parents living in pilot districts with the behaviour of lone parents living in Jobcentre Plus districts that were not affected by the LPPs (known as comparison districts). A DiD estimator assumes that changes in the observed labour market outcomes of lone parents in the comparison districts can act as a reliable guide to the changes in outcomes that would have been experienced by those in the pilot districts had there been no LPPs. This is often known as the 'common trends' assumption. If the assumption is not true, the analysis would attribute impacts to the LPPs that are really just different trends in the economic conditions in pilot and comparison areas. The 'common trends' assumption is fundamentally untestable after the LPPs have been introduced but this report looked for supportive graphical and statistical evidence immediately before the introduction of the pilots; this showed that there are significant differences in outcomes between the pilot and comparison districts before the LPPs began, but these differences are largely constant over time. There is, therefore, no evidence from this that the 'common trends' assumption fails during the period before the LPPs as a whole, nor immediately before the LPPs began, giving confidence in the DiD estimator.

The main impact estimated is that of the LPPs as a whole on lone parents who are **potentially eligible** for IWC (in the evaluation literature, this corresponds to estimating the impact of the 'intention to treat' of the LPPs). The DiD estimator provides estimates of the impact of the LPPs on the probability that a potentially eligible lone parent is, after being **potentially eligible** for IWC for some period, not receiving an out-of-work benefit (defined as IS, JSA or IB) and the probability that they are in work. These capture the impact of the LPPs both on encouraging potentially eligible lone parents to leave benefit for work and on encouraging those that do so to remain in work and off out-of-work benefits. Two methods are then used to try to separate these two impacts for IWC recipients:

- The first involves applying the conventional DiD approach to those lone parents who leave IS for work in order to estimate directly the extent to which the LPPs encourage those who do leave benefit for work to remain off out-of-work benefits and in work.

- The second is to use a duration (or survivor) model, which models all transitions onto and off benefit and onto and off IWC. Such models are typically only valid under a more restrictive set of circumstances than the conventional DiD estimator but if these stronger assumptions are true, the model provides a more detailed understanding of the impact of IWC, enabling the two effects of IWC – encouraging potentially eligible lone parents to leave benefit for work and encouraging those that do so to remain in work – to be untangled. In principle, a duration model can be used to estimate the overall impact of the LPPs, as well as their impact on retention. However, constraints on the size of the sample that could be used in the duration model mean that the preferred estimates of the overall impact of the LPPs are based on the DiD approach.

These methods are each valid in different situations and so it is informative to consider them both.

## Data

This evaluation used administrative data held by the Department for Work and Pensions (DWP) – the Work and Pensions Longitudinal Study (WPLS), the Income Support History file (IS History file) and the National Benefits Database (NBD) – which collectively provide information on benefit receipt and employment spells up to 31 March 2007. The data sources were used to construct a sample for analysis consisting of all 'potentially eligible' lone parents in Great Britain, i.e. all lone parents who claimed IS/JSA for 12 months continuously at some point between 1 April 2001 and 31 March 2007.

The sample of potentially eligible lone parents was split into two groups:

- the **flow sample**, which includes lone parents who became potentially eligible for IWC at some point after its start date;
- the **stock sample**, which includes lone parents who were potentially eligible for IWC from the day it was introduced, because they had already been on IS/JSA for at least 12 months.

The impact of the LPPs was estimated separately for the flow and stock samples. The more interesting estimates are those of the impact of the LPPs on the flow sample, because that determines how effective the pilots will be in the long run.

The outcome measures are **whether an individual is not claiming an out-of-work benefit (defined here as IS, IB or JSA)** according to the DWP databases and **whether an individual is in work** according to the WPLS. The employment records in the WPLS are based on employers' returns to Her Majesty's Revenue & Customs (HMRC) about individuals they are employing who are earning enough to be liable for income tax or National Insurance. The WPLS may, therefore not capture individuals who are in work but earning below the personal threshold, 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. However, the way in

which uncertain start and end dates of employment spells are recorded may lead to an overestimate of the amount of time spent in work if all dates in the WPLS are taken at face value. Steps were taken to minimise the impact of uncertain start and end dates. Reassuringly, the estimated impact of the LPPs on work outcomes was broadly consistent with, though not always identical to, the impact on benefit outcomes. The WPLS does not record the hours worked by individuals.

A large number of individual and local-area characteristics that may affect labour market outcomes were also included in the model as controls, including detailed work and benefit outcomes for the a period before lone parents became potentially eligible for IWC, personal characteristics (e.g. disability status, number and age of children and so on) recorded in the administrative datasets, and local-area data from a variety of sources, including the 2001 Census and data from the Office for Standards in Education, Children's Services and Skills (Ofsted) on registered childcare providers.

## Take-up of IWC

A broad measure of take-up of IWC is the number of lone parents who have received IWC as a proportion of those who have ever been potentially eligible. This also provides a theoretical upper bound to the additional impact of IWC. By 31 March 2007, just under ten per cent of all potentially eligible lone parents had received IWC, and just under 33 per cent of all potentially eligible lone parents who left IS had received IWC. Take-up rates were higher in Phases 2 and 4 than Phases 1 and 3: this could reflect differences in local labour markets, differences in the characteristics of lone parents in the districts in the various phases or differential awareness of IWC among lone parents.

## Characteristics of IWC recipients

IWC recipients are 56 ppts more likely to have ever been on New Deal for Lone Parents (NDLP) than other lone parents who leave IS after at least 12 months in the pilot districts (i.e. than other potentially eligible lone parents), although this may be because of the conditions attached to IWC receipt when the pilots were first introduced, and seven ppts less likely to have ever been disabled. They are less likely to have a child under the age of three and they tend to have fewer children, on average, than other potentially eligible lone parents who left IS. Previous research has identified these as factors associated with shorter periods on IS and more frequent moves into work (Yeo, 2007; D'Souza *et al.*, 2008; La Valle *et al.*, 2008). However, these two groups do not differ substantially in terms of the proportion of time spent in work in the 30 months before leaving IS.

## Durations of IWC claims and post-IWC destinations

Just under 70 per cent of lone parents who claimed IWC received it for the maximum 12 months and 16 per cent of IWC claims lasted less than six months. IWC recipients who claim for at least 11 months are more likely to have characteristics known (from previous research) to be associated with shorter spells of IS and more frequent transitions into work than those who claim for less than six months. For example, IWC recipients whose claim lasts at least 11 months are more likely to have an older child than IWC recipients whose claim lasts less than six months.

As IWC is a time-limited payment, an important issue is what happens to lone parents when payments of IWC stop. For lone parents who receive IWC for at least 11 months, there are very few changes, on average, to key labour market outcomes when IWC payments stop: over 80 per cent are still not receiving an out-of-work benefit one year after they stopped receiving IWC and more than 60 per cent are still in work.

However, the picture is different for those lone parents who do not receive IWC for the full 12 months: amongst those who receive IWC for less than six months, 63 per cent are receiving an out-of-work benefit one year after starting an IWC claim and only 26 per cent are in work. For those who receive IWC for more than six but less than 11 months, 49 per cent are receiving an out-of-work benefit one year after starting an IWC claim and 35 per cent are in work. Amongst all lone parents who received IWC for less than the full 12 months, 56 per cent were receiving an out-of-work benefit one year after starting an IWC claim and 31 per cent were in work.

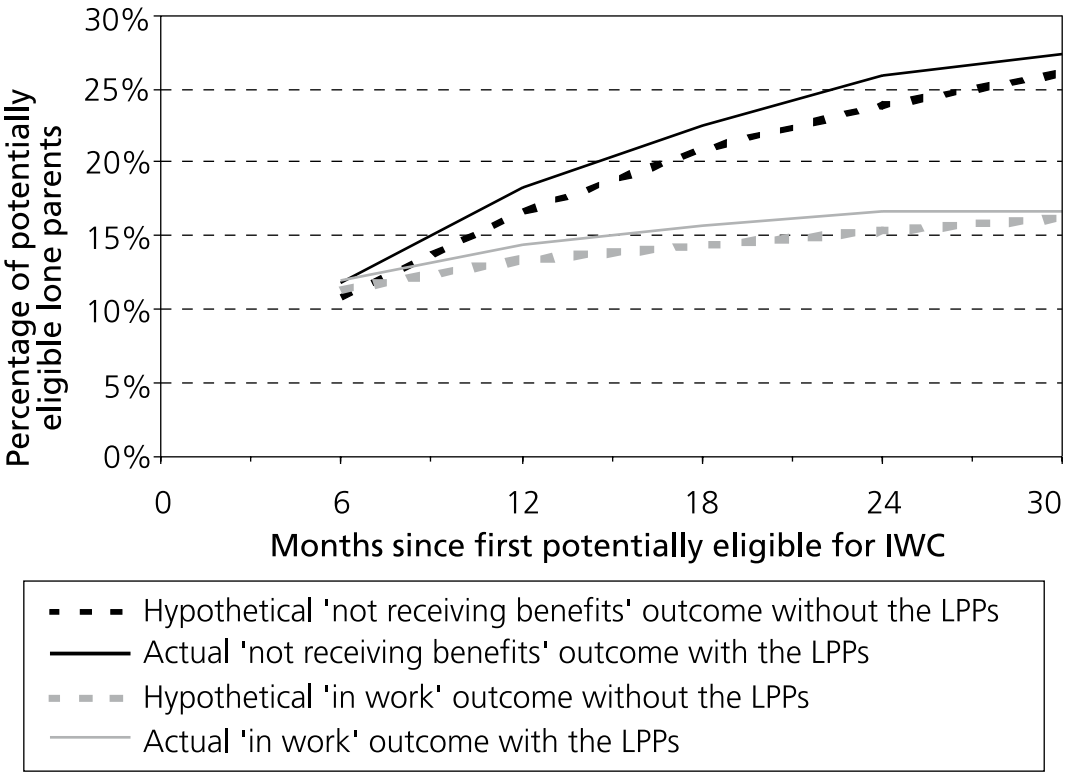
These findings strongly suggest that there are higher levels of job retention for the majority of IWC recipients who are able to maintain an IWC claim for the full 12 months. Furthermore, they suggest that the majority of those who do not complete an IWC claim stop receiving IWC because they are no longer working and have returned to benefits.

## Difference-in-differences estimates of the impact of the lone parent pilots: headline results

The main aim of this impact assessment is to estimate how many potentially eligible lone parents left benefit and started work purely as a result of the LPPs. The estimates suggest that, on average, the pilots led to statistically significant improvements in work and benefit outcomes.

Figure 1 shows the average benefit and work outcomes of potentially eligible lone parents in the flow sample and how they change with the length of time that a lone parent is potentially eligible for IWC. The figure also shows estimates of the outcomes that would have occurred had the LPPs not been operating; the gap between the dotted and solid lines of the same colour, therefore, represents the additional or net impact of the LPPs (see also Table 1 later).

**Figure 1 Percentage of potentially eligible lone parents in the flow sample who are off benefit and in work, and estimated percentage off benefit and in work in the absence of the LPPs**




Notes: Figure shows average (mean) outcomes and mean outcomes less the estimated impact. Impacts estimated by ordinary least squares (OLS) regressions on flow sample a certain number of months after first becoming potentially eligible for IWC. Work outcome is 'whether in work according to WPLS'. Benefit outcome is 'no longer receiving out-of-work benefits according to NBD'. Outcomes at month 0 are not shown. Not all phases contribute to impacts and outcomes at all durations. Number of lone parents potentially eligible for IWC and living in LPP districts when IWC in operation was 102,433 at six months and 4,509 at 30 months.

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 ppts of that 18.2 per cent attributable to the LPPs. 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 the LPPs responsible for 1.0 ppts of this 14.3 per cent. This highlights that, even with the additional impact of the LPPs, potentially eligible lone parents can remain on IS for long periods.

It is also valid to express the additional impact of the LPPs as a proportion of those **potentially eligible lone parents who are in work or no longer receiving an out-of-work benefit**. This is sometimes known as the additionality rate. These

numbers are reported in Table 1. They show that, for example, 8.8 per cent of the potentially eligible lone parents no longer receiving an out-of-work benefit after 12 months' exposure to the LPPs is attributable to the LPPs; the equivalent figure for work outcomes is 7.0 per cent.

The additional impact of the LPPs, expressed as a proportion of all potentially eligible lone parents, rises over time (measured relative to when they first became potentially eligible for IWC), as shown by the distance between the solid and dashed lines of the same colour in Figure 1. For example, after 24 months' exposure to the LPPs, a quarter (25.9 per cent) of potentially eligible lone parents were no longer on benefit and 2.0 ppts of this is attributable to the LPPs. For work outcomes, the equivalent figures are 16.7 per cent and 1.4 ppts. These are larger impacts than those after 12 months' exposure to the LPPs but it is not at all surprising that the impact of the LPPs rises the longer a lone parent is exposed to their policies and services. However, there is much less change over time in the additionality rate (see Table 1). This means that the additional impact of the LPPs on all potentially eligible lone parents rises with the length of time during which a lone parent is exposed to the LPPs, but their additionality rate is fairly constant.

## Difference-in-differences estimates of the impact of the lone parent pilots: variation across different types of lone parents, between the phases, by calendar time and by different combinations of policies offered as part of the LPPs

The headline results presented above were for the flow sample as a whole, meaning that the estimates pooled all the phases together and, within a phase, also pooled lone parents who became potentially eligible for IWC at different points in time.

The additional impact of the LPPs was estimated separately for the stock sample (those lone parents who were potentially eligible for the LPPs on the day they were introduced). The key difference between the flow and stock samples is that lone parents in the stock sample tend to have been receiving out-of-work benefits for far longer. The impact of the LPPs on the flow sample is more interesting than the impact of the LPPs on the stock sample, as it determines the impact of the LPPs in the long run. In general, the additional impact on the stock was smaller than that on the flow. After 12 months of being potentially eligible for the LPPs, 12.3 per cent of the stock sample was no longer receiving an out-of-work benefit, 0.5 ppts of which is attributable to the LPPs. After 24 months, the equivalent figures are 18.4 per cent and 1.6 ppts. The implied additionality rate for those not on benefit is 3.7 per cent after 12 months' exposure and 9.0 per cent after 24 months. The impact on work outcomes was very similar. The estimated impacts on benefit outcomes in Phases 1 and 4 after 12 months were not statistically significant but all those on all outcomes at 24 months were statistically significant.

There are no robust differences in the impact of the LPPs across the four phases. For benefit outcomes, the impact of the LPPs is greater in Phases 2 and 4 than it is in Phases 1 and 3 (both dominated by London). For work outcomes, the impact of the LPPs is greater in Phases 1 and 3 (both dominated by London) than it is in Phases 2 and 4. However, the variation across phases in the estimated impacts for the benefit outcomes is almost never statistically significant. Estimates from the stock sample suggest that the impact of the pilots is greater for lone parents in Phase 2 and 3 districts than it is for lone parents in Phase 1 or Phase 4 districts. These differences exist after the analysis has controlled for many characteristics of lone parents and the areas in which they live, but they are small.

Figure 1 showed how the impact of the LPPs changes with the length of time for which a lone parent is exposed to the LPPs but it is also possible that the impact of the LPPs is different for lone parents who became potentially eligible at different dates. This was investigated by estimating separate impacts for each 'cohort' of potentially eligible lone parents, where a cohort is defined as those lone parents who became potentially eligible for IWC in the same six-month window. For all phases, the estimated impact of the LPPs increases for each successive cohort, such that the LPPs seem to have had the largest impact on those lone parents who became potentially eligible between 1 October 2005 and 31 March 2006 (where outcomes are measured 12 months later, between 1 October 2006 and 31 March 2007). However, this finding is only statistically significant for work outcomes.

This report has found no robust evidence of variation in the impact of the LPPs according to the combinations of policies that were on offer. Specifically, the results do not suggest that the impact of the LPPs was any greater in pilot districts where ND+fLP was in place, nor for lone parents subject to ESQWFIs, than in pilot districts where only IWC was in place. For ESQWFIs, this is because few potentially eligible lone parents would have been subject to them, so the estimated impacts are very imprecise. For ND+fLP, the estimated impacts are more precise but are either very similar to the impacts in non-ND+fLP districts or weaker than in non-ND+fLP districts.

There were very strong impacts of the LPPs among lone parents who had previously been on NDLP. It is not possible to tell whether this difference is genuinely caused by NDLP – which might happen if, for example, lone parents on NDLP were more likely to find out about IWC – or whether it is because the sort of lone parents who join NDLP are more work-ready and therefore, more likely to respond to an increased incentive to work, than those who do not, or whether there is some sort of beneficial interaction between the two policies (it was also the case that, between April 2004 and October 2004 in the Phase 1 districts, it was a requirement for lone parents who wanted to receive IWC to have been on NDLP when they left IS).

## Summary of key results

Table 1 summarises the main impact estimates for those outcomes for which estimates are available for all phases.

### Table 1 Summary of impacts of the lone parent pilots

| *Percentage points* | *After 12 months' exposure to LPPs* | | | | *After 24 months' exposure to LPPs* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Impact on number no longer receiving out-of-work benefits* | | *Impact on number in work* | | *Impact on number no longer receiving out-of-work benefits* | | *Impact on number in work* | |
| | *As percentage of all potentially eligible lone parents* | *Additionality rate* | *As percentage of all potentially eligible lone parents* | *Additionality rate* | *As percentage of all potentially eligible lone parents* | *Additionality rate* | *As percentage of all potentially eligible lone parents* | *Additionality rate* |
| **Flow sample** | | | | | | | | |
| Overall | 1.6*** | 8.8 | 1.0*** | 7.0 | 2.0*** | 7.7 | 1.4*** | 8.4 |
| Phase 1 | 0.8** | 5.2 | 1.4*** | 9.8 | 1.9*** | 7.9 | 1.4*** | 8.9 |
| Phase 2 | 2.0*** | 10.1 | 0.9*** | 5.9 | 2.1*** | 7.5 | 1.3*** | 7.4 |
| Phase 3 | 1.2*** | 7.8 | 1.5*** | 12.0 | N/A | N/A | N/A | N/A |
| Phase 4 | 1.8*** | 8.3 | 0.2 | 1.4 | N/A | N/A | N/A | N/A |
| **Stock sample** | | | | | | | | |
| Overall | 0.5 | 3.7 | 0.7 | 4.8 | 1.6 | 9.0 | 1.2 | 8.1 |
| Phase 1 | 0.1 | 0.9 | 0.4*** | 2.9 | 0.9*** | 5.1 | 0.8*** | 5.1 |
| Phase 2 | 0.7*** | 5.6 | 0.8*** | 5.4 | 1.5*** | 7.5 | 1.2*** | 7.5 |
| Phase 3 | 0.6*** | 6.3 | 1.1*** | 8.7 | 2.2*** | 13.1 | 1.5*** | 10.7 |
| Phase 4 | 0.3* | 1.4 | 0.2 | 2.1 | N/A | N/A | N/A | N/A |

Notes: The table shows the estimated impact of the LPPs on the proportion of lone parents no longer on benefit, and (separately) now in work, a certain number of months after first becoming potentially eligible for IWC. Impacts estimated by OLS regressions on flow sample and stock sample a certain number of months after first becoming potentially eligible for IWC. Work outcome is 'whether in work according to WPLS'. Benefit outcome is 'no longer receiving out-of-work benefits according to NBD'. Results are presented in ppts, so an estimate of 1.6 means 1.6 ppts. * = significant at 10 per cent level, ** = significant at 5 per cent level, *** = significant at 1 per cent level; standard errors have not been calculated for the impacts expressed as percentage of those no longer on benefit (or now in work), nor the overall impact for the stock sample. Additionality rate is calculated as '100 × impact/(outcome)'.

## Disentangling the impact of the LPPs: did they encourage more lone parents to leave benefit for work or encourage those who did leave to stay in work and off benefit for longer?

The headline estimates of the LPPs combine any initial impact the LPPs had on encouraging lone parents to leave benefit and enter work, and any subsequent impact they had on encouraging IWC recipients to stay in work and off benefit. Two separate analyses suggest that 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 the LPPs on reducing the benefit re-entry rate of IWC recipients seems to have been very small in comparison. One piece of evidence that supports this conclusion comes from estimating the impact of IWC on potentially eligible lone parents who left IS for work in the LPP districts using the DiD method. These estimated impacts are small (but statistically significant): for example, around 70 per cent of these lone parents are still off benefit a year after leaving IS, and only 2 ppts of this can be attributed to IWC. The other piece of evidence comes from a duration (or survivor) model. This was used to simulate directly how long IWC recipients would remain off out-of-work benefits in the absence of IWC, and estimated that only 9 per cent of the overall effect of the LPPs a year after first receiving IWC was attributable to a retention impact. These two methods are each valid in different situations, and so it is informative to consider them both.

## Apparent impacts of the LPPs on lone parents who are not yet eligible for IWC

It is possible to use the DiD method to estimate the 'impact' of the LPPs on lone parents who have been on IS for less than 12 months and who are, therefore, not yet potentially eligible for IWC. These estimates are small (although generally statistically significant) and negative. But interpreting such 'impacts' is not simple: there are two main causes, with very different implications, and the data available to the research team was insufficient to distinguish between these hypotheses.

First, the negative 'impacts' may be genuinely caused by the LPPs. There are at least two ways this could occur: Lone parents in IWC districts whose IS claim has lasted less than 12 months, and who are contemplating leaving IS for a job of 16 or more hours a week, might delay leaving IS until they become eligible for IWC in order to benefit from the £2,080 maximum payment of IWC; this is known as an 'anticipation effect'. There may also be 'spillover effects'; in the case of the LPPs, this would refer to a situation where the higher number of lone parents induced by the LPPs to look for work makes it harder for others – such as lone parents who have been on IS for less than 12 months – to find work, although these effects seem unlikely to be very important in a flexible labour market. If anticipation or substitution effects are present, and are leading to the apparent

negative impacts on lone parents whose IS claim has lasted less than 12 months, the headline estimates of the additional impact of the LPPs presented earlier are **overstating** the overall impact of the LPPs. However, qualitative research with IWC recipients (Ray *et al.*, 2007) found that the majority of those IWC recipients who had not received WSP or had a QWFI heard about IWC for the first time after they had found a job, suggesting anticipation effects are unlikely (although that research was based on a small sample of IWC recipients). Furthermore, a variant of the duration model that allows for anticipation effects finds little evidence for their existence. However, anticipation effects were found to be present in a similar programme in Canada (Card and Hyslop, 2005) and it is also plausible that there were spillover effects, as described above in the Canadian programme.

Second, the negative 'impacts' may be due to a general deterioration in the outcomes in the pilot districts that did not occur in the comparison districts and which cannot be explained by the explanatory factors included in the analysis (this would reflect a failure of the 'common trends' assumption). If such a deterioration had occurred, the headline estimates of the impact of the LPPs presented above are **understating** the actual impact of the LPPs.

## Deadweight

'Deadweight' reports what fraction of IWC recipients would have behaved in the same way in the absence of IWC. It is possible to calculate a rough measure of deadweight as

$$\left(1-\frac{\text{Number of additional people off benefit or in work as a result of the LPPs}}{\text{Number of people who have received IWC}}\right)\times 100$$

This measure has been calculated separately for the stock and the flow samples and separately for all of the outcomes analysed.

For the flow sample, the estimates of deadweight for benefit outcomes are grouped around 80 per cent in all phases; for the stock sample, estimated deadweight for benefit outcomes is 85 per cent in Phases 1 and 2, 95 per cent in Phase 4 and 66 per cent in Phase 3 (the estimated deadweight for work outcomes is rather erratic).

These results are broadly consistent with those from the duration model, which estimates that, two years after first receiving IWC, only one out of every five IWC recipients is not receiving IS thanks to the LPPs: the remaining four in five IWC recipients have either returned to IS or would have left IS and started work without the LPPs. The fact that their behaviour is – after two years – unaffected by IWC represents the 'deadweight' of the policy. The size of the deadweight is similar to that implied by previous evaluations of the Working Families' Tax Credit (WFTC), another in-work financial incentive programme, in Brewer *et al.* (2006) and of the NDLP, a voluntary programme to help lone parents leave IS and start work, in Dolton *et al.* (2006) and Cebulla *et al.* (2008).

## What has changed since DWP Research Report 415 (RR 415)?

These estimates supersede those in RR 415. In general, the estimated impact of the LPPs in this report is higher than that in RR 415. It is not possible to isolate a single reason for this, as there have been many changes to the data analysed and the empirical strategy, the most important of which are:

- This report had access to more recent data containing newer cohorts of lone parents. From a statistical point of view, the larger flow sample has made it easier to detect small impacts reliably. More importantly, there is evidence that the impact of the LPPs on later cohorts of lone parents in the flow sample is greater than that on earlier cohorts and that the impact on the stock sample seems to have grown over time; this is partly why the estimated impacts of the LPPs reported here are higher than those in RR 415.
- This report uses data for Phase 4 districts, as well as the LPP districts in Scotland and Wales, which were not covered by RR 415. Furthermore, the sample of lone parents used before the LPPs began has been extended back to cover all those whose claims exceeded 12 months' duration on or after 1 April 2001 (compared with 1 April 2002 in RR 415).
- The measure of whether a lone parent is 'off benefit' has been improved to account for errors in the DWP administrative data and the measure of work has been further refined to account for errors in the WPLS.
- Estimates of the number of IWC recipients provided by DWP to the authors were lower than they were for RR 415; this has reduced estimates of the IWC take-up rates.
- In the flow sample, the implementation of the DiD estimator has been refined to correctly allow for the start dates of the LPPs to vary by phase and to allow for an arbitrary underlying trend in outcomes.

## Implications for policy

The target population for the LPPs – lone parents who have been receiving out-of-work benefits for at least one year – tend to stay on benefits and out of work for long periods of time. The results in this report imply that the main role of the LPPs is to encourage more lone parents to leave benefit and start work. The size of the impact is similar to the estimated impacts of NDLP and WFIs on all lone parents on IS, as reported by Cebulla *et al.* (2008).

There is little evidence that the LPPs are having any impact on job retention, although job retention amongst most IWC recipients is very high, with 70 per cent remaining off benefit a year after claiming IWC.

One potential drawback of limiting IWC payments to a maximum of 12 months, compared with, say, a £40 a week increase in the Working Tax Credit (WTC), is that any positive impact it had would cease immediately when the payments stopped. This report has rejected this concern, by showing that lone parents do not stop work or start a new IS claim when they reach the 12-month limit of IWC payments.

A potential drawback of restricting eligibility for IWC to lone parents who have spent at least 12 months receiving out-of-work benefits is that it gives lone parents on out-of-work benefits a financial incentive to postpone starting work until they have been on out-of-work benefits for a year. The data is consistent with this happening on a small scale but there are alternative explanations. Furthermore, an estimate of the overall impact of IWC that allows for such anticipation effects is very similar to the headline estimate reported earlier.

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.

Finally, it should be noted that this impact assessment covers the operation of the LPPs from 1 April 2004 to 31 March 2007. It is entirely possible that the impact of IWC and related policies during a recession is different from its impact when the economy is growing.

# 1 Introduction

This is the second and final published report from a project designed to evaluate, quantitatively, the net impact on various labour market outcomes of a set of Government policies designed to help lone parents into work (known as the lone parent pilots (LPP)). The first report was Brewer *et al.* (2007), hereafter referred to as RR 415 (as it was published as Department for Work and Pensions (DWP) Research Report 415). This report includes the material that was intended to be published as a DWP working paper in 2007.

Over the period covered by this report (April 2004 to March 2007), various central government policies were piloted to help or encourage lone parents into work and/or to stop claiming benefits. These were collectively known as the lone parent pilots (LPPs or 'the pilots') and in full are In-Work Credit (IWC), Work Search Premium (WSP), Extended Schools Childcare and Childcare Tasters (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 (ESQWFI), and New Deal Plus for Lone Parents (ND+fLP). The main estimates are of the overall impact of the LPPs but an attempt is made to estimate the additional impact of QWFIs and to estimate impacts separately for ND+fLP districts.

This report estimates the impact of the LPPs on the benefit and employment outcomes of lone parents who had been receiving Income Support (IS) or Jobseeker's Allowance (JSA). Lone parents who were eligible for the LPPs because they had been claiming Incapacity Benefit (IB), Carer's Allowance or Severe Disability Allowance (SDA) were not included in this analysis. It makes use of two empirical methods – difference-in-differences (DiD) and a duration (or survivor) model – both of which use lone parents in Jobcentre Plus districts not operating an LPP as a comparison group. Data was available up to 31 March 2007, covering the first 18 months (Phase 4 districts) to the first 36 months (Phase 1 districts) of the pilots' operation (Appendix A contains full details of the districts and policies that are included in each phase). IWC was rolled out to all of Great Britain in April 2008, outside the period covered by this report.

Much of the analysis focuses on those lone parents who were 'potentially eligible' for IWC: this is a key concept and refers to lone parents in pilot districts who had

been receiving IS or JSA for at least 12 months, and so would have been eligible to claim IWC had they left IS/JSA and started a job of 16 or more hours per week. If they had entered work of 16 or more hours, such lone parents could have been paid IWC of £40 per week while they were in work, for a maximum of 12 months. Formally, then, this report calculates the impact of the LPPs on lone parents who were potentially eligible for IWC.

The outline of this report is as follows:

- Chapter 2 discusses the aims, the methodology and the data used. The substantive analysis in this report is then in several chapters.
- Chapter 3 presents descriptive analysis of what is known about IWC recipients from administrative data. It examines the take-up rate of IWC, how long potentially eligible lone parents spent on IS before claiming IWC, how long they received IWC and whether they claimed IS or stopped work after they had stopped receiving IWC. It also examines whether certain sorts of lone parents were more likely than others to receive IWC or to receive IWC for the full 12 months. This analysis is new to this report, as RR 415 did not have data on which lone parents were receiving IWC.[3]
- Chapters 4 and 5 present the headline estimates of this report: the additional impact of the LPPs on the key benefit and work outcomes of the whole population of potentially eligible lone parents. These estimates can be derived from the DiD or the duration model and both are presented. Chapter 4 also examines the apparent impact of the LPPs on lone parents who are not yet eligible for IWC: such impacts might be affected by anticipation or substitution effects, or they may be informative about trends in underlying outcomes specific to the LPP districts. Chapter 4 presents results for the flow and Chapter 5 presents results for the stock: an estimate of the long-run impact of the LPPs needs to be made using the flow sample, because, in the long run, the initial stock sample will have all left IS/JSA and the only lone parents eligible for the pilots will be those from the flow sample (i.e. those who become eligible for IWC after the pilots were introduced). In the short run, though, the impact of the LPPs on the stock sample is of interest in itself as the majority of those potentially eligible for IWC come from the stock sample.
- Chapter 6 extends the DiD analyses in Chapters 4 and 5 to break down the impact of the LPPs on the population of potentially eligible lone parents into impacts among different groups of lone parents. Specifically, this chapter examines whether the impact varies according to which 'flavour' of LPP packages the lone parents were exposed to. This supplementary analysis is conducted for both the flow and stock samples.

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[3] RR 415 presented estimates of participation rates in IWC derived from Jobcentre Plus district-level aggregate data, now known to be inaccurate (see Chapter 3 for discussion).

- Chapter 7 presents a full discussion of the differences in results between this report and RR 415. The results should be seen as an update to similar analysis presented in RR 415 but the results in this report are based on a longer spell of data and include the Phase 4 districts and districts in Scotland and Wales, and there are also small but important differences in the precise specification of the analysis.
- Any positive impacts of the LPPs on the whole population of potentially eligible lone parents could arise both because the LPPs encouraged more lone parents to leave benefit (or encouraged lone parents to leave benefit sooner than they otherwise would) and because the LPPs (particularly IWC) encouraged those lone parents who left benefit for work to stay in work and off benefit for longer (hereafter abbreviated to 'encouraging job retention'). Chapter 8 aims to isolate the second of these: the impact of the LPPs (particularly IWC) on encouraging job retention. This is done with both the duration model and a DiD estimator.
- Chapter 9 presents further analysis of the impact of the LPPs on IWC recipients. It also provides grossed-up estimates of the actual number of lone parents moved off benefit or into work thanks to the IWC.
- Finally, Chapter 10 summarises the report's conclusions and provides policy implications.

As stated above, this report has made use of two methods: a DiD model and a duration model. Both models have been used to examine most of the questions that this report addresses and so the results they produce can be compared with each other. In general, the methods give similar answers. However, the computational demands of the duration model meant that it was not possible to make use of data on employment and it had to be estimated on a (random) 5 per cent sample of the lone parents who claim IS, with only a handful of explanatory variables.

# 2 Aims of the research and methodology

This chapter sets out the aims of the research project as a whole and of this report in particular. It also describes the methods used in this report to estimate the impact of the lone parent pilots.

## 2.1 The policies that comprise the lone parent pilots

This project was designed to evaluate the impact of a number of policies designed to help or encourage lone parents into work and/or to stop claiming benefits, collectively known as the lone parent pilots (LPPs). These policies are:

- In-Work Credit (IWC);
- Work Search Premium (WSP);
- Extended Schools Childcare and Childcare Tasters (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).

Appendix A to this report gives more details of the policies and shows how the policies overlap spatially and temporally.

Chapter 6 attempts to estimate impacts separately for ND+fLP areas and to estimate the additional impact of ESQWFIs on lone parents who were subject to them. But it is the opinion of the authors that the impact of the pilots as a whole will be dominated by the impact of IWC, which substantially alters the financial gain to working for eligible lone parents. IWC also operates in more districts than the other policies, reaching around 45 per cent of lone parents on benefit for at least a year.

IWC was piloted in four phases:

- Phase 1 (April 2004): Bradford; North London; South-East London.
- Phase 2 (October 2004): Cardiff and Vale; Central London; Dudley and Sandwell; Edinburgh, Lothian and Borders; Lancashire West; Leeds; Leicestershire; Staffordshire; West London.
- Phase 3 (April 2005): Brent, Harrow and Hillingdon; City and East London; Lambeth, Southwark and Wandsworth; South London.
- Phase 4 (October 2005): Bedfordshire and Hertfordshire; Berkshire, Buckinghamshire and Oxfordshire; Essex; Hampshire and the Isle of Wight; Kent; Surrey and Sussex.

## 2.2 The population of interest, what outcome variables will be investigated and what might be expected to happen

### 2.2.1 The population of interest

The fact that this evaluation is using the Work and Pensions Longitudinal Study (WPLS) means that it is constrained to evaluate the impact of the LPPs on lone parents who appear in the WPLS – that is, those lone parents who, at some point in time, have claimed a Department for Work and Pensions (DWP) benefit.

Much of the analysis estimates the impact of the LPPs on lone parents who are **potentially eligible** for IWC: these are lone parents who have been receiving Income Support (IS)/Jobseeker's Allowance (JSA) for at least 12 months and who live in a Jobcentre Plus district where IWC is being piloted; they would be eligible for IWC if they stopped claiming IS, started a job of at least 16 hours per week and were living in a Jobcentre Plus district operating IWC at the time. This concept of being **potentially eligible** is fundamental to the evaluation: a lone parent is **potentially eligible** for IWC if they live in a pilot district and have been on IS/JSA for at least 12 months.

Using the technical terms, the analysis measuring the impact on lone parents who are **potentially eligible** means that this report presents estimates of the 'intention to treat' impact of the LPPs. How this definition was implemented in practice is described in Appendix B.

Chapter 3 includes analysis of IWC recipients and various groups of lone parents who leave IS and the duration model is estimated on all lone parents who have made a claim for IS since 2001. And some parts of the report (Section 4.2.3) look at a wider population: all lone parents who make a claim for IS/JSA. Theoretically, if they were aware of IWC, some lone parents on IS/JSA might delay leaving benefits until the duration of their claim exceeds 12 months in order to become potentially eligible for IWC; conversely, the prospect of having to attend QWFIs as part of the

ESC programme (ESQWFIs) may induce some lone parents to leave IS/JSA in the first 12 months when they might not have done so had they been unaware of ESQWFIs.

### 2.2.2 Outcome variables: what impacts does this report investigate?

The key outcomes of interest under consideration in this report are whether, at particular points in time, lone parents who are potentially eligible for IWC in the pilot districts are more likely to have stopped claiming out-of-work benefits (defined as IS, JSA or Incapacity Benefit (IB)), or are more likely to have started working, thanks to the LPPs (Appendix B discusses how this was measured in practice; note that the measure of work does not record the number of hours worked).

The data used in this evaluation means that this report cannot provide information about the impact of the LPPs on the lone parent employment rate nor on the proportion of lone parents claiming IS/JSA, as these require the existence of a dataset containing all lone parents. Such estimates could be produced using a household survey, such as the Family Resources Survey (FRS) or the Labour Force Survey (LFS) but, in practice, the small impacts that this report estimates (discussed in subsequent chapters) mean that any impact on the overall employment rate amongst lone parents would be very small.

### 2.2.3 What might be expected to happen?

Economic theory and past evidence from similar programmes suggest the following responses are likely following the introduction of IWC:

- IWC should make it more likely that a potentially eligible lone parent in a pilot district leaves benefit to work at least 16 hours a week.
- Having left benefits for a job, IWC should make it more likely that a lone parent recipient stays in work of at least 16 hours a week, but this effect may decline or cease entirely when an individual stops receiving IWC payments.
- IWC may induce some lone parents who would otherwise have left IS/JSA after less than 12 months to remain on IS/JSA for longer in order to be entitled to these additional payments. These responses are known as anticipation effects. (Card and Hyslop (2005) 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. A variant of the duration model allows for anticipation effects (see Appendix F).) In the extreme, they may also induce lone parents who would otherwise not have claimed IS/JSA at all to claim IS/JSA and continue doing so for at least 12 months in order to become eligible for IWC, but this is very unlikely in practice and these effects are assumed not to exist in the analysis in this report.

In addition, the ESC pilots should increase parents' information about childcare opportunities and/or make childcare more accessible. This should increase the usage of formal childcare, perhaps at the expense of informal childcare and may increase parental employment as a result. The ESQWFIs should increase flows off IS/JSA and into work for lone parents with a youngest child aged 12 or above through various mechanisms that increase the likelihood of the lone parent receiving an acceptable job offer. They may also act as a deterrent and lead to some lone parents leaving IS/JSA in under 12 months in order to avoid having an ESQWFI.

The conclusion from Research Report 415 (RR 415) was that *'the* [lone parent] *pilots had small, positive impacts on the number of lone parents in work and no longer receiving out-of-work benefits'* but that *'the main achievement of the pilots was to make better off those lone parents who would have left benefits for work had the pilots not been in operation, rather than to encourage substantially more lone parents to do just that.'* (Brewer *et al.*, 2007, 1 and 2).

## 2.3 Empirical methods

There are two empirical methods used in this report to produce estimates of the impact of the LPPs: one is a difference-in-differences (DiD) estimator and the other is based on a duration (or survivor) model. Appendices E and F give full details of these methods and how they were implemented.

Both methods need to estimate what would have happened to potentially eligible lone parents in the LPP districts in the absence of the LPPs and, in principle, this can be addressed using an appropriate comparison group which was not affected by the pilots. RR 415 explained that the preferred comparison group is lone parents who have been claiming IS/JSA for at least 12 months but who live in districts that are not affected by the LPPs.

The DiD estimator works by comparing trends in the outcomes of lone parents in the LPP districts with trends in the outcomes of lone parents in the comparison districts (in practice, this comparison is made having controlled for a very wide range of explanatory factors). This will be a good estimate of the impact of the LPPs if trends in the outcomes of lone parents in the comparison districts are a good guide to what the trends in the outcomes of lone parents in the LPP districts would have been had there been no LPPs. This requirement is known as the 'common trends' assumption and estimates of the impact of a labour market programme that are based on DiD are only ever valid if the assumption of 'common trends' is true in practice. Estimates based on a duration model do not technically require the common trends assumption to be true but, in practice, the model's estimate of the impact of the LPPs will be derived to a large extent from comparisons between the behaviour of lone parents in pilot and comparison districts before and after the LPPs began.

The 'common trends' assumption will be satisfied if the unobserved influences on labour market outcomes do not change in different ways between the pilot and comparison groups during the period under consideration. An informal test of the 'common trends' assumption is to test for a 'placebo effect' – in other words, to apply the DiD method to a period of time where it is known that there was no policy change, and then to test whether the DiD estimator correctly estimates there to be no effect. Section 4.2.1 reports the results of a similar test, which examines whether the differences in outcomes between each of the pilot phases and the set of comparison districts are constant over the period before the LPPs begin.

Both the DiD method and a duration model can be used to investigate the additional impact of the LPPs on the population of potentially eligible lone parents, and this is done in Chapters 4, 5 and 6. But these positive impacts of the LPPs on the population of potentially eligible lone parents could arise both because the LPPs encouraged more lone parents to leave benefit (or encouraged lone parents to leave benefit sooner than they otherwise would have done) and because the LPPs (particularly IWC) encouraged those lone parents who left benefit for work to stay in work and off benefit for longer (hereafter abbreviated to 'encouraging job retention'). Understanding the relative importance of these two effects is very important, and can be done in two ways:

- The duration model can provide an exact breakdown of the overall impact of the LPPs into the two effects described above; it can do this because it attempts to model lone parents' transitions onto and off benefit and into and out of work, and how these depend upon observable and unobservable characteristics, as well as on potential eligibility for, or receipt of, IWC.
- The DiD estimator can be applied to the sample of potentially eligible lone parents who left benefit for work. Because this sample has already left benefit, any impact detected by this method must be due to the impact of the LPPs on encouraging job retention.

There are statistical advantages and disadvantages to both methods, and each method will produce robust estimates of the true impact only under a particular set of conditions: see Appendices E and F.

# 3 Descriptive analysis of In-Work Credit recipients

This chapter presents descriptive analysis of In-Work Credit (IWC) recipients.

Section 3.1 discusses the take-up rate of IWC by pilot phase: this is of interest because some measures of take-up provide a theoretical upper bound to the additional impact of IWC on labour market outcomes; furthermore, knowing what fraction of lone parents actually received IWC helps the estimated impacts to be understood better. Section 3.2 discusses how long IWC recipients stayed on IWC and what they did next, and Section 3.3 analyses the characteristics of IWC recipients: in both cases, the findings for IWC recipients are compared with the findings for other groups of Income Support (IS) leavers.

Appendix G provides supplementary tables. In particular, it provides comparisons between IWC and work/benefit data from the Work and Pensions Longitudinal Study (WPLS), which allows one to see whether IWC recipients are recorded as being in work in the WPLS.

## 3.1 Participation in (or take-up of) IWC

This section presents a number of different ways of looking at take-up of IWC.

A significant issue when looking at take-up of IWC is defining and estimating the population of lone parents eligible for IWC. It is possible to calculate three different take-up rates:

i. Number receiving IWC as a percentage of the number of potentially eligible lone parents (where, as in the rest of this report, 'potentially eligible' means a lone parent on IS or Jobseeker's Allowance (JSA) for at least 12 months and living in a pilot district).

ii. Number of new IWC recipients as a percentage of the number of potentially eligible lone parents who left benefit over some period.

iii. Number of new IWC recipients as a percentage of the number of potentially eligible lone parents who left benefit and started a job of at least 16 hours a week over some period.

To be genuinely entitled to IWC, a lone parent has to be potentially eligible, and then leave benefit and start a job of at least 16 hours per week, so definition (iii) is the closest to a genuine measure of 'take-up'. The measure of work constructed from eligibility to Working Tax Credit (WTC), which is now available in the WPLS, potentially provides an accurate assessment of which lone parents are in work of 16 or more hours. However, this measure was not available in time for this research report. Research Report 415 (RR 415) showed that an estimate of IWC take-up according to definition (iii) (but that disregards the hours worked per week) often exceeds 100 per cent, presumably because of the limitations of the measure of work in the WPLS. In particular, it is suspected that some lone parents receiving IWC have met the conditions for receiving IWC but that this is not being reflected in the WPLS (for example, if a job start date has been incorrectly recorded in the WPLS or if a lone parent receiving IWC has taken a job earning less than the personal allowance which does not appear in the WPLS). Such estimates are, therefore, not repeated here.

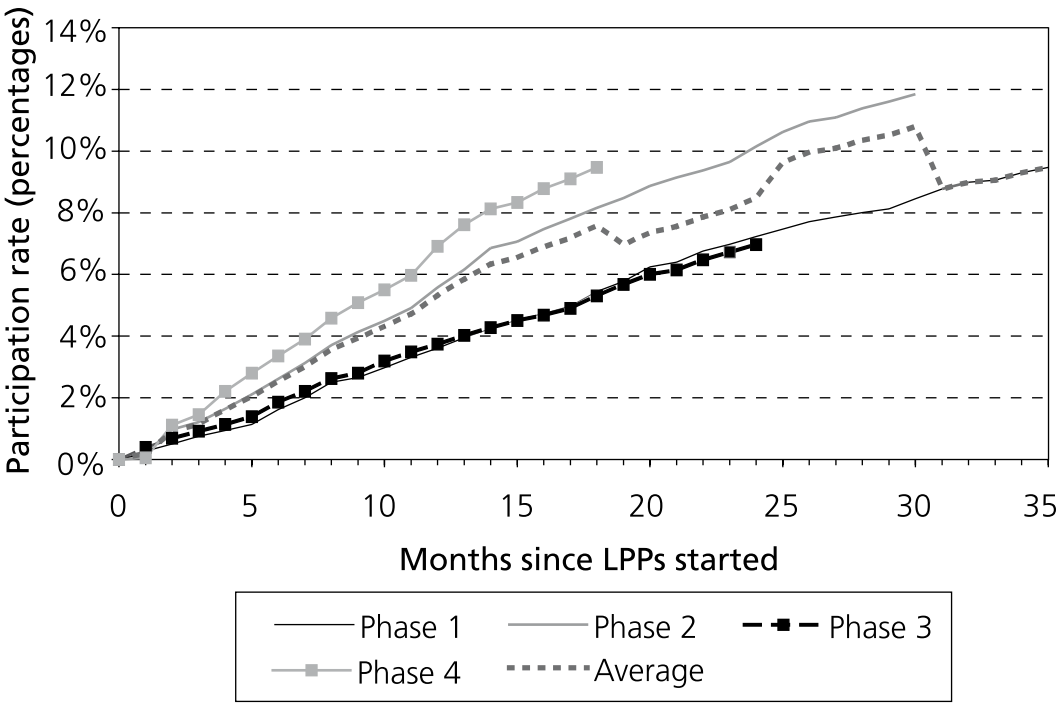
Because of this problem in identifying in the WPLS lone parents who have met all of the conditions necessary for receipt of IWC, the other two measures of take-up use a broader definition of eligibility. Measure (ii) requires that the lone parent is recorded in the IS History database as leaving IS but does not necessarily have an entry for a new job in the WPLS. One downside of this measure is that lone parents will leave benefit 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.

Measure (i) compares the numbers receiving IWC to the total potentially eligible population (i.e. those lone parents who could receive IWC were they to leave benefit and start a job of at least 16 hours per week). This measure is of interest partly because it provides a theoretical upper bound to the additional impact of IWC on the proportion of lone parents who leave benefit or move into work: in the extreme scenario where none of the lone parents receiving IWC would have left benefit in the absence of the IWC (i.e. where the policy has no deadweight, discussed in Chapter 9), the additional impact of IWC would be equal to this measure.

Figure 3.1 shows take-up rate (i) over time: the cumulative number receiving IWC as a percentage of the cumulative number of potentially eligible lone parents (Appendix G gives the numbers starting IWC in each phase over time and take-up rates separately for the stock and flow samples; Box 3.1 discusses why Figure 3.1 is different from the equivalent figure in RR 415). The figure shows that:

- in each phase, the number of IWC recipients as a proportion of the potentially eligible population has increased over time (the average take-up rate exhibits step changes after 18, 24 and 30 months, as the number of phases contributing to the average falls over time – see Section 4.1.2). By March 2007, just under 10 per cent of potentially eligible lone parents had received IWC;
- the participation rate varies across the phases, with Phases 1 and 3 having lower participation rates than Phases 2 and 4. This disparity could reflect differences in local labour markets, or in the characteristics of lone parents in the districts in the various phases. But given that potentially eligible lone parents in the Phase 1 districts were less likely to leave benefit than those in the Phase 2 districts in the absence of IWC (this is shown in RR 415, or see Figure I.1 for justification), it is not surprising to see that participation in IWC as a proportion of all potentially eligible lone parents varies across phases in the same way. However, the lower take-up rate could reflect that it took longer in the Phase 1 and 3 districts for staff and customers to become aware of IWC.

**Figure 3.1 Participation measure (i): recipients of IWC as percentage of all lone parents ever potentially eligible, by phase and month since LPPs started (up to 31 March 2007)**

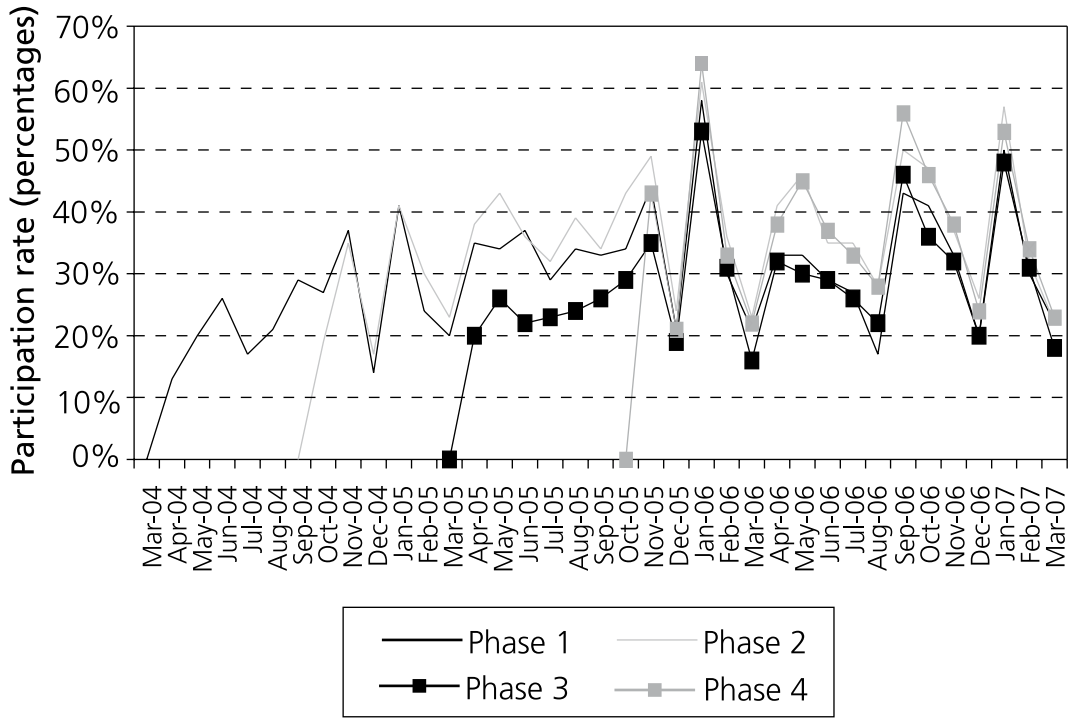



Note: Numerator is recipients of IWC to date and denominator is all potentially eligible lone parents, both based on DWP administrative data described in Appendix B.

Figure 3.2 shows IWC starts as a fraction of IS off-flows amongst potentially eligible lone parents. It reveals that:

- on average, the number of new IWC claims each month is a third of the number of potentially eligible lone parents who leave benefit but there is considerable variation across the year, with the highest ratios in September, January and May (also see Table G.1);
- this measure has a slight upward trend in the first few months of operation in each phase, consistent with potentially eligible lone parents who left benefit for work very early in the pilots' operation, not being aware of IWC;
- this measure is slightly higher in Phases 2 and 4 than in Phases 1 and 3; it is likely that this is because a higher proportion of benefit leavers in the Phase 2 and 4 districts move into work of at least 16 hours than in the other phases (this is shown in RR 415 or see Figure I.1 in Appendix I for justification);

**Figure 3.2 Participation measure (ii): new recipients of IWC as percentage of IS off-flows from potentially eligible lone parents, by phase and month (up to 31 March 2007)**




Notes: Numerator is new recipients of IWC in each month and denominator is exits from IS by potentially eligible lone parents, both based on DWP administrative data described in Appendix B. The average rates across all months were 29 per cent for Phase 1, 35 per cent for Phase 2, 28 per cent for Phase 3 and 36 per cent for Phase 4, with an average of 33 per cent across all phases in all months. Phase 4 IWC starts in October 2005 have been reclassified as November 2005.

**Box 3.1: Why have estimates of the IWC participation/take-up rates changed since RR 415?**

The participation rates presented in Figure 3.1 are different from (and lower than) those in Figure 5.1 in RR 415. This is because the estimates of the number of IWC starts in each month, by district, that have been estimated from the full micro-data on IWC payments (and that the project team have verified with officials at DWP) are considerably **lower** than similar estimates provided to the project team for RR 415: this clearly acts to lower the implied take-up rate. The current estimates have calculated more precisely which lone parents are potentially eligible for IWC, and this has slightly reduced (by around 3 per cent) the estimate of the ever-potentially-eligible population: this acts to raise, very slightly, the implied take-up rate. The former effect is much more important, though.

The analysis in Figure 3.2 is different from that in Figure 5.2 in RR 415. Cosmetically, the horizontal axis has been changed to record calendar time, not time since the pilots started, and this brings out the seasonal pattern to IWC participation rates. More importantly, though, and as with Figure 3.1, the estimates of the number of IWC starts are considerably lower than those provided to the project team for the 12 month report, and exits from IS amongst potentially eligible lone parents have been measured more precisely; each of these has the effect of reducing the implied IWC participation rate.

## 3.2 How long did IWC recipients stay on IWC and what did they do next?

This section looks at the length of IWC claims and at what IWC recipients did after their IWC claims ended.

### 3.2.1 Duration of IWC claims

Table 3.1 shows the distribution of the length of IWC claim in each phase, dividing claims into those that lasted less than six months, those that lasted at least six but less than 11 months and those that lasted at least 11 months (this last category essentially corresponds to those who received IWC for the full 12 months, but allows for some measurement error in the administrative data). The length of IWC claim is measured in two ways in the table: the top panel uses information on the start and end dates of the IWC claim and the bottom panel uses the total amount of IWC received to infer the length of claim. The choice of measure makes little difference to the results.

### Table 3.1 Length of IWC claim, by phase

| | Phase 1 | Phase 2 | Phase 3 | Phase 4 | All phases |
|---|---|---|---|---|---|
| | IWC claim length defined using spell start and end dates | | | | |
| At least 11 months | 2,709 (65.0%) | 6,697 (68.9%) | 1,824 (61.4%) | 2,379 (70.5%) | 13,609 (67.2%) |
| 6–11 months | 723 (17.3%) | 1,481 (15.2%) | 610 (20.6%) | 583 (17.3%) | 3,397 (16.8%) |
| Less than 6 months | 739 (17.7%) | 1,549 (15.9%) | 535 (18.0%) | 415 (12.3%) | 3,238 (16.0%) |
| Total | 4,171 | 9,727 | 2,969 | 3,377 | 20,244 |
| | IWC claim length defined using total amount paid to recipients | | | | |
| At least 11 months | 2,551 (63.3%) | 6,334 (67.3%) | 1,686 (59.1%) | 2,270 (69.0%) | 12,841 (65.6%) |
| 6–11 months | 650 (16.1%) | 1,280 (13.6%) | 539 (18.9%) | 479 (14.6%) | 2,948 (15.1%) |
| Less than 6 months | 831 (20.6%) | 1,795 (19.1%) | 627 (22.0%) | 541 (16.4%) | 3,794 (19.4%) |
| Total | 4,032 | 9,409 | 2,852 | 3,290 | 19,583 |

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

Table 3.1 shows that the majority of IWC recipients (66–67 per cent) claim for at least 11 of the maximum 12 months. This figure is highest in Phase 4 (69–71 per cent) and lowest in Phase 3 (59–61 per cent). Of the remaining IWC recipients, 15–17 per cent claim for between six and 11 months and 16–19 per cent claim for less than six months. Using spell start and end dates (top panel) generates IWC claims of slightly longer length than using the amount of IWC received (bottom panel).

### 3.2.2 What IWC recipients did next

This section documents the benefit and work profiles of IWC recipients (by length of IWC claim) and compares them with those of other groups of lone parents who leave IS. These other groups are:

- lone parents in pilot districts who leave IS after claiming for at least 12 months, but not for IWC;
- lone parents in comparison districts who leave IS after claiming for at least 12 months;
- lone parents in pilot districts who leave IS after claiming for less than 12 months.

In most cases, the work and benefit outcomes of these groups of lone-parent IS leavers would not be expected to be very similar to those of IWC recipients. Any differences between the groups should not be inferred as having been caused

by IWC: the purpose of this section is to provide background information and context to the main impact estimates in subsequent chapters.

Table 3.2 compares the numbers of IWC recipients and the numbers of these other groups of lone-parent IS claimants. It shows that IWC recipients made up 18–19 per cent of all lone-parent IS leavers in pilot districts and 27 per cent of all lone parents who leave IS after 12 months in the pilot districts.[4] (The figure of 27 per cent is calculated as follows: 18,284 IWC recipients (using start and end dates)/66,523 IS leavers after at least 12 months = 27.49%; similarly, 17,698 IWC recipients (using amount received)/65,937 IS leavers after at least 12 months = 26.84%).

## Table 3.2 Summary of the destinations of lone-parent IS leavers

| | Comparison districts | Pilot districts | |
|---|---|---|---|
| | | IWC claim length defined using start and end dates | IWC claim length defined using amount received |
| **Leave IS after claiming for at least 12 months, of which:** | **201,761 (63.0%)** | **66,523 (68.3%)** | **65,937 (68.1%)** |
| *IWC recipients, of which:* | | *18,284 (18.8%)* | *17,698 (18.3%)* |
| Claims for at least 11 months | | 12,625 (13.0%) | 11,943 (12.3%) |
| Claims for between 6 and 11 months | | 2,894 (3.0%) | 2,501 (2.6%) |
| Claims for less than 6 months | | 2,765 (2.8%) | 3,254 (3.4%) |
| *Leave IS after 12 months but not for IWC* | | *48,239 (49.5%)* | *48,239 (49.8%)* |
| **Leave IS 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 IS between the introduction of the pilots and 31 March 2006.

[4] This take-up figure of 27 per cent is slightly lower than the take-up figure calculated in Section 3.1, for four reasons: (i) Sections 3.2 and 3.3 consider all potentially eligible lone parents who leave IS, rather than all lone parents who are potentially eligible for the LPPs; (ii) in the analysis in Sections 3.2 and 3.3, individuals are deemed to be potentially eligible if they are a lone parent living in one of the pilot districts on the date they leave IS; (iii) the period over which take-up is assessed is slightly different; and (iv) Sections 3.2 and 3.3 use individual data and Section 3.1 uses aggregate data.

Figures 3.3 to 3.8 illustrate the proportions of each of these groups of IS leavers who are on benefit and in work, from two years before to 30 months after leaving IS. These graphs use IWC recipients whose claim length is defined using IWC start and end dates.

Figures 3.3 and 3.4 compare the benefit and work profiles of all lone parents who leave IS after claiming for at least 12 months in pilot districts (including IWC recipients), all lone parents who leave IS after claiming for at least 12 months in comparison districts and all lone parents who leave IS after claiming for less than 12 months in pilot districts.

For benefit outcomes, these graphs show that:

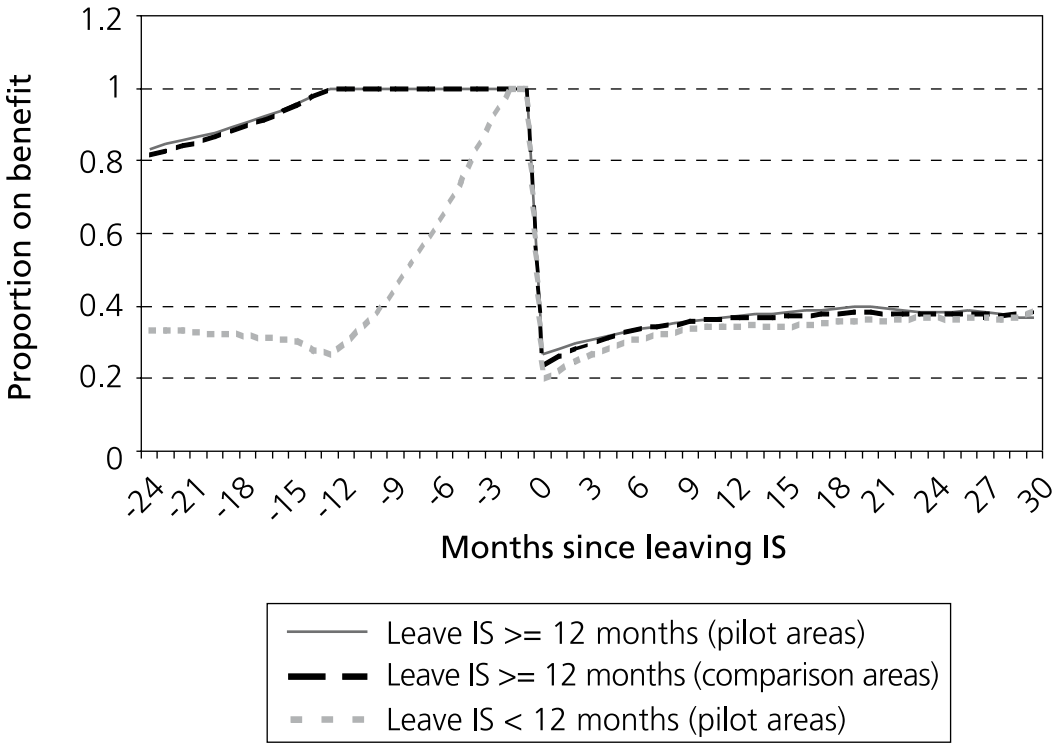
- the patterns of benefit receipt in the run-up to leaving IS are virtually identical for lone parents in pilot and comparison districts whose IS claims lasted for at least 12 months, with just over 80 per cent on benefit two years before leaving IS and 100 per cent on benefit in the 12 months prior to leaving IS (by construction);
- lone parents in pilot districts who leave IS having claimed for less than 12 months are much less likely to have been on benefit in the two years prior to leaving IS than lone parents in either pilot or comparison districts who leave IS having claimed for at least 12 months;
- despite their different benefit histories, these three groups of lone-parent IS leavers have very similar patterns of benefit receipt in the months after leaving IS, rising from just over 20 per cent on benefit in the first month after leaving to around 40 per cent on benefit two years later.

For work outcomes, the graphs show that:

- in the two years prior to leaving IS, between 15 and 23 per cent of lone parents in pilot and comparison districts who have claimed IS for at least 12 months are recorded as being in work;
- over 45 per cent of lone parents who have claimed IS for less than 12 months are recorded as being in work approximately one year before leaving IS. This suggests that many of the lone parents who leave IS quickly were in work immediately before claiming IS;
- throughout the two years after leaving IS, lone parents in pilot districts whose IS claim lasted at least 12 months (including IWC recipients) are marginally more likely to be in work than lone parents in comparison districts whose IS claim lasted at least 12 months and slightly more likely to be in work than lone parents in pilot districts whose IS claim lasted less than 12 months.

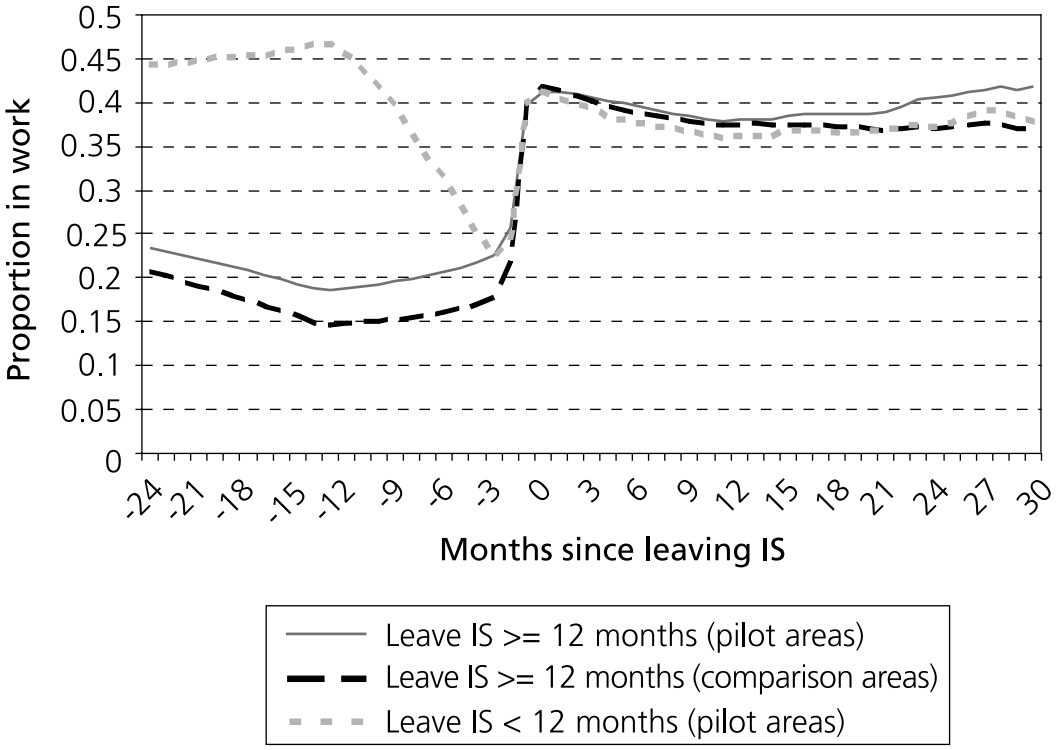
These disparities are not particularly surprising, given the likely differences in the composition of these groups of lone-parent IS leavers (see Section 3.3).

**Figure 3.3 Lone parents who leave IS: proportion on benefit over time**




Note: Sample is all lone parents who left IS in pilot districts (97,426) and all lone parents who left IS having claimed for at least 12 months in comparison districts (201,761) between when the pilots were introduced and 31 March 2006.

**Figure 3.4 Lone parents who leave IS: proportion in work over time**



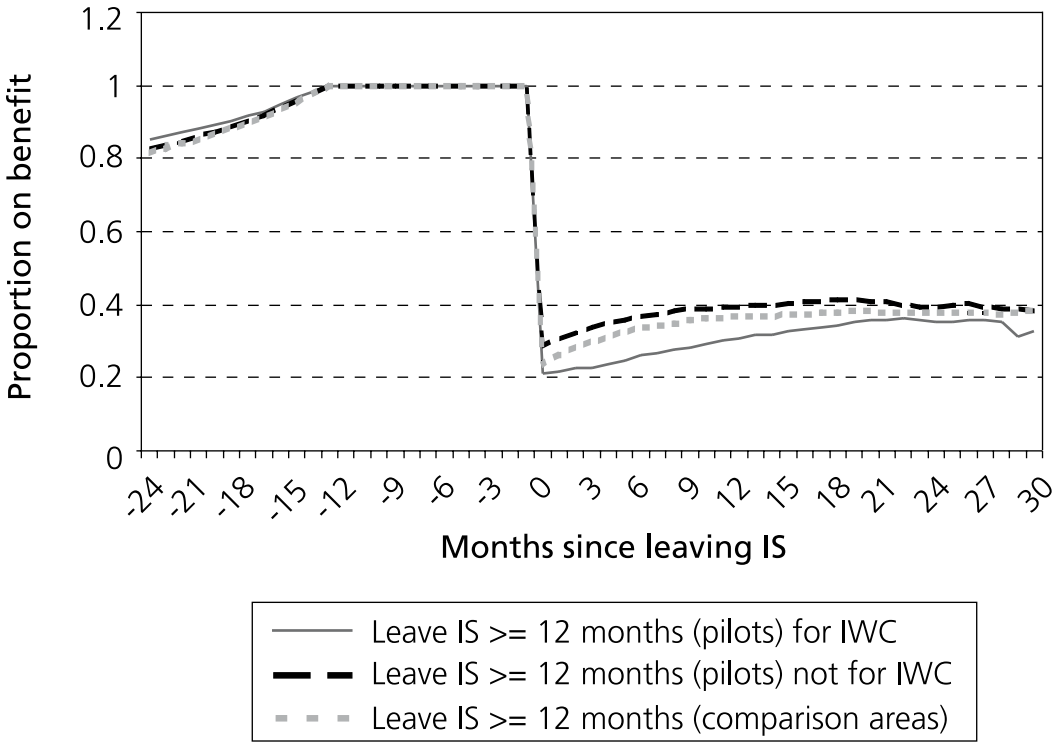

Note: Sample is all lone parents who left IS in pilot districts (97,426) and all lone parents who left IS having claimed for at least 12 months in comparison districts (201,761) between when the pilots were introduced and 31 March 2006.

Figures 3.5 and 3.6 split the group of lone parents who have been claiming IS for at least 12 months in pilot districts into two groups: those who leave IS for IWC and those who do not. The outcomes of these two groups are then compared with those of lone parents in comparison districts who have claimed IS for at least 12 months. The graphs show that:

- the benefit outcomes of lone parents who leave IS having claimed for at least 12 months are similar in the run-up to leaving IS across both pilot and comparison districts and, within pilot districts, for both IWC and non-IWC recipients;
- IWC recipients are much more likely to have been in work (of any number of hours) in the months before leaving IS than non-IWC recipients in pilot districts (and lone parents in comparison districts) who leave IS having claimed for at least 12 months;
- IWC recipients are slightly less likely (than non-IWC recipients and lone-parent IS leavers in comparison districts whose IS claim lasted at least 12 months) to be on benefit after leaving IS, with around 22 per cent on benefit one month after leaving IS, compared with 26 per cent of lone parents in comparison districts and 31 per cent of non-IWC recipients;

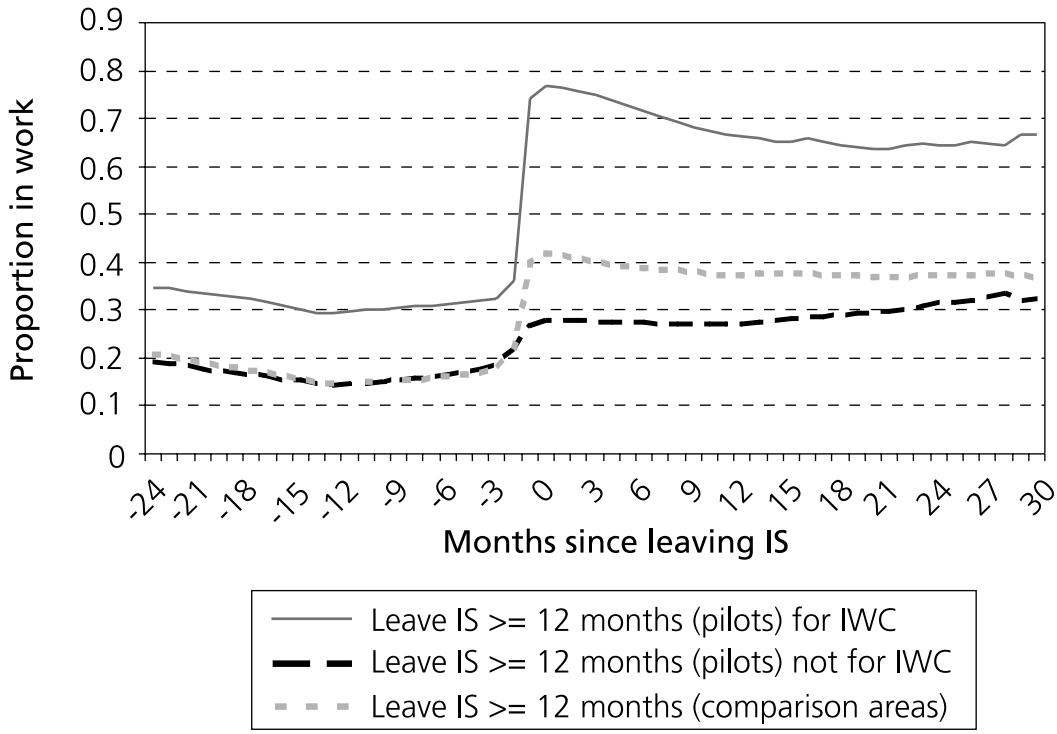
- in the months after leaving IS, IWC recipients are considerably more likely to be recorded as being in work than lone-parent IS leavers in comparison districts, who are, in turn, more likely to be recorded as being in work than non-IWC recipients in pilot districts. These differences are largest in the months immediately after leaving IS but persist throughout the next 30 months. Note that even amongst those who leave IS and start IWC, less than 80 per cent have a matching job start recorded in the WPLS at that time.

**Figure 3.5 Lone parents who leave IS after claiming for at least 12 months: proportion on benefit over time**




Note: Sample is all lone parents who left IS 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 3.6 Lone parents who leave IS after claiming for at least 12 months: proportion in work over time**



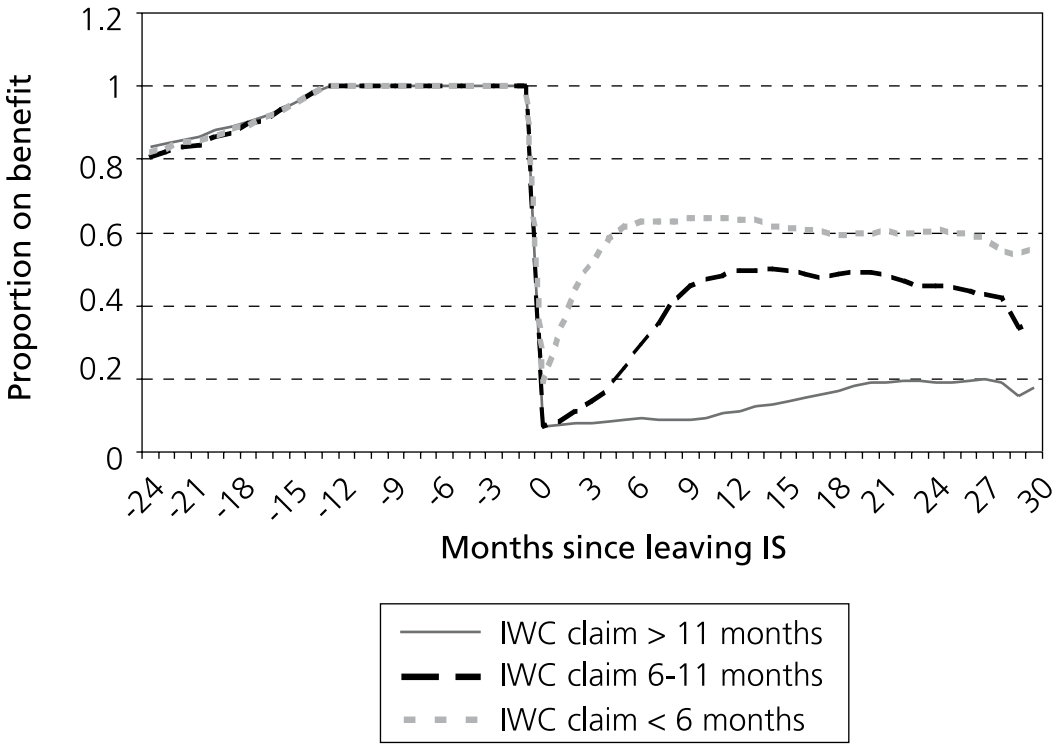

Note: Sample is all lone parents who left IS after claiming for at least 12 months in pilot districts (66,523) and comparison districts (201,761) between when the pilots were introduced and 31 March 2006.

Figures 3.7 and 3.8 illustrate the benefit and work profiles for IWC recipients split according to the length of their IWC claim. They show that:

- the observed patterns of employment and benefit receipt in the months before leaving IS are similar for all IWC recipients; but thereafter, there are clear differences according to the length of the IWC claim;
- lone parents who claimed IWC for at least 11 months are the least likely to be on benefit and the most likely to be in work. Only 11 per cent are on benefit one year after leaving IS, compared with 49 per cent of IWC recipients whose claim lasted between six and 11 months and 63 per cent of IWC recipients whose claim lasted less than six months. Two-thirds (66 per cent) of IWC recipients whose claim lasted at least 11 months are in work one year after leaving IS, 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. Amongst all lone parents who received IWC for less than the full 12 months, 56 per cent were receiving an out-of-work benefit one year after starting an IWC claim and 30 per cent were in work.

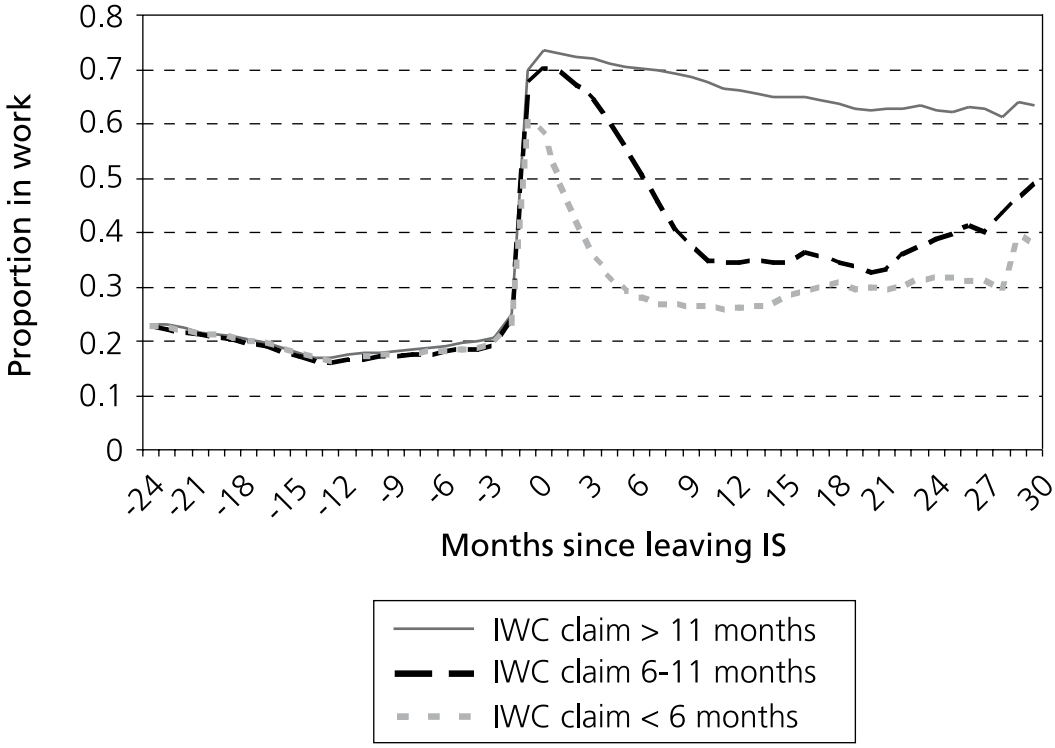
Again, these disparities are not particularly surprising, given the likely differences in the composition of these groups of IWC recipients (see Section 3.3).

**Figure 3.7 IWC recipients: proportion on benefit over time**




Note: Sample is all lone parents who left IS for IWC between when the pilots were introduced and 31 March 2006 (18,284).

**Figure 3.8 IWC recipients: proportion in work over time**




Note: Sample is all lone parents who left IS for IWC between when the pilots were introduced and 31 March 2006 (18,284).

To summarise: IWC recipients are generally less likely to be on benefit, and more likely to be in work, than other groups of lone-parent IS leavers, particularly in the first year after leaving IS (when they are likely to be receiving IWC). This is particularly true for individuals who claim IWC for at least 11 months, who experience only a slow increase in benefit receipt rates (and a slow reduction in employment rates) after they stop receiving IWC.

These patterns are roughly similar when the sample is restricted to individuals whose IS claim was less than 12 months old when the pilots were introduced in their area (see Appendix G for details).

## 3.3 Characteristics of IWC recipients compared with other IS claimants

This section considers whether IWC recipients differ from other lone-parent IS claimants in terms of a range of observable characteristics, including the age and sex of lone parent, age of youngest child, number of children, work and benefit histories and some local area characteristics (average claimant counts and job densities).

Several different comparisons are made:

- Lone parents in pilot districts whose IS claim lasted at least 12 months and who left IS whilst the pilots were in operation are compared with lone parents in pilot districts whose IS claim lasted at least 12 months but who were still claiming IS on 31 March 2006 (Table 3.3).
- Lone-parent IS leavers in pilot districts whose IS claim lasted at least 12 months are compared with lone-parent IS leavers in pilot districts whose IS claim lasted less than 12 months (Table 3.4).
- Lone-parent IS leavers in pilot districts whose IS claim lasted at least 12 months are compared with lone-parent IS leavers in comparison districts whose IS claim lasted at least 12 months (Table 3.5).
- Lone parents in pilot districts whose IS claim lasted at least 12 months and who left IS for IWC are compared with lone parents in pilot districts whose IS claim lasted at least 12 months but who did not claim IWC after leaving IS (Table 3.6).
- IWC recipients whose IWC claim lasted at least 11 months (defined using IWC start and end dates) are compared with IWC recipients whose IWC claim lasted less than six months (Table 3.7).

Table 3.3 compares the characteristics of lone parents in pilot districts whose IS claim lasted at least 12 months and who left IS whilst the pilots were in operation ('leavers') with those of lone parents in pilot districts whose IS claim lasted at least 12 months but who were still claiming IS on 31 March 2006 ('stayers'). The table includes an assessment of whether the differences are statistically significant and shows the following:

- leavers are more likely to be male and are, on average, slightly younger than stayers;
- leavers tend to have fewer children than stayers and their youngest child tends to be older;
- leavers have spent a greater proportion of the 30 months prior to IS leave date in work and a larger percentage of months 13 to 21 prior to IS leave date off benefit than stayers (for stayers, this is assessed over the period ending on 31 March 2006);
- leavers are 17 percentage points (ppts) more likely to have been on the New Deal for Lone Parents (NDLP) than stayers and are significantly less likely to have received a disability benefit in the previous 18 months.

## Table 3.3 Characteristics of IS leavers compared to IS stayers in pilot districts

| | Leavers | Stayers | Difference |
|---|---|---|---|
| Percentage male | 6.8 | 4.8 | 2.0** |
| Average age | 34.7 | 34.9 | –0.3** |
| Average age of youngest child | 7.7 | 6.5 | 1.2** |
| Percentage with youngest child aged 0 to 3 | 23.8 | 28.9 | –5.1** |
| Percentage with youngest child aged 3 to 7 | 28.9 | 28.7 | 0.3 |
| Percentage with youngest child aged 7 to 11 | 18.3 | 21.6 | –3.3** |
| Percentage with youngest child aged 11 plus | 29.0 | 20.8 | 8.2** |
| Percentage with one child | 52.2 | 43.4 | 8.8** |
| Percentage with two children | 30.7 | 33.1 | –2.4** |
| Percentage with three children | 11.7 | 15.1 | –3.4** |
| Percentage with four children | 5.4 | 8.4 | –3.0** |
| Percentage of 30 months prior to IS leave date (31 March 2006 for stayers) spent in work | 8.8 | 0.1 | 8.7** |
| Percentage of months 13 to 30 prior to IS leave date (31 March 2006 for stayers) spent off benefit | 17.5 | 7.6 | 9.9** |
| Percentage ever been on NDLP in the three years prior to IS leave date (31 March 2006 for stayers) | 43.9 | 27.1 | 16.8** |
| Percentage ever been disabled in the 18 months prior to IS leave date (31 March 2006 for stayers) | 12.1 | 17.4 | –5.2** |
| Average claimant count in local area in 2003/04 | 2.8 | 2.7 | 0.1** |
| Average job density in local area in 2004 | 88.8 | 88.9 | –0.1** |
| *Sample size* | *66,523* | *245,414* | |

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

Table 3.4 compares the characteristics of lone-parent IS leavers in pilot districts whose IS claim lasted at least 12 months with those of lone-parent IS leavers in pilot districts whose IS claim lasted less than 12 months. It shows that lone-parent IS leavers in pilot districts whose IS claim lasted at least 12 months:

- are somewhat older, on average, than lone-parent IS leavers in pilot districts whose IS claim lasted less than 12 months;
- are considerably less likely to have a youngest child under the age of three (24 per cent compared with 36 per cent of lone-parent IS leavers whose IS claim lasted less than 12 months) and also tend to have more children;

- have spent a considerably smaller proportion of the 30 months prior to their IS leaving date in work and a considerably smaller proportion of months 13 to 21 prior to their IS leaving date off benefit than lone-parent IS leavers in pilot districts whose IS claim lasted less than 12 months;
- are considerably more likely to have been on NDLP in the three years before leaving IS;
- are slightly less likely to have been recorded as having received a disability benefit in the previous 18 months.

## Table 3.4 Characteristics of IS leavers after 12 months compared to before 12 months in pilot districts

| | Leave after claim reaches 12 months | Leave before claim reaches 12 months | Difference |
|---|---|---|---|
| Percentage male | 6.8 | 6.9 | –0.1 |
| Average age | 34.7 | 32.8 | 1.8** |
| Average age of youngest child | 7.7 | 6.3 | 1.4** |
| Percentage with youngest child aged 0 to 3 | 23.8 | 36.0 | –12.2** |
| Percentage with youngest child aged 3 to 7 | 28.9 | 25.8 | 3.2** |
| Percentage with youngest child aged 7 to 11 | 18.3 | 16.7 | 1.6** |
| Percentage with youngest child aged 11 plus | 29.0 | 21.6 | 7.4** |
| Percentage with one child | 52.2 | 55.4 | –3.2** |
| Percentage with two children | 30.7 | 28.7 | 2.0** |
| Percentage with three children | 11.7 | 10.9 | 0.8** |
| Percentage with four children | 5.4 | 5.0 | 0.4** |
| Percentage of 30 months prior to IS leave date (31 March 2006 for stayers) spent in work | 8.8 | 68.9 | –60.1** |
| Percentage of months 13 to 21 prior to IS leave date (31 March 2006 for stayers) spent off benefit | 17.5 | 38.3 | –20.8** |
| Percentage ever been on NDLP in the 18 months prior to IS leave date (31 March 2006 for stayers) | 43.9 | 22.2 | 21.6** |
| Percentage ever been disabled in the 18 months prior to IS leave date (31 March 2006 for stayers) | 12.1 | 15.0 | –2.8** |
| Average claimant count in local area in 2003/04 | 2.8 | 2.7 | 0.1** |
| Average job density in local area in 2004 | 88.8 | 87.9 | 0.9** |
| *Sample size* | *66,523* | *30,903* | |

Notes: Sample is all lone parents in pilot districts who left IS 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 3.5 compares the characteristics of lone-parent IS leavers in pilot districts whose IS claim lasted at least 12 months (including IWC recipients) with the characteristics of lone-parent IS leavers in comparison districts whose claim lasted at least 12 months. It shows that:

- pilot district leavers tend to be slightly older than comparison district leavers and tend to have slightly older children;
- pilot district leavers are less likely to have been on NDLP or on a disability benefit in the period prior to leaving IS than comparison district leavers and they also tend to live in areas with higher average job densities.

## Table 3.5 Characteristics of pilot compared to comparison district leavers

| | Pilot district leavers | Comparison district leavers | Difference |
|---|---|---|---|
| Percentage male | 6.8 | 6.7 | 0.1 |
| Average age | 34.7 | 33.4 | 1.3** |
| Average age of youngest child | 7.7 | 7.3 | 0.4** |
| Percentage with youngest child aged 0 to 3 | 23.8 | 25.8 | –2.0** |
| Percentage with youngest child aged 3 to 7 | 28.9 | 29.2 | –0.3 |
| Percentage with youngest child aged 7 to 11 | 18.3 | 18.4 | –0.1 |
| Percentage with youngest child aged 11 plus | 29.0 | 26.6 | 2.4** |
| Percentage with one child | 52.2 | 52.1 | 0.1 |
| Percentage with two children | 30.7 | 31.0 | –0.3 |
| Percentage with three children | 11.7 | 11.9 | –0.2 |
| Percentage with four children | 5.4 | 5.0 | 0.4** |
| Percentage of 30 months prior to IS leave date (31 March 2006 for stayers) spent in work | 8.8 | 9.3 | –0.6** |
| Percentage of months 13 to 21 prior to IS leave date (31 March 2006 for stayers) spent off benefit | 17.5 | 16.9 | 0.6** |
| Percentage ever been on NDLP in the 18 months prior to IS leave date (31 March 2006 for stayers) | 43.9 | 48.3 | –4.4** |
| Percentage ever been disabled in the 18 months prior to IS leave date (31 March 2006 for stayers) | 12.1 | 14.9 | –2.7** |
| Average claimant count in local area in 2003/04 | 2.8 | 2.8 | 0.0** |
| Average job density in local area in 2004 | 88.8 | 79.9 | 8.9** |
| *Sample size* | *66,523* | *201,761* | |

Notes: Sample is all lone parents in pilot and comparison districts whose IS claim lasted at least 12 months and who left IS 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 3.6 compares the characteristics of lone parents in pilot districts whose IS claim lasted at least 12 months and who left IS for IWC ('IWC recipients') with those of lone parents in pilot districts whose IS claim lasted at least 12 months but who did not claim IWC after leaving IS ('non-IWC recipients'). It shows the following:

- IWC recipients are slightly less likely to be male and are over a year younger, on average, than non-IWC recipients. They also tend to have fewer children, on average, than non-IWC recipients;
- there is no significant difference between the proportion of the 30 months prior to IS leave date that IWC and non-IWC recipients have spent in work, although IWC recipients tend to have spent a larger proportion of months 13 to 21 prior to IS leave date off benefit;
- IWC recipients are considerably more likely to have been on NDLP in the three years prior to leaving IS than non-IWC recipients (84 per cent compared with 29 per cent), although this may be because joining NDLP was a condition of IWC receipt when the pilots were first introduced;
- IWC recipients are significantly less likely to have been recorded as receiving a disability benefit in the 18 months before leaving IS than non-IWC recipients.

## Table 3.6 Characteristics of IWC recipients compared to 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 IS leave date (31 March 2006 for stayers) spent in work | 8.8 | 8.8 | 0.0 |
| Percentage of months 13 to 21 prior to IS leave date (31 March 2006 for stayers) spent off benefit | 20.0 | 16.6 | 3.4** |
| Percentage ever been on NDLP in the 18 months prior to IS leave date (31 March 2006 for stayers) | 84.2 | 28.6 | 55.7** |
| Percentage ever been disabled in the 18 months prior to IS 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 IS claim lasted at least 12 months and who left IS 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 3.7 compares the characteristics of IWC recipients whose IWC claim lasted at least 11 months ('long-claim IWC recipients') with those of IWC recipients whose IWC claim lasted less than six months ('short-claim IWC recipients'). The top panel defines IWC claim length using IWC start and end dates, while the bottom panel defines claim length using the total amount of IWC received. The table shows the following:

- the vast majority (more than 90 per cent) of IWC recipients are female. Long-claim IWC recipients are slightly less likely to be male than short-claim IWC recipients and are nearly three years older than them on average;

- long-claim IWC recipients are significantly less likely to have a child under the age of three than short-claim IWC recipients and are significantly more likely to have a child over the age of seven;
- there are only very small differences between the work and benefit histories of long- and short-claim IWC recipients but slightly larger differences in the proportion who have been on NDLP in the three years prior to leaving IS (85 per cent for long-claim IWC recipients compared with 82–83 per cent for short-claim IWC recipients) and in the proportion who have been recorded as receiving a disability benefit in the 18 months before leaving IS (6–7 per cent compared with 8–9 per cent).

## Table 3.7 Characteristics of long-claim IWC claimants compared to short-claim IWC claimants

| | Claim IWC for at least 11 months | Claim IWC for less than 6 months | Difference |
|---|---|---|---|
| | *IWC claim length defined using spell start and end dates* | | |
| Percentage male | 3.7 | 5.2 | –1.5** |
| Average age | 34.2 | 31.4 | 2.9** |
| Average age of youngest child | 7.6 | 6.4 | 1.2** |
| Percentage with youngest child aged 0 to 3 | 18.4 | 28.8 | –10.4** |
| Percentage with youngest child aged 3 to 7 | 32.4 | 33.8 | –1.4 |
| Percentage with youngest child aged 7 to 11 | 22.4 | 19.1 | 3.3** |
| Percentage with youngest child aged 11 plus | 26.8 | 18.3 | 8.5** |
| Percentage with one child | 53 | 57.6 | –4.6** |
| Percentage with two children | 33.6 | 28.9 | 4.7** |
| Percentage with three children | 10.5 | 10.6 | –0.1 |
| Percentage with four children | 2.9 | 2.9 | –0.1 |
| Percentage of 30 months prior to IS leave date (31 March 2006 for stayers) spent in work | 8.5 | 9.2 | –0.7 |
| Percentage of months 13 to 21 prior to IS leave date (31 March 2006 for stayers) spent off benefit | 20.3 | 19.5 | 0.8 |
| Percentage ever been on NDLP in the 18 months prior to IS leave date (31 March 2006 for stayers) | 84.9 | 82.6 | 2.3** |
| Percentage ever been disabled in the 18 months prior to IS leave date (31 March 2006 for stayers) | 6.5 | 8.7 | –2.2** |
| Average claimant count in local area in 2003/04 | 2.7 | 2.8 | –0.1** |
| Average job density in local area in 2004 | 87.9 | 88.8 | –0.9** |
| *Sample size* | *12,625* | *2,765* | |

*Continued*

**Table 3.7 Continued**

| | Claim IWC for at least 11 months | Claim IWC for less than 6 months | Difference |
|---|---|---|---|
| | *IWC claim length defined using total amount paid to recipients* | | |
| Percentage male | 3.7 | 5.0 | –1.4** |
| Average age | 34.3 | 31.4 | 2.9** |
| Average age of youngest child | 7.7 | 6.4 | 1.3** |
| Percentage with youngest child aged 0 to 3 | 18.1 | 28.3 | –10.2** |
| Percentage with youngest child aged 3 to 7 | 32.3 | 34.1 | –1.8 |
| Percentage with youngest child aged 7 to 11 | 22.4 | 18.9 | 3.5** |
| Percentage with youngest child aged 11 plus | 27.2 | 18.7 | 8.5** |
| Percentage with one child | 52.8 | 58.2 | –5.4** |
| Percentage with two children | 33.7 | 28.4 | 5.3** |
| Percentage with three children | 10.6 | 10.4 | 0.2 |
| Percentage with four children | 2.9 | 3 | –0.2 |
| Percentage of 30 months prior to IS leave date (31 March 2006 for stayers) spent in work | 8.5 | 9.4 | –0.9* |
| Percentage of months 13 to 21 prior to IS leave date (31 March 2006 for stayers) spent off benefit | 20.3 | 19.9 | 0.4 |
| Percentage ever been on NDLP in the 18 months prior to IS leave date (31 March 2006 for stayers) | 85.1 | 82.4 | 2.7** |
| Percentage ever been disabled in the 18 months prior to IS leave date (31 March 2006 for stayers) | 6.3 | 8.4 | –2.1** |
| Average claimant count in local area in 2003/04 | 2.7 | 2.8 | –0.0** |
| Average job density in local area in 2004 | 87.9 | 88.6 | –0.8** |
| *Sample size* | *11,943* | *3,254* | |

Notes: Sample is all lone parents in pilot districts whose IS claim lasted at least 12 months and who left IS for IWC 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.

## 3.4 Summary

This chapter has provided some descriptive details about IWC participants: their rates of take-up, their claim durations and post-IWC destinations and their background characteristics.

Section 3.1 showed that take-up of IWC amongst those ever potentially eligible for it has grown over time in both the flow and stock samples, with spikes in the number of IWC claims in the first full month of operation in Phases 2 and 4, and in September of each year. The take-up rate is higher in Phases 2 and 4 than in Phases 1 and 3.

Section 3.2 revealed that just under 70 per cent of IWC recipients claimed it for at least 11 months. Furthermore, lone parents who claimed IWC for at least 11 months experienced better labour market outcomes after their IWC claim ended than lone parents who claimed it for a shorter period, lone parents in pilot districts who did not claim it or lone parents in comparison groups who left IS after at least 12 months. There is no evidence that lone parents who claimed IWC for the full 12 months stopped work or re-claimed IS when their IWC payments stopped.

Finally, Section 3.3 examined the family characteristics and work and benefit histories of lone parents who left IS. IWC recipients tend to have slightly more of the characteristics that are associated with return to work than other lone parents who leave IS after at least 12 months in the pilot districts (i.e. than other potentially eligible lone parents). (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).) Most notably, IWC recipients are 55 ppts more likely to have been on NDLP (although this may be because of the conditions attached to IWC receipt when the pilots were first introduced) and 7 ppts less likely to have been receiving a disability benefit. They are also less likely to have a child under the age of three and tend to have fewer children, on average, than other potentially eligible lone parents who left IS. However, these groups do not differ substantially in terms of the proportion of time spent in work in the 30 months before leaving IS. Amongst IWC recipients, those who claim for at least 11 months are much less likely to have a child under the age of three and much more likely to have a child over the age of seven than IWC recipients who claim for less than six months. The difference-in-differences (DiD) analysis in Chapters 4, 5 and 8, therefore, controls for these characteristics (and many others) when estimating the impact of the lone parent pilots (LPPs).

The findings about lone parents in pilot districts provide useful background information for the next chapter, in which the impact of the LPPs on work and benefit outcomes is estimated using DiD techniques.

# 4 The overall impact of the lone parent pilots on potentially eligible lone parents in the flow sample

This chapter presents estimates of the overall impact of the lone parent pilots (LPPs) on all potentially eligible lone parents in the flow sample – that is, on all potentially eligible lone parents who become eligible for In-Work Credit (IWC) at some point after the pilots have been introduced in their district. In general, the impact of the LPPs on the flow sample is more interesting than the impact of the LPPs on the stock sample, as it determines the impact of the LPPs in the long run. The estimates in this chapter, then, should be thought of as the headline estimates of the impact of the LPPs. They were derived in two ways, first using a difference-in-differences (DiD) estimate and then using a duration (or survivor) model.

Section 4.1 presents the headline estimates. Extensions to this are presented in Appendix J; these allow the impact of the LPPs to be different in each pilot phase and in each cohort (where a 'cohort' of lone parents refers to a group of lone parents who first became potentially eligible for IWC in a particular six-month period).

Section 4.2 assesses the robustness of the main findings. Specifically, it tests whether the 'common trends' assumption appears to hold in the period before the LPPs began, it tests whether the estimated impact of the LPPs is sensitive to the way in which the underlying trend in outcomes has been specified and it tests for effects of the policy on lone parents who are not yet potentially eligible. Section 4.3 presents the estimated impact of the LPPs using a duration model and Section 4.4 concludes.

## 4.1 DiD estimates: overall impact of the LPPs on potentially eligible lone parents in the flow sample

This section reports DiD estimates of the impact of the LPPs on potentially eligible lone parents in the flow sample. It first discusses the impact on all potentially eligible lone parents in the flow sample and then discusses estimates of the impact of the LPPs by pilot phase, and by pilot phase and cohort, with full results in Appendix J. Box 4.1 describes the flow sample for the DiD analysis. Appendix E gives full details of this method and how it was implemented. This report does not present the coefficients on the other regressors in the model, as there are a large number of regressions and a very large number of regressors in each but they are listed in Appendix D.

Section 6.1 extends the DiD analysis in this chapter to show how the overall impact in the flow sample varies for different policy packages within the LPPs.

**Box 4.1: Technical information about the DiD analysis on the flow sample**

The 'flow sample' comprises all claims of Income Support (IS) that reached 12 months' duration between 1 April 2001 and 31 March 2007 where the claimant was a lone parent on that date, plus other claims of IS whose duration exceeded 12 months and during which the claimant subsequently became a lone parent; these claims were followed from the earliest date meeting all these conditions. The intention was to create a sample of IS claims that would have been potentially eligible for IWC if the LPPs had been in existence in all districts since April 2001 and to follow lone parents from the first day on which they became potentially eligible for IWC.

The 'variant flow sample' (used in Appendix L and discussed in Section 4.2.3) comprised all claims of IS made by lone parents between 1 April 2001 and 31 March 2007.

Appendix B describes how the samples were constructed, Appendix D contains some summary statistics and sample sizes and mean outcomes are given in Appendix H.

### 4.1.1 The headline results

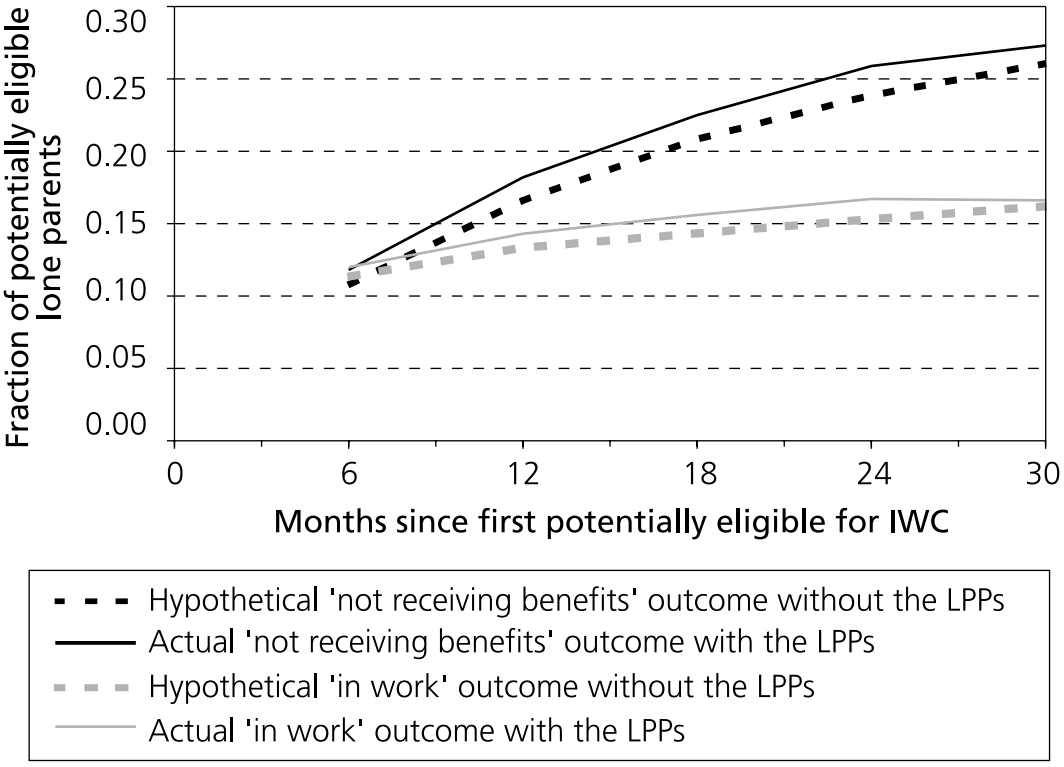
Table 4.1 presents estimates of the headline impact of the LPPs (in percentage-point (ppt) terms) on work and benefit outcomes for the flow sample, at three-month intervals from the date on which the lone parent first became potentially eligible for the LPPs; they are also shown in Figures 4.1 and 4.2.

## Table 4.1 Estimated impact of the LPP 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 benefit | Impact on number in work | Benefit outcome (percentage off benefit in pilot districts) | Work outcome (percentage in work in pilot districts) | Benefit additionality rate (benefit impact as percentage of gross outcome) | Work additionality rate (work impact as percentage of gross outcome) |
|---|---|---|---|---|---|---|
| | Estimates reported 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 |

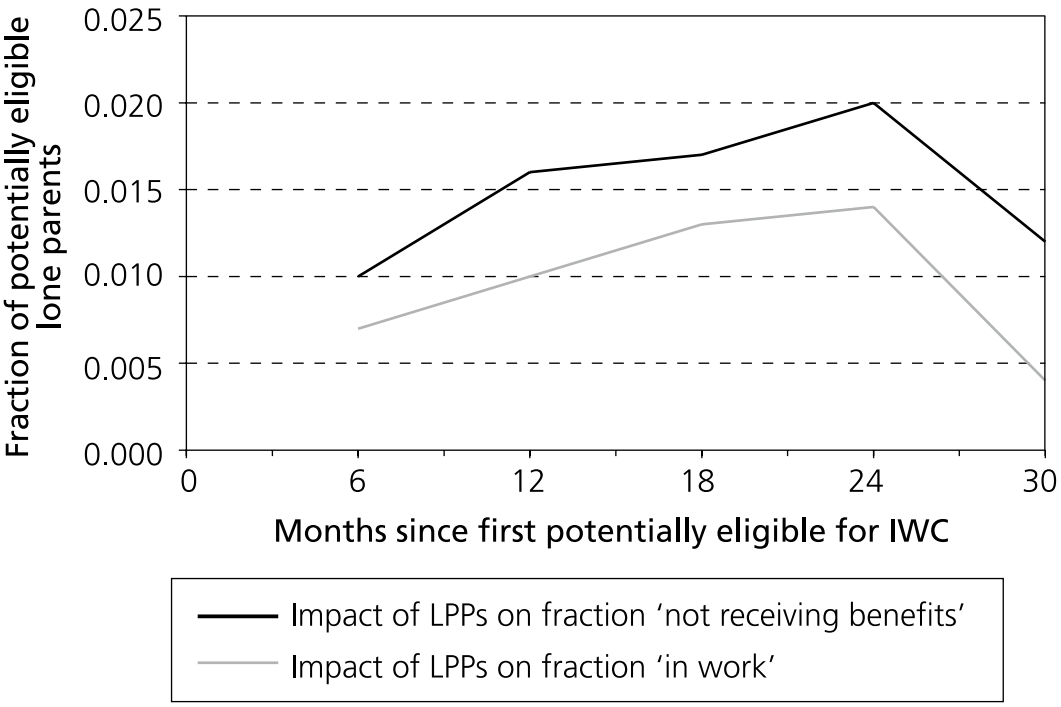
Notes: The table reports the estimated impact of the LPPs based on various ordinary least squares (OLS) regressions on the flow sample (see Appendix B). Sample sizes are shown in Appendix H. Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent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

**Figure 4.1 Fractions of potentially eligible lone parents in the flow sample who are off benefit and in work, and estimated fractions off benefit and in work in the absence of the LPPs**




Note: Derived from outcomes and impacts in Table 4.1.

**Figure 4.2 Estimated impact of the LPPs on potentially eligible lone parents in the flow sample**




Notes: Derived from outcomes and impacts in Table 4.1. All estimated impacts except those at 30 months are statistically different from zero at (at least) the 5 per cent level.

As a guide to how to interpret these results, the top left-hand figure in the table shows that the DiD estimate of the impact of the LPPs is 0.5 ppts. This indicates that the proportion of lone parents no longer claiming benefit three months after first becoming potentially eligible for the pilots is 0.5 ppts higher for lone parents living in the pilot districts than it is for lone parents living in the comparison districts. Chapter 10 compares these estimated impacts with those of other Department for Work and Pensions (DWP) programmes.

The estimated impacts at months 6 to 24 are all positive and significantly different from zero at (at least) the 1 per cent level.

The point estimates of the impact of the LPPs on benefit outcomes rise over time (where time is measured relative to when a lone parent first became potentially eligible for IWC), peaking at 2.0 ppts after 24 months, and then decline. This decline is partly caused by the increasing importance given to Phase 1 districts for the later outcomes, as discussed in Section 4.1.2. The impact on work follows a similar pattern to that for benefit outcomes but the point estimates are smaller, peaking at 1.6 ppts after 27 months.

It is also valid to express the additional impact of the LPPs as a proportion of those potentially eligible lone parents who are in work or no longer receiving an

out-of-work benefit. This is sometimes known as the additionality rate. As an example, the first column of Table 4.1 says that the LPPs led to a 1.6 ppt increase in the proportion of potentially eligible lone parents who were off benefit 12 months after they first became potentially eligible for IWC. They show that, for example, 8.8 per cent of the potentially eligible lone parents no longer receiving an out-of-work benefit after 12 months' exposure to the LPPs is attributable to the LPPs and the equivalent figure for the work outcome is 7.0 per cent.

Expressing the impacts in this way is interesting because there is less change over time in the additionality rate of the LPPs expressed as a proportion of those potentially eligible lone parents who are in work or no longer receiving an out-of-work benefit. For example, the proportion of potentially eligible lone parents who are in work (or no longer receiving an out-of-work benefit) rises over time measured relative to when they first became potentially eligible for IWC. The same is true for the additional impact of the LPPs, expressed as a proportion of all potentially eligible lone parents. For example, after 24 months' exposure to the LPPs, 25.9 per cent of potentially eligible lone parents were no longer on benefit, and 2.0 ppts of this is attributable to the LPPs. For work outcomes, the equivalent figures are 16.7 per cent and 1.4 ppts. These are larger impacts than those after 12 months' exposure to the LPPs, but it is not at all surprising that the impact of the LPPs rises the longer a lone parent is exposed to their policies and services. However, there is less change over time in the additionality rate of the LPPs defined for potentially eligible lone parents who are in work or no longer receiving an out-of-work benefit: after 24 months, this ratio was 7.7 per cent for the benefit outcomes or 8.4 per cent for the work outcomes; the respective ratios after 12 months were 8.8 per cent and 7.0 per cent. In other words, while the additional impact of the LPPs on all potentially eligible lone parents rises with the length of time during which a lone parent is exposed to the LPPs, their additionality rate is fairly constant.

### 4.1.2 Variation between phases and between different cohorts of lone parents

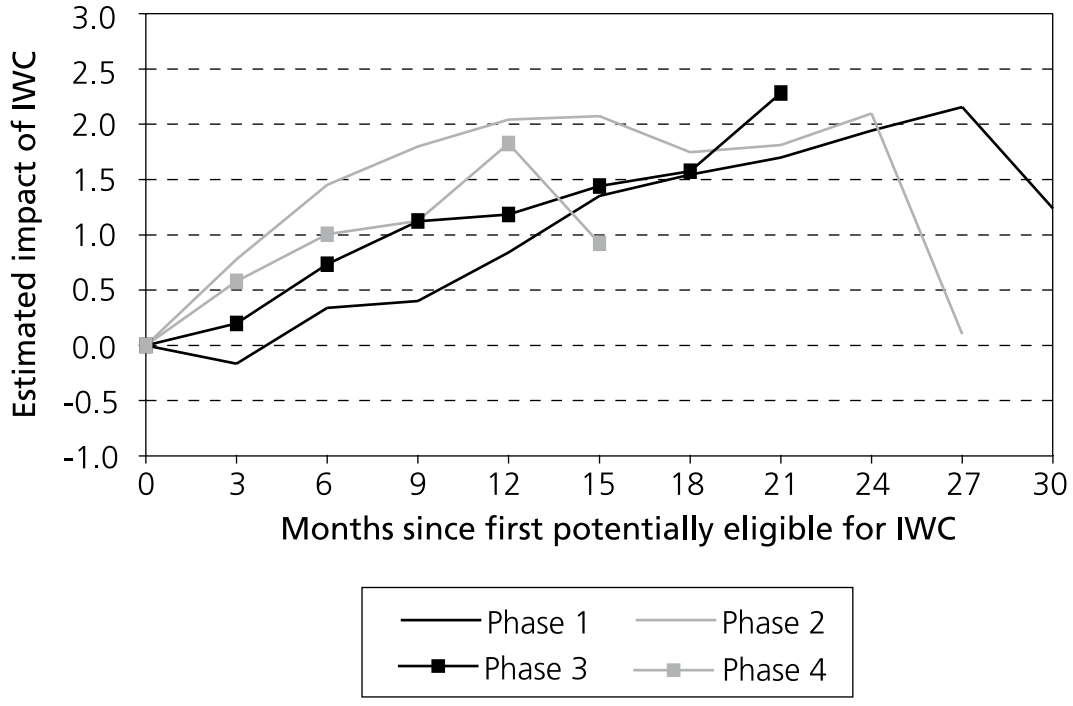
Table 4.1 reported a single treatment effect for all phases. It is important to note, though, that the estimate of the impact at each point in time is based on a different sample of potentially eligible lone parents, because later cohorts of potentially eligible lone parents appear in the data for shorter durations (given the cut-off date in the data of 31 March 2007). This means that the number of potentially eligible lone parents falls as outcomes are measured over longer periods of time. For example, outcomes after 30 months are only observed for lone parents in the flow sample who first became potentially eligible for IWC in the Phase 1 districts between April and September 2004.

This also means that the contribution of particular phases to the average estimated impact alters as outcomes are measured over a longer period of time: Phase 4 districts contribute to outcomes at 3–15 months, Phase 3 districts to outcomes at 3–21 months, Phase 2 districts to outcomes at 3–27 months and Phase 1 districts

to outcomes at 3–33 months. To get round this problem, Appendix J reports the estimated impact of the LPPs separately by phase and these results are summarised in Figures 4.3 and 4.4. The key results are:

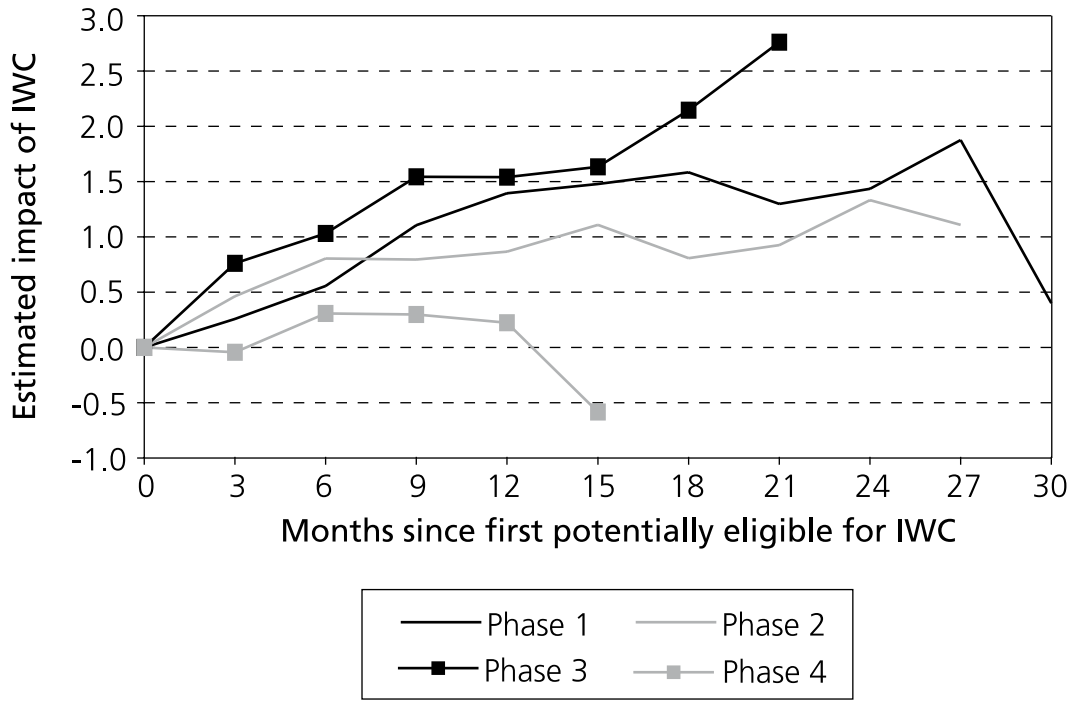
- as in Table 4.1, the estimated impacts tend to increase with the length of time a lone parent has been potentially eligible for IWC;
- as in Table 4.1, the estimates of the impact on work outcomes are a little smaller than those on benefit outcomes at the same point in time (except in Phase 3 and initially in Phase 1);
- for benefit outcomes, the impact of the LPPs is greater in Phases 2 and 4 than it is in Phases 1 and 3 (both dominated by London). For work outcomes, the impact of the LPPs is greater in Phases 1 and 3 (both dominated by London) than it is in Phases 2 and 4. However, the variation across phases in the estimated impacts for the benefit outcomes is almost never statistically significant.

**Figure 4.3 Estimated impact of the LPPs on percentage off benefit: potentially eligible lone parents in the flow sample, all cohorts, by phase (ppts)**




Notes: Derived from estimated impacts in Table J.1. Appendix J reports which differences between phases are statistically significant.

**Figure 4.4 Estimated impact of the LPPs on percentage in work: potentially eligible lone parents in the flow sample, all cohorts, by phase (ppts)**




Notes: Derived from estimated impacts in Table J.1. Appendix J reports which differences between phases are statistically significant.

Appendix J also presents estimates of the impact of the LPPs where a separate impact of the LPPs is estimated for separate cohorts of lone parents within a particular phase. The key results are:

- the estimated impact of the LPPs on both benefit and work outcomes appears to be greater for later cohorts of potentially eligible lone parents than it is for the earlier cohorts. For example, lone parents in Phase 1 pilot districts who became potentially eligible for IWC between April 2004 and October 2004 (during the first six months of its operation) were no more likely to be off benefit and/or in work than lone parents who became potentially eligible at the same time in the comparison districts, but lone parents in the Phase 1 districts who became potentially eligible after October 2005 (at least 18 months after its introduction) were 2.0 ppts more likely to be off benefit and 2.7 ppts more likely to be in work than potentially eligible lone parents in comparison districts. However, only for work outcomes is the growth in impacts statistically significant;

- the increasing impact of the LPPs over time is consistent with a story in which awareness of the policy among potentially eligible lone parents is low to begin with, but gradually increases, leading to higher take-up rates. Alternatively, it could reflect an increase in the effectiveness of Jobcentre Plus advisers (and other practitioners) in the pilot districts as they gain experience of the policy. A third possible interpretation is that the more recent cohorts of potentially eligible lone parents are somehow different from previous cohorts in ways that are not captured by the data. If such differences also affected their chances of leaving benefit for work, they would lead to increases in the estimated impact of the LPPs. Research based on secondary-data analysis, such as this, cannot differentiate between these possible causes.

## 4.2 Robustness checks

This section discusses the results from robustness checks, designed to see how sensitive the results in Section 4.1 are to the specification used and the assumptions relied upon. In particular, it probes the effects of relaxing the following assumptions:

- the underlying difference between each pilot and comparison district can be adequately represented by a constant and that the underlying time trend can be adequately represented by a full set of quarterly indicators, common to all districts;
- there are no anticipation effects.

These are discussed in turn below.

### 4.2.1 Testing the 'common trends' assumption

This section discusses supporting evidence (presented in full in Appendix I) that there is no evidence that the 'common trends' assumption fails to hold in the period before the LPPs began. This should provide some reassurance that it will also hold after the LPPs have started and thus, that DiD provides an unbiased estimate of the impact of the LPPs.

As explained in Appendix E, the essence of the DiD approach is to attribute any change over time in the difference between outcomes in the pilot and comparison districts to the impact of the LPPs, having controlled for a range of explanatory factors that are changing over time. Of course, what one would ideally want to know is whether, in the absence of the LPPs, the trends in the pilot and comparison districts would have been identical – but this is unobservable. As a substitute, though, it is possible to test whether there were 'common trends' in the pilot and comparison districts in the period before the introduction of the LPPs. This is examined first over the whole period (from April 2001 onwards) and then over six-monthly periods immediately before the LPPs were introduced (from April 2003 onwards). The full results, presented in Appendix I, show that:

- before the LPPs began, outcomes were statistically significantly different in the pilot and comparison districts. This is why the estimates of the impact of the LPPs have to use a DiD estimator, rather than simply comparing outcomes after the LPPs began;
- for each phase and for both work and benefit outcomes, the set of differences between pilot and comparison districts in each time period before the LPPs begin is almost always not significantly different from a constant: this is another way of saying that the trends in outcomes in the pilot and comparison areas are essentially parallel, with the difference between them not changing over time. Formally, therefore, the hypothesis of common pre-programme trends cannot be rejected for any phase or for any outcome; the exception is the work outcome after 12 months in the Phase 3 districts.

Appendix I also reports the result of an explicit 'placebo' test. This examines whether there appear to be 'placebo treatment effects' amongst potentially eligible lone parents in the pilot districts immediately before the pilots were introduced. In general, there is no evidence of these 'placebo treatment effects', which gives further confidence that the 'common trends' assumption holds after the LPPs have begun.

### 4.2.2 Trend variants

Section 4.2.1 concluded that the 'common trends' assumption appeared to hold before the LPPs began. This is equivalent to saying that the difference between each pilot and comparison district can be represented adequately by a constant, and that the underlying time trend can be represented by a full set of quarterly indicators, common to all districts. However, it is never possible to test whether the 'common trends' assumption holds after the start of the LPPs and so tables in Appendix K report three alternative estimates of the impact of the LPPs using different assumptions about the underlying trend in outcomes:

a. no time trend but seasonal indicators;
b. separate quadratic and linear time trends (see Glossary of terms) for each of the four phases and the set of comparison districts and seasonal indicators common to all districts;
c. separate linear time trends for each of the four phases and the set of comparison districts, a common quadratic time trend and seasonal indicators common to all districts.

Compared with the results in Section 4.1, which assumed that the underlying trend in outcomes is common to all phases but has an unrestricted form:

- under the assumption of no trend in outcomes, the estimated impacts on benefit outcomes are higher and for work outcomes are lower, particularly for outcomes measured a long time since first becoming potentially eligible for IWC;

- under the assumption of a differential quadratic trend in outcomes specific to each phase, the estimated impacts on benefit and work outcomes are lower and the standard errors on the estimated impacts are substantially higher;
- under the assumption of a differential linear trend in outcomes specific to each phase and a common quadratic trend, the estimated impacts on benefit and work outcomes are generally higher, except for outcomes at the longest durations, and the standard errors on the estimated impacts are substantially higher.

The overall conclusion, then, is that the estimated impacts do not differ dramatically when different assumptions are made about the underlying trend in outcomes.

### 4.2.3 Allowing for treatment effects on lone parents who are not yet potentially eligible for IWC

Section 4.1 presented the estimated impact of the LPPs on lone parents who had been receiving IS or Jobseeker's Allowance (JSA) for at least 12 months. One assumption underpinning these results was that the LPPs did not affect lone parents before they had been receiving out-of-work benefits for 12 months (if the LPPs had affected lone parents before they had been receiving out-of-work benefits for 12 months, this would bias the estimated impacts of the LPPs in an unknown direction).

But this assumption can be tested by estimating apparent 'treatment effects' on lone parents who have been on IS for less than 12 months and who are, therefore, not yet eligible for IWC, as well as on lone parents who are potentially eligible for IWC. The results are reported in Appendix L. An example is given in Table 4.2, which estimates the impact of the LPPs on all lone parents who have made a claim for IS and who, if they had remained on IS for at least 12 months and there were no changes in personal circumstances since the start of the claim, would have been potentially eligible for IWC.

## Table 4.2 Estimated impact of the LPPs on lone parents who are not yet potentially eligible: variant flow sample, all phases and all cohorts

| | | Estimates reported in ppts (standard errors given in parentheses) | |
|---|---|---|---|
| Months before/ since potentially eligible for IWC | Months since claim of IS | Impact on number off benefit | Impact on number in work |
| -9 | 3 | –0.6 | –0.3 |
| | | (0.094)*** | (0.134)** |
| -6 | 6 | –0.4 | –0.3 |
| | | (0.147)*** | (0.151)* |
| -3 | 9 | –0.7 | –0.6 |
| | | (0.178)*** | (0.168)*** |
| 0 | 12 | –0.6 | –0.7 |
| | | (0.199)*** | (0.184)*** |
| 3 | 15 | –0.2 | –0.6 |
| | | (0.221) | (0.203)*** |
| 6 | 18 | 0.3 | –0.4 |
| | | (0.244) | (0.222) |
| 9 | 21 | 0.2 | –0.0 |
| | | (0.274) | (0.249) |
| 12 | 24 | 0.9 | 0.6 |
| | | (0.310)*** | (0.285)** |
| 15 | 27 | 0.8 | 0.2 |
| | | (0.363)** | (0.334) |
| 18 | 30 | 1.2 | 0.8 |
| | | (0.429)*** | (0.398)** |
| 21 | 33 | 0.4 | 0.2 |
| | | (0.492) | (0.458) |
| 24 | 36 | 0.7 | 1.0 |
| | | (0.579) | (0.542)* |

Notes: The table reports the estimated impact of the LPPs based on various OLS regressions on the variant flow sample (see Appendix B). Standard errors are given in brackets. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

For both benefit and work outcomes, the estimated apparent impacts are negative (and generally statistically different from zero) in months –9 to 3, where time is measured relative to when the claimant would have actually become potentially eligible for IWC and then rise until month 18.

However, interpreting such treatment effects is not simple: there are two main causes, with very different implications, and no reliable way of distinguishing between them given the data available to the authors:

1 Any estimated apparent treatment effects may genuinely be caused by the LPPs. There are at least three ways this could occur:

- Chapter 2 discussed that one might expect that lone parents in the LPP districts whose duration of IS is less than 12 months and who are contemplating leaving IS for a job of 16 or more hours a week, might delay leaving IS until they become eligible for IWC; these are known as anticipation effects. The benefits from doing this would be up to £2,080 in IWC payments; assuming it is costless to delay leaving IS for a job, the only cost would be the net earnings (i.e. net of taxes paid and benefits lost) forgone during the period of delay. If present, such effects would lead to a negative apparent treatment effect on lone parents in pilot districts whose duration of IS is less than 12 months before they become potentially eligible; the implication would be that estimates of the net impact of the LPPs that ignored these would be overstating the genuine impact of the LPPs.
- There may be 'spillover' or 'substitution' effects operating through the labour market; in the case of the LPPs, this would refer to a situation where the higher number of lone parents whose duration on IS exceeds 12 months looking for work makes it harder for others – such as lone parents on IS for less than 12 months – to find work. Such effects would lead to a negative apparent treatment effect on lone parents in pilot districts whose duration of IS is less than 12 months; the implication would be that estimates of the net impact of the LPPs that ignored these would be overstating the genuine impact of the LPPs.
- Some of the IWC districts were also operating other LPPs, such as New Deal Plus for Lone Parents (ND+fLP), which, in principle, could have affected lone parents whose duration on IS was less than 12 months. If these programmes had a positive impact on lone parents' outcomes, then this could lead to estimated positive apparent treatment effects on outcomes measured before the duration on IS reaches 12 months. The implication would be that estimates of the net impact of the LPPs that ignored these other programmes would correctly estimate the impact of the LPPs on potentially eligible lone parents but underestimate the impact of the LPPs as a whole (Chapter 6 analyses the additional impacts of Extended Schools Quarterly Work Focused Interviews (ESQWFIs) and of ND+fLP).

The authors' view is that substitution effects through the labour market are unlikely to explain the apparent negative impacts: the additional impact of IWC on potentially eligible lone parents is too small for it to be plausible that this would disadvantage other lone parents looking for work. The authors also consider that the presence of policies other than IWC is unlikely to explain the apparent negative impacts (because the LPPs were designed to encourage lone parents to leave IS and find work, not stay on IS for longer). It is also possible to question whether anticipation effects are plausible: anticipation effects can exist only if lone parents whose duration on IS is less than 12 months are aware of IWC and alter their behaviour as a result. But qualitative research with IWC recipients (Ray *et al.*, 2007) found that the majority of those IWC recipients

who had not received Work Search Premium (WSP) or had a Quarterly Work Focused Interview (QWFI) heard about IWC for the first time after they had found a job (although this research was based on a small sample). Furthermore, in a variant of the duration model that allowed for anticipation effects, these were found to be statistically insignificant, and the overall impact of IWC was little different (see Appendix F). However, anticipation effects were found to be present in a similar programme in Canada (Card and Hyslop, 2005) and it is also plausible that there were spillover effects as described above in the Canadian programme.

2 Any estimated treatment effects may be due to a failure of the 'common trends' assumption after the LPPs started (see Section 4.2.1). This would happen if there were a deterioration or improvement in the outcomes in the pilot districts that did not occur in the comparison districts, which could not be explained by the explanatory factors included in the regression. If such a deterioration had occurred, it would lead to estimated treatment effects on outcomes measured before duration on IS reaches 12 months that were negative, and it would imply that the conventional DiD estimates of the net impact of the LPPs were understating the genuine impact of the LPPs. Section 4.2.1 reported that statistical tests concluded that the 'common trends' assumption appeared to hold before the LPPs but allowing for time-varying area effects in a duration model increased the effect of the LPPs on the proportion of lone parents off benefit by around 1 ppt (see Appendix F).

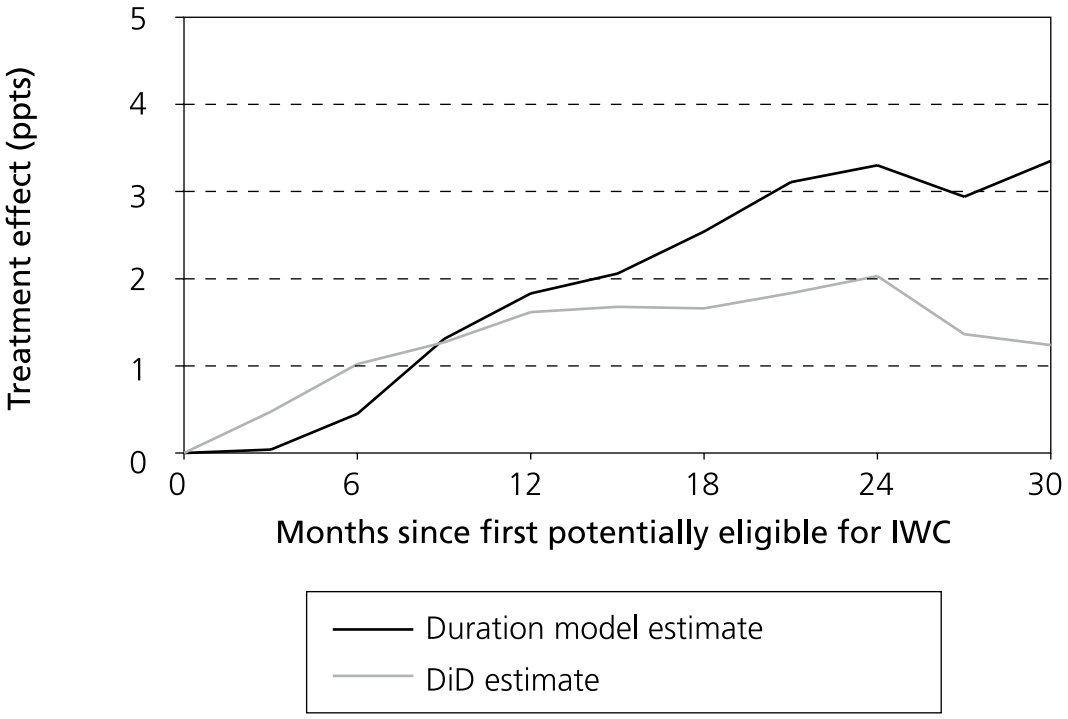
The data available to the research team was insufficient to distinguish between these hypotheses. It would be possible to learn more by using data on non-lone-parent benefit recipients or qualitative research with lone parents in their first year of receipt of IS.

## 4.3 Duration model estimates: overall impact of the LPPs on potentially eligible lone parents in the flow sample

This section presents simulations of the overall impact of the LPPs on all potentially eligible lone parents in the flow sample that have been derived from a duration model (set out in Appendix F).

The results of these simulations are shown in Figure 4.5. They are produced by using the duration model to simulate directly how outcomes would change in the absence of the LPPs. This is done by simulating the probability that each lone parent starts or stops receiving benefit in each quarter and then using a set of random numbers to decide whether each transition actually did occur. By doing this successively over time, a simulated profile is produced for each lone parent. When performing this simulation, the set of random terms is chosen so that the profile for each lone parent matches what is actually observed; this is sometimes known as calibrating the errors (see Appendix F).

**Figure 4.5 Simulated effect of the LPPs on proportion of lone parents off benefit: flow sample**




Notes: Uses model described in Appendix F. Base is those who become potentially eligible for IWC after the programme start date.

The estimated impact of the LPPs 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. This means that the proportion of lone parents in the flow sample in the pilot areas who were not on benefit at this time would have been 2 ppts lower if the LPPs had not existed. After 24 months' exposure, the impact is around 3 ppts. Section 9.1 uses the duration model to simulate the impact of the LPPs on IWC recipients – and thus, the policy's deadweight – but not distinguishing between whether they are in the stock or flow samples. The estimated coefficients of the model imply that IWC had a statistically significant impact on encouraging lone parents to leave IS but it has not been possible to estimate standard errors for the simulations reported in Figure 4.5.

The figure also contains the estimates based on the DiD model previously shown in Table 4.1. The estimated impacts of the LPPs 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 the LPPs using the duration model is actually capturing the impact of a characteristic that has been left out of the model (known as omitted-variable bias). Section 3.3 showed that IWC recipients had significantly different characteristics from other lone parents who left IS, and not all of these characteristics have been controlled for in the duration model;
- the simulation results using the duration model only take one draw from the error distribution; it is conceivable (but unlikely) that re-running the simulation several times with different draws from the error distribution might change the results;
- the duration model assumes that the effect of the LPPs on the probability of starting and leaving benefit is the same for the stock and flow samples, and that it is the same for all durations of time spent on benefit. On the other hand, by running different regressions for the stock and flow and at every three-month point after the date on which the lone parent first became potentially eligible for IWC, the DiD estimates relax these assumptions. Thus, the DiD method potentially allows for more accurate estimates of the effect of the LPPs;
- there is a slight difference in the outcomes measured: the duration model considers lone parents on IS and JSA as being 'on benefit', but the DiD analysis also considers lone parents on Incapacity Benefit (IB) as being 'on benefit'. This will affect estimates of the impact of the LPPs if the LPPs encouraged lone parents to leave IS for IB; this seems unlikely for all aspects of the LPPs apart from ESQWFIs.

Because of these points, and because a stronger set of assumptions about the nature of the unobserved heterogeneity and error terms is needed for the duration model than for the DiD analysis to provide robust estimates, it is likely that the estimates in Figure 4.5 based on the DiD analysis give a more reliable guide to the true impact of the LPPs on the total population of potentially eligible lone parents. However, the simulations from the duration model do add considerably to our understanding of the impact of the LPPs, as will be shown in Chapter 8.

## 4.4 Summary: overall impact of the LPPs on potentially eligible lone parents in the flow sample

This chapter has provided a series of estimates of the overall impact of the LPPs on all potentially eligible lone parents derived from a DiD estimator and also using

a duration model. In general, the impact of the LPPs on the flow sample (in this chapter) is more interesting than the impact of the LPPs on the stock sample (in Chapter 5), as it determines the impact of the LPPs in the long run. This is because, eventually, all lone parents in the flow sample will have become potentially eligible for IWC after the pilots were introduced.

Section 4.1 provided the headline estimates of the impact of the LPPs on all potentially eligible lone parents in the flow sample (i.e. those who first became potentially eligible for IWC at some point after the pilots had been introduced in their area). The main estimates are that 1.6 ppts more potentially eligible lone parents were no longer receiving an out-of-work benefit after 12 months' exposure to the pilots and 2.0 ppts more lone parents were no longer receiving an out-of-work benefit after 24 months' exposure (the latter is based on Phases 1 and 2 only). An alternative way of expressing these impacts is that the additionality rate of the LPPs was 8.8 per cent for benefit outcomes after 12 months' exposure and 7.7 per cent after 24 months' exposure. The equivalent estimates for being in work are 1.0 ppts and 1.4 ppts. Unsurprisingly, the impact as a proportion of all potentially eligible lone parents rises over time, but the additionality rate changes by much less.

In general, the percentage-point impact of the LPPs on the proportion of potentially eligible lone parents off benefit exceeded the percentage-point impact of the LPPs on the proportion of potentially eligible lone parents in work; in theory, the impacts should be identical in the short run, so these differences probably reflect errors in the administrative data, particularly for work spells.

Section 4.1 also discussed the impact of the LPPs on benefit and work outcomes by pilot phase and cohort, where a 'cohort' refers to a group of lone parents who first became potentially eligible for IWC in a particular six-month period. These estimates suggest that later cohorts benefited more from the introduction of the LPPs than earlier cohorts, although most of the differences are not statistically significant. One potential explanation for this pattern is that, over time, lone parents on IS become more aware of the existence of IWC and other parts of the LPPs and therefore more likely to respond to them.

Section 4.2.1 justified the use of a DiD estimator: it showed that work and benefit outcomes were significantly different across the pilot and comparison districts, thus necessitating a DiD estimator rather than a straightforward comparison of outcomes following the introduction of the LPPs. It also showed that this difference was constant over time for all pilot districts, which supports the 'common trends' assumption underlying the DiD approach. Section 4.2.2 showed that the estimated impacts of the LPPs do not differ dramatically when different assumptions are made about the underlying trend in outcomes. However, Section 4.2.3 found that lone parents on IS for less than 12 months in the pilot districts were slightly (and statistically significantly) less likely to be off benefit and less likely to be in work than lone parents on IS for less than 12 months in the comparison districts. Interpreting such 'impacts' is not simple: there are two main potential causes,

with different implications, and the data available to the research team was insufficient to distinguish between these hypotheses. First, the negative 'impacts' may be genuinely caused by the LPPs, most likely either through anticipation effects or substitution effects. If so, then the headline estimates of the additional impact of the LPPs presented earlier are **overstating** the overall impact of the LPPs (although estimates based on the duration model suggest that the extent of any such 'overstatement' is very small). Second, the negative impacts may be due to a general deterioration in the outcomes in the pilot districts that did not occur in the comparison districts and which cannot be explained by the explanatory factors included in the analysis (this would reflect a failure of the 'common trends' assumption). If such a deterioration had occurred, the headline estimates of the impact of the LPPs presented above are **understating** the actual impact of the LPPs.

A technical conclusion is that simulations of the impact of the LPPs derived from the duration model (shown in Section 4.3) are slightly larger than those based on DiD estimates (Section 4.1) but the larger sample means that those based on the DiD estimator should be preferred in this case. The benefit of the duration model is that it can be used to examine how much of the overall impact of IWC is due to retention effects, and this is done in Chapter 8.

# 5 The overall impact of the lone parent pilots on potentially eligible lone parents in the stock sample

The previous chapter presented estimates of the impact of the lone parent pilots (LPPs) on the flow sample. This chapter presents estimates of the additional impact of the LPPs on the stock of potentially eligible lone parents – that is, on all lone parents who were potentially eligible for In-Work Credit (IWC) on the day the pilots were introduced in their district. The long-run impact of the LPPs is determined by its impact on the flow sample but the stock sample is of interest because it still represents the majority of lone parents who are potentially eligible for IWC.

As in the previous chapter, estimates of the overall impact on the stock sample have been derived from both the difference-in-differences (DiD) method and the duration model; full details can be found in Appendices E and F. Box 5.1 describes the stock sample used for the DiD analysis and provides some technical background information on the analysis in this chapter.

### Box 5.1: Technical information about the DiD analysis on the stock sample

There is a separate stock sample for each of the four pilot phases.

The stock sample for analysing Phase 1 of the LPPs comprises the following:

- all claims of Income Support (IS) live on 1 April 2001 in the comparison districts and the Phase 1 districts, where the claimant was a lone parent and the duration of the IS/Jobseeker's Allowance (JSA) claim exceeded 12 months on that date;
- all claims of IS live on 1 April 2004 in the comparison districts and the Phase 1 districts, where the claimant was a lone parent and the duration of the IS/JSA claim exceeded 12 months on that date.

This sample, therefore, consists of the IS claims that were immediately eligible for IWC when the LPPs were introduced in the Phase 1 districts, plus their equivalents in the comparison districts, plus their equivalents in the Phase 1 pilot and comparison districts had the LPPs started on 1 April 2001. Stock samples for the other three phases were constructed similarly, always using 1 April 2001 for the first bullet but using the actual start date for that phase in the second bullet.

Appendix B describes how the sample was constructed, Appendix D contains some summary statistics, and sample sizes and mean outcomes are given in Appendix H. The coefficients on the other regressors in the model (the individual and local-area characteristics) are not shown as there are too many of them and too many regressions but they are listed in Appendix D.

There are fewer variants to the estimated impact on the stock sample than there were to the estimated impact on the flow sample in Chapter 4, for a number of reasons:

- it is not possible to calculate an impact averaged across pilot districts, because each phase requires its own comparison group and many lone parents will appear in more than one comparison group;
- within phase, all lone parents in the stock sample became potentially eligible for IWC on the same day, so there is no variation by cohort;
- similarly, because all lone parents became potentially eligible for IWC on the same day, there is no time trend (simply a before/after comparison); thus, one cannot test different specifications of the underlying trend;
- it is, in principle, possible to examine whether there were anticipation effects amongst this group but the way the stock samples are constructed makes this much more involved than it was for the flow sample.

## 5.1 DiD estimates: overall impact of the LPPs on potentially eligible lone parents in the stock sample

Table 5.1 presents estimates of the impact of the LPPs on work and benefit outcomes amongst all potentially eligible lone parents in the stock samples separately by phase. Outcomes are available up to 36/30/24/18 months following the introduction of the pilots in the Phase 1/2/3/4 districts, and are presented in percentage-point terms and as a percentage of the outcome (the additionality rate).

In all four phases, the estimated impacts of the pilots are generally smaller than the equivalent set of estimates for the flow sample in Table 4.1 and sometimes they are not statistically different from zero. For benefit outcomes after 12 months, the point estimates suggest that the impact was greatest in the Phase 2 districts and smallest (insignificantly different from zero) in the Phase 1 districts. The weighted average of the four estimates is 0.5 percentage points (ppts) (weighted by the number of potentially eligible lone parents on the first day of operation of the LPPs in each phase), so this is the central estimate of the additional impact of the LPPs on the fraction of lone parents in the stock sample as a whole who have left benefits in the pilot districts, 12 months after the pilots were introduced. The estimated impacts in the different phases come from separate regressions and so it is not possible to tell whether the differences in estimates between the phases are statistically significant.

For work outcomes after 12 months, the point estimates suggest that the impact was greatest in the Phase 3 districts and smallest (and insignificantly different from zero) in the Phase 4 districts. The weighted average of the four estimates is 0.6 ppts, so this is the central estimate of the additional impact of the LPPs on the fraction of lone parents in the stock sample as a whole who are in work in the pilot districts, 12 months after the pilots were introduced.

In general, the point estimates on both benefit and work outcomes tend to increase over time, reaching 1.4 and 1.6 ppts respectively after 36 months in the Phase 1 pilot districts, 1.7 and 1.8 ppts after 30 months in the Phase 2 pilot districts, 2.2 and 1.5 ppts after 24 months in the Phase 3 pilot districts and 0.5 and 0.8 ppts after 18 months in the Phase 4 pilot districts. These impacts – which correspond to outcomes measured at the end of the period of data available for this report – can be measured much more accurately for the stock than for the flow, because the sample size does not change as the length of time since becoming potentially eligible increases. The impact of the LPPs on the stock sample is smaller than on the flow sample (compare Tables 5.1 and 4.1). This is unsurprising: lone parents in the stock sample are likely to have been on IS for considerably longer periods of time when they first become potentially eligible for IWC than lone parents in the flow sample.

## Table 5.1 Estimated impact of the LPPs on potentially eligible lone parents in the stock sample, by phase

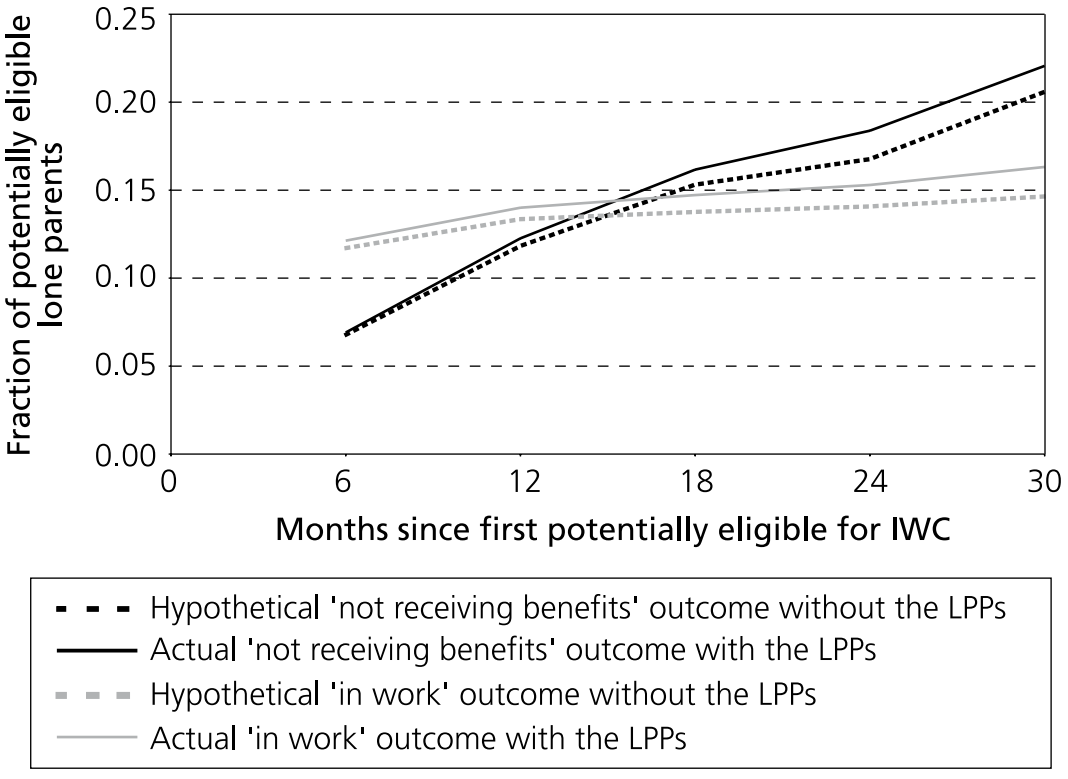
| | Estimates reported in ppts (standard errors given in parentheses) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Phase 1 | | Phase 2 | | Phase 3 | | Phase 4 | |
| Months since first potentially eligible for IWC | Impact on number off benefit | Impact on number in work | Impact on number off benefit | Impact on number in work | Impact on number off benefit | Impact on number in work | Impact on number off benefit | Impact on number in work |
| 6 | –0.2 | 0.2 | 0.3 | 0.6 | 0.0 | 0.5 | 0.3 | 0.2 |
| | (0.196) | (0.202) | (0.135)** | (0.134)*** | (0.164) | (0.164)*** | (0.132)** | (0.127)** |
| 12 | 0.1 | 0.4 | 0.7 | 0.8 | 0.6 | 1.1 | 0.3 | 0.2 |
| | (0.258) | (0.236)*** | (0.173)*** | (0.159)*** | (0.211)*** | (0.189)*** | (0.169)* | (0.149) |
| 18 | 0.2 | 0.5 | 1.1 | 1.0 | 1.0 | 1.8 | 0.5 | 0.8 |
| | (0.279) | (0.266)*** | (0.189)*** | (0.175)*** | (0.229)*** | (0.211)*** | (0.183)*** | (0.164)** |
| 24 | 0.9 | 0.8 | 1.5 | 1.2 | 2.2 | 1.5 | | |
| | (0.300)*** | (0.275)*** | (0.203)*** | (0.184)*** | (0.248)*** | (0.221)*** | | |
| 30 | 1.0 | 1.4 | 1.7 | 1.8 | | | | |
| | (0.311)*** | (0.294)*** | (0.211)*** | (0.195)*** | | | | |
| 36 | 1.4 | 1.6 | | | | | | |
| | (0.323)*** | (0.302)*** | | | | | | |
| | Additionality rate (impact as percentage of gross outcome) | | | | | | | |
| | Phase 1 | | Phase 2 | | Phase 3 | | Phase 4 | |
| Months since first potentially eligible for IWC | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 6 | -4.0 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12 | 0.9 | 2.9 | 5.6 | 5.4 | 6.3 | 8.7 | 1.4 | 2.1 |
| 18 | 1.4 | 3.3 | 6.5 | 6.6 | 7.8 | 13.6 | 4.2 | 3.3 |
| 24 | 5.1 | 5.1 | 7.5 | 7.5 | 13.1 | 10.7 | | |
| 30 | 5.0 | 8.9 | 7.4 | 10.8 | | | | |
| 36 | 6.1 | 9.8 | | | | | | |

Notes: Based on all lone parents in stock sample (described in Appendix B). Mean outcomes and sample sizes given 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/gross outcome'.

Table 5.1 also shows the estimated impact as a percentage of the gross outcome, i.e. the additionality rate. For example, the net impact of the LPPs in Phase 1 districts accounted for 6 per cent of the potentially eligible lone parents who were not on benefit 36 months after the LPPs began. Unlike the flow sample, these estimates tend to rise with the length of time for which lone parents have been exposed to the LPPs.

Figure 5.1 shows the actual fractions of potentially eligible lone parents in the stock sample who are off benefit and in work and the estimated fractions off benefit and in work in the absence of the LPPs. The difference between each pair of lines is the impact on the stock sample averaged across the four phases.

**Figure 5.1 Fractions of potentially eligible lone parents in the stock sample who are off benefit and in work, and estimated fractions off benefit and in work in the absence of the LPPs**



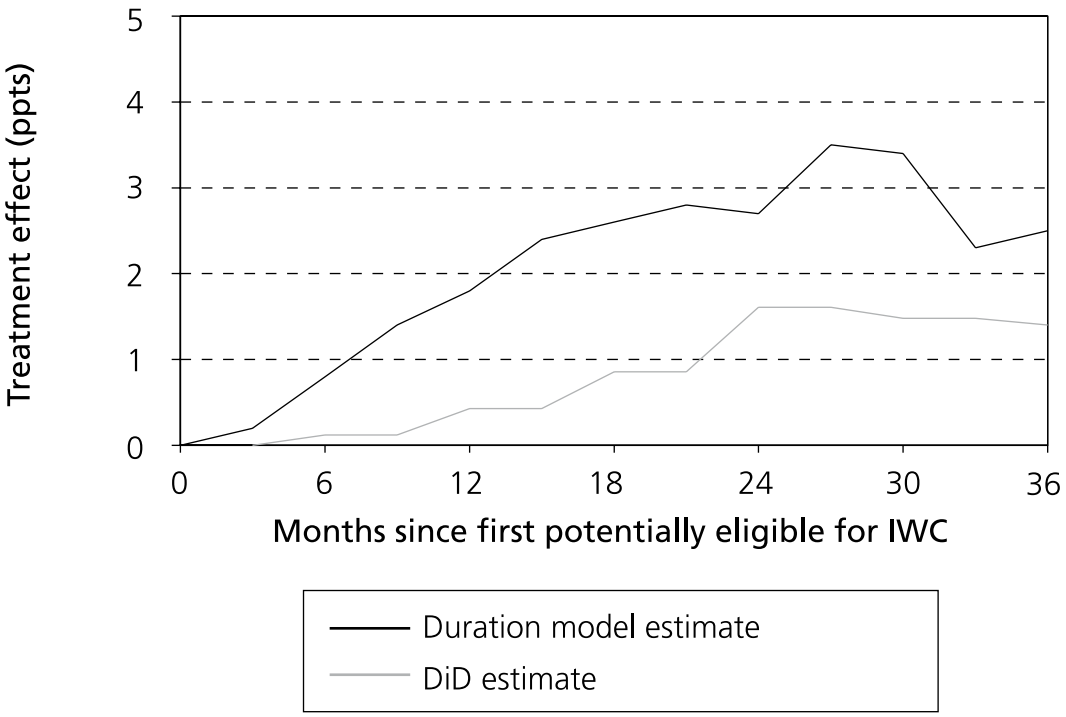

Note: Based on impacts in Table 5.1, weighted by number of lone parents in each phase and outcomes given in Appendix H.

## 5.2 Duration model estimates: overall impact of the LPPs on potentially eligible lone parents in the stock sample

This section presents simulations of the overall impact of the LPPs on all potentially eligible lone parents in the stock sample that have been derived from a duration model (set out in Appendix F).

The results of these simulations are shown in Figure 5.2. They are produced by using the duration model to simulate directly how outcomes would change in the absence of the LPPs. This is done by simulating the probability that each lone parent starts or stops receiving benefit in each quarter, and then using a set of random numbers to decide whether each transition actually did occur. By doing this successively over time, a simulated profile is produced for each lone parent. When performing this simulation, the set of random terms is chosen so that the profile for each lone parent matches what is actually observed; this is sometimes known as calibrating the errors (see Appendix F).

**Figure 5.2 Simulated effect of the LPPs on proportion of lone parents off benefit: stock sample**




Notes: Results for those who became potentially eligible for IWC on the day it was introduced in their area, using results reported in Appendix F. DiD results from Section 5.1 weighted by the number of lone parents in each phase. Errors calibrated as described in Appendix F.

The estimated impact of the LPPs on potentially eligible lone parents in the stock sample based on the duration model increases the longer lone parents have been potentially eligible for IWC, reaching 2.6 ppts 18 months after the date on which the lone parent first became potentially eligible for IWC. This means that the proportion of lone parents off benefit at this time in the pilot areas would have been 2.6 ppts lower if the LPPs had not been introduced (the impact after this date is not strictly comparable as the number of phases contributing to outcomes changes over time, as discussed in Section 4.1). Section 9.1 uses the duration model to simulate the impact of the LPPs on IWC recipients – and thus, the policy's deadweight – but not distinguishing between whether they are in the stock or flow samples. The estimated coefficients of the model imply that IWC had a statistically significant impact on encouraging lone parents to leave IS, but it has not been possible to estimate standard errors for the simulations reported in Figure 5.2.

Figure 5.2 also contains the estimates based on the DiD model (and previously shown in Table 5.1). Estimated impacts of the LPPs derived from the duration model are slightly larger than the DiD estimates, but it is not possible to estimate whether the difference is statistically different from zero, as the two estimates are from entirely different models. Section 4.3 discussed a number of reasons why the differences might exist, to which should be added:

- The stock sample examined in the duration model is a subset of that used in the DiD analysis and contains those lone parents with relatively short durations on IS at the time the LPPs were introduced (because it does not include lone parents whose IS claim started before 1 April 2001). It is possible that the genuine impact of the LPPs is greater on the subsample of the overall stock sample with relatively short durations on IS.

## 5.3 Summary: overall impact of the LPPs on potentially eligible lone parents in the stock sample

In general, the impact of the LPPs on the flow sample is more interesting than the impact of the LPPs on the stock sample, as it determines the impact of the LPPs in the long run. This is because, eventually, all lone parents in the flow sample will have become potentially eligible for IWC after the pilots were introduced. But the stock sample is of interest too, both because it comprises the majority of lone parents who have become potentially eligible for IWC to date and because it indicates, reliably, the time profile of the impact of the LPPs beyond 24 months.

In general, the impact of the LPPs on the stock of potentially eligible lone parents (based on the DiD estimator) is smaller than the impact of the LPPs on the flow of potentially eligible lone parents, particularly for benefit outcomes: this is unsurprising, given that lone parents in the stock sample are likely to have been on IS for considerably longer than 12 months when they first become potentially eligible for IWC. For example, 12 months after becoming potentially eligible, lone parents in the stock sample in Phase 1 districts were 0.1 ppts more likely to be off

benefits than lone parents in the stock sample in comparison districts, but lone parents in the flow sample in Phase 1 districts were 0.8 ppts significantly more likely to be off benefits than lone parents in the flow sample in comparison districts. For Phase 2 districts, the equivalent numbers were 0.7 ppts for the stock and 2.0 ppts for the flow (the estimated impacts in each phase for the flow sample are reported in Table J.1. In most cases, the impact of the LPPs on the stock samples peaked in the final month in which outcomes were available, suggesting that the impact of the LPPs on the flow sample might also continue to grow.

A technical conclusion is that simulations of the impact of the LPPs derived from the duration model were up to twice as large as those based on DiD estimates but the larger sample means that those based on the DiD estimator should be preferred. The benefit of the duration model is that it can be used to examine how much of the overall impact of IWC is due to retention effects and this is done in Chapter 8.

# 6 Variation in the overall impact of the lone parent pilots on potentially eligible lone parents

Chapters 4 and 5 presented the overall impact of the lone parent pilots (LPPs) for all potentially eligible lone parents in the flow and stock samples respectively. This chapter supplements that analysis by examining, for both the flow and stock samples, how the impact of the LPPs varies according to different combinations of policies offered as part of the LPPs that were available to potentially eligible lone parents in pilot districts at the time when their outcomes were recorded and whether the potentially eligible lone parents had previously participated in New Deal for Lone Parents (NDLP).

The analysis in this chapter has been implemented by taking the difference-in-differences (DiD) model used to look at the overall impact of the LPPs in Chapters 4 and 5 and extending it in order to break down the overall impact into:

- the impact in New Deal Plus for Lone Parents (ND+fLP) districts;
- the impact in districts where mandatory Extended Schools Quarterly Work Focused Interviews (ESQWFIs) were in operation for certain lone parents;
- the impact for lone parents who were previously on NDLP or ND+fLP;
- the impact for all other kinds of potentially eligible lone parents.

This last term is hereafter referred to as the 'base impact', against which the three variants of the impact will be compared. Box 6.1 explains how the estimates were produced, and how they should be interpreted, in more detail.

### Box 6.1: Estimating the variation in the overall impact of the LPPs: detail

This chapter looks at what the estimated impact of the LPPs is for potentially eligible lone parents in pilot districts:

- who were subject to mandatory ESQWFIs when their labour market outcomes were measured, because their youngest child was aged 12 or over and they lived in a Local Education Authorities (LEA) operating Extended Schools Childcare and Childcare Tasters (ESC) at the time;
- where ND+fLP was in operation when their labour market outcomes were measured;
- who had participated in NDLP at some point during the period 6–30 months before the date on which they became potentially eligible for IWC. As in Research Report 415 (RR 415), NDLP participation less than six months before a lone parent first became potentially eligible for In-Work Credit (IWC) is ignored in this analysis, in order to avoid any issues surrounding the fact that during the first months of Phase 1 of the LPPs, receipt of IWC was conditional on participating in NDLP.

Appendix A has more details on ESQWFIs and ND+fLP.

The base impact, therefore, measures the impact of the LPPs on potentially eligible lone parents in pilot districts where ND+fLP was not in operation, who were not subject to ESQWFIs and who had not previously participated in NDLP. It is based on a comparison with the outcomes of lone parents in comparison districts whose Income Support (IS) claim had reached 12 months (and who had not previously been on NDLP), after controlling for observable personal and geographic characteristics.

continued

The ESQWFI impact measures the impact of the LPPs on potentially eligible lone parents who lived in pilot districts where ND+fLP was not in operation but who were subject to ESQWFIs (because their youngest child was aged 12 or over and they lived in an LEA offering ESC) and who did not participate in NDLP. It is based on a comparison with the outcomes of equivalent lone parents in comparison districts who had similar observable characteristics and whose youngest child was aged 12 or over.[5]

The ND+fLP impact measures the impact of the LPPs on potentially eligible lone parents in pilot districts where ND+fLP was in operation (at the time their labour market outcomes were measured), but who were not subject to ESQWFIs and did not previously participate in NDLP/ND+fLP. It is based on a comparison with the outcomes of lone parents in comparison districts whose IS claim had reached 12 months (and who had not previously been on NDLP/ ND+fLP), after controlling for observable personal and geographic characteristics.

The NDLP impact measures the impact of the LPPs on potentially eligible lone parents in pilot districts where ND+fLP was not in operation and who were not subject to ESQWFIs, but did participate in NDLP. It is based on a comparison with the outcomes of equivalent lone parents in comparison districts who had previously been on NDLP.[6]

continued

5 Strictly speaking, this comparison is made only for outcomes measured before October 2005, after which Quarterly Work-Focused Interviews (QWFIs) were rolled out nationally for lone parents whose youngest child was aged 14 or over. This policy change must be accommodated in order to ensure that potentially eligible lone parents in pilot districts who had to attend pilot QWFIs are always compared with potentially eligible lone parents in comparison districts who did not have to attend QWFIs. Therefore, when looking at outcomes measured after October 2005, the analysis compares lone parents in LEAs operating ESC whose youngest child was between 12 and 14, with lone parents in comparison districts whose youngest child was between 12 and 14.

6 The model used to produce the analysis for this chapter assumes that previous participation in NDLP (for lone parents who did not live in ND+fLP areas) has the same effect on labour market outcomes as previous participation in NDLP/ND+fLP for lone parents who did live in ND+fLP areas. Thus while this chapter reports the former, the latter can also be calculated from the same set of estimates.

All of these impacts are estimated jointly (i.e. within the same model), so in addition to testing whether the LPPs had a statistically significant impact on benefit and work outcomes for the variants above, it is possible to test whether the impacts for these variants are statistically different from the base impact: that is, whether there is any statistically significant variation in the overall impact.

It is important to note that the base impact defined here will not match the impacts in Chapters 4 and 5, although it is very similar in most cases. The base impact in this chapter measures the impact for potentially eligible lone parents who did not previously participate in NDLP and who lived in pilot districts where ND+fLP was not in operation and were not subject to ESQWFIs. The estimates in Chapters 4 and 5 are a weighted combination of the base impact and the three variant impacts, as they are the average impact across all potentially eligible lone parents in all pilot districts.

## 6.1 Flow sample: variation in the overall impact of the LPPs on potentially eligible lone parents

Tables 6.1 and 6.2 present the estimated base impacts and variant impacts for potentially eligible lone parents in the flow sample, at six-monthly intervals after the date on which they first became potentially eligible for IWC. The base impacts (first column of numbers) are generally very slightly lower than the average impacts (final column of numbers) shown in Section 4.1.

The first row of Table 6.1 indicates that the impact of the LPPs on lone parents subject to ESQWFIs (second column) was to make them 0.8 percentage points (ppts) less likely to be off benefit six months after they became potentially eligible for IWC than lone parents in comparison areas with a child aged 12 or over. Note that this estimated impact is not statistically significant, so there is no evidence that IWC made these lone parents less likely to leave benefit after six months. However, the impact is statistically different from the base impact of 1.0 ppts, so there is evidence that the impact on this particular outcome was smaller for lone parents who attended ESQWFIs than for those who did not.

## Table 6.1 Variants of estimated impact of the LPPs on number of potentially eligible lone parents off benefit in the flow sample

| Months after became potentially eligible for IWC | Base | Subject to ESQWFI | Lived in an ND+fLP district | Previously on NDLP | Average |
|---|---|---|---|---|---|
| | Impact in ppts (Standard errors given in parentheses) | | | | |
| 6 | | | | | |
| Impact | 1.0 | –0.8 | 1.2 | 2.1 | 1.0 |
| | (0.164)*** | (0.753) | (0.264)*** | (0.763)*** | (0.154)*** |
| Impact significantly different from base? | N/A | Yes | No | No | N/A |
| 12 | | | | | |
| Impact | 1.5 | 0.2 | 1.4 | 4.2 | 1.6 |
| | (0.247)*** | (1.028) | (0.337)*** | (1.010)*** | (0.220)*** |
| Impact significantly different from base? | N/A | No | No | Yes | N/A |
| 18 | | | | | |
| Impact | 1.6 | 2.0 | 1.6 | 2.4 | 1.7 |
| | (0.368)*** | (1.345) | (0.410)*** | (1.329)* | (0.301)*** |
| Impact significantly different from base? | N/A | No | No | No | N/A |
| 24 | | | | | |
| Impact | 1.8 | 3.2 | 1.9 | 2.8 | 2.0 |
| | (0.662)*** | (1.844)* | (0.500)*** | (1.872) | (0.419)*** |
| Impact significantly different from base? | N/A | No | No | No | N/A |
| 30 | | | | | |
| Impact | 1.4 | –1.2 | N/A | 1.7 | 1.2 |
| | (0.793)* | (2.510) | N/A | (3.113) | (0.758) |
| Impact significantly different from base? | N/A | No | N/A | No | N/A |

Notes: Based on various ordinary least squares (OLS) regressions on the flow sample (see Appendix B). Sample sizes given in Appendix H.

Base impact refers to impact of LPPs in areas not operating ESQWFIs or ND+fLP, for lone parents not subject to ESQWFIs and not previously on NDLP. Average impact at each date is taken from Table 4.1.

Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

'Impact significantly different from base?' is a test that the estimated impact in each column is significantly different from the base impact.

In districts where ND+fLP was in operation, lone parents were 1.2 ppts more likely to be off benefit six months after they became potentially eligible for IWC; this impact is statistically significant, but it is not statistically different from the base impact. In other words, while potentially eligible lone parents in ND+fLP districts were more likely to leave benefit after six months, the impact was not stronger than in non-ND+fLP districts.

Finally, looking at the fourth column, lone parents in pilot districts who had previously been on NDLP were 2.1 ppts more likely to be off benefit six months after becoming potentially eligible for IWC; this impact is statistically different from zero, but not statistically different from the base impact. In other words, six months after lone parents became potentially eligible for IWC, the benefit outcomes of those in pilot districts who had been on NDLP improved by 2.1 ppts more relative to the outcomes of lone parents who had been on NDLP in comparison districts. This relative improvement is significantly different from zero. However, it is not significantly different from the relative improvement experienced by the other lone parents in pilot districts (who had not been on NDLP).

Over time, the estimated impacts tend to become more positive for all groups of lone parents considered here – as in Section 4.1 – although they become erratic towards the end of the flow sample window, probably because small numbers of lone parents are observed for 30 months after becoming potentially eligible for IWC.

In districts where ND+fLP was operating, lone parents who had been potentially eligible for two years were 1.9 ppts more likely to be off benefit, which is very similar to the base impact. Lone parents who had previously been on NDLP were 2.8 ppts more likely to be off benefit by this time, but as this impact is very imprecisely measured, it is neither statistically significant nor statistically different from the base impact.

As a whole, Table 6.1 shows:

- the impact of the LPPs on the benefit outcomes of lone parents subject to ESQWFIs is never significantly positive, and is almost never significantly different from the base impact, but this reflects the imprecision of this estimate, because ESQWFIs applied to relatively few lone parents;
- the impacts for lone parents in ND+fLP areas are always statistically significant. They are very similar in magnitude to the base impacts, so the impact on benefit outcomes does not vary significantly according to the availability of ND+fLP;
- the estimated impact of the LPPs for lone parents who had previously been on NDLP is always larger than the base impact, being in the region of 2.0–4.0 ppts across the table as a whole. However, these impacts become imprecise as the sample sizes diminish for later outcomes and as a result are not significantly different from the base impact (except at 12 months after lone parents became potentially eligible for IWC).

Table 6.2 repeats the analysis for work outcome. As for the benefit outcomes in Table 6.1:

- the estimated impact for potentially eligible lone parents who were subject to ESQWFIs is not statistically significant (despite growing over time), and it is not statistically different from the base impact either. This reflects the imprecision of the estimates due to the small numbers of lone parents affected by ESQWFIs;
- the estimated impacts in ND+fLP districts are between 1.0 and 1.5 ppts, which are, as for benefit outcomes, similar to the base impact and therefore not significantly different from it (but always significantly different from zero);
- for lone parents who had previously been on NDLP, the impact of the LPPs on work outcome is larger (around 1–2 ppts) and significantly positive up to 18 months after lone parents became potentially eligible for IWC but then becomes erratic as the sample sizes fall for later outcomes. As it is quite imprecisely measured, it is never statistically different from the base impact.

Some of the findings for the flow sample can be compared with the findings in RR 415 and they are broadly consistent with the results in that report. In particular, small (and therefore, insignificant) differences between impacts in ND+fLP areas and non-ND+fLP areas were found before, which is consistent with the estimates here. Second, the impacts in RR 415 were larger for potentially eligible lone parents who had previously been on NDLP but not in a significant manner (due to the imprecision caused by small samples). This is also consistent with the estimates here.

## Table 6.2 Variants of estimated impact of the LPPs on number of potentially eligible lone parents in work in the flow sample

| Months after became potentially eligible for IWC | Base | Subject to ESQWFI | Lived in an ND+fLP district | Previously on NDLP | Average |
|---|---|---|---|---|---|
| | Impact in ppts (Standard errors given in parentheses) | | | | |
| 6 | | | | | |
| Impact | 0.7 | 0.3 | 1.0 | 1.3 | 0.7 |
| | (0.133)*** | (0.664) | (0.217)*** | (0.635)** | (0.151)*** |
| Impact significantly different from base? | N/A | No | No | No | N/A |
| 12 | | | | | |
| Impact | 0.8 | 0.2 | 1.3 | 1.9 | 1.0 |
| | (0.203)*** | (0.895) | (0.284)*** | (0.852)** | (0.199)*** |
| Impact significantly different from base? | N/A | No | No | No | N/A |
| 18 | | | | | |
| Impact | 1.1 | 0.7 | 1.5 | 2.4 | 1.3 |
| | (0.312)*** | (1.204) | (0.353)*** | (1.160)** | (0.265)*** |
| Impact significantly different from base? | N/A | No | No | No | N/A |
| 24 | | | | | |
| Impact | 1.3 | 1.7 | 1.2 | 0.9 | 1.4 |
| | (0.571)** | (1.690) | (0.439)*** | (1.623) | (0.366)*** |
| Impact significantly different from base? | N/A | No | No | No | N/A |
| 30 | | | | | |
| Impact | 0.1 | 0.1 | N/A | –4.6 | 0.4 |
| | (0.691) | (2.400) | N/A | (2.661)* | (0.650 |
| Impact significantly different from base? | N/A | No | N/A | No | N/A |

Notes: Based on various OLS regressions on the flow sample (see Appendix B). Sample sizes given in Appendix H.

Base impact refers to impact of LPPs in areas not operating ESQWFIs or ND+fLP, for lone parents not subject to ESQWFIs and not previously on NDLP. Average impact at each date is taken from Table 4.1.

Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

'Impact significantly different from base?' is a test that the estimated impact in each column is significantly different from the base impact.

## 6.2 Stock sample: variation in the overall impact of the LPPs on potentially eligible lone parents

The DiD analysis in Chapter 5 showed estimates of the impact of the LPPs on the stock sample separately for each phase because each phase required its own comparison group. In keeping with that method, this section presents separate estimates for each phase. However:

- as ESQWFIs were never introduced in Phases 3 and 4, their impact can only be presented for Phases 1 and 2; this is illustrated in Table 6.3;
- only Phase 2 contained a mixture of ND+fLP and non-ND+fLP districts, so the impact in ND+fLP districts can only be measured for this phase, and is shown in Table 6.4;
- Tables 6.5 and 6.6 present the impacts on (respectively) benefit and work outcomes for lone parents who had previously participated in NDLP.

Table 6.3 shows that, in Phase 1 districts, the impact of the LPPs on benefit outcomes is almost always greater for those subject to ESQWFIs than the base impact and this difference is statistically significant between 12 and 30 months after becoming potentially eligible for IWC. Both impacts generally increase over time (except towards the end of the sample window) and this holds true for the work outcome as well. However, the impact on work outcomes in Phase 1 does not seem to differ significantly according to whether potentially eligible lone parents were subject to ESQWFIs.

## Table 6.3 Estimated impact of the LPPs for potentially eligible lone parents subject to ESQWFIs on benefit and work outcomes in Phases 1 and 2 of the stock sample

| Months after became potentially eligible for IWC | Phase 1 | | Phase 2 | |
|---|---|---|---|---|
| | Benefit | Work | Benefit | Work |
| | Impact in ppts (Standard errors given in parentheses) | | | |
| 6 | | | | |
| Base impact | –0.5 | 0.1 | 0.1 | 0.5 |
| | (0.182)** | (0.191) | (0.137) | (0.136)*** |
| ESQWFI impact | –0.0 | –0.8 | 1.4 | 1.4 |
| | (0.391) | (0.420)* | (0.581)** | (0.564)** |
| Impact significantly different from base? | No | Yes | Yes | No |
| Average impact | –0.2 | 0.3 | 0.3 | 0.5 |
| | (0.20) | (0.20) | (0.14)** | (0.14)*** |
| 12 | | | | |
| Base impact | –0.3 | 0.1 | 0.6 | 0.8 |
| | (0.249) | (0.227) | (0.189)*** | (0.173)*** |
| ESQWFI impact | 1.0 | 0.3 | 2.8 | 2.5 |
| | (0.497)** | (0.456) | (0.769)*** | (0.717)*** |
| Impact significantly different from base? | Yes | No | Yes | Yes |
| Average impact | 0.1 | 0.6 | 0.7 | 0.7 |
| | (0.26) | (0.23)*** | (0.17)*** | (0.16)*** |
| 18 | | | | |
| Base impact | –0.4 | 0.3 | 1.0 | 1.2 |
| | (0.275) | (0.257) | (0.208)*** | (0.192)*** |
| ESQWFI impact | 0.8 | 0.6 | 1.8 | 2.5 |
| | (0.545) | (0.519) | (0.834)** | (0.741)*** |
| Impact significantly different from base? | Yes | No | No | No |
| Average impact | 0.2 | 0.9 | 1.0 | 1.0 |
| | (0.28) | (0.24)*** | (0.19)*** | (0.18)*** |
| 24 | | | | |
| Base impact | 0.2 | 0.5 | 1.4 | 1.6 |
| | (0.301) | (0.269)* | (0.249)*** | (0.223)*** |
| ESQWFI impact | 2.0 | 0.9 | 0.2 | 1.5 |
| | (0.598)*** | (0.549) | (0.854) | (0.771)* |
| Impact significantly different from base? | Yes | No | No | No |
| Average impact | 0.9 | 1.2 | 1.5 | 1.3 |
| | (0.30)*** | (0.26)*** | (0.20)*** | (0.18)*** |

Continued

## Table 6.3 Continued

| Months after became potentially eligible for IWC | Phase 1 | | Phase 2 | |
|---|---|---|---|---|
| | Benefit | Work | Benefit | Work |
| | Impact in ppts (Standard errors given in parentheses) | | | |
| 30 | | | | |
| Base impact | 0.4 | 1.3 | 1.5 | 2.4 |
| | (0.316) | (0.287)*** | (0.260)*** | (0.237)*** |
| ESQWFI impact | 1.8 | 1.0 | –0.9 | 1.5 |
| | (0.621)*** | (0.569)* | (0.881) | (0.789)* |
| Impact significantly different from base? | Yes | No | Yes | No |
| Average impact | 1.0 | 1.8 | 1.7 | 1.8 |
| | (0.31)*** | (0.27)*** | (0.21)*** | (0.19)*** |
| 36 | | | | |
| Base impact | 0.8 | 1.5 | | |
| | (0.331)*** | (0.297)*** | | |
| ESQWFI impact | 0.9 | 0.8 | | |
| | (0.635) | (0.576) | | |
| Impact significantly different from base? | No | No | No | No |
| Average impact | 1.4 | 2.1 | | |
| | (0.31)*** | (0.28)*** | | |

Notes: Based on various OLS regressions on the flow sample (see Appendix B). Sample sizes given in Appendix H.

Base impact refers to impact of LPPs in areas not operating ESQWFIs or ND+fLP, for lone parents not subject to ESQWFIs and not previously on NDLP. Average impact at each date is taken from Table 5.1.

Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

'Impact significantly different from base?' is a test that the estimated ESQWFI impact is significantly different from the base impact.

Results are presented in percentage points, so an estimate of –0.1 means –0.1 ppts, not –10 ppts.

The impact of the LPPs on the stock sample as a whole is generally higher in Phase 2 than in Phase 1, in line with the findings in Section 5.1 of larger impacts in Phase 2 for benefit outcomes and slightly larger impacts in Phase 2 for work outcomes. Within Phase 2 districts, the impact of the LPPs on benefit outcomes starts off higher for lone parents who attended ESQWFIs than for lone parents who did not, but falls over time and is eventually lower. As a result, it is significantly higher 12 months after lone parents became potentially eligible for IWC, but then significantly lower after 30 months and no longer significantly positive. This pattern is also true to an extent for work outcomes, where the impact in ESQWFI areas is only significant in the first 18 months after becoming potentially eligible, and is only significantly higher than the base impact at 12 months.

Table 6.4 compares the impacts of the LPPs in Phase 2 districts that operated ND+fLP with the impacts in Phase 2 districts that did not operate it (the base impact). Impacts are only presented from month 12 onwards because the introduction of ND+fLP happened just after lone parents in Phase 2 had been potentially eligible for six months.

## Table 6.4 Estimated impact of the LPPs for potentially eligible lone parents in ND+fLP districts on benefit and work outcomes in Phase 2 of the stock sample

| Months after became potentially eligible for IWC | Phase 2 | |
|---|---|---|
| | Benefit | Work |
| | Impact in ppts (Standard errors given in parentheses) | |
| 12 | | |
| Base impact | 0.6 | 0.8 |
| | (0.189)*** | (0.173)*** |
| Impact in ND+fLP areas | –0.6 | 0.0 |
| | (0.377)* | (0.337) |
| Impact significantly different from base? | Yes | Yes |
| Average impact | 0.7 | 0.7 |
| | (0.17)*** | (0.16)*** |
| 18 | | |
| Base impact | 1.0 | 1.2 |
| | (0.208)*** | (0.192)*** |
| Impact in ND+fLP areas | –0.5 | –0.8 |
| | (0.421) | (0.374)** |
| Impact significantly different from base? | Yes | Yes |
| Average impact | 1.0 | 1.0 |
| | (0.19)*** | (0.18)*** |
| 24 | | |
| Base impact | 1.4 | 1.6 |
| | (0.249)*** | (0.223)*** |
| Impact in ND+fLP areas | 0.6 | 0.2 |
| | (0.317)** | (0.285) |
| Impact significantly different from base? | Yes | Yes |
| Average impact | 1.5 | 1.3 |
| | (0.20)*** | (0.18)*** |

Continued

## Table 6.4 Continued

| Months after became potentially eligible for IWC | Phase 2 | |
|---|---|---|
| | Benefit | Work |
| | Impact in ppts (Standard errors given in parentheses) | |
| 30 | | |
| Base impact | 1.5 | 2.4 |
| | (0.260)*** | (0.237)*** |
| Impact in ND+fLP areas | 0.9 | 0.5 |
| | (0.331)*** | (0.301) |
| Impact significantly different from base? | No | Yes |
| Average impact | 1.7 | 1.8 |
| | (0.21)*** | (0.19)*** |

Notes: Based on various OLS regressions on the flow sample (see Appendix B). Sample sizes given in Appendix H.

Base impact refers to impact of LPPs in areas not operating ESQWFIs or ND+fLP, for lone parents not subject to ESQWFIs and not previously on NDLP. Average impact at each date is taken from Table 5.1.

Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

'Impact significantly different from base?' is a test that the estimated ND+fLP impact is significantly different from the base impact.

Results are presented in percentage points, so an estimate of –0.1 means –0.1 ppts, not –10 ppts.

The impact in ND+fLP districts is always smaller than the base impact, for both benefit and work outcomes, and this difference is almost always statistically significant (the sole exception being benefit outcomes 30 months after lone parents became potentially eligible). The estimated impacts in ND+fLP districts do rise over time, but they only become statistically greater than zero for benefit outcomes 24 months after becoming potentially eligible for IWC. It is difficult to think of explanations for a significantly lower impact in ND+fLP areas (Cardiff and Vale; Dudley and Sandwell; Edinburgh, Lothian and Borders; Leicestershire), but it could be that the assumption underlying a DiD analysis – namely a common trend in outcomes in the absence of the policy – was not satisfied here.

These estimates are qualitatively similar to the comparable estimated impacts in RR 415.

Tables 6.5 and 6.6 examine the impact of the LPPs for potentially eligible lone parents in pilot districts who joined NDLP at least six months before the LPPs began. For benefit outcomes (Table 6.5), the impact of the LPPs for lone parents who had previously been on NDLP is large, always statistically significant and always significantly different from the base impact. It increases with the length of time that lone parents are potentially eligible for IWC in each phase, eventually reaching about 5.5 ppts in Phase 1, 4 ppts in Phase 2, 7 ppts in Phase 3 and 3 ppts in Phase 4.

## Table 6.5 Estimated impact of the LPPs for potentially eligible lone parents previously on NDLP on benefit outcomes: stock sample

| Months after became potentially eligible for IWC | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
|---|---|---|---|---|
| | Impact in ppts (Standard errors given in parentheses) | | | |
| 6 | | | | |
| Base impact | –0.5 | 0.1 | –0.1 | –0.0 |
| | (0.182)** | (0.137) | (0.152) | (0.144) |
| Impact for previous NDLP participation | 2.5 | 1.2 | 1.2 | 1.9 |
| | (0.706)*** | (0.520)** | (0.549)** | (0.486)*** |
| Impact significantly different from base? | Yes | Yes | Yes | Yes |
| Average impact | –0.2 | 0.3 | 0.0 | 0.3 |
| | (0.20) | (0.14)** | (0.16) | (0.13)** |
| 12 | | | | |
| Base impact | –0.3 | 0.6 | 0.1 | –0.1 |
| | (0.249) | (0.189)*** | (0.201) | (0.184) |
| Impact for previous NDLP participation | 3.6 | 2.5 | 3.9 | 2.6 |
| | (0.948)*** | (0.657)*** | (0.699)*** | (0.612)*** |
| Impact significantly different from base? | Yes | Yes | Yes | Yes |
| Average impact | 0.1 | 0.7 | 0.6 | 0.3 |
| | (0.26) | (0.17)*** | (0.21)*** | (0.17)* |
| 18 | | | | |
| Base impact | –0.4 | 1.0 | 0.5 | 0.0 |
| | (0.275) | (0.208)*** | (0.219)** | (0.200) |
| Impact for previous NDLP participation | 4.5 | 3.2 | 4.6 | 3.2 |
| | (1.033)*** | (0.710)*** | (0.760)*** | (0.658)*** |
| Impact significantly different from base? | Yes | Yes | Yes | Yes |
| Average impact | 0.2 | 1.1 | 1.0 | 0.5 |
| | (0.28) | (0.19)*** | (0.23)*** | (0.18)*** |

Continued

## Table 6.5 Continued

| Months after became potentially eligible for IWC | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
|---|---|---|---|---|
| | Impact in ppts (Standard errors given in parentheses) | | | |
| 24 | | | | |
| Base impact | 0.2 | 1.4 | 1.5 | |
| | (0.301) | (0.249)*** | (0.242)*** | |
| Impact for previous NDLP participation | 5.9 | 4.3 | 7.4 | |
| | (1.103)*** | (0.760)*** | (0.816)*** | |
| Impact significantly different from base? | Yes | Yes | Yes | |
| Average impact | 0.9 | 1.5 | 2.2 | |
| | (0.30)*** | (0.20)*** | (0.25)*** | |
| 30 | | | | |
| Base impact | 0.4 | 1.5 | | |
| | (0.316) | (0.260)*** | | |
| Impact for previous NDLP participation | 5.1 | 4.4 | | |
| | (1.140)*** | (0.780)*** | | |
| Impact significantly different from base? | Yes | Yes | | |
| Average impact | 1.0 | 1.7 | | |
| | (0.31)*** | (0.21)*** | | |
| 36 | | | | |
| Base impact | 0.9 | | | |
| | (0.331)*** | | | |
| Impact for previous NDLP participation | 5.7 | | | |
| | (1.174)*** | | | |
| Impact significantly different from base? | Yes | | | |
| Average impact | 1.4 | | | |
| | (0.31)*** | | | |

Notes: Based on various OLS regressions on the flow sample (see Appendix B). Sample sizes given in Appendix H.

Base impact refers to impact of LPPs in areas not operating ESQWFIs or ND+fLP, for lone parents not subject to ESQWFIs and not previously on NDLP. Average impact at each date is taken from Table 5.1.

Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

'Impact significantly different from base?' is a test that the estimated impact for NDLP participants is significantly different from the base impact.

For work outcomes (Table 6.6), the impacts for NDLP participants are typically smaller than those for benefit outcomes, and they are initially not statistically significant in Phase 2, but they grow over time and are eventually statistically significant in all phases. It is still the case that the LPPs had a greater impact for lone parents who had previously been on NDLP than for those who had not. This difference is always positive and mostly statistically significant (always in Phases 3 and 4, sometimes in Phase 1 and never in Phase 2).

## Table 6.6 Estimated impact of the LPPs for potentially eligible lone parents previously on NDLP on work outcomes: stock sample

| Months after became potentially eligible for IWC | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
|---|---|---|---|---|
| | Impact in ppts (Standard errors given in parentheses) | | | |
| 6 | | | | |
| Base impact | 0.1 | 0.5 | 0.2 | 0.0 |
| | (0.191) | (0.136)*** | (0.153) | (0.134) |
| Impact for previous NDLP participation | 2.3 | 0.9 | 2.4 | 1.0 |
| | (0.794)*** | (0.549)* | (0.602)*** | (0.497)** |
| Impact significantly different from base? | Yes | No | Yes | Yes |
| Average impact | 0.3 | 0.5 | 0.8 | –0.3 |
| | (0.20) | (0.14)*** | (0.16)*** | (0.14)** |
| 12 | | | | |
| Base impact | 0.1 | 0.8 | 0.7 | 0.0 |
| | (0.227) | (0.173)*** | (0.178)*** | (0.158) |
| Impact for previous NDLP participation | 2.6 | 1.0 | 4.1 | 1.3 |
| | (0.929)*** | (0.633) | (0.678)*** | (0.568)** |
| Impact significantly different from base? | Yes | No | Yes | Yes |
| Average impact | 0.6 | 0.8 | 1.5 | –0.3 |
| | (0.23)*** | (0.16)*** | (0.19)*** | (0.16) |
| 18 | | | | |
| Base impact | 0.3 | 1.2 | 1.4 | 0.6 |
| | (0.257) | (0.192)*** | (0.198)*** | (0.174)*** |
| Impact for previous NDLP participation | 2.2 | 2.2 | 5.0 | 2.0 |
| | (1.033)** | (0.693)*** | (0.755)*** | (0.626)*** |
| Impact significantly different from base? | No | No | Yes | Yes |
| Average impact | 0.9 | 1.0 | 2.2 | 0.4 |
| | (0.24)*** | (0.18)*** | (0.20)*** | (0.17)** |

Continued

## Table 6.6 Continued

| Months after became potentially eligible for IWC | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
|---|---|---|---|---|
| | Impact in ppts (Standard errors given in parentheses) | | | |
| 24 | | | | |
| Base impact | 0.5 | 1.6 | 1.2 | |
| | (0.269)* | (0.223)*** | (0.210)*** | |
| Impact for previous NDLP participation | 2.5 | 2.7 | 4.6 | |
| | (1.059)** | (0.724)*** | (0.781)*** | |
| Impact significantly different from base? | No | No | Yes | |
| Average impact | 1.2 | 1.3 | 2.0 | |
| | (0.26)*** | (0.18)*** | (0.21)*** | |
| 30 | | | | |
| Base impact | 1.3 | 2.4 | | |
| | (0.287)*** | (0.237)*** | | |
| Impact for previous NDLP participation | 2.4 | 3.4 | | |
| | (1.122)* | (0.757)*** | | |
| Impact significantly different from base? | No | No | | |
| Average impact | 1.8 | 1.8 | | |
| | (0.27)*** | (0.19)*** | | |
| 36 | | | | |
| Base impact | 1.5 | | | |
| | (0.297)*** | | | |
| Impact for previous NDLP participation | 2.8 | | | |
| | (1.144)** | | | |
| Impact significantly different from base? | No | | | |
| Average impact | 2.1 | | | |
| | (0.28)*** | | | |

Notes: Based on various OLS regressions on the flow sample (see Appendix B). Sample sizes given in Appendix H.

Base impact refers to impact of LPPs in areas not operating ESQWFIs or ND+fLP, for lone parents not subject to ESQWFIs and not previously on NDLP. Average impact at each date is taken from Table 5.1.

Standard errors are given in parentheses. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level.

'Impact significantly different from base?' is a test that the estimated impact for NDLP participants is significantly different from the base impact.

Results are presented in percentage points, so an estimate of –0.1 means –0.1 ppts, not –10 ppts.

What this means, as in the flow sample, is that after the introduction of the pilots, the outcomes of lone parents in pilot districts who had previously been on NDLP improved significantly more than the outcomes of lone parents in comparison districts who had previously been on NDLP. However, unlike in the flow sample, this relative improvement is usually statistically different from the improvement made by lone parents who had not previously been on NDLP.

The finding that the impact of the LPPs is stronger for NDLP participants than for non-NDLP participants was also found in RR 415 (for Phase 3 districts), and it has at least four possible causes and interpretations:

- The difference may be driven by an 'information effect': lone parents who had previously been on NDLP would have had more contact with their Personal Adviser, and thus may have been more likely to find out about IWC; they might then have been more likely to respond to IWC.
- There may be a 'selection effect': since NDLP is a voluntary programme, it is highly likely that those who chose to sign up are lone parents with a greater underlying propensity to work, and this may also mean that they are more responsive to financial incentives to work, such as those offered by IWC.[7]
- There may be some sort of beneficial interaction between the two policies: that the advice and support provided by NDLP becomes much more effective when combined with the incentive of IWC.
- Finally, between April 2004 and October 2004 in the Phase 1 districts, it was a requirement for lone parents who wanted to receive IWC to have been on NDLP when they left IS.

It is not possible for research based on secondary data analysis to differentiate between these possible explanations.

## 6.3 Summary: variation in the overall impact of the LPPs on potentially eligible lone parents

This chapter has extended the analysis in previous chapters, based on DiD, to look at the overall impact of the LPPs in more detail. It split the overall impact across all potentially eligible lone parents in all pilot districts into impacts on: (i) lone parents in pilot districts that operated ESQWFIs and who had to attend them; (ii) lone parents in pilot districts that operated ND+fLP; (iii) lone parents who had previously been on NDLP or ND+fLP; and (iv) all other lone parents.

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7 In technical terms, note that this would have to be 'selection on unobservables', whereby some innate characteristics of lone parents (that are invisible to researchers) influence the lone parents' decision to participate in NDLP, their decision to take up IWC and their potential labour market outcomes.

For the flow sample, all phases were considered together. The chapter found that:

- the estimated impacts for potentially eligible lone parents who were subject to ESQWFIs are imprecise and statistically insignificant, because few lone parents had to attend ESQWFIs. The imprecision means that it is not possible to make robust statements about the additional impact of ESQWFIs;
- the estimated impacts in pilot areas that operated ND+fLP are statistically significant. However, they are very similar to (and not statistically different from) the estimated impacts in non-ND+fLP areas;
- potentially eligible lone parents who had previously been on NDLP appear to have been more responsive to the LPPs than those who had not, but this difference is rarely statistically significant and only apparent for short- and medium-term outcomes. Longer-term impacts are erratic and imprecise as the sample sizes diminish.

For the stock sample, impacts are reported separately by phase. The chapter found that:

- there is no uniform finding for the impact of the LPPs in areas that operated ESQWFIs on lone parents who would have been subject to them. In Phase 1, only for benefit outcomes does the estimated impact appear to be significantly higher. There is some evidence that the impact was higher in Phase 2 areas where lone parents were subject to ESQWFIs, but only for short-term outcomes as the impacts tend to fall thereafter;
- the estimated impact of the LPPs was generally lower in areas that operated ND+fLP than in areas that did not, and this difference is usually statistically significant. While this is odd, it may reflect a failure of the 'common trends' assumption;
- finally, there is evidence across all phases in the stock sample that the impact on the benefit outcomes of lone parents who had previously been on NDLP is both positive and larger than the impact on lone parents who had not previously been on NDLP. For work outcomes, the NDLP impacts are larger than the base impacts, but fewer of these differences are statistically significant (the differences are generally not significant in Phases 1 and 2 and generally, are significant in Phases 3 and 4).

There are several possible explanations for the finding that the impact of IWC is greater amongst NDLP participants and it is not possible to distinguish between them with the data available. First, the difference might be because lone parents on NDLP were more likely to hear about IWC. Second, it could be that, since NDLP is a voluntary programme, those who sign up are lone parents with a greater underlying propensity to work and have a greater responsiveness to financial incentives to work. Third, there may be some sort of beneficial interaction between the two policies. Finally, between April 2004 and October 2004 in the Phase 1 districts, it was a requirement for lone parents who wanted to receive IWC to have been on NDLP when they left IS.

The analysis in this chapter provides no robust evidence that the additional combinations of policies analysed here made the overall package of LPPs more effective at getting lone parents off benefit and into work, compared with IWC alone. This is especially true for the flow sample, which is more interesting for long-run analysis.

The estimates in this chapter are generally consistent with the comparable findings in RR 415.

# 7 Why is the estimated impact of the lone parent pilots higher than in previous work?

Chapters 4 and 5 presented estimates of the impact of the lone parent pilots (LPPs) on the whole population of potentially eligible lone parents and Chapter 6 presented estimates of the impact of the LPPs which were allowed to vary across lone parents. Similar estimates were presented in Research Report 415 (RR 415). There are several reasons why the current estimates differ from those in RR 415:

- This report uses more data and more recent data. The fact that more data is used makes it easier to detect impacts reliably in the flow sample. The fact that more recent data is used is relevant because the impact on the stock sample seems to have grown over time, and because there is evidence that the impact of the LPPs on later cohorts of potentially eligible lone parents in the flow sample may be greater than that on the earlier cohorts.
- The method of determining when a lone parent is off benefit has been improved. In RR 415, a lone parent was deemed to be 'on benefit' on a certain day if they had a live claim of a key Department for Work and Pensions (DWP) benefit or were on a DWP programme. However, the end dates of programmes recorded in the National Benefits Database (NBD) is not felt to be reliable (specifically, lone parents can often seem to be on New Deal for Lone Parents (NDLP) long after their Income Support (IS) claim has ended), and so the definition of 'on benefit' used in this report only looks at whether a lone parent is receiving a key DWP benefit. The impact of this change has been to increase the proportion of lone parents recorded as off benefit.

- The work measure has been refined in this report. The work outcomes are based on employment spells in the Work and Pensions Longitudinal Study (WPLS), the start and end dates of which are not deemed to be very reliable. For this report, there was an extra data-cleaning stage wherein the employment spells for a lone parent were ended at the date on which they started a new spell of IS in the NBD dataset (see Appendix C).
- The sample of lone parents used before the LPPs began has been extended back to cover all those whose claims exceeded 12 months' duration on or after April 2001; this is likely to have more of an effect on the estimated impacts for the stock than the flow.
- The estimate of the number of In-Work Credit (IWC) recipients provided to us is lower than it was for the 12-month report (the impact of this has been to lower implied participation rates and deadweight estimates; it has no impact on the estimated impact of the LPPs on the proportion of lone parents off benefit or in work).
- This report uses data for Phase 4 districts, which were not included in RR 415; while this does not affect the estimated impacts for Phases 1, 2 and 3, it will have some effect on the overall impacts across all phases. Furthermore, this report has also used data on lone parents in the Welsh and Scottish Jobcentre Plus districts in Phase 2; this change potentially affects the estimated impacts for Phase 2 and the overall estimated impacts.
- The empirical methodology for estimating the impacts on the flow sample has been refined in the following ways:
  - Correctly allowing for the LPP start dates to vary by phase. In RR 415, the flow-sample analysis used only one start date for the pilots: the date on which the LPPs were introduced in Phase 1. This was clearly the incorrect start date for Phases 2 and 3 (Phase 4 was not analysed); as a result, lone parents in these districts would have been falsely classified as exposed to the LPPs if their IS claim had reached 12 months between April 2004 and the date on which the LPPs were actually introduced in their Jobcentre Plus district. This report allows each phase to have its own (correct) start date, so that there is no such misclassification. This change affects the overall results and the phase-specific results for all phases including Phase 1 (as the impacts for all the phases are estimated jointly in the same model).

– Including lone parents who were previously in the stock sample. The flow sample contains all lone parents who became potentially eligible for IWC at some point after the LPPs had been introduced in their Jobcentre Plus district. In addition, and in contrast to RR 415, it now contains all lone parents for whom the LPPs were not in operation when they first became potentially eligible, but were in operation on the date that their labour outcomes were measured. In RR 415, these lone parents only featured in the stock sample (thus there was a 'window' in the flow sample between lone parents who became potentially eligible before the LPPs were in operation and those who became eligible after they were in operation). This change has served to increase the size of the flow sample, making statistically significant impacts easier to detect.

– Allowing for various trends. All of the difference-in-differences (DiD) analyses presented in this report rely on the premise that the underlying trend in labour market outcomes is the same in the pilot and comparison areas (after controlling for background characteristics). In RR 415, there was no allowance for a trend in outcomes at all; in this report, various trend specifications, both common and differential, have been employed before settling on the preferred specification. This has the potential to change the estimated impacts and their precision.

For reference, Tables 7.1 to 7.4 compare the impacts estimated in this report with the equivalent estimates from RR 415.

## Table 7.1 Estimated impact of the LPPs on percentage off benefit for potentially eligible lone parents in the stock sample

| Months since potentially eligible for IWC | Phase 1 | | Phase 2 | | Phase 3 | |
|---|---|---|---|---|---|---|
| | RR 415 | New estimates | RR 415 | New estimates | RR 415 | New estimates |
| 6 | –0.0 | –0.2 | –0.0 | 0.3 | 0.7 | 0.0 |
| | (0.19) | (0.20) | (0.14) | (0.14)** | (0.15)*** | (0.16) |
| 12 | 0.5 | 0.1 | 0.3 | 0.7 | 1.2 | 0.6 |
| | (0.25)** | (0.26) | (0.19) | (0.17)*** | (0.20)*** | (0.21)*** |
| 18 | 0.7 | 0.2 | | | | |
| | (0.28)*** | (0.28) | | | | |
| 24 | 1.2 | 0.9 | | | | |
| | (0.30)*** | (0.30)*** | | | | |

Notes: Based on estimates in Table 5.1 of this report and in Table 5.1 of RR 415. Estimated impacts reported in percentage points; standard errors shown in parentheses.

## Table 7.2 Estimated impact of the LPPs on percentage off benefit for potentially eligible lone parents in the flow sample

| Months since potentially eligible for IWC | All phases | | Phase 1 | |
|---|---|---|---|---|
| | RR 415 | New estimates | RR 415 | New estimates |
| 3 | –0.2 | 0.5 | –0.7 | –0.2 |
| | (0.19) | (0.112)*** | (0.30)** | (0.216) |
| 6 | 0.1 | 1.0 | –0.3 | 0.3 |
| | (0.25) | (0.154)*** | (0.40) | (0.293) |
| 9 | 0.3 | 1.3 | –0.4 | 0.4 |
| | (0.32) | (0.187)*** | (0.50) | (0.346) |
| 12 | 0.2 | 1.6 | –0.4 | 0.8 |
| | (0.41) | (0.220)*** | (0.59) | (0.390)** |
| Months since potentially eligible for IWC | Phase 2 | | Phase 3 | |
| | RR 415 | New estimates | RR 415 | New estimates |
| 3 | 0.2 | 0.8 | –0.4 | 0.2 |
| | (0.24) | (0.164)*** | (0.34) | (0.188) |
| 6 | 0.5 | 1.5 | –0.5 | 0.7 |
| | (0.31) | (0.220)*** | (0.44) | (0.263)*** |
| 9 | 0.8 | 1.8 | –0.4 | 1.1 |
| | (0.40)** | (0.261)*** | (0.66) | (0.322)*** |
| 12 | 0.7 | 2.0 | –1.6 | 1.2 |
| | (0.51) | (0.298)*** | (2.56) | (0.382)*** |

Notes: Based on estimates in Tables 4.1 and J.1 of this report and in Table 5.3 of RR 415. Estimated impacts reported in percentage points; standard errors shown in parentheses.

## Table 7.3 Estimated impact of the LPPs on percentage in work for potentially eligible lone parents in the stock sample

| Months since potentially eligible for IWC | Phase 1 | | Phase 2 | | Phase 3 | |
|---|---|---|---|---|---|---|
| | RR 415 | New estimates | RR 415 | New estimates | RR 415 | New estimates |
| 6 | 0.3 | 0.3 | 0.3 | 0.5 | 1.1 | 0.8 |
| | (0.20) | (0.20) | (0.14)** | (0.14)*** | (0.15)*** | (0.16)*** |
| 12 | 0.2 | 0.6 | 0.6 | 0.8 | | |
| | (0.23) | (0.23)*** | (0.17)*** | (0.16)*** | | |
| 18 | 0.9 | 0.9 | | | | |
| | (0.26)*** | (0.24)*** | | | | |

Notes: Based on estimates in Table 5.1 of this report and in Table 5.2 of RR 415. Estimated impacts reported in percentage points, standard errors shown in parentheses.

## Table 7.4 Estimated impact of the LPPs on percentage in work for potentially eligible lone parents in the flow sample

| Months since potentially eligible for IWC | All phases | | Phase 1 | |
|---|---|---|---|---|
| | RR 415 | New estimates | RR 415 | New estimates |
| 3 | 0.2 | 0.3 | 0.2 | 0.3 |
| | (0.20) | (0.129)** | (0.30) | (0.263) |
| 6 | 0.6 | 0.7 | 0.4 | 0.6 |
| | (0.29)** | (0.151)*** | (0.40) | (0.300)* |
| 9 | 0.7 | 0.9 | 0.8 | 1.1 |
| | (0.41)* | (0.174)*** | (0.51) | (0.334)*** |
| 12 | 0.3 | 1.0 | 0.3 | 1.4 |
| | (0.64) | (0.199)*** | (0.64) | (0.363)*** |
| Months since potentially eligible for IWC | Phase 2 | | Phase 3 | |
| | RR 415 | New estimates | RR 415 | New estimates |
| 3 | 0.3 | 0.5 | –0.1 | 0.8 |
| | (0.25) | (0.188)** | (0.43) | (0.232)*** |
| 6 | 0.8 | 0.8 | –2.1 | 1.0 |
| | (0.36)** | (0.217)*** | (1.90) | (0.267)*** |
| 9 | 0.6 | 0.8 | | |
| | (0.61) | (0.243)*** | | |

Notes: Based on estimates in Tables 4.1 and J.1 of this report and in Table 5.4 of RR 415.
Estimated impacts reported in percentage points; standard errors shown in parentheses.

# 8 The impact of the lone parent pilots on job retention

Chapters 4, 5 and 6 examined the overall impact of the lone parent pilots (LPPs) on potentially eligible lone parents and showed that the LPPs did lead to fewer lone parents receiving out-of-work benefits and more lone parents being in work. These impacts could arise both because the LPPs encouraged more lone parents to leave benefit (or encouraged lone parents to leave benefit sooner than they otherwise would) and because the LPPs (particularly In-Work Credit (IWC)) encouraged those lone parents who left benefit for work to stay in work and off benefit for longer.

This chapter attempts to isolate the second of these impacts by estimating the impact of the LPPs on encouraging those lone parents who left benefit for work to stay in work and off benefit for longer (hereafter abbreviated to 'encouraging job retention', although the analysis in Section 8.2 looks only at the impact of the LPPs on keeping people off benefit).

This is done in two ways:

- the difference-in-differences (DiD) estimator can be applied to the sample of potentially eligible lone parents who left benefit for work. Because this sample have already left benefit, any impact detected by this method must be due to the impact of the LPPs on encouraging job retention;
- the duration model can provide an exact breakdown of the overall impact of the LPPs into the two effects described above; it can do this because it models lone parents' transitions onto and off benefit, and how these depend on their characteristics and potential eligibility for, or receipt of, IWC.

There are statistical advantages and disadvantages to both methods and each method will produce robust estimates of the true impact only under a particular set of conditions, as discussed in Appendices E and F.

## 8.1 DiD estimates: impact of the LPPs on job retention

This section uses a DiD model to estimate the impact of the LPPs on job retention.

It is not possible to use the DiD framework to estimate the impact of the LPPs on IWC recipients directly, because one needs to be able to identify otherwise-identical individuals in the pilot districts before the LPPs started and otherwise-identical individuals in the comparison districts, and one can never know which individuals in the comparison districts would have claimed IWC had it been available.

Instead, then, this section reports estimates of the impact of the LPPs on those lone parents who are observed (in the Work and Pensions Longitudinal Study (WPLS)) to start work within a month of leaving Income Support (IS) and who were potentially eligible for IWC when they left IS. The idea is that such lone parents in the pilot districts should provide a good proxy for IWC recipients and this section hereafter refers to this group as 'IWC recipients' (see Box 8.1 for more discussion).

**Box 8.1: Constructing the samples for the DiD estimates of the impact of the LPPs on job retention**

The sample used in this section comprises all potentially eligible lone parents who left IS and started work within a month of this date, according to the WPLS.

The intention was to create a sample of IS claims that ended and that would have been directly eligible for IWC if it had been in existence in all districts since April 2001. See Appendix B for full details, Appendix H for sample sizes and mean outcomes in this sample and Appendix D for summary statistics.

Seventy per cent of potentially eligible lone parents who leave IS for work in the pilot districts do indeed receive IWC (and 70 per cent of IWC recipients are observed to leave IS for work in the WPLS); slightly more potentially eligible lone parents who leave IS for work are recorded as being IWC recipients in Phases 2 and 4 (71 per cent and 73 per cent respectively) and slightly fewer in Phases 1 and 3 (66 per cent and 67 per cent respectively). These figures could be below 100 per cent for a number of reasons. For example, some lone parents who are recorded as being in work according to the WPLS may actually be working fewer than 16 hours per week, making them ineligible for IWC, or there may have been a delay in the recording of some IWC spells, such that genuine IWC recipients do not appear to have a claim starting within the correct period of time. On the other hand, some IWC recipients may be earning less than the tax threshold and therefore, not appear in the WPLS.

As well as hoping that lone parents in pilot districts who start work within a month of leaving IS are a good proxy for IWC recipients, it is also hoped that equivalent lone parents in non-pilot districts are a suitable comparison group. However, as

Appendix E discusses, if the LPPs do encourage more lone parents off benefit and into work, it is likely that those lone parents who do leave benefit for work in the pilot districts are likely to have different characteristics, on average, from the characteristics of lone parents who leave benefit for work in the comparison districts. If these differences affect the likelihood that they stay in work, and if they cannot be controlled for in the regressions, then the estimates of the impact of the LPPs on retention reported in this chapter may be too small (i.e. biased downwards).

Table 8.1 presents the headline impact estimates of the LPPs (in percentage-point terms) on benefit and work outcomes for the sample of IWC recipients at three-month intervals after the potentially eligible lone parents left IS for work. Like the estimates in Section 4.1, this analysis estimates a single treatment effect across all phases.

The additional impacts (but not the additionality rates) are generally larger than the estimates reported in Section 4.1 and are almost always significantly different from zero. Three months after leaving IS for work, IWC recipients are 1.3 percentage points (ppts) more likely than potentially eligible lone parents in the comparison districts who left IS for work to remain off benefit and in work; this is a difference of 1.6 per cent. The size of the impact generally increases over time, reaching a peak 15 months after leaving IS for work, at which point IWC recipients are 2.6 ppts more likely to be off benefit and 2.4 ppts more likely to be in work than potentially eligible lone parents who left IS for work in the comparison districts. The implied additionality rates are also shown in Table 8.1.

It is important to note, as was the case in Section 4.1, that the estimate of the impact of the LPPs at each point in time is based on a different sample of lone parents because later cohorts of lone parents appear in our data for shorter durations. This also means that the contribution of particular phases to the average impact alters as the time since becoming potentially eligible increases. Appendix J, therefore, presents estimates of the impact of the LPPs on job retention separately for each phase.

## Table 8.1 Estimated impact of the LPPs on lone parents who left IS for work: all phases and all cohorts

| Months since left IS | Off benefit | In work | | Benefit outcome (percentage off benefit in pilot districts) | Work outcome (percentage in work in pilot districts) | Additionality rate (benefit impact as percentage of gross outcome) | Additionality rate (work impact as percentage of gross outcome) |
|---|---|---|---|---|---|---|---|
| | Estimates reported in ppts (standard errors given in parentheses) | | | | | | |
| 3 | 1.3 | 1.3 | | 82.7 | 84.5 | 1.6 | 1.5 |
| | (0.323)*** | (0.360)*** | | | | | |
| 6 | 1.7 | 1.8 | | 75.8 | 73.4 | 2.2 | 2.5 |
| | (0.418)*** | (0.463)*** | | | | | |
| 9 | 2.2 | 1.4 | | 73.2 | 70.3 | 3.0 | 2.0 |
| | (0.485)*** | (0.533)*** | | | | | |
| 12 | 2.2 | 1.8 | | 71.4 | 66.9 | 3.1 | 2.7 |
| | (0.550)*** | (0.604)*** | | | | | |
| 15 | 2.6 | 2.4 | | 70.8 | 65.1 | 3.7 | 3.7 |
| | (0.616)*** | (0.680)*** | | | | | |
| 18 | 2.5 | 1.3 | | 70.2 | 63.1 | 3.6 | 2.1 |
| | (0.712)*** | (0.785)* | | | | | |
| 21 | 2.1 | 1.3 | | 69.9 | 62.3 | 3.0 | 2.1 |
| | (0.813)*** | (0.893) | | | | | |
| 24 | 2.1 | 2.6 | | 69.8 | 61.9 | 3.0 | 4.2 |
| | (0.956)** | (1.044)** | | | | | |

Notes: The table reports the estimated impact of the LPPs based on various ordinary least squares (OLS) regressions on the sample of lone parents who were potentially eligible for IWC and started a job within a month of leaving IS (see Appendix B for details). 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'.

It is possible to recalculate the estimates shown in Table 8.1 so that they are relative to the date on which the lone parent first became potentially eligible for IWC, rather than to the date on which the lone parent left IS. Even so, comparing the estimates in Table 8.1 – which shows the impact of the LPPs on job retention – with those in Section 4.1 – which shows the overall impact of the LPPs – is difficult, as the samples used are very different. Table 8.2, nonetheless, expresses the estimated impact of the LPPs on job retention as a fraction of the overall estimated impact of the LPPs (i.e. both on initial movements off benefit and/or into work and on retention) reported in Section 4.1.[8] It suggests that, particularly during the first few months after a lone parent first became potentially eligible for IWC, the impact of the LPPs was skewed more towards encouraging potentially eligible lone parents off benefit and into work than it was towards encouraging those who leave IS and enter work to remain in work. For example, for benefit outcomes after 12 months' exposure to the LPPs, between 11 and 26 per cent of the impact of the LPPs appears to be on retention. However, there also seems to be a great deal of variability in this proportion over time, which might indicate that the comparison is not appropriate.

**Table 8.2 Estimated impact of the LPPs on job retention as percentage of the estimated overall impact of the LPPs on all potentially eligible lone parents, by phase**

| Months since left IS | Benefit outcomes | | | | Work outcomes | | | |
|---|---|---|---|---|---|---|---|---|
| | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| 6 | 18 | 13 | 10 | 4 | 4 | 23 | 10 | 25 |
| 12 | 24 | 22 | 26 | 11 | N/A | 54 | 217 | 183 |
| 18 | 25 | 42 | 61 | | 1 | 138 | 56 | |
| 24 | 31 | 63 | | | 35 | 198 | | |

Notes: Based on estimates reported in Tables J.1 and J.4. N/A means that one of the estimated impacts was negative.

## 8.2 Duration model estimates: impact of the LPPs on keeping lone parents off IS

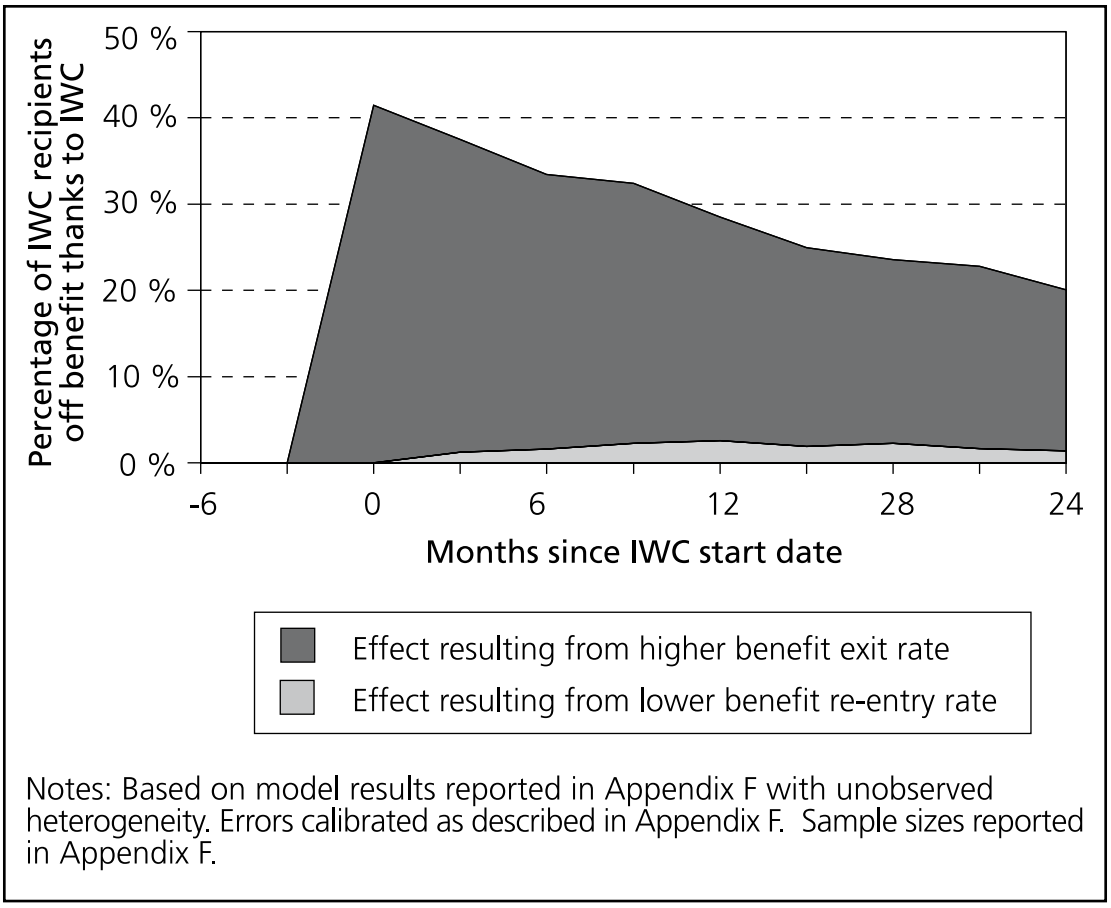
Sections 4.3 and 5.2 reported simulations of the overall additional impact of the LPPs on all potentially eligible lone parents based on the duration model set out in Appendix F. But the duration model allows the overall additional impact of the LPPs

[8] This intermediate calculation is available on request. Because the samples used to calculate these two sets of estimates were chosen in different ways, and because the estimates were calculated independently, the two sets of estimates are not guaranteed to be consistent with each other and this is why some numbers exceed 100 per cent (which would mean that the impact of the LPPs on retention exceeds its overall impact).

to be separated into the impact of the LPPs on encouraging more lone parents to leave benefit and the impact of the LPPs (particularly IWC) on encouraging those lone parents who left benefit for work to stay in work and off benefit for longer. This can be done by performing two simulations: one where it is assumed that the LPPs affect only transitions off benefit and one where it is assumed that the LPPs affect only subsequent transitions back on to benefit (i.e. where the LPPs only have a 'retention' effect).

Figure 8.1 presents the results of these two simulations, which have been performed only on IWC recipients (note that summing the two parts of our decomposition gives a total impact which is very slightly different from that shown in Appendix F). The dark grey area shows the additional impact of the LPPs on IWC recipients that is due to the LPPs encouraging more lone parents to leave IS for work; the light grey area shows the additional impact of the LPPs on IWC recipients that is due to any retention effects.

**Figure 8.1 Decomposing the additional impact of the LPPs 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.

In month 0, the simulations suggest that just over 40 per cent of IWC recipients would have left IS for work at that time, and none of this (by definition) can be due to a retention effect: it is all due to the LPPs encouraging more lone parents to leave IS for work. Over time, the retention effect grows, but it remains small: the simulations suggest that the retention effect of the LPPs leads to 2.6 per cent of IWC recipients remaining off IS 12 months after they first left benefit for work (and claimed IWC). This is close to the equivalent estimates in Section 8.1 produced using the DiD model, of 2.2 per cent for benefit outcomes (and 1.8 per cent for work outcomes). But these numbers are much smaller than the impact of the LPPs that is attributed to the LPPs encouraging more lone parents to leave IS for work. Out of the total estimated impact of the LPPs on IWC recipients, only 9 per cent of the overall impact of the LPPs on IWC recipients 12 months after they first received IWC can be attributed to a retention effect. Note that the estimated coefficients of the model imply that IWC had a statistically significant impact on encouraging lone parents to leave IS and to remain off benefit but it has not been possible to estimate standard errors for the simulations reported in Figure 8.1.

Note that the simulations also suggest that the LPPs 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 the LPPs 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.[9]

## 8.3 Conclusions

This chapter has presented the estimated impact of the LPPs (but particularly IWC) on job retention, i.e. on encouraging those lone parents who left benefit for work to stay in work and off benefit for longer.

By combining the results from Sections 8.1 and 8.2, it can be seen that the main impact of the LPPs is to induce more people to leave IS (or to leave IS earlier than they would have done otherwise; it is not possible to tell which, given our data) and that their impact on job retention (or the time spent off benefit) is small (but statistically significant). Simulations based on the duration model suggest that only 9 per cent of the overall impact of the LPPs on IWC recipients is through a retention effect; calculations based on the DiD estimates imply a higher (although highly variable) proportion.

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[9] 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 report.

However, this result should be seen alongside the analysis in Chapter 3, which examined what happened to IWC recipients when their IWC claim 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.

A technical conclusion is that estimates of the effect of the LPPs on job retention based on the two methods are comparable in magnitude, although those derived from the duration model are slightly larger.

# 9 Impact of the lone parent pilots on IWC recipients, the headcount impact of the LPPs, and estimates of deadweight

Chapters 4, 5 and 6 reported estimates of the impact of the lone parent pilots (LPPs) on all potentially eligible lone parents (or, in Chapter 8, all lone parents who left benefit to start work). This chapter presents some related estimates:

- Section 9.1 reports simulations, based on the duration model, about the impact of the LPPs on In-Work Credit (IWC) recipients and how this changes over time.
- Section 9.2 presents estimates, based on the difference-in-differences (DiD) analysis presented in Chapters 4 and 5, of the additional number of lone parents in work or not on benefit as a result of the LPPs (this is known as the headcount impact of the LPPs).

Both of these analyses allow one to estimate simple measures of the 'deadweight' of the LPPs, although the methods are different. Box 9.1 discusses deadweight in more detail. Section 9.3 concludes.

**Box 9.1: Calculating and interpreting deadweight**

The deadweight of a policy measures how poorly targeted or wasteful it is, although a finding of a high deadweight does not necessarily mean that a policy was a failure: only a full assessment of the costs and benefits of a policy can inform such a decision.

This chapter uses a definition of deadweight that measures what fraction of the recipients or beneficiaries of a policy have not changed their behaviour because of the policy: in other words, it is equal to 1 minus the additional impact of the policy amongst its recipients, or:

$$\left(1-\frac{\text{Number of additional people off benefit or in work as a result of the LPPs}}{\text{Number of people who have received IWC}}\right)\times 100.$$

Note that this will understate the true deadweight of IWC if the other policies that make up the LPPs were responsible for a significant part of the overall impact of the LPPs.

It should be noted that estimates of deadweight are often high for in-work financial incentive programmes such as IWC. For example, estimates presented in Brewer *et al.* (2006) imply that there was a deadweight rate of 74 per cent for the replacement of Family Credit with Working Families' Tax Credit (WFTC) and a rate of 71 per cent for WFTC overall.[10] Amongst other Department for Work and Pensions (DWP) programmes for lone parents, Dolton *et al.* (2006) estimated that the New Deal for Lone Parents (NDLP) led to its participants being 14.24 percentage points (ppts) less likely to be on benefit, and this means that its deadweight was 85.76 per cent (in the case of NDLP, the deadweight arises because some NDLP participants do not leave Income Support (IS) and because some of those who do leave IS would have done so anyway without NDLP).

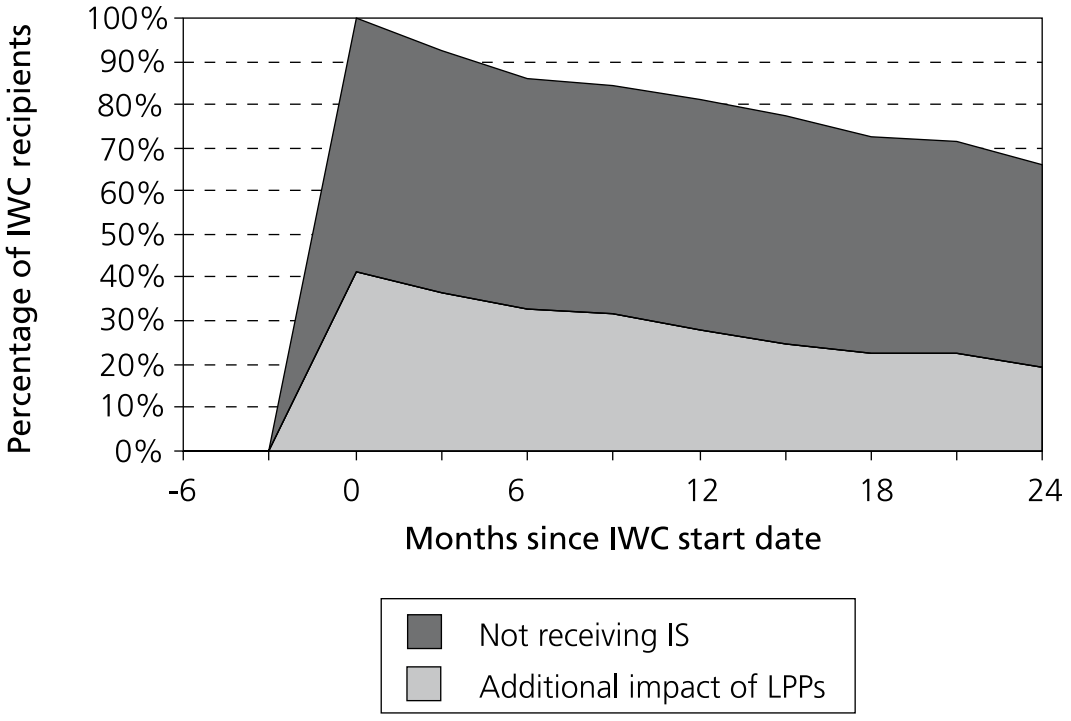
## 9.1 The impact of the LPPs on IWC recipients

Sections 4.3 and 5.2 presented simulations, based on the duration model, of the impact of the LPPs on all potentially eligible lone parents in the flow and stock samples respectively. This section presents a simulation of the impact of the LPPs on IWC recipients, similar to that in Section 8.2. That calculation can also be used to provide a measure of deadweight.

[10] These are based on the estimates in Brewer *et al.* (2006) that the replacement of Family Credit by WFTC led to a rise in the lone parent employment rate of 5 per cent and that abolishing WFTC would reduce the lone parent employment rate by 11 per cent. Calculation of deadweight based on the following numbers: 407,000 lone parents in Great Britain were receiving Family Credit in August 1999, 698,000 lone parents in Great Britain were receiving WFTC in August 2002 and there were 1.85 million lone parents in Great Britain in 2002 – see Inland Revenue (2003).

Figure 9.1 shows the proportion of IWC recipients who are not receiving an out-of-work benefit over time relative to the month in which they first received IWC. By definition, none of these lone parents is receiving an out-of-work benefit at the time they first receive IWC (the figure does not show the small overlaps in receiving IS and receiving IWC that are present for some lone parents in the administrative data). The figure also shows the estimated additional impact of the LPPs on IWC recipients, which is calculated by comparing the actual outcomes of IWC recipients with their simulated behaviour in the absence of the LPPs (note that this impact is identical to the sum of the two impacts shown in Figure 8.1). This shows that just over 40 per cent of lone parents in the sample who left IS for IWC would not have left IS **at that point in time** if the LPPs had not been available. However, the additional impact of the LPPs 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 is 29 per cent.

**Figure 9.1 Simulated impact of the LPPs for IWC recipients, and deadweight**




Notes: Base is 5 per cent sample of lone parents who claimed IS since April 2001 and who ever received IWC. Actual proportion off benefit calculated from the Work and Pensions Longitudinal Study (WPLs). Additional impact of LPPs from simulation using model reported in Appendix F with unobserved heterogeneity.

There are three reasons for this decline over time:

- some of the 40 per cent of IWC recipients who are estimated to have been induced to leave IS by the LPPs would have left IS anyway in the absence of the LPPs but at a later date;
- some lone parents who leave IS for IWC do return to IS. This clearly reduces the impact of the LPPs on the proportion of IWC recipients off benefit;
- more subtly, the additional lone parents who are induced to leave IS by the LPPs return to IS slightly more quickly than those who would have left anyway: 28 per cent of lone parents who are induced to leave benefit by the existence of the LPPs return to benefit before the end of the 12 months of IWC, compared with 26 per cent of those who would have left IS in any event (it is not possible to tell whether these numbers are statistically significantly different from each other).

Note that this analysis is measuring the impact of the LPPs on IWC recipients relative to the time that they first received IWC. This is different from the main DiD analysis in Sections 4.1 and 5.1, which measured time relative to when a lone parent first became potentially eligible for IWC. This helps explain why this analysis shows the impact declining over time and Section 4.1 found the impact of the LPPs rising over time: these two findings are for different groups of lone parents and are measuring 'time' in different ways.

As Box 9.1 explains, if deadweight is understood to measure the extent to which a programme fails to alter the behaviour of its recipients or beneficiaries, then this is defined as 1 minus the impact amongst its recipients or beneficiaries. Accordingly, the estimated deadweight at the moment that lone parents claim IWC is 60 per cent.

However, the estimate of deadweight 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 IS, and 54 per cent are not receiving IS but would have been not receiving IS anyway in the absence of the LPPs, with the remaining 28 per cent representing the additional impact of the LPPs (because they are not receiving IS but would have been receiving IS in the absence of the LPPs). This suggests two ways of calculating deadweight:

- amongst those still receiving IWC after 12 months, the estimated deadweight is 66 per cent (54 per cent divided by 81 per cent, although the numbers in the text use the unrounded estimates);
- if one also includes the former IWC recipients in the calculation of deadweight, then the deadweight after 12 months is 73 per cent: this is the sum of the 19 per cent who have returned to IS 12 months after starting an IWC claim and the 54 per cent who are not receiving IS but would have left IS anyway in the absence of the LPPs. However, this is a slightly odd definition of deadweight, as some of the individuals under consideration are no longer receiving IWC.

After 24 months, it is not possible to calculate deadweight amongst IWC recipients, as none of this group is receiving IWC at this stage. But deadweight calculated amongst the initial sample of IWC recipients has risen to 81 per cent (consisting of 34 per cent who are back on IS and 47 per cent who are not receiving IS but would have left IS anyway in the absence of the LPPs).

## 9.2 The headcount impact of the LPPs

Tables 9.1 and 9.2 take the estimated impact of the LPPs on potentially eligible lone parents in the flow sample by phase, based on the DiD analysis in Chapters 4 and 5, and gross it up to estimate the number of additional lone parents who are off benefit or in work at various points in time as a result of the LPPs. Tables 9.3 and 9.4 show the same calculation for the stock sample, while Table 9.5 grosses up the estimated impact of the LPPs on potentially eligible lone parents who left IS for work in order to estimate the number of IS leavers who remain off benefit or in work as a result of receiving IWC.

### Table 9.1 Headcount impact of the LPPs and estimated deadweight on benefit outcomes amongst potentially eligible lone parents in the flow sample, by phase

| Months since potentially eligible for IWC | Phase 1 | | | Phase 2 | | |
|---|---|---|---|---|---|---|
| | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) |
| 6 | 71 | 1,020 | 93% | 571 | 2,658 | 78% |
| 12 | 162 | 1,164 | 86% | 608 | 2,780 | 78% |
| 18 | 248 | 1,102 | 77% | 378 | 2,194 | 83% |
| 24 | 233 | 827 | 72% | 238 | 1,123 | 79% |
| 30 | 98 | 485 | 80% | | | |
| Months since potentially eligible for IWC | Phase 3 | | | Phase 4 | | |
| | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) |
| 6 | 145 | 771 | 81% | 245 | 1,509 | 84% |
| 12 | 164 | 775 | 79% | 196 | 1,062 | 82% |
| 18 | 121 | 554 | 78% | | | |

Notes: Based on estimated impacts in Table 4.1, sample sizes in Appendix H and estimated number of IWC recipients from DWP administrative data.

## Table 9.2 Headcount impact of the LPPs and estimated deadweight on work outcomes amongst potentially eligible lone parents in the flow sample, by phase

| Months since potentially eligible for IWC | Phase 1 | | | Phase 2 | | |
|---|---|---|---|---|---|---|
| | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) |
| 6 | 69 | 1,020 | 93% | 293 | 2,658 | 89% |
| 12 | 208 | 1,164 | 82% | 217 | 2,780 | 92% |
| 18 | 140 | 1,102 | 87% | 99 | 2,194 | 95% |
| 24 | 48 | 827 | 94% | 63 | 1,123 | 94% |
| 30 | –95 | 485 | N/A | | | |
| Months since potentially eligible for IWC | Phase 3 | | | Phase 4 | | |
| | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) |
| 6 | 178 | 771 | 77% | 102 | 1,509 | 93% |
| 12 | 193 | 775 | 75% | 30 | 1,062 | 97% |
| 18 | 126 | 554 | 77% | | | |

Notes: Based on estimated impacts in Table 4.1, sample sizes in Appendix H and estimated number of IWC recipients from DWP administrative data.

## Table 9.3 Headcount impact of the LPPs and estimated deadweight on benefit outcomes amongst potentially eligible lone parents in the stock sample, by phase

| Months since potentially eligible for IWC | Phase 1 | | | Phase 2 | | |
|---|---|---|---|---|---|---|
| | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) |
| 6 | –82 | 545 | N/A | 287 | 2,010 | 86% |
| 12 | 60 | 1,242 | 95% | 669 | 4,466 | 85% |
| 18 | 95 | 1,927 | 95% | 1,013 | 6,788 | 85% |
| 24 | 385 | 2,647 | 85% | 1,396 | 8,747 | 84% |
| 30 | 441 | 3,191 | 86% | 1,578 | 10,240 | 85% |
| 36 | 596 | 3,666 | 84% | | | |
| Months since potentially eligible for IWC | Phase 3 | | | Phase 4 | | |
| | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) | Headcount numbers off benefit | IWC recipients to date | Deadweight (benefit outcomes) |
| 6 | 29 | 1,115 | 97% | 260 | 3,167 | 92% |
| 12 | 437 | 2,361 | 81% | 280 | 6,779 | 96% |
| 18 | 715 | 3,536 | 80% | 529 | 9,222 | 94% |
| 24 | 1,568 | 4,596 | 66% | | | |

Note: Based on estimated impacts in Table 5.1, sample sizes in Appendix H and estimated number of IWC recipients from DWP administrative data.

## Table 9.4 Headcount impact of the LPPs and estimated deadweight on work outcomes amongst potentially eligible lone parents in the stock sample, by phase

| Months since potentially eligible for IWC | Phase 1 | | | Phase 2 | | |
|---|---|---|---|---|---|---|
| | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) |
| 6 | 112 | 545 | 79% | 497 | 2,010 | 75% |
| 12 | 264 | 1,242 | 79% | 736 | 4,466 | 84% |
| 18 | 393 | 1,927 | 80% | 994 | 6,788 | 85% |
| 24 | 527 | 2,647 | 80% | 1,195 | 8,747 | 86% |
| 30 | 786 | 3,191 | 75% | 1,731 | 10,240 | 83% |
| 36 | 920 | 3,666 | 75% | | | |
| Months since potentially eligible for IWC | Phase 3 | | | Phase 4 | | |
| | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) | Headcount numbers in work | IWC recipients to date | Deadweight (work outcomes) |
| 6 | 540 | 1,115 | 52% | –300 | 3,167 | N/A |
| 12 | 1,108 | 2,361 | 53% | –250 | 6,779 | N/A |
| 18 | 1,626 | 3,536 | 54% | 360 | 9,222 | 96% |
| 24 | 1,480 | 4,596 | 68% | | | |

Note: Based on estimated impacts in Table 5.1, sample sizes in Appendix H and estimated number of IWC recipients from DWP administrative data.

## Table 9.5 Headcount impact of the LPPs on lone parents who left IS for work amongst potentially eligible lone parents in the flow and stock sample: benefit and work outcomes

| Months since left IS | Benefit outcomes | | Work outcomes | |
|---|---|---|---|---|
| | Headcount numbers off benefit | IWC recipients to date | Headcount numbers in work | IWC recipients to date |
| 3 | 317 | 4,637 | 305 | 4,637 |
| 6 | 350 | 5,958 | 356 | 5,958 |
| 9 | 368 | 6,175 | 240 | 6,175 |
| 12 | 313 | 5,781 | 258 | 5,781 |
| 15 | 291 | 4,697 | 272 | 4,697 |
| 18 | 205 | 3,850 | 107 | 3,850 |
| 21 | 126 | 2,900 | 74 | 2,900 |
| 24 | 82 | 1,950 | 100 | 1,950 |

Note: Based on estimated impacts in Table 8.1 and estimated number of IWC recipients from DWP administrative data. It is not sensible to calculate deadweight for this table.

Tables 9.1 to 9.4 also compare the estimated number of additional lone parents off benefit or in work as a result of the LPPs with estimates of the number of individuals in each phase of the same sample who have ever received IWC, to produce a crude measure of deadweight (see Box 9.1). These suggest the following:

- for benefit outcomes amongst the flow sample, 12 months after first becoming potentially eligible for IWC, deadweight was lowest in Phase 2 (78 per cent) and highest in Phase 1 (86 per cent). Unsurprisingly, the deadweight measure was lowest in districts where IWC appeared to have the greatest additional impact;
- for work outcomes amongst the flow sample at the same point in time, deadweight was lowest in Phase 3 (75 per cent) and highest in Phase 4 (97 per cent);
- across all outcomes and all time points amongst the flow sample, the estimate of deadweight never drops below 70 per cent, although there is some suggestion – for Phase 1 districts in particular – that this measure of deadweight declines over time: this would be the case if the lone parents in the flow sample who were the first to claim IWC were more likely (than lone parents who claimed IWC later) to have left benefit anyway;
- for benefit outcomes among the stock sample, 18 months after first becoming potentially eligible for IWC, deadweight was lowest in Phase 3 (80 per cent) and highest in Phase 1 (95 per cent);
- for work outcomes amongst the stock sample at the same point in time, deadweight was lowest in Phase 3 (54 per cent) and highest in Phase 4 (96 per cent). For Phase 3 in particular, these estimates of deadweight are considerably lower than they were for the flow sample; this implies that IWC has been instrumental in Phase 3 districts in helping lone parents with very long benefit histories to start work who would not otherwise have done so.

## 9.3 Summary

A measure of deadweight reports what fraction of IWC recipients have not had their benefit or employment behaviour altered by the LPPs. This chapter has presented estimates of deadweight calculated in two different ways which are not directly comparable with each other.

Estimates based on the duration model suggest that, at the instant when IWC recipients first received IWC (and left IS), deadweight was 60 per cent (i.e. 60 per cent of this group would have left IS anyway) and the remaining 40 per cent represents the additional impact of IWC. But the impact of IWC falls over time: after 12 months, 19 per cent of the IWC recipients have returned to IS, 54 per cent are not receiving IS but would have been not receiving IS anyway in the absence of the LPPs and the remaining 28 per cent represent the additional impact of the LPPs. The estimated deadweight similarly rises, although the actual number depends on precisely how it is calculated.

Crude estimates of the deadweight of the LPPs based on the DiD method are calculated in a different way and are not directly comparable. But they suggest that deadweight for benefit outcomes is grouped around 80 per cent in all phases for the flow sample. For the stock sample, estimated deadweight for benefit outcomes is 85 per cent in Phases 1 and 2, 95 per cent in Phase 4 and 66 per cent in Phase 3. The estimated deadweight for work outcomes is rather erratic.

These figures are fairly similar to the deadweight implied by previous impact assessments of WFTC and NDLP.

# 10 Summary and conclusions

This is the second and final published report from a project designed to estimate the labour market impact of a set of five government policies designed to help lone parents into work. These policies are being piloted in different combinations in Jobcentre Plus districts in Great Britain. The five policies in question are In-Work Credit (IWC), Work Search Premium (WSP), Extended Schools Childcare and Childcare Tasters (ESC), Quarterly Work Focused Interviews (QWFIs) for lone parents whose youngest child is aged 12 or over in Local Education Authorities (LEAs) in which an ESC pilot is operating (Extended Schools Quarterly Work Focused Interview (ESQWFI)) and New Deal Plus for Lone Parents (ND+fLP). These are collectively referred to as 'the lone parent pilots' (LPPs or 'the pilots'). This impact assessment covers the operation of the LPPs from 1 April 2004 to 31 March 2007.

The report provides estimates of the overall impact of the LPPs. Much of the analysis focuses on those lone parents who were 'potentially eligible' for IWC: this refers to lone parents in pilot districts who had been receiving Income Support (IS) or Jobseeker's Allowance (JSA) for at least 12 months and so would have been eligible to claim IWC had they left IS/JSA and started a job of 16 or more hours per week.

The results update and supersede those in Research Report 415 (RR 415). Compared with that report, this report contains a number of new analyses:

- It investigates the characteristics and labour market behaviour of IWC recipients compared with other lone parents who leave IS, making use of individual data on which lone parents received IWC.
- It separates the impact of the LPPs into an initial impact of encouraging more potentially eligible lone parents to leave benefit and start work and a subsequent impact of encouraging recipients to stay in work and off IS.
- It assesses more thoroughly whether the key assumption of 'common trends', needed for estimates based on a difference-in-differences (DiD) approach to be valid, is likely to hold.
- It examines what more can be learned about the impact of the LPPs from a duration (or survivor) model.

An additional aim – to investigate the impact of the LPPs on other outcomes, using data on earnings and tax credit claimants – proved infeasible as the tax credit data in the Work and Pensions Longitudinal Study (WPLS) was not available to the research team in time to affect this report and as the P14 earnings data was only available for 2003/04 to 2005/06, which did not give enough data after IWC had begun.

## 10.1 Summary of results

### 10.1.1 Take-up of IWC

A broad measure of take-up of IWC is the number of lone parents who have received IWC as a proportion of those who have ever been potentially eligible. This also provides a theoretical upper bound to the additional impact of IWC. By 31 March 2007, just under 10 per cent of all potentially eligible lone parents had received IWC, and just under 33 per cent of all potentially eligible lone parents who left IS had received IWC. Take-up rates were higher in Phases 2 and 4 than Phases 1 and 3: this could reflect differences in local labour markets, differences in the characteristics of lone parents in the districts in the various phases, or differential awareness of IWC among lone parents. However, research based on secondary data analysis will always be unable to differentiate between these various explanations.

### 10.1.2 Characteristics of IWC recipients

IWC recipients tend to have characteristics known from past research (Yeo, 2007; D'Souza *et al.*, 2008; La Valle *et al.*, 2008) to be associated with a greater likelihood of leaving benefit and moving into work than other potentially eligible lone parents in the pilot districts who did not receive IWC. Most notably, IWC recipients are 56 percentage points more likely to have ever been on New Deal for Lone Parents (NDLP) (although this may be because of the conditions attached to IWC receipt when the pilots were first introduced) and 7 percentage points (ppts) less likely to have been recently disabled. They are also less likely to have a child under the age of three and they tend to have fewer children, on average, than other potentially eligible lone parents in the pilot districts who left IS but not for IWC. However, these groups do not differ substantially in terms of the proportion of time spent in work in the 30 months before leaving IS.

### 10.1.3 Durations of IWC claims and post-IWC destinations

Just under 70 per cent of lone parents who claimed IWC received it for the maximum 12 months and 16 per cent of IWC claims lasted less than six months.

As IWC is a time-limited payment, an important issue is what happens to lone parents when payments of IWC stop. For lone parents who receive IWC for at least 11 months, there are very few changes, on average, to key labour market outcomes when IWC payments stop: over 80 per cent are still not receiving an

out-of-work benefit one year after they stopped receiving IWC and more than 60 per cent are still in work.

However, the picture is different for those lone parents who do not receive IWC for the full 12 months: of those who receive IWC for less than six months, 63 per cent are receiving an out-of-work benefit one year after starting a claim of IWC and only 26 per cent are in work. For those who receive IWC for more than six but less than 11 months, 49 per cent are receiving an out-of-work benefit one year after starting a claim of IWC and 35 per cent are in work. Amongst all lone parents who received IWC for less than the full 12 months, 56 per cent were receiving an out-of-work benefit one year after starting an IWC claim and 30 per cent were in work.

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. Furthermore, they suggest that the majority of those who do not complete an IWC claim stop receiving IWC because they are no longer working and have returned to benefits.

### 10.1.4 Flow sample: difference-in-differences estimates of the impact of the lone parent pilots (headline results)

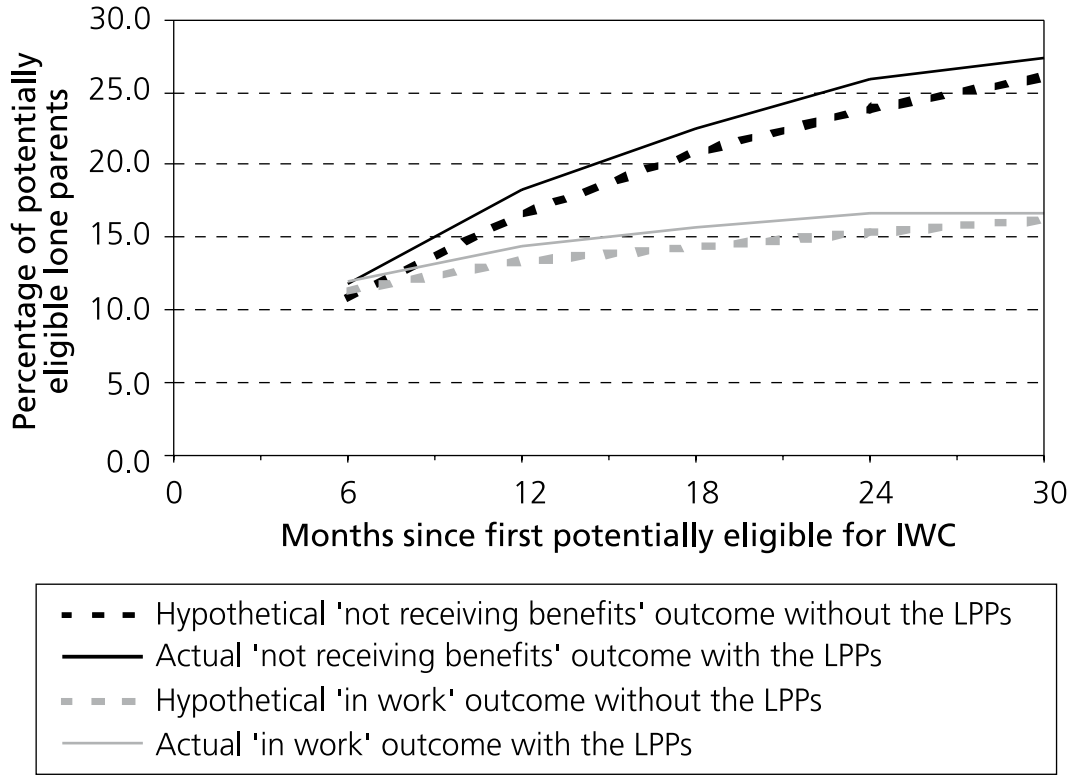
The estimates suggest that, on average, the LPPs led to statistically significant improvements in work and benefit outcomes. For example, 12 months after first becoming potentially eligible for IWC, just under a fifth (18.2 per cent) of potentially eligible lone parents were no longer receiving an out-of-work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

It is also valid to express the additional impact of the LPPs as a proportion of those potentially eligible lone parents who are in work or no longer receiving an out-of-work benefit. This is sometimes known as the additionality rate. These numbers are reported in Table 10.1 later. They show that, for example, 8.8 per cent of the potentially eligible lone parents no longer receiving an out-of-work benefit after 12 months' exposure to the LPPs, is attributable to the LPPs; the equivalent figure for work outcomes is 7.0 per cent.

The additional impact of the LPPs, expressed as a proportion of all potentially eligible lone parents, rises over time (measured relative to when they first became potentially eligible for IWC), as shown by the distance between the solid and dashed lines of the same colour in Figure 10.1. For example, after 24 months' exposure to the LPPs, a quarter (25.9 per cent) of potentially eligible lone parents were no longer on benefit and 2.0 ppts of this is attributable to the LPPs. For work outcomes, the equivalent figures are 16.7 per cent and 1.4 ppts. These are larger impacts than those after 12 months' exposure to the LPPs but it is not at all surprising that the impact of the LPPs rises the longer a lone parent is exposed

to their policies and services. However, there is much less change over time in the additionality rate (see Table 10.1). This means that the additional impact of the LPPs on all potentially eligible lone parents rises with the length of time during which a lone parent is exposed to the LPPs but their additionality rate is fairly constant.

**Figure 10.1 Percentage of potentially eligible lone parents in the flow sample who are off benefit and in work, and estimated percentage off benefit and in work in the absence of the LPPs**




Notes: Figure shows average (mean) outcomes, and mean outcomes less the estimated impact. Impacts estimated by ordinary least squares (OLS) regressions on flow sample a certain number of months after first becoming potentially eligible for IWC. Work outcome is 'whether in work according to WPLS'. Benefit outcome is 'no longer receiving out-of-work benefits according to National Benefits Database (NBD)'. Outcomes at month 0 are not shown. Not all phases contribute to impacts and outcomes at all durations. Number of lone parents potentially eligible for IWC and living in LPP districts when IWC in operation was 102,433 at six months and 4,509 at 30 months.

### 10.1.5 Stock sample: difference-in-differences estimates of the impact of the lone parent pilots

The headline results presented above were for the flow sample as a whole, meaning that the estimates pooled all the phases together and, within a phase, also pooled lone parents who became potentially eligible for IWC at different points in time.

The additional impact of the LPPs was estimated separately for the stock sample (those lone parents who were potentially eligible for the LPPs on the day they were introduced). The key difference between the flow and stock samples is that lone parents in the stock sample tend to have been receiving out-of-work benefits for far longer. In general, the additional impact on the stock was smaller than that on the flow. After 12 months of being potentially eligible for the LPPs, 12.3 per cent of the stock sample were no longer receiving an out-of-work benefit, 0.5 ppts of which is attributable to the LPPs. After 24 months, the equivalent figures are 18.4 per cent and 1.6 ppts. The impact on work outcomes was very similar. The estimated impacts on benefit outcomes in Phases 1 and 4 after 12 months were not statistically significant but all impacts on all outcomes at 24 months were statistically significant. The implied additionality rate for those not on benefit is 3.7 per cent after 12 months' exposure and 9.0 per cent after 24 months.

### 10.1.6 Variation across phases, cohorts and combinations of policies

There are no robust differences in the impact of the LPPs across the four phases. For benefit outcomes, the impact of the LPPs is greater in Phases 2 and 4 than it is in Phases 1 and 3 (both dominated by London). For work outcomes, the impact of the LPPs is greater in Phases 1 and 3 (both dominated by London) than it is in Phases 2 and 4. However, the variation across phases in the estimated impacts for the benefit outcomes is almost never statistically significant. Estimates from the stock sample suggest that the impact of the pilots is greater for lone parents in Phase 2 and 3 districts than it is for lone parents in Phase 1 or Phase 4 districts. These differences exist after the analysis has controlled for many characteristics of lone parents and the areas in which they live, but they are small.

It is also possible that the impact is different for lone parents who became potentially eligible at different dates. This is investigated by estimating separate impacts for each cohort of potentially eligible lone parents, where a cohort is defined as those lone parents who became potentially eligible for IWC in the same six-month window. Estimates suggest that, for all phases, the impact of the LPPs increases for each successive cohort: for example, in all phases, the LPPs seem to have had the largest impact on those lone parents who became potentially eligible between 1 October 2005 and 31 March 2006 (where outcomes are measured 12 months later, between 1 October 2006 and 31 March 2007). One potential explanation for this pattern is that awareness of the LPPs amongst lone parents or Personal Advisers (PAs) grew over time. However, the estimated impacts of the

LPPs for different cohorts were generally not statistically significantly different from one another (but were statistically significantly different from zero), meaning that one should use the headline results averaged over all cohorts presented earlier.

This report has found no robust evidence of variation in the impact of the LPPs according to the combinations of policies that were on offer. Specifically, the results do not suggest that the impact of the LPPs was any greater in pilot districts where ND+fLP was in place, nor for lone parents subject to ESQWFIs, than in pilot districts where only IWC was in place. Thus, there is no robust evidence that these additional policies have made the overall package of LPPs more effective at getting lone parents off benefit and into work. For ESQWFIs, this is because few potentially eligible lone parents would have been subject to them, so the estimated impacts are very imprecise. For ND+fLP, the estimated impacts are more precise but are either very similar to the impacts in non-ND+fLP districts or, as in the stock sample, weaker than in non-ND+fLP districts; in any case, most differences are not statistically significant.

There were very strong impacts of the LPPs among lone parents who had previously been on NDLP. For example, the impact of the LPPs on benefit outcomes for all potentially eligible lone parents in the flow sample 12 months after becoming potentially eligible to IWC is estimated to be 1.6 ppts (see Table 10.1). The impact for lone parents who had not previously been on NDLP is 1.5 ppts and the impact for those who had previously been on NDLP is 4.2 ppts. It is not possible to tell whether this difference is genuinely caused by NDLP – which might happen if, for example, lone parents on NDLP were more likely to find out about IWC – or whether it is because the sort of lone parents who join NDLP are more work-ready, and therefore, more likely to respond to an increased incentive to work, than those who do not, or whether there is some sort of beneficial interaction between the two policies (it was also the case that, between April 2004 and October 2004 in the Phase 1 districts, it was a requirement for lone parents who wanted to receive IWC to have been on NDLP when they left IS).

### 10.1.7 Summary of key results

Table 10.1 summarises the main impact estimates for those outcomes for which estimates are available for all phases.

## Table 10.1 Summary of impacts of the lone parent pilots

| *Percentage points* | *After 12 months' exposure to LPPs* | | | | *After 24 months' exposure to LPPs* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Impact on number no longer receiving out-of-work benefits* | | *Impact on number in work* | | *Impact on number no longer receiving out-of-work benefits* | | *Impact on number in work* | |
| | *As percentage of all potentially eligible lone parents* | *Additionality rate* | *As percentage of all potentially eligible lone parents* | *Additionality rate* | *As percentage of all potentially eligible lone parents* | *Additionality rate* | *As percentage of all potentially eligible lone parents* | *Additionality rate* |
| **Flow sample** | | | | | | | | |
| Overall | 1.6*** | 8.8 | 1.0*** | 7.0 | 2.0*** | 7.7 | 1.4*** | 8.4 |
| Phase 1 | 0.8** | 5.2 | 1.4*** | 9.8 | 1.9*** | 7.9 | 1.4*** | 8.9 |
| Phase 2 | 2.0*** | 10.1 | 0.9*** | 5.9 | 2.1*** | 7.5 | 1.3*** | 7.4 |
| Phase 3 | 1.2*** | 7.8 | 1.5*** | 12.0 | N/A | N/A | N/A | N/A |
| Phase 4 | 1.8*** | 8.3 | 0.2 | 1.4 | N/A | N/A | N/A | N/A |
| **Stock sample** | | | | | | | | |
| Overall | 0.5 | 3.7 | 0.7 | 4.8 | 1.6 | 9.0 | 1.2 | 8.1 |
| Phase 1 | 0.1 | 0.9 | 0.4*** | 2.9 | 0.9*** | 5.1 | 0.8*** | 5.1 |
| Phase 2 | 0.7*** | 5.6 | 0.8*** | 5.4 | 1.5*** | 7.5 | 1.2*** | 7.5 |
| Phase 3 | 0.6*** | 6.3 | 1.1*** | 8.7 | 2.2*** | 13.1 | 1.5*** | 10.7 |
| Phase 4 | 0.3* | 1.4 | 0.2 | 2.1 | N/A | N/A | N/A | N/A |

Notes: The table shows the estimated impact of the LPPs on the proportion of lone parents no longer on benefit, and (separately) now in work, a certain number of months after first becoming potentially eligible for IWC. Impacts estimated by OLS regressions on flow sample and stock sample a certain number of months after first becoming potentially eligible for IWC. Work outcome is 'whether in work according to WPLS'. Benefit outcome is 'no longer receiving out-of-work benefits according to NBD'. Results are presented in ppts, so an estimate of 1.6 means 1.6 ppts. * = significant at 10 per cent level; ** = significant at 5 per cent level; *** = significant at 1 per cent level; standard errors have not been calculated for the impacts expressed as a percentage of those no longer on benefit (or now in work) nor the overall impact for the stock sample. Additionality rate is calculated as '100 × impact/outcome'.

### 10.1.8 Disentangling the impact of the LPPs: did they encourage more lone parents to leave benefit for work or encourage those that did leave to stay in work and off benefit for longer?

The headline estimates of the LPPs combine any initial impact the LPPs had on encouraging lone parents to leave benefit and enter work, and any subsequent impact they had on encouraging IWC recipients to stay in work and off benefit.

Two separate analyses suggest that 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 the LPPs on reducing the benefit re-entry rate of IWC recipients seems to have been very small in comparison. One piece of evidence that supports this conclusion comes from applying the DiD method to a sample of potentially eligible lone parents who left IS for work: IWC recipients formed a high proportion (70 per cent) of this sample in the pilot districts after the pilots started, and so any impacts estimated from this analysis should reflect only the impact of the LPPs on reducing the benefit re-entry rate of IWC recipients. However, these estimated impacts are small (although statistically significant). The other piece of evidence comes from a duration (or survivor) model. This was used to simulate directly how long IWC recipients would remain off out-of-work benefits in the absence of IWC.

### 10.1.9 Apparent impacts of the LPPs on lone parents who are not yet eligible for IWC

It is possible to use the DiD method to estimate the 'impact' of the LPPs on lone parents who have been on IS for less than 12 months and who are, therefore, not yet potentially eligible for IWC. These estimates are small (although generally statistically significant) and negative. But interpreting such 'impacts' is not simple: there are two main causes, with very different implications, and the data available to the research team was insufficient to distinguish between these hypotheses.

First, the negative 'impacts' may be genuinely caused by the LPPs. There are at least two ways this could occur. Lone parents in IWC districts whose IS claim has lasted less than 12 months and who are contemplating leaving IS for a job of 16 or more hours a week, might delay leaving IS until they become eligible for IWC in order to benefit from the £2,080 maximum payment of IWC; this is known as an anticipation effect. There may also be 'spillover' effects; in the case of the LPPs, this would refer to a situation where the higher number of lone parents induced by the LPPs to look for work makes it harder for others – such as lone parents who have been on IS for less than 12 months – to find work, although these effects seem unlikely to be very important in a flexible labour market. If anticipation or spillover effects are present, and are leading to the apparent negative impacts on lone parents whose IS claim has lasted less than 12 months, then the headline estimates of the additional impact of the LPPs presented earlier are overstating the overall impact of the LPPs. However, qualitative research with IWC recipients (Ray *et al.*, 2007) found that the majority of those IWC recipients who had not received WSP or had a QWFI heard about IWC for the first time after they had found a job, suggesting anticipation effects are unlikely, although that research was based on a small sample. Furthermore, in a variant of the duration model that allowed for anticipation effects, these were found to be statistically insignificant and the overall impact of IWC was little different. However, anticipation effects were found to be present in a similar programme in Canada (Card and Hyslop, 2005) and it is also plausible that there were spillover effects as described above in the Canadian programme.

Second, the negative 'impacts' may be due to a general deterioration in the outcomes in the pilot districts that did not occur in the comparison districts and which cannot be explained by the explanatory factors included in the analysis (this would reflect a failure of the 'common trends' assumption). If such a deterioration had occurred, then the headline estimates of the impact of the LPPs presented above are **understating** the actual impact of the LPPs.

### 10.1.10 Deadweight

'Deadweight' reports what fraction of IWC recipients would have behaved in the same way in the absence of IWC. For the flow sample, the estimates of deadweight for benefit outcomes are grouped around 80 per cent in all phases; for the stock sample, estimated deadweight for benefit outcomes ends up at 85 per cent in Phases 1 and 2, 95 per cent in Phase 4 and 66 per cent in Phase 3 (the estimated deadweight for work outcomes is rather erratic). These results are broadly consistent with those from the duration model, which estimates deadweight to be around 73 per cent 12 months after IWC recipients first received IWC and 81 per cent after 24 months.

These figures suggest that, 12 months after first receiving IWC, the behaviour of around four out of every five (former) IWC recipients was unaffected by the LPPs, either because they had returned to claiming IS or because they would have left IS and stayed off it without the LPPs. This compares to an estimated deadweight of 85 per cent for NDLP – implied by the headline estimates in Dolton *et al.* (2006) reported in Cebulla *et al.* (2008) – and one of 71 per cent for Working Families' Tax Credit (WFTC) overall, implied by the estimates in Brewer *et al.* (2006).

### 10.1.11 How do the estimated impacts compare with those of other Department for Work and Pensions programmes for lone parents?

Cebulla *et al.* (2008) sought to compare the findings of a number of evaluations and impact assessments of Government policies designed to encourage lone parents to work: see especially their Table 1 on pages 10–11. Below, we compare findings from Cebulla *et al.* with those in this report. Cebulla *et al.* discussed, extensively, the difficulties involved in making direct comparisons, given the different approaches taken by the original evaluations. One very important difference is that the most-cited result for NDLP refers to its impact on NDLP participants but the headline results for the evaluations of Work Focused Interviews (WFIs) and of the LPPs presented in this report, are for their impacts among lone parents who were potentially eligible for a WFI or for IWC, not all of whom actually had a WFI or received IWC.

The headline result in this report for the flow sample is that, after 12 months of being potentially eligible for IWC, the LPPs had led to an additional 1.6 ppts of potentially eligible lone parents being off benefit (i.e. not receiving IS, JSA or Incapacity Benefit (IB)). After 24 months, the figure was 2.0 ppts. Cebulla *et al.* calculated the impact of NDLP amongst all lone parents on IS to be 1.7 ppts

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 IS that are similar in magnitude (however, the estimated impacts of the three programmes are all for slightly different populations: the LPP estimates are for all lone parents whose IS claim reaches 12 months in the pilot districts, the NDLP estimate is for all lone parents on IS in Great Britain and the WFI estimates are for the stock of lone parents on IS with children of various ages).

The most cited result for NDLP is that it led to 14.24 per cent of NDLP participants being off benefit as a result. This report has estimated that the deadweight of IWC was around 80 per cent and this implies that the LPPs have led to 20 per cent of IWC recipients being off benefit as a result. Figure 9.1 showed such estimates from the duration model more precisely: the duration model implies that, at the time IWC recipients first claimed IWC, 40 per cent would not have left benefit without the LPPs, but this fraction falls to 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 IWC recipients is 29 per cent).

### 10.1.12 What has changed since DWP Research Report 415?

In general, the estimated impact of the LPPs in this report is higher than that in RR 415. It is not possible to isolate the reason for this, as there have been many changes to the data analysed and the empirical strategy, the most important of which are:

- this report had access to more recent data. The larger flow sample has made it easier to detect small impacts reliably and there is evidence that the impact of the LPPs on later cohorts of lone parents in the flow sample is greater than that on earlier cohorts, and that the impact on the stock sample seems to have grown over time (although this report did not test whether this growth was statistically significant or not);
- this report uses data for Phase 4 districts and the LPP districts in Scotland and Wales. The sample of lone parents used before the LPPs began has also been extended back to cover all those whose claims exceeded 12 months' duration on or after 1 April 2001;
- the measure of whether a lone parent is 'off benefit' has been improved to account for errors in the Department for Work and Pensions (DWP) administrative data and the measure of work has been refined to account for errors in the WPLS;
- estimates of the number of IWC recipients provided by (DWP to the research team were lower than they were for RR 415; this has reduced the participation rates;

- the implementation of the DiD estimator has been refined to correctly allow for the start dates of the LPPs to vary by phase and to allow for an arbitrary trend in outcomes.

## 10.2 Implications for policy and research

### 10.2.1 What more can be learned about the impact of the LPPs from a duration model?

There are two empirical methods used in this report to produce estimates of the impact of the LPPs: one is a DiD estimator and the other is based on a duration model (this is similar to what is known in the statistical literature as a 'survivor model', with repeated spells and competing risks). Both methods try to learn about the impact of the LPPs by, in essence, comparing the behaviour of lone parents who were potentially eligible for IWC with that of those who were not (the latter is known as a 'comparison group').

A duration model typically involves making stronger assumptions than in a conventional DiD estimator but the stronger assumptions permit a richer understanding of the impact of the LPPs: for example, the duration model can provide internally consistent estimates of the overall impact of the LPPs on the potentially eligible population of lone parents and their impact on job retention for IWC recipients. A disadvantage is that it is computationally intensive to estimate such models. The model estimated for this report was, thus, based on a 5 per cent sample of lone parents and used a very small set of explanatory variables, so the results from this model should be regarded as tentative.

Generally, the results from the duration model are consistent with those based on the DiD approach. Given the theoretical advantage of such models when estimating the impact of DWP programmes on job retention or repeat claims of benefit, the authors recommend that they be pursued in future evaluations undertaken or commissioned by DWP, particularly if a more accurate measure of whether a lone parent is in work can be used, based on the estimated eligibility to Working Tax Credit (WTC) now in the WPLS.

### 10.2.2 Implications for policy

The target population for the LPPs – lone parents who have been receiving out-of-work benefits for at least one year – tend to stay on benefits and out of work for long periods of time. The results in this report imply that the overall impact of the LPPs is to lead to more potentially eligible lone parents being in work, and fewer receiving out of work benefits, and these impacts are statistically different from zero. Results also suggest that the main role of the LPPs is to encourage more lone parents to leave benefit and start work. There is little evidence that they are having any impact on job retention, although job retention amongst most IWC recipients is high.

This report has also examined impacts on specific groups of lone parents. There is little reliable evidence on whether the impact was stronger where ESQWFIs were in operation because too few lone parents were subject to ESQWFIs for any significant variation in the impact to be detected. This question, therefore, remains unanswered. There is also no robust evidence that the impact was greater in pilot districts operating ND+fLP. As a result, this research has not found any robust evidence that these additional policies have made the overall package of LPPs more effective at getting lone parents off benefit and into work, compared with IWC alone.

Finally, there is some evidence that the impact is greater for lone parents who have previously been on NDLP. It is not possible to tell whether this difference is genuinely caused by NDLP – which might happen if, for example, lone parents on NDLP were more likely to find out about IWC – or whether it is because the sort of lone parents who join NDLP are more work-ready and therefore, more likely to respond to an increased incentive to work, than those who do not, or whether there is some sort of beneficial interaction between the two policies (it was also the case that, between April 2004 and October 2004 in the Phase 1 districts, it was a requirement for lone parents who wanted to receive IWC to have been on NDLP when they left IS).

One potential drawback of limiting IWC payments to a maximum of 12 months is that any positive impact it had would cease immediately when the payments stopped. This report has rejected this concern, by showing that those lone parents who receive IWC for the full 12 months do not stop work or start a new IS claim when they pass the 12-month limit of IWC payments.

A potential drawback of restricting eligibility for IWC to lone parents who have spent at least 12 months receiving out-of-work benefits is that it gives lone parents on out-of-work benefits a financial incentive to postpone starting work until they have been on out-of-work benefits for a year. This report cannot rule out the possibility that this is happening but if it is, then the impact is small.

Ultimately, 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.

Finally, it should be noted that this impact assessment covers the operation of the LPPs from 1 April 2004 to 31 March 2007. It is entirely possible that the impact of IWC and related policies during a recession is different from its impact when the economy is growing.

# 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.

## In-Work Credit

In-Work Credit (IWC) was available to lone parents who had:

- been receiving Income Support (IS) or Jobseeker's Allowance (JSA) income-based or contributory) or a combination of the two for a continuous period of 12 months or more; and
- who stopped claiming benefits 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 or if the lone parent claimed an out-of-work benefit. Lone parents had to provide evidence that they were still in work (or were self-employed) at four points: 10, 26, 38 and 52 weeks after taking a job. The bonus was paid weekly in arrears. IWC payments did not count as income for the purpose of other means-tested benefits or tax credits.

In April 2004 (Phase 1), IWC was introduced in the Jobcentre Plus districts of Bradford, North London and South-East London. In October 2004 (Phase 2), it became available in a further nine districts: Cardiff and Vale; Central London; Dudley and Sandwell; Edinburgh, Lothian and Borders; Lancashire West; Leeds; Leicestershire; Staffordshire; and West London. These districts were chosen because they had relatively poor outcomes for lone parents on benefit and relatively high proportions of lone parents in the population. In April 2005 (Phase 3), IWC was rolled out across the remaining London districts (with the

exception of North-East London, in which the Employment Retention and Advancement (ERA) programme offered similar incentives). In October 2005 (Phase 4), IWC was extended to a further six districts in the south-east of England: Bedfordshire and Hertfordshire; Berkshire, Buckinghamshire and Oxfordshire; Essex; Hampshire and the Isle of Wight; Kent: Surrey and Sussex. The expansion to Phases 3 and 4 was justified on the grounds that work incentives might be particularly poor for lone parents in London and the South-East, perhaps because of high transport costs, or high levels of rents and council tax, which weaken work incentives through the operation of Housing Benefit (HB) and Council Tax Benefit (CTB). After this expansion, around 45 per cent of lone parents on benefit for at least a year lived in districts offering IWC. In July 2007, IWC payments were increased to £60 a week in London; and in April 2008, IWC was rolled out to the whole of Great Britain. Both these changes happened outside the period examined by this report.

## Work Search Premium

Lone parents who were on IS/JSA (or some combination) for 12 months or more, and who were willing to join the New Deal for Lone Parents (NDLP) and engage voluntarily in job-search activity, were eligible to claim a Work Search Premium (WSP) payment of £20 per week for a maximum of 26 weeks.

The WSP was payable to lone parents who were participants on NDLP and who agreed an action plan with their Personal Adviser (PA). They were not tied into specific job-search activities but receipt of WSP was at the continual discretion of their PA, with whom they discussed job search on a fortnightly basis.

WSP operated in a number of districts in tandem with IWC: Bradford and South-East London (Phase 1); and Cardiff and Vale; Dudley and Sandwell; Edinburgh, Lothian and Borders; Lancashire West; Leicestershire; West London (Phase 2). The pilot ended in September 2006.

In the WSP pilot districts that were **not** also providing services as part of the New Deal Plus for Lone Parents (ND+fLP) pilot (Lancashire West and West London), WSP stopped being available to new clients from the end of September 2006; however, lone parents who started receiving WSP before this date continued to receive it until they lost eligibility in the usual way (i.e. after six months or after leaving IS/JSA). Uptake of WSP was small. There were 1,640 lone parent starts in total within ND+fLP districts during the period April 2005 to October 2007.

## 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, although the details vary slightly between England, Scotland and Wales as implementation was a devolved issue. In England, the pilots were managed by LEAs in order to best meet local needs, working in close cooperation with

Jobcentre Plus, schools and other stakeholders. This inevitably meant that there was variation in the effective treatment across locations.

Extended Schools Childcare pilots aimed to improve the availability of affordable childcare for working parents. In England, each pilot had a Childcare Coordinator, employed by the LEA, who worked with schools to create new childcare places. Childcare Partnership Managers from Jobcentre Plus were to provide the strategic link between Jobcentre Plus and LEAs. Childcare Coordinators and Childcare Partnership Managers were to work with Children's Information Services, providing up-to-date information on local childcare vacancies, including those in schools. The aims of the pilots were the same in Wales and Scotland, although the institutional arrangements were different.

The pilot was intended to primarily help parents of school-age children (i.e. children aged 5–14, 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 Childcare pilots ran from 1 April 2004 until 31 March 2006 in Bradford, Haringey and Lewisham LEAs in England, and from 1 October 2004 to 31 March 2006 in Greenwich, Leicester, Leicestershire and Sandwell LEAs in England; Aberdeenshire and Fife in Scotland; and Torfaen in Wales. These LEAs also ran the ESC pilot, the aim of which was to help lone parents build trust and confidence in the use of formal childcare. Childcare Tasters also operated in some areas that did not operate an ESC pilot but this is ignored during the empirical work (in other words, it was assumed that the ESC pilot on its own had negligible impact on the likelihood that lone parents in that area left benefit or found work).

The ESC pilots ended on 31 March 2006.

## Extended Schools Quarterly Work Focused Interviews

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 (Extended Schools Quarterly Work Focused Interviews (ESQWFIs)). Where Jobcentre Plus districts were larger than LEAs, ESQWFIs only applied to lone parents living within the LEA. ESQWFIs were introduced in Bradford, Lewisham and Haringey in September 2004; and Greenwich, Leicester, Leicestershire and Sandwell in October 2004; they ended in all districts in April 2007. From October 2005, mandatory quarterly review meetings were required of lone parents claiming benefit 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.

Lone parents claiming IS/JSA but not required to attend QWFIs were subject to the following WFI regime. For new or repeat claims, there was an initial interview, reviews at six and 12 months, followed by annual WFIs (i.e. at 24, 36, 48 months, etc.). For existing IS recipients, there was an initial interview, followed by annual WFIs. WFIs were gradually extended to the stock of lone parents in receipt of IS/JSA through a phased roll-out based on the age of the lone parent's youngest child. In practice, this means that lone parents eligible for QWFIs should have received WFIs 6, 12, 15, 18, 21 (etc.) months after first claiming IS/JSA. Since October 2005, lone parents who have been claiming IS for 12 months or more with a youngest child aged 14 years or over have been required to attend an interview once every three months to help them prepare for the transition to work when their child reaches 16. This nationwide initiative is not the subject of this project.

## New Deal Plus for Lone Parents

At the end of April 2005, five Jobcentre Plus districts started offering ND+fLP in addition to the other LPP programmes that they were operating. These Jobcentre Plus districts were: Bradford, North London and South-East London (Phase 1); and Dudley and Sandwell and Leicestershire (Phase 2). From October 2006, Cardiff and Vale and Edinburgh, Lothian and 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. The range of services on offer included: WSP, IWC, QWFIs (for lone parents with children aged 12 or over), Childcare Tasters/ Childcare Chats, Extended Schools Childcare, Action Plans, Childcare Assist, Discovery Weeks, In-Work Emergencies Fund, Extra Administrative Support for PAs, Enhanced Training for Lone Parent PAs, More Voluntary Contact with Lone Parents between WFIs, Additional Childcare Partnership Manager, Jobpoints in Children's Centres, Access to Flexible Provision, Marketing Package and In-Work Support. There is some variation in service provision between the districts offering ND+fLP: WSP is not being offered in North London; and there is not an ESC pilot, nor are there ESQWFIs, in Edinburgh, Lothian and Borders or Cardiff and Vale. Results from a qualitative evaluation of ND+fLP were published in 2007 (Hosain and Breen, 2007).

## Overlaps between the policies

Table A.1 summarises the programmes and defines the eligible population for each.

## Table A.1 Summary of the programmes and the eligible population

| | Who is potentially eligible? (the pilot group) | Under what conditions do they actually receive treatment? | Administered at what level? |
|---|---|---|---|
| In-Work Credit | Lone parents on IS or JSA for at least 12 months | Move off benefits and into work of at least 16 hours per week (that is expected to last at least five weeks) | Jobcentre Plus district |
| Work Search Premium | Lone parents on IS or JSA for at least 12 months | Join NDLP and agree to undertake job-search activities | Jobcentre Plus district |
| Extended Schools Childcare | Any parent in the area (lone parents are targeted but not singled out) | None | LEA |
| Childcare Taster | Taster weeks: lone parents and partners on NDLP or ND+fLP<br>Chats: any lone parents | Taster weeks: if PA recommends<br>Chats: if PA recommends | LEA |
| ESQWFI | Lone parents on IS for at least 12 months whose youngest child is aged 12 or more in ESC areas | Automatic | Jobcentre Plus district |
| New Deal Plus for Lone Parents | Any lone parent meeting the conditions for joining NDLP | It is a voluntary programme | Jobcentre Plus district |

Table A.2 shows which Jobcentre Plus districts and LEAs operated which policies. The 'Phase' column of this table shows which phase each Jobcentre Plus district/ LEA has been allocated to for the purposes of this evaluation; this is defined according to the date on which IWC was introduced in each district.

## Table A.2 Spatial and temporal overlap of the lone parent pilots

| Jobcentre Plus district | LEA in which CT/ESC runs | LEA as percentage of Jobcentre Plus district | IWC | WSP | ESC & ESQWFI | Childcare Taster | ND+fLP | Phase |
|---|---|---|---|---|---|---|---|---|
| Bradford | Bradford | 100 | ✓ | ✓ | ✓ | ✓ | ✓ | 1 |
| North London | Haringey | 40 | ✓ | | ✓ | ✓ | ✓ | 1 |
| SE London | Greenwich | 40 | ✓ | ✓ | ✓ | ✓ | ✓ | 1 |
| SE London | Lewisham | 40 | ✓ | ✓ | ✓ | ✓ | ✓ | 1 |
| Cardiff & Vale | | | ✓ | ✓ | | | ✓ | 2 |
| Central London | | | ✓ | | | ✓ | | 2 |
| Dudley & Sandwell | Sandwell | 60 | ✓ | ✓ | ✓ | ✓ | ✓ | 2 |
| Edinburgh, Lothian & Borders | | | ✓ | ✓ | | | ✓ | 2 |
| Lancashire West | | | ✓ | ✓ | | | | 2 |
| Leeds | | | ✓ | | | ✓ | | 2 |
| Leicestershire | Leicester | 60 | ✓ | ✓ | ✓ | ✓ | ✓ | 2 |
| Leicestershire | Leicestershire | 40 | ✓ | ✓ | ✓ | ✓ | ✓ | 2 |
| Staffordshire | | | ✓ | | | | | 2 |
| West London | | | ✓ | ✓ | | ✓ | | 2 |
| Brent, Harrow & Hillingdon | | | ✓ | | | | | 3 |
| City & East London | | | ✓ | | | | | 3 |
| Lambeth, Southwark & Wandsworth | | | ✓ | | | | | 3 |
| South London | | | ✓ | | | | | 3 |
| Bedfordshire | | | ✓ | | | | | 4 |

Continued

## Table A.2 Continued

| Jobcentre Plus district | LEA in which CT/ESC runs | LEA as percentage of Jobcentre Plus district | IWC | WSP | ESC & ESQWFI | Childcare Taster | ND+fLP | Phase |
|---|---|---|---|---|---|---|---|---|
| Essex | | | ✓ | | | | | 4 |
| Hertfordshire | | | ✓ | | | | | 4 |
| Berkshire | | | ✓ | | | | | 4 |
| Buckinghamshire & Oxfordshire | | | ✓ | | | | | 4 |
| Hampshire | | | ✓ | | | | | 4 |
| Kent | | | ✓ | | | | | 4 |
| Surrey | | | ✓ | | | | | 4 |
| Birmingham & Solihull | | | | | | ✓ | | |
| Forth Valley & Fife | Fife | 100 | | | ✓ | ✓ | | |
| Glasgow | | | | | | ✓ | | |
| Grampian &Tayside | Aberdeenshire | 30 | | | ✓ | ✓ | | |
| Liverpool | | | | | | ✓ | | |
| Oldham & Rochdale | | | | | | ✓ | | |
| SE Wales | Torfaen | 30 | | | ✓ | ✓ | | |

Notes: 'Phase' is assigned by the authors according to the date on which the IWC programme was introduced in each district: April 2004 for the Phase 1 districts, October 2004 for the Phase 2 districts, April 2005 for the Phase 3 districts and October 2005 for the Phase 4 districts. Note that other policies may have been introduced at a later date in some districts. Note that Phases 3 and 4 are formally not considered to be pilot districts, but this project is examining the impact of IWC in these districts. The series 'LEA as percentage of Jobcentre Plus district' is the percentage of lone parents on IS in a particular district that live within the boundaries of the LEA.

# Appendix B Constructing a dataset for analysis using the DWP and HMRC administrative data

This appendix describes how the dataset used for the empirical work was created from the various administrative databases held by the Department for Work and Pensions (DWP).

First, the Income Support (IS) History file and the National Benefits Database (NBD) were used to create a set of IS/Jobseeker's Allowance (JSA) claims that either started between 1 April 2001 and 31 March 2007 or were ongoing on 1 April 2001, and where the claimant was a lone parent at some point during the claim. Consecutive or overlapping claims of IS and JSA by the same individual were merged – because the rules for In-Work Credit (IWC) eligibility treated the two benefits identically – but such claims were only retained in the sample if the last benefit to be claimed was IS and that was by a lone parent, as the data available did not identify whether JSA claimants were lone parents (this means that a small number of claims of JSA from potentially eligible lone parents are not included in the analysis). The use of the IS History database was crucial for this analysis as it allowed the authors to see when changes of circumstances occurred within an individual's claim of IS. This required a lot of cleaning: see Appendix C.

For the difference-in-differences (DiD) analysis, four main sub-samples were derived from the master sample, known as 'the stock sample' (one for each phase), 'the flow sample', 'the variant flow sample' (a variant sample for the flow) used to test for anticipation or substitution effects, and a sample of lone parents who left benefits for work.

- The stock sample for analysing Phase 1 of the lone parent pilots (LPPs) comprised the following: (a) all claims of IS live on 1 April 2001 in the comparison districts and the Phase 1 districts, where the claimant was a lone parent and the duration of the IS/JSA claim exceeded 12 months on that date; plus (b) all claims of IS live on 1 April 2004 in the comparison districts and the Phase 1 districts, where the claimant was a lone parent and the duration of the IS/JSA claim exceeded 12 months on that date. The intention was to create a sample of IS claims that would be immediately eligible for IWC when the LPPs were introduced in the Phase 1 districts, plus their equivalents in the comparison districts, plus their equivalents in the Phase 1 pilot and comparison districts had the LPPs started on 1 April 2001. Stock samples for the other three phases were constructed similarly, always using 1 April 2001 for step (a) but using the actual start date for that phase in step (b).
- The flow sample comprised all claims of IS that reached 12 months' duration between 1 April 2001 and 31 March 2007 and where the claimant was a lone parent on that date, plus other claims of IS whose duration exceeded 12 months where the claimant became a lone parent; these claims were followed from the earliest date meeting all these conditions.[11]
- The variant flow sample comprised all claims of IS made by lone parents between 1 April 2001 and 31 March 2007.
- The sample used to examine the impact on job retention using the DiD method was of potentially eligible lone parents who were observed in the Work and Pensions Longitudinal Study (WPLS) to start work within a month of leaving IS between 1 April 2001 and 31 March 2007.

The analysis in Chapter 3 uses a number of different samples, documented in that chapter.

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[11] The flow sample contained all lone parents who become potentially eligible for IWC at some point after IWC had been introduced in their area. In addition, it contains all lone parents for whom IWC was not in operation when they first became potentially eligible but was in operation on the date outcomes were measured. In DWP Research Report 415 (RR 415), these lone parents only featured in the stock sample (meaning that there was a 'window' in the flow sample between lone parents who became potentially eligible before IWC was in operation and those who became eligible after it was in operation); in the interest of obtaining more precise estimates, these lone parents have been included in the flow sample in this report. Of course, this group has only been partially exposed to the policy at the time their outcome is measured; thus, the impact of the LPPs on these individuals would be expected to be smaller than the impact of the LPPs on the flow sample as a whole. The estimates for this group have been calculated but not shown here in full: the estimated impacts tend to be smaller than those for the rest of the flow sample.

The duration model was estimated on a 5 per cent random sample of all lone parents who started an IS claim on or after 1 April 2001.

Appendix H details the number of IS/JSA claims potentially eligible for the LPPs.

The evaluation also had access to several other DWP databases which could be combined with the main data from the IS History database using encrypted National Insurance number (NINO), orcid. These:

- recorded who had received IWC and when;
- recorded participation in New Deal for Lone Parents (NDLP) and Work Focused Interviews (WFIs);
- included information on all working-age benefits (from the NBD);
- informed the creation of a measure of work (from the WPLS).

For the DiD analysis in Chapters 4, 5, 6 and 8, a large set of background characteristics was added to provide explanatory factors (also see Appendix D). These are:

- a set of benefit (and work) history variables derived from the WPLS and NBD. Variables were created to describe individuals' benefit-claiming and work history during the period 12–21 months (0–30 months for work history) before the individual first became potentially eligible for the LPPs (by definition, all lone parents were on benefit in the 12 months before first becoming potentially eligible for the LPPs). This method was used in Dolton *et al.* (2006), although the periods are a different size in this analysis. The variables were constructed as follows: the relevant period was split into three (benefit) or six (work) equal-sized periods; for each period, an indicator variable was calculated indicating whether the person was mainly in work or mainly on benefit; both sets of variables were independently combined to give two categorical variables, taking values 1 to 8 (benefit) or 64 (work) depending on the ordering of the history over these periods; these categorical variables were then used to generate indicator variables corresponding to each of the possible work and benefit histories;
- a set of background characteristics from the NBD/IS History database, recorded at the start of the claim or at the time at which the individual first became potentially eligible for IWC;
- a set of local-area variables derived from several sources (and described in Appendix C to RR 415, to which have been added the Scottish and Welsh equivalent of the Index of Multiple Deprivation; data on childcare availability was not available for lone parents in Scotland and Wales).

The outcome variables used in the DiD analysis in Chapters 4, 5 and 6 were defined as whether an individual was on an out-of-work benefit (IS, JSA or Incapacity Benefit (IB))/in work **X** days after they first became eligible for the policies, where **X** is defined here as 91, 182, 273, 364, 455, 546, 637, 728, 819 and 910 days

(corresponding approximately to three-monthly intervals). In Chapter 8, these same outcome variables were constructed relative to when a lone parent left IS. For the duration model, the outcome measure was whether a lone parent was receiving IS in a given three-month period.

It should be stressed that the authors consider there to be a degree of noise in the measure of work in the WPLS in both directions. The employment records in the WPLS are based on employers' returns to Her Majesty's Revenue & Customs (HMRC) for individuals they are employing who are earning enough to be liable for income tax or National Insurance. This means that it may not include individuals who are in work but earning below the personal allowance (although the perceived 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, there is a general feeling that the way in which uncertain start and end dates are recorded may lead to an overestimate of the amount of time spent in work if all dates in the WPLS are taken at face value (adjustments made to the WPLS are discussed in Appendix C). The overall effect should be that differences (between groups or over time) in the measure of work in the WPLS underestimate actual changes. There is also no measure of how many hours a week were worked in this data.

The administrative data used in this evaluation limits the population whose outcomes can be measured to people who have claimed a DWP-administered benefit and this means that it cannot provide any information on the impact of the LPPs on measures such as the lone parent employment rate, nor on the proportion of lone parents claiming IS/JSA.

# Appendix C
# Cleaning the DWP and HMRC administrative data

## Cleaning and augmenting the IS History database

The Income Support (IS) History database is supposed to be constructed so that each line gives the dates within which a certain set of personal characteristics is applicable. But the file is not 'cleaned' before being released to users. Appendix A of Department for Work and Pensions (DWP) Research Report 415 (RR 415) described in full how it was cleaned by the authors. This 'cleaning' dealt with the following problems:

- Some lines were exact duplicates of other lines in the dataset (in terms of ccnino, pclmstdt, pefffmdt, pefftodt, pdob, psex, pcd, pptrflg, pnumchld, pdobchld, pbranoff, bdisdat, bdispre and cincapfg).
- For some consecutive lines in the dataset, none of the relevant variables were different from those in the line above.
- There are gaps within a given IS claim where it is unclear which set of personal characteristics apply (i.e. the pefftodt is earlier than the following pefffmdt).
- There are overlaps within a given IS claim where it is unclear which set of personal characteristics apply (i.e. the pefftodt is later than the following pefffmdt).
- In some cases, the first peffmdt of an IS claim was later than the pclmstdt, and in these cases peffmdt was set to be equal to pclmstdt.

- If a postcode was missing or incomplete, information on the postcode was imputed from elsewhere in an individual's IS claim, but only where this would not compromise the integrity of the IS History database (where personal characteristics, including postcode, may change from line to line). In other words, missing and incorrect postcodes were replaced with the postcode from the neighbouring lines of a particular spell but only if one of the personal circumstances (pnumchld, pdobchld, bdisdat, bdispre, cincapfg or pptrflg) that was not postcoded had changed between the two lines.
- To be eligible for the lone parent pilots (LPPs), an individual needs to have been claiming IS (or Jobseeker's Allowance (JSA) and IS continuously) for at least 12 months. Using the IS History database alone to select the sample for the empirical work would, therefore, miss any individuals who had, for example, been claiming JSA for six months and then moved onto IS (and been claiming IS for a period of less than 12 months). All JSA spells from the National Benefits Database (NBD) for individuals in the IS history file were, therefore, appended to the IS History database. The information about JSA claims is only available from the NBD and this restricts information to what is known at the start and end of an individual's claim (and not, for example, at the point at which their claim duration hits 12 months, as for individuals in the IS History database). Lone parents who had been claiming JSA for a period of 12 months or more in the sample (either with or without a consecutive IS spell) were, therefore, omitted from the sample, as it is not known for certain whether they were a lone parent or whether they lived in a pilot district, at the point at which their claim hit 12 months. However, individuals who had initially claimed JSA (but for less than 12 months) and then moved onto IS, without a break in benefit receipt (and, of course, individuals who had been claiming IS alone for a period of 12 months or more) were included in the sample for the empirical work. Including these JSA claims sometimes led to overlapping IS/JSA claims and these were combined together. If there were discrepancies in the personal characteristics of the individual in the two overlapping claims, it was assumed that the information in the more recent claim was accurate.

Further detail on the number of claims, spells or individuals affected by this cleaning is available from the authors on request.

## Cleaning the Work and Pensions Longitudinal Study

The Work and Pensions Longitudinal Study (WPLS) combines employment (or, more accurately, income tax) records from Her Majesty's Revenue & Customs (HMRC) with a range of programme and benefit spells from the DWP. This section describes what was done to the data before it was used in the analysis.

## Dropping 'work' spells from the WPLS

Upon receipt of the employment (income tax) records from HMRC, the DWP performs a number of 'data-cleaning' exercises. Based on recommendations from DWP and the authors' own analysis, the following spells were dropped:

- spells where the individual appeared to be aged under 10 at the start of the spell;
- benefit and work spells that ended before 1 June 1999 or started after 1 April 2007;
- work spells that had negative, zero or one-day length and benefit spells that had negative length;
- work spells flagged by the variable benflag;[12]
- work spells that had been poorly matched to an individual's benefit records (i.e. those with match = AmbRe or RedAm);
- work spells where the start or end dates were genuinely missing (this does **not** mean spells where the start date has been set to 6 April or the end date has been set to 5 April or 31 December 9999).

## Uncertain start and end dates in the WPLS and NBD

Having done this, the work spells in the WPLS still suffer from two major problems:

- duplicate records describing the same spell in work (or near-duplicate records that appear to describe the same spell in work but contain different information about start and end dates);
- uncertain start and end dates: where HMRC knows in which tax year a job started or finished but not the precise date, it uses 6 April to indicate start date and 5 April to indicate end date.

Records of work spells that were exact duplicates (in terms of start and end date) were dropped. If this still left multiple work spells with the same start date, all were dropped except the most recently-added spell with a certain end date. If none of the spells with the same start date had a certain end date, all were dropped except the spell that indicated that the job was ongoing (if it existed). If all of the spells with the same start date had end dates of 5 April, no spells were dropped.

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[12] The variable benflag was created by DWP to identify employment spells that it believes are not really employment spells. This may arise because HMRC records relate to periods in which income tax has been paid (and not necessarily periods in which an individual has been employed), which means it is entirely possible that some of the 'employment' spells in the WPLS are actually periods in which income tax has been paid on the receipt of certain taxable benefits. The variable was augmented by the authors – so that it covered more 'employment spells' – as described in Appendix B of RR 415.

RR 415 added a correction that amended uncertain start and end dates by using information from the NBD (essentially by assuming that the start and end dates of uncertain work spells are likely to have occurred at similar times to the end and start dates (respectively) of out-of-work benefit spells. This report went further by imputing an end date to all ongoing work spells on the day that a subsequent claim for IS was made.

The end date of non-JSA benefit claims is also not known with certainty: the NBD and WPLS record the date of the last extract at which a claim was live (extract), and the date before the first extract where a claim did not appear (cdmaxclm). All that is known is that the claim ended at some point between those two dates. Usually, the gap between cdmaxclm and extract is 13 days for IS spells (because extracts are fortnightly) but the gap can be considerably longer.

# Appendix D
# Explanatory variables used in multivariate analysis

This appendix presents the average (mean) values of the explanatory variables used in the difference-in-differences (DiD) regressions. For the flow sample, outcomes are shown for those lone parents for whom outcomes are available 12 months after first becoming potentially eligible for In-Work Credit (IWC).

## Table D.1 Flow and stock samples, all potentially eligible lone parents

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| *Area-based variables* | | | | | | | | | | |
| In Scotland | 11.2 | 0.0 | 11.9 | 0.0 | 0.0 | 11.9 | 0.0 | 10.7 | 0.0 | 0.0 |
| In Wales | 7.9 | 0.0 | 7.1 | 0.0 | 0.0 | 8.1 | 0.0 | 7.5 | 0.0 | 0.0 |
| Proportion of lone parents in SOA who owned their property in 2001 and in England or Wales | 27.4 | 27.5 | 25.5 | 21.9 | 33.6 | 26.2 | 25.5 | 23.8 | 20.6 | 32.9 |
| Proportion of lone parents in SOA who owned their property in 2001 and in Scotland | 2.3 | 0.0 | 2.8 | 0.0 | 0.0 | 2.3 | 0.0 | 2.5 | 0.0 | 0.0 |
| Day care places per child under 8 in 2003–04 (weighted average of OA, SOA and ward) | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 0.3 | 0.4 |
| Other centre-based care places per child under 8 in 2003–04 (weighted average of OA, SOA and ward) | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Childminder places per child under 8 in 2003–04 (weighted average of OA, SOA and ward) | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| SOA in 2nd quintile of IMD in England | 5.8 | 4.5 | 4.3 | 6.4 | 17.1 | 5.0 | 4.0 | 3.7 | 5.4 | 16.5 |

Continued

## Table D.1 Continued

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| SOA in 3rd quintile of IMD in England | 10.3 | 11.6 | 8.7 | 12.0 | 22.7 | 9.3 | 10.4 | 7.9 | 11.6 | 23.1 |
| SOA in 4th quintile of IMD in England | 17.9 | 30.4 | 21.0 | 27.2 | 28.2 | 17.0 | 31.1 | 21.1 | 26.8 | 29.3 |
| SOA in 5th quintile of IMD in England | 44.0 | 52.1 | 44.9 | 51.2 | 17.8 | 46.2 | 53.3 | 47.4 | 53.7 | 18.2 |
| SOA in 2nd quintile of IMD in Wales | 0.8 | 0.0 | 0.5 | 0.0 | 0.0 | 0.7 | 0.0 | 0.5 | 0.0 | 0.0 |
| SOA in 3rd quintile of IMD in Wales | 1.4 | 0.0 | 0.9 | 0.0 | 0.0 | 1.3 | 0.0 | 0.9 | 0.0 | 0.0 |
| SOA in 4th quintile of IMD in Wales | 2.0 | 0.0 | 1.3 | 0.0 | 0.0 | 2.0 | 0.0 | 1.3 | 0.0 | 0.0 |
| SOA in 5th quintile of IMD in Wales | 3.4 | 0.0 | 3.6 | 0.0 | 0.0 | 3.7 | 0.0 | 4.1 | 0.0 | 0.0 |
| SOA in 2nd quintile of IMD in Scotland | 0.7 | 0.0 | 1.4 | 0.0 | 0.0 | 0.6 | 0.0 | 1.2 | 0.0 | 0.0 |
| SOA in 3rd quintile of IMD in Scotland | 1.5 | 0.0 | 2.2 | 0.0 | 0.0 | 1.3 | 0.0 | 1.8 | 0.0 | 0.0 |
| SOA in 4th quintile of IMD in Scotland | 2.8 | 0.0 | 3.7 | 0.0 | 0.0 | 2.6 | 0.0 | 3.4 | 0.0 | 0.0 |
| SOA in 5th quintile of IMD in Scotland | 6.1 | 0.0 | 3.8 | 0.0 | 0.0 | 7.2 | 0.0 | 3.6 | 0.0 | 0.0 |
| Lone parent employment rate in SOA in 2001 | 66.2 | 61.9 | 65.4 | 61.6 | 73.2 | 65.2 | 61.7 | 64.6 | 61.2 | 73.0 |

Continued

**Table D.1 Continued**

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| Percentage of workless lone parents in SOA with level 4 or 5 qualifications in 2001 | 5.2 | 8.6 | 7.0 | 10.0 | 6.2 | 5.0 | 8.5 | 7.3 | 9.9 | 6.1 |
| Percentage of workless lone parents in SOA with level 3 qualifications in 2001 | 5.5 | 7.9 | 6.8 | 8.8 | 6.3 | 5.4 | 7.8 | 6.9 | 8.7 | 6.2 |
| Percentage of workless lone parents in SOA with level 2 qualifications in 2001 | 21.7 | 21.9 | 20.6 | 22.3 | 25.3 | 21.3 | 21.9 | 20.4 | 22.2 | 25.1 |
| Percentage of workless lone parents in SOA with level 1 qualifications in 2001 | 20.4 | 19.0 | 19.1 | 18.7 | 22.6 | 20.3 | 19.1 | 18.9 | 18.7 | 22.7 |
| Percentage of workless lone parents in SOA with unknown qualifications in 2001 | 4.2 | 4.5 | 4.4 | 4.8 | 3.7 | 4.2 | 4.5 | 4.4 | 4.8 | 3.7 |
| Percentage of Jobcentre offices in Jobcentre Plus district that were integrated when first became eligible for IWC | 12.9 | 0.0 | 10.8 | 14.7 | 17.4 | 2.3 | 0.0 | 0.5 | 3.1 | 6.0 |
| Unemployment in 2000/01 | 3.4 | 3.4 | 3.0 | 3.2 | 2.0 | 3.5 | 3.4 | 3.0 | 3.2 | 2.0 |

Continued

## Table D.1 Continued

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| Unemployment in 2001/02 | 3.1 | 3.2 | 2.8 | 3.0 | 1.8 | 3.2 | 3.2 | 2.8 | 3.0 | 1.8 |
| Unemployment in 2002/03 | 2.9 | 3.3 | 2.8 | 3.2 | 1.9 | 3.0 | 3.3 | 2.8 | 3.2 | 1.9 |
| Unemployment in 2003/04 | 2.8 | 3.3 | 2.8 | 3.2 | 1.9 | 2.9 | 3.3 | 2.8 | 3.3 | 1.9 |
| Unemployment in 2004/05 | 2.5 | 3.1 | 2.6 | 3.1 | 1.8 | 2.6 | 3.1 | 2.6 | 3.1 | 1.8 |
| Unemployment in 2005/06 | 2.7 | 3.2 | 2.7 | 3.2 | 1.9 | 2.8 | 3.2 | 2.8 | 3.2 | 2.0 |
| Unemployment in 2006/07 | 2.9 | 3.2 | 2.9 | 3.1 | 2.1 | 3.0 | 3.3 | 2.9 | 3.2 | 2.1 |
| Unemployment in 2007/08 | 2.6 | 2.8 | 2.5 | 2.7 | 1.8 | 2.7 | 2.8 | 2.5 | 2.7 | 1.8 |
| *Individual-level variables* | | | | | | | | | | |
| Receiving benefits continuously in months –21 to –12 | 24.4 | 20.5 | 23.2 | 20.7 | 17.7 | 90.2 | 91.2 | 90.6 | 91.9 | 89.1 |
| Became potentially eligible for IWC in April–June | 26.0 | 25.8 | 25.8 | 25.7 | 25.6 | n/a | n/a | n/a | n/a | n/a |
| Became potentially eligible for IWC in July–September | 25.7 | 26.2 | 26.1 | 26.0 | 26.0 | n/a | n/a | n/a | n/a | n/a |

Continued

**Table D.1 Continued**

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| Became potentially eligible for IWC in October–December | 22.7 | 22.3 | 22.7 | 22.3 | 22.5 | n/a | n/a | n/a | n/a | n/a |
| White | 80.5 | 42.4 | 66.8 | 34.8 | 77.5 | 78.0 | 46.3 | 63.6 | 39.9 | 75.5 |
| Black | 1.6 | 19.4 | 7.0 | 27.3 | 1.9 | 1.3 | 14.7 | 6.7 | 22.9 | 1.4 |
| Asian | 2.5 | 5.8 | 4.6 | 8.7 | 2.1 | 2.1 | 4.1 | 3.8 | 6.2 | 1.7 |
| Chinese | 0.1 | 0.6 | 0.2 | 0.4 | 0.1 | 0.1 | 0.7 | 0.2 | 0.6 | 0.1 |
| Mixed | 0.7 | 2.3 | 1.6 | 2.7 | 0.8 | 0.7 | 1.8 | 1.4 | 2.5 | 0.7 |
| Other | 0.5 | 7.0 | 3.0 | 5.5 | 0.7 | 0.4 | 5.4 | 2.6 | 4.2 | 0.5 |
| White and first eligible for IWC after 1 April 2004[1] | 30.3 | 16.8 | 25.7 | 13.7 | 31.0 | 38.7 | 23.1 | 31.8 | 19.7 | 38.6 |
| Black and first eligible for IWC after 1 April 2004 | 0.7 | 8.4 | 2.9 | 11.3 | 0.8 | 0.7 | 8.1 | 3.8 | 12.5 | 0.9 |
| Asian and first eligible for IWC after 1 April 2004 | 1.1 | 2.4 | 1.9 | 3.7 | 0.9 | 1.2 | 2.3 | 2.1 | 3.5 | 1.0 |
| Chinese and first eligible for IWC after 1 April 2004 | 0.0 | 0.3 | 0.1 | 0.2 | 0.1 | 0.0 | 0.4 | 0.1 | 0.3 | 0.1 |
| Mixed and first eligible for IWC after 1 April 2004 | 0.3 | 1.1 | 0.7 | 1.2 | 0.4 | 0.4 | 1.0 | 0.8 | 1.4 | 0.4 |
| Other and first eligible for IWC after 1 April 2004 | 0.2 | 3.1 | 1.2 | 2.4 | 0.3 | 0.2 | 3.1 | 1.5 | 2.4 | 0.3 |

Continued

## Table D.1 Continued

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| Male | 8.2 | 8.2 | 8.4 | 8.1 | 7.4 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 |
| Number of children | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 |
| Age of youngest child (years) | 5.3 | 5.1 | 5.3 | 5.2 | 5.2 | 7.0 | 6.8 | 6.9 | 6.9 | 6.9 |
| Amount of IS received at start of claim (£/wk) | 78.38 | 81.43 | 80.08 | 81.92 | 78.43 | 85.77 | 88.76 | 87.64 | 89.03 | 84.83 |
| Age | 30.9 | 32.0 | 31.4 | 32.5 | 31.4 | 33.9 | 34.9 | 34.5 | 35.5 | 34.4 |
| Percentage of months –30 to 0 in work | 24.2 | 22.7 | 24.2 | 24.1 | 27.1 | 13.3 | 13.3 | 13.1 | 13.8 | 15.8 |
| Joined NDLP in months –6 to –12 | 5.4 | 4.8 | 4.5 | 3.9 | 5.0 | 3.7 | 2.5 | 2.9 | 2.5 | 3.9 |
| Joined NDLP before month –12 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 8.1 | 6.5 | 7.3 | 8.0 | 8.8 |
| Ever on JSA in months –18 to 0 | 18.2 | 20.4 | 18.9 | 20.4 | 14.7 | 3.7 | 3.7 | 3.6 | 3.4 | 2.9 |
| Ever received a disability benefit in months –18 to 0 | 26.7 | 19.8 | 24.6 | 19.7 | 17.9 | 19.7 | 13.5 | 17.8 | 13.4 | 12.6 |
| Receiving Bereavement Benefit | 0.6 | 0.4 | 0.6 | 0.6 | 0.5 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 |
| Receiving Disability Living Allowance | 6.2 | 4.5 | 6.0 | 4.4 | 4.7 | 7.7 | 5.7 | 7.5 | 5.9 | 5.6 |
| Receiving Incapacity Benefit | 14.8 | 12.1 | 14.0 | 12.1 | 9.8 | 11.8 | 7.7 | 10.3 | 7.7 | 6.7 |

Continued

## Table D.1 Continued

| Variable | Flow | | | | | Stock | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Comparison districts | Phase 1 | Phase 2 | Phase 3 | Phase 4 |
| Receiving Carer's Allowance | 5.1 | 3.5 | 4.5 | 3.1 | 4.5 | 7.3 | 5.3 | 6.2 | 4.9 | 6.3 |
| Receiving JSA | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Receiving Severe Disablement Allowance | 1.0 | 0.5 | 0.9 | 0.4 | 0.7 | 1.5 | 0.8 | 1.4 | 0.7 | 1.0 |
| Receiving Widow's Benefit | 0.4 | 0.5 | 0.5 | 0.7 | 0.4 | 0.6 | 0.7 | 0.7 | 0.9 | 0.5 |
| Not present in NBD | 0.8 | 0.5 | 0.7 | 0.5 | 0.7 | 0.5 | 0.5 | 0.6 | 0.3 | 0.4 |
| Amount of IS at start of claim missing | 0.8 | 0.5 | 0.7 | 0.5 | 0.7 | 0.5 | 0.5 | 0.6 | 0.3 | 0.4 |
| Had a one-day work spell in WPLS | 9.3 | 7.5 | 7.9 | 7.0 | 7.9 | 5.9 | 4.8 | 4.9 | 4.4 | 5.1 |
| Sample size | 470,349 | 43,663 | 109,476 | 70,365 | 133,914 | 1,642,112 | 42,863 | 100,224 | 74,524 | 107,660 |

Notes: If no date is specified, then characteristics are measured on first date became potentially eligible for IWC. Months are measured relative to first date became potentially eligible for IWC. Indicators for Jobcentre Plus district, detailed work history indicators, detailed benefit history indicators and indicators for quarter of time are not shown. For the flow sample, outcomes are shown for those lone parents for whom outcomes are available 12 months after first becoming potentially eligible for IWC. For the stock samples, there was a different comparison sample for each phase (which were very similar to each other); the table reports the average across these four comparison samples. SOA = Super Output Area; OA = Output Area; IMD = Index of Multiple Deprivation.

[1] The omitted category is 'ethnicity not recorded'. The proportion of lone parents who are recorded as 'ethnicity not recorded' declines over time and so the impact of ethnicity on the outcomes has been allowed to vary over time in a simple manner.

## Table D.2 Sample who left IS for work

| Variable | Comparison districts | Phase 1 pilot districts | Phase 2 pilot districts | Phase 3 pilot districts | Phase 4 pilot districts |
|---|---|---|---|---|---|
| *Area-based variables* | | | | | |
| In Scotland | 12.0 | 0.0 | 14.1 | 0.0 | 0.0 |
| In Wales | 7.8 | 0.0 | 8.1 | 0.0 | 0.0 |
| Proportion of lone parents in SOA who owned their property in 2001 and in England or Wales | 27.4 | 26.5 | 26.6 | 22.0 | 33.2 |
| Proportion of lone parents in SOA who owned their property in 2001 and in Scotland | 2.4 | 0.0 | 3.3 | 0.0 | 0.0 |
| Day care places per child under 8 in 2003–04 (weighted average of OA, SOA and ward) | 0.3 | 0.2 | 0.3 | 0.3 | 0.4 |
| Other centre-based care places per child under 8 in 2003–04 (weighted average of OA, SOA and ward) | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Childminder places per child under 8 in 2003–04 (weighted average of OA, SOA and ward) | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| SOA in 2nd quartile of IMD in England | 6.1 | 4.4 | 4.9 | 7.5 | 17.7 |
| SOA in 3rd quartile of IMD in England | 10.8 | 11.1 | 9.3 | 13.0 | 22.9 |
| SOA in 4th quartile of IMD in England | 18.9 | 30.9 | 20.2 | 28.0 | 28.0 |
| SOA in 5th quartile of IMD in England | 41.4 | 51.9 | 40.8 | 48.1 | 16.8 |
| SOA in 2nd quartile of IMD in Wales | 0.8 | 0.0 | 0.6 | 0.0 | 0.0 |
| SOA in 3rd quartile of IMD in Wales | 1.4 | 0.0 | 1.1 | 0.0 | 0.0 |
| SOA in 4th quartile of IMD in Wales | 2.0 | 0.0 | 1.5 | 0.0 | 0.0 |
| SOA in 5th quartile of IMD in Wales | 3.2 | 0.0 | 4.1 | 0.0 | 0.0 |
| SOA in 2nd quartile of IMD in Scotland | 0.7 | 0.0 | 1.8 | 0.0 | 0.0 |
| SOA in 3rd quartile of IMD in Scotland | 1.7 | 0.0 | 2.7 | 0.0 | 0.0 |
| SOA in 4th quartile of IMD in Scotland | 3.0 | 0.0 | 4.7 | 0.0 | 0.0 |
| SOA in 5th quartile of IMD in Scotland | 6.4 | 0.0 | 3.9 | 0.0 | 0.0 |
| Lone parent employment rate in SOA in 2001 | 67.0 | 63.8 | 66.8 | 63.1 | 73.5 |
| Percentage of workless lone parents in SOA with level 4 or 5 qualifications in 2001 | 5.1 | 7.9 | 6.1 | 10.0 | 6.1 |
| Percentage of workless lone parents in SOA with level 3 qualifications in 2001 | 5.5 | 7.3 | 6.1 | 8.6 | 6.2 |

Continued

## Table D.2 Continued

| Variable | Comparison districts | Phase 1 pilot districts | Phase 2 pilot districts | Phase 3 pilot districts | Phase 4 pilot districts |
|---|---|---|---|---|---|
| Percentage of workless lone parents in SOA with level 2 qualifications in 2001 | 21.9 | 21.7 | 20.7 | 22.7 | 25.5 |
| Percentage of workless lone parents in SOA with level 1 qualifications in 2001 | 20.6 | 19.4 | 19.7 | 19.1 | 22.8 |
| Percentage of workless lone parents in SOA with unknown qualifications in 2001 | 4.2 | 4.6 | 4.4 | 4.8 | 3.8 |
| Percentage of Jobcentre offices in Jobcentre Plus district that were integrated when left IS for work | 4.3 | 0.0 | 3.2 | 5.3 | 6.0 |
| Unemployment in 2000/01 | 3.4 | 3.5 | 3.0 | 3.2 | 2.0 |
| Unemployment in 2001/02 | 3.1 | 3.2 | 2.8 | 3.0 | 1.8 |
| Unemployment in 2002/03 | 2.9 | 3.3 | 2.8 | 3.2 | 1.9 |
| Unemployment in 2003/04 | 2.8 | 3.3 | 2.7 | 3.2 | 1.9 |
| Unemployment in 2004/05 | 2.5 | 3.0 | 2.5 | 3.1 | 1.8 |
| Unemployment in 2005/06 | 2.7 | 3.2 | 2.7 | 3.2 | 1.9 |
| Unemployment in 2006/07 | 2.9 | 3.2 | 2.9 | 3.1 | 2.1 |
| Unemployment in 2007/08 | 2.6 | 2.8 | 2.5 | 2.6 | 1.8 |
| *Individual-level variables* | | | | | |
| Receiving benefits continuously in months –21 to –12 | 10.9 | 9.4 | 10.8 | 8.7 | 9.3 |
| Left IS for work in April–June | 26.1 | 24.2 | 25.4 | 24.2 | 26.5 |
| Left IS for work in July–September | 24.7 | 22.8 | 24.7 | 24.4 | 22.5 |
| Left IS for work in October–December | 30.8 | 31.8 | 30.6 | 29.8 | 31.5 |
| White | 84.8 | 58.2 | 78.1 | 43.6 | 80.1 |
| Black | 1.2 | 16.7 | 4.3 | 28.3 | 1.4 |
| Asian | 0.9 | 2.6 | 2.4 | 4.2 | 0.9 |
| Chinese | 0.1 | 0.3 | 0.1 | 0.2 | 0.1 |
| Mixed | 0.7 | 2.3 | 1.4 | 3.2 | 0.6 |
| Other | 0.4 | 3.2 | 1.1 | 2.9 | 0.6 |
| White and left IS for work after 1 April 2004[1] | 40.0 | 29.1 | 38.7 | 22.0 | 38.3 |
| Black and left IS for work after 1 April 2004 | 0.6 | 8.7 | 2.3 | 14.9 | 0.7 |
| Asian and left IS for work after 1 April 2004 | 0.5 | 1.3 | 1.3 | 2.3 | 0.5 |
| Chinese and left IS for work after 1 April 2004 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| Mixed and left IS for work after 1 April 2004 | 0.4 | 1.4 | 0.8 | 2.0 | 0.4 |

Continued

## Table D.2 Continued

| Variable | Comparison districts | Phase 1 pilot districts | Phase 2 pilot districts | Phase 3 pilot districts | Phase 4 pilot districts |
|---|---|---|---|---|---|
| Other and left IS for work after 1 April 2004 | 0.2 | 1.7 | 0.5 | 1.4 | 0.2 |
| Male | 4.5 | 4.2 | 4.6 | 3.9 | 4.0 |
| Number of children | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| Age of youngest child (years) | 7.2 | 7.4 | 7.2 | 7.1 | 7.5 |
| Amount of IS received at start of claim (£/wk) | 8.6 | 8.7 | 8.9 | 8.6 | 9.1 |
| Age | 32.5 | 33.6 | 32.7 | 33.9 | 33.5 |
| Percentage of months –30 to 0 in work | 11.5 | 12.4 | 11.9 | 12.6 | 13.0 |
| Joined NDLP in months –6 to –12 | 8.0 | 8.3 | 7.9 | 8.6 | 7.2 |
| Joined NDLP before month –12 | 8.4 | 9.2 | 8.2 | 12.7 | 8.5 |
| Ever on JSA in months –18 to 0 | 6.7 | 6.7 | 6.8 | 6.6 | 6.0 |
| Ever received a disability benefit in months –18 to 0 | 10.1 | 6.2 | 9.0 | 5.9 | 6.0 |
| Receiving Bereavement Benefit | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 |
| Receiving Disability Living Allowance | 1.7 | 1.5 | 1.9 | 1.3 | 1.3 |
| Receiving Incapacity Benefit | 2.9 | 2.4 | 2.7 | 1.9 | 1.9 |
| Receiving Carer's Allowance | 3.1 | 2.6 | 3.1 | 2.0 | 2.7 |
| Receiving JSA | 2.4 | 2.5 | 2.6 | 2.8 | 2.9 |
| Receiving Severe Disablement Allowance | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 |
| Receiving Widow's Benefit | 0.2 | 0.3 | 0.2 | 0.2 | 0.3 |
| Not present in NBD | 83.2 | 84.4 | 83.2 | 85.2 | 84.2 |
| Amount of IS at start of claim missing | 83.2 | 84.4 | 83.2 | 85.2 | 84.2 |
| Had a one-day work spell in WPLS | 14.1 | 13.5 | 12.9 | 12.4 | 11.8 |
| Sample size | 101,145 | 5,821 | 20,576 | 8,702 | 24,826 |

Notes: If no date is specified, then characteristics are measured on first date became potentially eligible for IWC. Months are measured relative to first date became potentially eligible for IWC. Indicators for Jobcentre Plus district, detailed work history indicators, detailed benefit history indicators and indicators for quarter of time are not shown. Outcomes are shown for those lone parents for whom outcomes are available 12 months after leaving IS for work.

[1] The omitted category is 'ethnicity not recorded'. The proportion of lone parents who are recorded as 'ethnicity not recorded' declines over time, and so the impact of ethnicity on the outcomes has been allowed to vary over time in a simple manner.

# Appendix E
# The difference-in-differences estimator of the additional impact of the lone parent pilots

Many of the estimated impacts of the additional impact of the lone parent pilots (LPPs) presented in this report were calculated using a difference-in-differences (DiD) estimator. In particular, a DiD estimator was used to estimate the additional impact of the LPPs on:

- the flow of potentially eligible lone parents;
- the stock of potentially eligible lone parents;
- potentially eligible lone parents who left Income Support (IS) for work.

This appendix gives the theoretical justification for a DiD estimator and more details on the specifications used.

## Background

Identifying the impact of the LPPs on those who were potentially eligible for In-Work Credit (IWC) requires the following key question to be answered: what would the outcomes of lone parents living in the pilot districts have been if they had not had access to the pilots? This is called the 'counterfactual'. Constructing the counterfactual is the central issue that most evaluations face.[13]

Constructing the counterfactual – i.e. estimating what would have happened in the absence of the LPPs – can, in principle, be addressed with an appropriate comparison (or control) group which was not affected by the pilots. Such a group needs to be **as similar as possible** to the pilot group (to those lone parents whose IS/Jobseeker's Allowance (JSA) claim made them potentially eligible for the pilots), as the purpose of the comparison group is to provide a guide to the outcomes that lone parents in the pilot group would have achieved had they not been affected by the pilots. Given a suitable comparison group, and some important assumptions, it is then possible to estimate reliably the impact of the pilots on these outcomes.

RR 415 explained why the preferred comparison group is lone parents who have been claiming IS/JSA for at least 12 months living in districts that are not affected by the LPPs. But it concluded that simply comparing the labour market outcomes of lone parents living in the pilot and comparison districts is not sufficient to obtain an unbiased estimate of the impact of the LPPs, because there are unobserved differences in some labour market outcomes (evidence supporting this is provided in Section 4.2 of this report, as well as in RR 415, Appendix J). However, if one is prepared to assume that these unobserved differences are changing in the same way over time across all districts, then the impact of the LPPs can be estimated using a DiD estimator. This is otherwise known as the 'common trends' assumption; it might mean, for example, that the level (the local unemployment rate) is different, but that the trend (the change in unemployment over time) is the same.

This is the path taken in this report. In the simplest implementation of DiD using ordinary least squares (OLS) regression – where there is only one pilot and two time periods (before and after the pilot begins) – three indicator variables are required: the first indicates whether the individual lives in a pilot or comparison district; the second indicates whether the outcome in question is observed before or after the pilot was introduced; the third is the interaction of the first two variables (taking value 1 if the individual lives in the pilot district **and** has an outcome observed after the pilot has started and 0 otherwise). It is the estimated coefficient on the third variable that provides the estimate of the impact of the LPPs (see Box E.1 for details).

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13 Some of this is taken from Department for Work and Pensions (DWP) Research Report 415 (RR 415). See also Blundell and Costa Dias (2000, 2008).

**Box E.1: DiD estimators**

An alternative way of describing the DiD estimator in the simplest context is as follows:

| | Before policy | | After policy | |
|---|---|---|---|---|
| | Comparison districts | Pilot districts | Comparison districts | Pilot districts |
| Lone parents | $B^0$ | $A^0$ | $B^1$ | $A^1$ |

If the letters A and B refer to the mean (average) outcome for pilot and comparison groups respectively, 0 indicates outcomes measured before the introduction of the LPPs and 1 indicates outcomes measured after the introduction of the LPPs, then, having controlled for differences in observable characteristics, the DiD estimator is given by $(A^1 – A^0) – (B^1 – B^0)$. This is the trend (or difference) in outcomes in the pilot districts minus the equivalent trend in the comparison districts. It is also equal to $(A^1 – B^1) – (A^0 – B^0)$, the amount by which the difference between pilot and comparison area outcomes changes after the policy. This is the difference in the difference (hence the name).

With a DiD estimator, it is necessary to measure outcomes and background characteristics for individuals in both pilot and comparison districts both before and after the introduction of the LPPs. The pilot districts were listed in Table A.2; rather than choosing a set of Jobcentre Plus districts to form the comparison group, this report uses all districts in Great Britain that operated neither the LPPs nor the Employment Retention and Advancement (ERA) demonstration as the comparison group.[14] Data was used on potentially eligible lone parents from 1 April 2001 to 31 March 2007.[15]

The drawback of this comparison group is that it comprises lone parents who live in different parts of the country from the lone parents who were potentially eligible for IWC. If there are characteristics of the neighbourhoods in which lone parents live (or characteristics of the lone parents themselves that differ across districts) that are important determinants of labour market outcomes but that cannot be controlled for in our analysis (i.e. that are unobservable to the

14 Birmingham & Solihull, Glasgow, Liverpool and Oldham & Rochdale have been included in the comparison districts for the purposes of this evaluation, because the impact of the Childcare Tasters pilot alone was judged to be minimal. Three districts that operated only Quarterly Work Focused Interviews (QWFIs) were excluded from the pilot and comparison districts. One difference with RR 415 is that districts from Scotland and Wales are now included in the set of comparison districts.

15 RR 415 used April 2002 as the start date; this could affect the estimates of the impact of the LPPs, particularly for the stock sample.

researcher), then the evaluation may attribute an effect to the LPPs that is in reality due to unobserved differences between the pilot and comparison groups. This possibility is exacerbated by the fact that the pilot districts were chosen for having particularly high lone parent shares in the IS caseload and particularly low off-flow rates from IS. For these reasons, the estimates control for a large number of personal and neighbourhood characteristics that are relevant to the likelihood of working or claiming benefits, in order to substantially reduce the remaining unobserved neighbourhood characteristics that might influence labour market outcomes. (See Appendix D of this report and Appendix C of RR 415 for more details about the local-area characteristics that are controlled for.)

Estimates based on DiD are only ever valid if the assumption of 'common trends' is true in practice. Verbally, this requires that any unobserved influences on labour market outcomes do not change in different ways between the pilot and comparison groups during the period under consideration. A common informal test of the 'common trends' assumption is to test for a 'placebo effect' – in other words, to apply the DiD method to a period of time (or even a group of districts) where it is known that there was no policy change and then to test whether the DiD estimator correctly estimates there to be no effect. Section 4.2 reports the results of a similar test, which examines whether the differences in outcomes between each of the pilot phases and the set of comparison districts are constant over the period before the LPPs began.

A final concern for any attempts to recover the true impact of the LPPs is that the situation in this case is more complicated than in Box E.1. First, there is not one single date for implementation of the policy but instead, four phases, each with its own start date. Second, this report has access to data covering six years of outcomes and so a simple 'before' and 'after' split may be an inadequate specification of the underlying trends in outcomes. The analysis that looks at the flow sample therefore uses a generalisation of the simplest DiD model to allow for multiple time periods, multiple areas and multiple start dates; however, the principle is identical.

A DiD estimator can be implemented using either linear methods (OLS or fully interacted linear matching (FILM)) or propensity score matching (PSM) techniques. In previous work by the authors, estimates based on PSM took prohibitively long to calculate, and estimates using FILM were little different from those using OLS, and so all regressions were carried out using OLS with robust estimates of variance.

## Estimating the impact of the LPPs on work-contingent outcomes: dynamic selection bias

The DiD methodology is an appropriate method for estimating the overall effect of the LPPs on the population of interest: lone parents who are potentially eligible for IWC. However, it is also interesting to estimate the impact of the LPPs for their recipients on outcomes such as job duration/retention or the time until

another IS claim (it is highly likely that these effects will be dominated by those of IWC). However, this is not entirely straightforward, because the change in the population of interest – from all potentially eligible lone parents to, for example, all lone parents who leave IS for work – introduces what economists call a 'selection problem', because the sub-group of interest is defined by the choices that the group made.

It is easiest to explain this by means of an example. Suppose one is interested in the effect of the LPPs on the duration of work spells. Further suppose that one could find a comparison group of lone parents that is, on average, just like the group who are potentially eligible for IWC (such as one that would have been achieved had lone parents been given eligibility for IWC through a randomised trial). This comparison group would allow us to estimate the effect of the LPPs on the transition into work by a straightforward comparison of group averages (means). However, such a comparison group would not allow us to estimate the effect of the LPPs on subsequent employment durations. The reason is as follows: if the original pilot districts and comparison group are, on average, the same but the LPPs lead to a larger fraction of the pilot districts gaining employment, the employed pilot districts members will not necessarily be the same, on average, as the employed comparison group members. Although some of these differences will be reflected in the data in the Work and Pensions Longitudinal Study (WPLS) (i.e. they are observable), some of them may not be (i.e. they are unobservable).

To give an example, suppose that the key unobserved characteristic is intrinsic motivation: the most motivated find employment. Intrinsic motivation varies across individuals but is, on average, the same in the treatment and comparison groups of potentially eligible lone parents (that is the definition of a good comparison group). Suppose that the **X** per cent most motivated lone parents in the comparison group find work and the **Y** per cent most motivated individuals in the pilot districts find work; because the LPPs make it more likely that a lone parent will leave benefit for work, **Y** should be greater than **X**. But the average intrinsic motivation of employed members of the pilot districts will then not (in general) be equal to that of the employed members of the comparison group: if the treatment provides additional motivation to find work, then individuals in the pilot districts with lower intrinsic motivation will find work, and this in turn means that the average intrinsic motivation among employed members of the pilot districts will be lower than the average intrinsic motivation of employed members of the comparison group. A simple comparison of employment durations between the pilot districts and comparison group would then confound the true effect of the LPPs on employment durations with these differences in the intrinsic motivation of the employed members of the two groups (indeed, it would usually lead to an estimate of the treatment effect that is too small).

This is an example of what economists call a 'dynamic selection problem'. Initial randomisation – or the initial suitability of a DiD estimator – breaks down if we wish to study dynamic outcomes for a subset of the original population of interest, such as the duration of subsequent spells of employment and non-employment. Ham and Lalonde (1996) were the first to term this effect 'dynamic selection bias'. Note that this argument does not mean that the DiD methodology cannot be used to examine the impact of the LPPs on employment outcomes: the problem of dynamic selection bias arises when an outcome of interest is only measurable for a subset of the population, and that subset is defined by choices they make. For example, Sections 4.1 and 4.3 report estimates of the impact of the LPPs on the likelihood that a potentially eligible lone parent is in work; because this outcome can be measured for all potentially eligible lone parents, there is no dynamic selection bias.

This report takes two approaches to the possible existence of dynamic selection bias when looking at outcomes for those potentially eligible lone parents who leave benefit for work:

- Estimates are presented from a DiD estimator that was implemented on potentially eligible lone parents who leave benefit for work, in order to estimate the impact of the LPPs on subsequent outcomes. As argued above, this will produce biased estimates of the true impact of the LPPs if there is dynamic selection bias. On the other hand, because the DiD estimators are able to control for a very wide range of characteristics of the lone parent and the area in which they live, including previous benefit and work histories, it is possible that the magnitude of any dynamic selection bias is small.
- Estimates are presented of the impact of the LPPs based on a duration model. These models explicitly account for the way that outcomes depend both on IWC and on the unobserved characteristics of treated and untreated individuals. Because the unobserved heterogeneity is explicitly modelled, there is no dynamic selection bias (provided that it is modelled correctly).

## Estimating the additional impact of the LPPs on the stock of potentially eligible lone parents

For the stock sample, a relatively simple DiD estimator was implemented, as follows:[16]

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

In this equation, $i$ indexes individuals, $g$ indexes whether in a pilot district or control district, and $t$ is 0 or 1 (depending on whether the individual was observed before or after the LPPs began). The outcome of interest, $\lambda_t$, depends on: $\gamma$, a set of time effects (i.e. in this case, an indicator for being observed after the LPPs began);

16 The notation draws on Wooldridge (2007).

$\alpha_g$, a constant; a set of individual-level characteristics, $z_{igt}$; an individual-specific error term assumed to be independent and identically-distributed (iid) across individuals, $u_{igt}$; and $x$, which is merely the interaction of an indicator for being in a pilot district with an indicator for being observed after the LPPs had begun. The coefficient $\beta$, therefore, gives the estimated impact of the LPPs.

This equation was estimated separately for each outcome $\gamma$ (off benefit and in work) and separately for each duration $d$ (the time between the actual or hypothetical pilot starting and the outcome being measured), and separately for each of the four pilot phases, making 36 regressions altogether, and with no constraints that any coefficients should be equal across any of the regressions. There would be an efficiency gain from estimating the set of regressions for each phase simultaneously, or in a panel data framework, but this has not been pursued.

This DiD estimator does not make use of the fact that some individuals stop being eligible for the LPPs if they leave IS or if they remain on IS but move from a pilot into a comparison district, stop being responsible for a child or start to cohabit. Instead, the estimate of the impact of the LPPs should be thought of as estimating the 'intention to treat': the lone parents in the stock sample are those who were potentially eligible for the LPPs on their first day of operation, rather than those lone parents who were potentially eligible on any subsequent date.

## Estimating the additional impact of the LPPs on the flow of potentially eligible lone parents, and the set of potentially eligible lone parents who left IS for work

For the flow sample, a more sophisticated approach was taken, which uses data on all pilot districts simultaneously and fully accounts for the different start dates of the LPPs in the four pilot phases. This leads to a generalisation of the simplest DiD estimator that allows for multiple time periods (in this case, 24 quarters), multiple areas of interest (in this case, four pilot phases and one set of comparison districts) and multiple implementation dates (in this case, four) of the policy. The main benefit of this method is that it uses more information: if the LPPs have a genuine effect, then we would expect to see that effect in the four different phases following the four different dates that the LPPs were introduced.

The equation estimated is therefore:[17]

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

The notation is as before, but this time $\lambda_t$ is a full set of quarterly indicators or other ways of capturing changes over time, $\alpha_g$ is a full set of area effects (i.e. indicators for being in each of the four pilot phases or the comparison districts) and $x_{gt}$ is a set of indicators that are 1 for being in a district that is operating the LPPs at that time.

17 The following equation and notation are taken from Wooldridge (2007).

Estimates of the impact of the LPPs were generated under a number of different ways of specifying the time effects, $\lambda_t$, and the treatment effects, $x_{gt}$.

The time trend variants were:

1. a full set of quarterly indicators, common to all districts;
2. no time trend, but four indicators for whether the first date of potential eligibility occurred after the four start dates for the LPPs (irrespective of the district in which the lone parent was living);
3. separate quadratic time trends for each of the four phases plus the set of control districts, plus four indicators for whether the first date of potential eligibility occurred after the four start dates for the LPPs (irrespective of the district in which the lone parent was living);
4. separate linear time trends for each of the four phases and the set of control districts, plus a common quadratic time trend, plus four indicators for whether the first date of potential eligibility occurred after the four start dates for the LPPs (irrespective of the district in which the lone parent was living).

The treatment effect variants were:

1. $x_{gt}$ constrained to be identical across all cohorts of lone parents and phases, i.e. $x$;
2. $x_{gt}$ constrained to be identical across all cohorts of lone parents but different for each phase, i.e. $x_g$;
3. $x_{gt}$ different across cohorts of lone parents and for each phase, i.e. $x_{gt}$.

In all cases, the time variables and the treatment impact variables were defined based on the first date of potential eligibility. In addition to this, an indicator variable was added for lone parents in the treatment districts if the first date of potential eligibility occurred before the start date of the LPPs but outcomes were measured after the start date of the LPPs; this ensures that these lone parents do not contribute to the estimate of the additional impact of the LPPs.

Separate estimates were then made of the impact of the LPPs on the two different outcomes (off benefit and in work), and the outcomes at different durations $d$ (the time between first becoming potentially eligible for IWC and the outcome being measured). As with the stock sample, there would be an efficiency gain from estimating the combined set of regressions in a panel data framework, but this was not pursued.

Like the DiD estimates for the stock samples, this estimator does not make use of the fact that some individuals stop being eligible for the LPPs if they leave IS or if they remain on IS but move from a pilot into a comparison district, stop being responsible for a child or start to cohabit. Instead, the estimate of the impact of the LPPs should be thought of as estimating the 'intention to treat': the lone parents in the flow sample are those who were potentially eligible for the LPPs

when their claim reached 12 months, rather than those lone parents who were potentially eligible on their first day of operation.

The DiD estimator used on the set of potentially eligible lone parents who left IS for work was implemented in a very similar manner to this but with a different sample and measuring all dates relative to when the lone parent left IS for work.

# Appendix F
# Using a duration model to estimate the impact of the lone parent pilots

This report used a duration model to simulate how lone parents' transitions onto and off benefit depend upon observable and unobservable characteristics, and potential eligibility for, or receipt of, In-Work Credit (IWC). This appendix provides details about this model.

The model has been designed as if the only part of the lone parent pilots (LPPs) were IWC, because it takes explicit account of which lone parents received IWC; however, it is possible that any effects attributed to IWC in the model were caused by other parts of the LPPs.

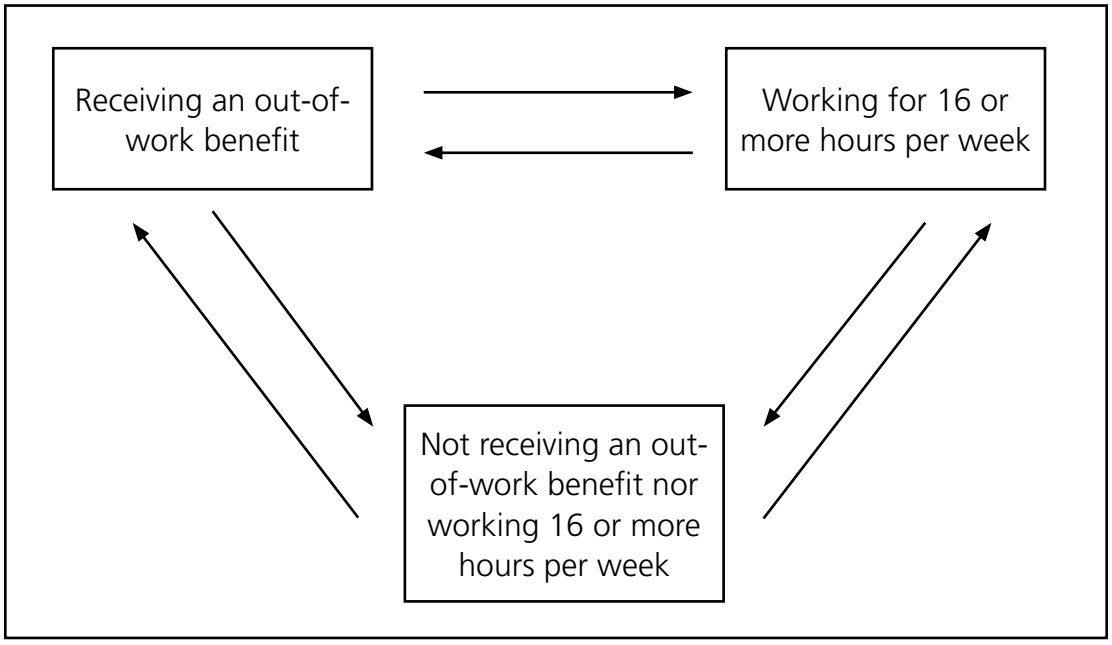
Given that this evaluation is seeking to understand the impact of IWC on whether lone parents are receiving out-of-work benefits or are in work, an ideal model would allow lone parents to be in one of three (exhaustive and mutually exclusive) states:

1. receiving an out-of-work benefit (for simplicity, the duration model defines 'on benefit' as being on Income Support (IS); this is different from the difference-in-differences (DiD) analysis, where 'off benefit' is defined as 'not receiving IS, Jobseeker's Allowance (JSA) or Incapacity Benefit (IB)').
2. not receiving an out-of-work benefit and in work for at least 16 hours per week;
3. not receiving an out-of-work benefit and working for fewer than 16 hours per week (including not working at all).

A duration model is based on data on transitions from one state to another: in this ideal model, there are six potential transitions (see Figure F.1). Although the

administrative data used in this project is in the form of spell data, it is often easier to work with discrete time data and to pretend that outcomes are observed only on specific dates and to ignore transitions between the states in the periods not observed. The transitions in Figure F.1 could be modelled as a function of observable and unobservable characteristics, as well as being potentially eligible for, or receiving, IWC; a simple way to do this is to express the probability of making each transition (sometimes known as 'the hazard') as a multinomial logit (one for each starting state).

**Figure F.1 Complete model of all work and benefit transitions**




However, the data available to the authors was not sufficient to estimate this ideal model. As discussed in Section 3.1 (and in Department for Work and Pension (DWP) Research Report 415 (RR 415)), 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 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 (because they have recently left IS/JSA for IWC, for example; see Chapter 3). And, although some techniques based on linear regression can be adapted simply to deal with this sort of measurement error, adapting a duration model to account for measurement error is substantially more complicated.

For this reason, the duration model estimated for this report 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 benefit, the model cannot tell whether they are working at least 16 hours a week or not. However, given the programme rules, lone parents receiving IWC are working 16 or more hours.

Given this problem with the data, the model estimated for this report takes full account of these data constraints in the following ways:

- There are only two initial states – receiving an out-of-work benefit and not receiving an out-of-work benefit.
- The model uses data on only three transitions:
  - i a transition from receiving an out-of-work benefit to work of 16 or more hours a week;
  - ii a transition from receiving an out-of-work benefit to work of 15 or fewer hours a week (including not working at all);
  - iii a transition from not receiving an out-of-work benefit to receiving an out-of-work benefit.
- It is only possible to distinguish between the first two transitions for lone parents who are potentially eligible for IWC and 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 IS move into work of 16 or more hours if and only if they then claim IWC (note that there is no way of reliably estimating the take-up rate of IWC amongst previously potentially eligible lone parents who stop receiving IS and move into work of 16 or more hours). This means that, for those lone parents who are not potentially eligible for IWC, the model simply examines transitions from receiving an out-of-work benefit to not receiving an out-of-work benefit, and it models this transition as the sum of the transition of leaving an out-of-work benefit for work of 16 or more hours and the probability of leaving an out-of-work benefit for work of fewer than 16 hours.
- The transitions from receiving an out-of-work benefit are modelled using a multinomial logit model and the transition from not receiving an out-of-work benefit is modelled using a logit.

To estimate the impact of IWC, the model allows the transition from receiving an out-of-work benefit to work of 16 or more hours a week to depend upon being potentially eligible for IWC and it allows the transition from not receiving an out-of-work benefit to receiving an out-of-work benefit to depend upon receipt of IWC. Since potential eligibility for IWC depends upon duration on IS, calendar time and whether a lone parent is in a pilot district or not, these variables themselves need to be included as explanatory factors so that our estimate of the impact of IWC identifies the genuine treatment effect rather than duration, time or area effects. 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:

i. 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 benefit;

ii. from variation in the transition rates between lone parents in the same Jobcentre Plus district and with the same duration on benefit but before and after the introduction of IWC;

iii. from variation in the transition rates among lone parents in the same Jobcentre Plus district observed after the introduction of IWC but with different durations on benefit.

Finally, the transitions are allowed to depend upon unobservable characteristics. Two versions of the model were estimated with different approaches to specifying the nature of this dependence:

1. The unobserved heterogeneity is assumed to be uncorrelated across individuals and uncorrelated across time periods for a given individual. This is effectively assuming that there is no dynamic selection bias.

2. The unobserved heterogeneity is assumed to be uncorrelated across individuals but correlated for a given individual over time and between transitions. 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.

The WPLS does now contain tax credit information for lone parents who have at some point received a DWP benefit, but this was not available to the authors in time for this report. The authors hope that, if the tax credit data provides a more reliable guide as to who is in work of 16 or more hours, the duration model could be expanded so it is more like the ideal model.

## Specifying the likelihood

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 benefit to work of 16 or more hours at time $t$ be:

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

and the additional utility from moving from benefit to work of fewer than 16 hours (including zero) at time $t$ be:

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

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 benefit received out of work), $\theta$ is an individual random effect and $\varepsilon$ 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 benefit 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 benefit to work of fewer than 16 hours (including zero) is:

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

while the probability of remaining on benefit is:

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

For those not potentially eligible for IWC, since we cannot observe their destination as discussed above, we model the probability of them leaving benefit as:

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

A similar reasoning can be used to model the probability of a lone parent starting a benefit claim as:

$$(7) \quad \lambda_{nb,b}(t \mid \theta_{nb,b}) = \frac{\exp(z_{nb,b}(t \mid \theta_{nb,b}))}{1 + \exp(z_{nb,b}(t \mid \theta_{nb,b}))}$$

and the probability of them remaining off benefit as:

$$(8) \quad 1 - \lambda_{nb,b}(t \mid \theta_{nb,b}) = \frac{1}{1 + \exp(z_{nb,b}(t \mid \theta_{nb,b}))}$$

In the more general specification, we assume that the unobserved heterogeneity terms in the three equations follow the one factor structure:

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

where $\theta^*$ takes a two mass point discrete distribution and $\alpha_{b,w} = 0$ and $c_{b,w} = 1$. While the fact that we only allow for two types of unobserved heterogeneity might seem limiting, increasing the number of points of support in these types of model usually has little impact on the results.

We take as our 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. We then

take quarterly observations on them from that point until the end of our data on 31 March 2007. This gives us a very large sample size of over 1.4 million lone parents, from which, given the computational intensity of the model, 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. 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 is estimated using maximum likelihood.

Table F.1 shows the distribution of the number of transitions onto and off benefit made by lone parents during the period we observe them (this relates to the full population in the WPLS, rather than the 5 per cent sample used for estimating the model). Only a quarter of the sample have more than one transition, and this will limit the ability of the model to identify accurately the extent to which the unobserved heterogeneity is correlated across spells. All of the sample start on benefit, so an odd number of transitions (1, 3, 5, … ) means that they are off benefit at the end of the sample window, and zero or an even number of transitions (2, 4, 6, …) means that they are on benefit at the end of the sample window.

### Table F.1 Transitions onto and off IS 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 IS claims starting on or after 1 April 2001 where the claimant was a lone parent at some point during the claim.

## Coefficient estimates

Tables F.2–F.7 show the estimated coefficients, including the impact of being potentially eligible for IWC on the transitions from receiving IS to work of 16 or more hours, from receiving IS to work of fewer than 16 hours and from not receiving IS to receiving IS, both with and without controls for correlated unobserved heterogeneity. Three different models are estimated: a baseline model (Tables F.2 and F.3), which does not account for anticipation effects or breakdown

in the 'common trends' assumption after IWC is introduced; a model that allows for anticipation effects for those who are soon to become eligible to IWC (Tables F.4 and F.5); and a model where the probability of leaving benefit changes in the pilot areas after IWC is introduced (we refer to this as 'time-varying area effects') (Tables F.6 and F.7).

## Table F.2 Coefficient estimates for the transition from receiving IS to work of 16 or more hours and the transition from receiving IS to work of fewer than 16 hours: baseline model

| | *No unobserved heterogeneity* | | *Correlated unobserved heterogeneity* | |
|---|---|---|---|---|
| Dependent variable: | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS 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)*** |

Continued

## Table F.2 Continued

| | *No unobserved heterogeneity* | | *Correlated unobserved heterogeneity* | |
|---|---|---|---|---|
| Dependent variable: | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* |
| 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 |
| | (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 F.3 Coefficient estimates for the transition from not receiving IS to receiving IS: baseline model

| | *No unobserved heterogeneity* | *Correlated unobserved heterogeneity* |
|---|---|---|
| Dependent variable: | *Not receiving IS to receiving IS* | |
| 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)*** |

Continued

## Table F.3 Continued

| | *No unobserved heterogeneity* | *Correlated unobserved heterogeneity* |
|---|---|---|
| Dependent variable: | *Not receiving IS to receiving IS* | |
| 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 |

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 F.4 Coefficient estimates for the transition from receiving IS to work of 16 or more hours and the transition from receiving IS to work of fewer than 16 hours: model with anticipation effects

| | *No unobserved heterogeneity* | | *Correlated unobserved heterogeneity* | |
|---|---|---|---|---|
| Dependent variable: | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* |
| Constant | –4.313 | –2.626 | N/A | –0.205 |
| | (30.15)*** | (96.11)*** | | (.) |
| Potentially eligible for IWC | 0.484 | N/A | 0.563 | N/A |
| | (4.61)*** | | (5.27)*** | |
| Will soon become eligible for IWC (anticipation effect) | –0.110 | N/A | 0.294 | N/A |
| | (0.25) | | (0.95) | |
| Number of children | –0.110 | 0.008 | –0.125 | 0.000 |
| | (5.00)*** | (1.31) | (5.08)*** | (0.07) |
| Youngest child aged < 1 | –0.916 | –0.500 | –1.090 | –0.511 |
| | (5.65)*** | (20.73)*** | (6.63)*** | (22.66)*** |
| Youngest child aged 1–3 | –0.219 | –0.408 | –0.271 | –0.424 |
| | (2.99)*** | (19.53)*** | (3.26)*** | (20.56)*** |
| Youngest child aged 3–5 | –0.135 | –0.254 | –0.221 | –0.267 |
| | (1.69)* | (11.19)*** | (2.54)** | (12.89)*** |
| Youngest child aged 5–11 | –0.035 | –0.294 | –0.059 | –0.295 |
| | (0.51) | (14.86)*** | (0.76) | (16.46)*** |
| Time trend | –0.182 | 0.059 | –0.188 | 0.039 |
| | (8.81)*** | (6.09)*** | (6.66)*** | (5.64)*** |
| Time$^2$ | 0.455 | –0.162 | 0.489 | –0.123 |
| | (6.66)*** | (6.54)*** | (6.66)*** | (6.33)*** |
| Duration | 0.043 | –0.160 | 0.084 | –0.134 |
| | (2.24)** | (30.16)*** | (4.19)*** | (34.29)*** |
| Duration$^2$ | –0.219 | 0.398 | –0.293 | 0.336 |
| | (3.00)*** | (17.98)*** | (3.86)*** | (18.33)*** |
| In Phase 1 pilot area | –0.200 | –0.431 | –0.046 | –0.462 |
| | (1.58) | (12.08)*** | (0.33) | (14.08)*** |
| In Phase 2 pilot area | 0.069 | –0.176 | 0.244 | –0.201 |
| | (0.61) | (6.76)*** | (1.89)* | (8.68)*** |
| In Phase 3 pilot area | –0.346 | –0.415 | –0.206 | –0.444 |
| | (2.87)*** | (13.57)*** | (1.47) | (15.95)*** |
| In Phase 4 pilot area | 0.061 | –0.111 | 0.211 | –0.127 |
| | (0.57) | (4.70)*** | (1.62) | (5.80)*** |

Continued

## Table F.4 Continued

| | *No unobserved heterogeneity* | | *Correlated unobserved heterogeneity* | |
|---|---|---|---|---|
| Dependent variable: | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* |
| Quarter 2 dummy | 0.198 | –0.111 | 0.102 | –0.086 |
| | (2.19)** | (4.34)*** | (1.09) | (4.61)*** |
| Quarter 3 dummy | 0.319 | 0.124 | 0.323 | 0.129 |
| | (4.53)*** | (6.97)*** | (4.33)*** | (8.18)*** |
| Quarter 4 dummy | 0.211 | –0.165 | 0.138 | –0.140 |
| | (2.56)** | (6.66)*** | (1.55) | (7.54)*** |
| Unobserved heterogeneity mass points: | | | | |
| Type 1 | N/A | | –4.999 | |
| | | | (.) | |
| Type 2 | N/A | | –3.628 | |
| | | | (85.40)*** | |
| Loading factor on unobserved heterogeneity mass point | N/A | | 1 (fixed) | 0.510 (110.13)*** |
| Proportion of lone parents of type 1 | N/A | | 0.772 | |
| Log likelihood | –283,820.27 | | –283,427.34 | |
| 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 F.5 Coefficient estimates for the transition from not receiving IS to receiving IS: model with anticipation effects

| | *No unobserved heterogeneity* | *Correlated unobserved heterogeneity* |
|---|---|---|
| Dependent variable: | *Not receiving IS to receiving IS* | |
| Constant | –3.004 | –0.137 |
| | (347.38)*** | (.) |
| Receiving IWC | –0.222 | –0.281 |
| | (3.08)*** | (3.79)*** |
| Number of children | –0.128 | –0.133 |
| | (18.16)*** | (17.89)*** |
| Youngest child aged < 1 | 0.785 | 0.769 |
| | (21.55)*** | (20.37)*** |
| Youngest child aged 1–3 | 0.582 | 0.574 |
| | (25.25)*** | (23.86)*** |
| Youngest child aged 3–5 | 0.470 | 0.471 |
| | (19.60)*** | (18.93)*** |
| Youngest child aged 5–11 | 0.486 | 0.480 |
| | (24.55)*** | (23.29)*** |
| Time trend | –0.017 | –0.014 |
| | (3.00)*** | (2.40)** |
| Time$^2$ | 0.062 | 0.051 |
| | (3.48)*** | (2.82)*** |
| Duration | –0.227 | –0.211 |
| | (46.21)*** | (42.13)*** |
| Duration$^2$ | 0.611 | 0.568 |
| | (21.96)*** | (20.11)*** |
| In Phase 1 pilot area | –0.076 | –0.090 |
| | (1.93)* | (2.18)** |
| In Phase 2 pilot area | –0.020 | –0.032 |
| | (0.89) | (1.38) |
| In Phase 3 pilot area | –0.102 | –0.122 |
| | (3.22)*** | (3.62)*** |
| In Phase 4 pilot area | –0.087 | –0.091 |
| | (4.25)*** | (4.21)*** |
| Quarter 2 dummy | 0.100 | 0.103 |
| | (5.09)*** | (5.18)*** |
| Quarter 3 dummy | 0.018 | 0.022 |
| | (0.93) | (1.08) |
| Quarter 4 dummy | –0.079 | –0.078 |
| | (3.97)*** | (3.91)*** |

Continued

## Table F.5 Continued

| | *No unobserved heterogeneity* | *Correlated unobserved heterogeneity* |
|---|---|---|
| Dependent variable: | *Not receiving IS to receiving IS* | |
| Loading factor on unobserved heterogeneity component | N/A | 0.637 |
| | | (101.99)*** |
| Log likelihood | –283,820.27 | –283,427.34 |
| Sample size: | 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 F.6 Coefficient estimates for the transition from receiving IS to work of 16 or more hours and the transition from receiving IS to work of fewer than 16 hours: model with time-varying area effects

| | *No unobserved heterogeneity* | | *Correlated unobserved heterogeneity* | |
|---|---|---|---|---|
| Dependent variable: | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* |
| Constant | –4.366 | –2.603 | N/A | –2.295 |
| | (20.49)*** | (67.59)*** | | (6.36)*** |
| Potentially eligible for IWC | 0.885 | N/A | 0.601 | N/A |
| | (4.45)*** | | (2.74)*** | |
| After IWC and in pilot area (failure of 'common trends' assumption) | –0.322 | –0.044 | –0.507 | 0.039 |
| | (1.35) | (1.15) | (2.76)*** | (0.93) |
| Number of children | –0.120 | 0.007 | –0.130 | 0.008 |
| | (5.14)*** | (1.12) | (3.54)*** | (1.14) |
| Youngest child aged < 1 | –0.970 | –0.500 | –1.023 | –0.484 |
| | (5.64)*** | (21.06)*** | (5.86)*** | (16.91)*** |
| Youngest child aged 1–3 | –0.216 | –0.405 | –0.379 | –0.412 |
| | (2.81)*** | (20.00)*** | (4.09)*** | (16.66)*** |
| Youngest child aged 3–5 | –0.134 | –0.253 | –0.266 | –0.262 |
| | (1.65)* | (11.47)*** | (2.60)*** | (9.84)*** |
| Youngest child aged 5–11 | –0.018 | –0.292 | –0.007 | –0.326 |
| | (0.25) | (15.04)*** | (0.08) | (8.53)*** |
| Time trend | –0.184 | 0.054 | –0.060 | 0.027 |
| | (7.06)*** | (5.37)*** | (1.84)* | (4.26)*** |
| $Time^2$ | 0.468 | –0.147 | 0.132 | –0.084 |
| | (5.73)*** | (5.66)*** | (1.39) | (4.57)*** |
| Duration | 0.049 | –0.158 | 0.021 | –0.146 |
| | (2.42)** | (26.44)*** | (0.35) | (29.95)*** |
| $Duration^2$ | –0.237 | 0.393 | 0.038 | 0.366 |
| | (3.13)*** | (16.46)*** | (0.20) | (16.58)*** |
| In Phase 1 pilot area | –0.223 | –0.399 | –0.357 | –0.385 |
| | (1.59) | (10.26)*** | (1.62) | (6.96)*** |
| In Phase 2 pilot area | 0.043 | –0.146 | –0.064 | –0.133 |
| | (0.34) | (4.89)*** | (0.28) | (2.77)*** |
| In Phase 3 pilot area | –0.374 | –0.393 | –0.530 | –0.372 |
| | (2.83)*** | (12.35)*** | (2.47)** | (6.85)*** |

Continued

## Table F.6 Continued

| | *No unobserved heterogeneity* | | *Correlated unobserved heterogeneity* | |
|---|---|---|---|---|
| Dependent variable: | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* | *Stops receiving IS for work of 16 or more hours* | *Stops receiving IS for work of fewer than 16 hours (including not working)* |
| In Phase 4 pilot area | 0.033 | –0.091 | –0.099 | –0.067 |
| | (0.27) | (3.44)*** | (0.45) | (1.39) |
| Quarter 2 dummy | 0.177 | –0.104 | 0.076 | –0.096 |
| | (1.79)* | (3.97)*** | (0.88) | (3.48)*** |
| Quarter 3 dummy | 0.327 | 0.125 | 0.407 | 0.092 |
| | (4.48)*** | (6.89)*** | (6.17)*** | (3.57)*** |
| Quarter 4 dummy | 0.193 | –0.158 | 0.128 | –0.161 |
| | (2.11)** | (5.93)*** | (1.61) | (5.48)*** |
| Unobserved heterogeneity mass points: | | | | |
| Type 1 | N/A | | –5.228 | |
| | | | (.) | |
| Type 2 | N/A | | –2.586 | |
| | | | (.) | |
| Loading factor on unobserved heterogeneity component | N/A | | 1 (fixed) | 0.085 (1.38) |
| Proportion of lone parents of type 1 | N/A | | 0.746 | |
| Log likelihood | –283,815.62 | | –283,495.14 | |
| 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 F.7 Coefficient estimates for the transition from not receiving IS to receiving IS: model with time-varying area effects

| | *No unobserved heterogeneity* | *Correlated unobserved heterogeneity* |
|---|---|---|
| Dependent variable: | *Not receiving IS to receiving IS* | |
| Constant | –3.004 | –1.535 |
| | (347.38)*** | (16.21)*** |
| Receiving IWC | –0.222 | –0.531 |
| | (3.08)*** | (6.66)*** |
| Number of children | –0.128 | –0.129 |
| | (18.16)*** | (16.82)*** |
| Youngest child aged < 1 | 0.785 | 0.797 |
| | (21.55)*** | (20.47)*** |
| Youngest child aged 1–3 | 0.582 | 0.588 |
| | (25.25)*** | (23.39)*** |
| Youngest child aged 3–5 | 0.470 | 0.474 |
| | (19.60)*** | (18.74)*** |
| Youngest child aged 5–11 | 0.486 | 0.474 |
| | (24.55)*** | (22.26)*** |
| Time trend | –0.017 | –0.016 |
| | (3.00)*** | (2.58)*** |
| $Time^2$ | 0.062 | 0.056 |
| | (3.48)*** | (3.03)*** |
| Duration | –0.227 | –0.209 |
| | (46.21)*** | (39.28)*** |
| $Duration^2$ | 0.611 | 0.568 |
| | (21.96)*** | (19.96)*** |
| In Phase 1 pilot area | –0.076 | –0.067 |
| | (1.93)* | (1.50) |
| In Phase 2 pilot area | –0.020 | –0.013 |
| | (0.89) | (0.47) |
| In Phase 3 pilot area | –0.102 | –0.098 |
| | (3.22)*** | (2.62)*** |
| In Phase 4 pilot area | –0.087 | –0.080 |
| | (4.25)*** | (3.28)*** |
| Quarter 2 dummy | 0.100 | 0.105 |
| | (5.09)*** | (5.31)*** |
| Quarter 3 dummy | 0.018 | 0.024 |
| | (0.93) | (1.20) |
| Quarter 4 dummy | –0.079 | –0.078 |
| | (3.97)*** | (3.90)*** |

Continued

## Table F.7 Continued

| | *No unobserved heterogeneity* | *Correlated unobserved heterogeneity* |
|---|---|---|
| Loading factor on unobserved heterogeneity component | N/A | 0.348 |
| | | (20.09)*** |
| Log likelihood | –283,815.62 | –283,495.15 |
| Sample size: | 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).

A positive coefficient on a variable means that a higher value of that variable makes a transition more likely but the scale of the coefficients has no immediate interpretation. The following variables are associated with more frequent transitions from IS 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 IS 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 IS (conditional on having previously stopped an IS claim):

- having more dependent children;
- having older children;
- being in one of the Phase 3 or 4 districts rather than one of the comparison districts.

There are also statistically significant seasonal effects, time trends and duration impacts in all three transitions but these are harder to characterise.

Anticipation effects are statistically insignificant in both the models with and without unobserved heterogeneity, although time-varying area effects are statistically significant in the model with unobserved heterogeneity.

None of these results varies dramatically according to whether unobserved heterogeneity across individuals is accounted for or whether we allow for

anticipation or time-varying area effects, although there are small changes in the pure 'duration dependence' when unobserved heterogeneity is introduced.

Finally, 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 IS, in all the models. These effects are of similar magnitude in the baseline model and the model with anticipation effects but are much larger in the model with time-varying area effects. Introducing unobserved heterogeneity into the baseline model makes little difference to the size of these effects. The differences between the models with and without unobserved heterogeneity are greater in the models with anticipation effects and time-varying area effects. In the case of the model with anticipation effects, the impact of IWC is larger when unobserved heterogeneity is introduced. In the model with time-varying area effects, IWC has a smaller impact on transitions into work but a larger impact on transitions onto IS when unobserved heterogeneity is introduced.

## Simulating outcomes in the absence of IWC using calibrated random terms

The duration model can 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 to simulate the probability of each transition occurring and then using a set of random numbers (corresponding to the error terms in the logit or multinomial logit) to decide whether each transition actually did occur at each point in time. By doing this successively over time, a simulated on- and off-benefit and on- and off-IWC profile is produced for each lone parent.

For example, suppose that for a particular lone parent, there are predicted probabilities of 20 per cent, 15 per cent, 10 per cent and 5 per cent that there is a transition from receiving an out-of-work benefit to not receiving an out-of-work benefit in four successive quarters. A random number between 0 and 1 is then produced for each quarter. The rule used is that, if the random number is less than the predicted probability, the transition occurs. For example, if the four random numbers were 0.34, 0.87, 0.16 and 0.45, the simulated lone parent would remain on IS for all four quarters. If the four random numbers were 0.34, 0.87, 0.09 and 0.45, the simulated lone parent would leave IS in the third quarter.

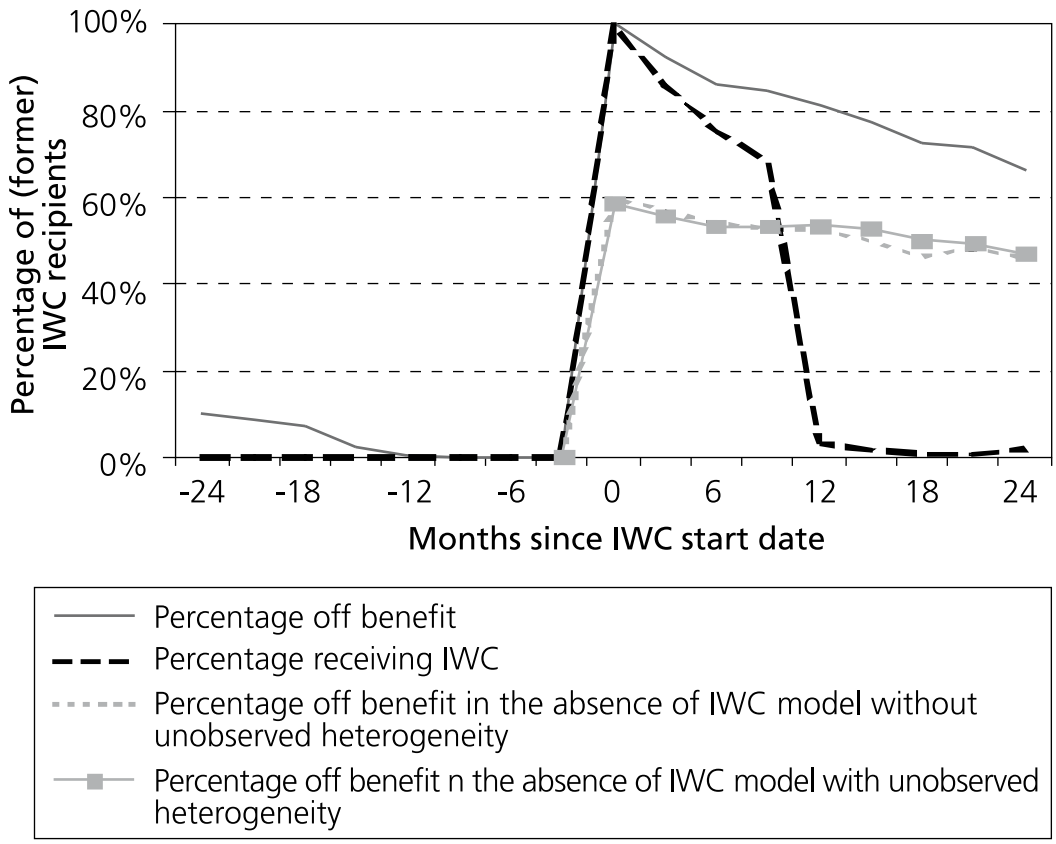
However, when using this method to simulate the impact of a policy, it is convenient to choose the random numbers so that the simulated outcomes are identical to the actual outcomes when the policy is in effect. This is known as calibrating the errors. For example, suppose a lone parent who is potentially eligible for IWC leaves IS for a job of 16 or more hours (and IWC) in the sixth quarter, and suppose that the predicted probability of leaving IS for a job of 16 or more hours in each quarter were given by 20 per cent, 15 per cent, 10 per cent, 5 per cent, 25 per cent and 20 per cent, with the rise in probability in the fifth quarter due to the lone parent becoming potentially eligible for IWC at that time. To be consistent

with the actual outcomes, the calibrated random terms for each quarter would have to lie between 0.20 and 1, 0.15 and 1, 0.10 and 1, 0.05 and 1, 0.25 and 1, and 0 and 0.2 respectively.

Finally, suppose that the actual calibrated random numbers were 0.24, 0.78, 0.56, 0.09, 0.36 and 0.18 and suppose that, in the absence of IWC, the predicted probabilities of leaving IS for a job of 16 or more hours in each quarter were given by 20 per cent, 15 per cent, 10 per cent, 5 per cent, 4 per cent and 3 per cent; note that the predicted probabilities in quarters 1–4 have not changed as the lone parent is not potentially eligible for IWC in those periods, but they are much lower in quarters 5 and 6. If the calibrated random terms are compared with these predicted probabilities in order to simulate outcomes in the absence of IWC, it can be seen that the simulation would suggest that this lone parent would not have left IS in the sixth quarter in the absence of IWC, as the calibrated random term of 0.18 is higher than the predicted probability of 3 per cent.

Figure F.2 shows the result of such a simulation for all IWC recipients in the sample. It shows the percentage who are simulated to receive IS and IWC in each quarter relative to when they actually received IWC. Outcomes are simulated with and without the existence of IWC: by construction, simulated outcomes with IWC are identical to the lone parents' actual outcomes at this time. The figure is based on the model where there are no anticipation effects or time-varying area effects.

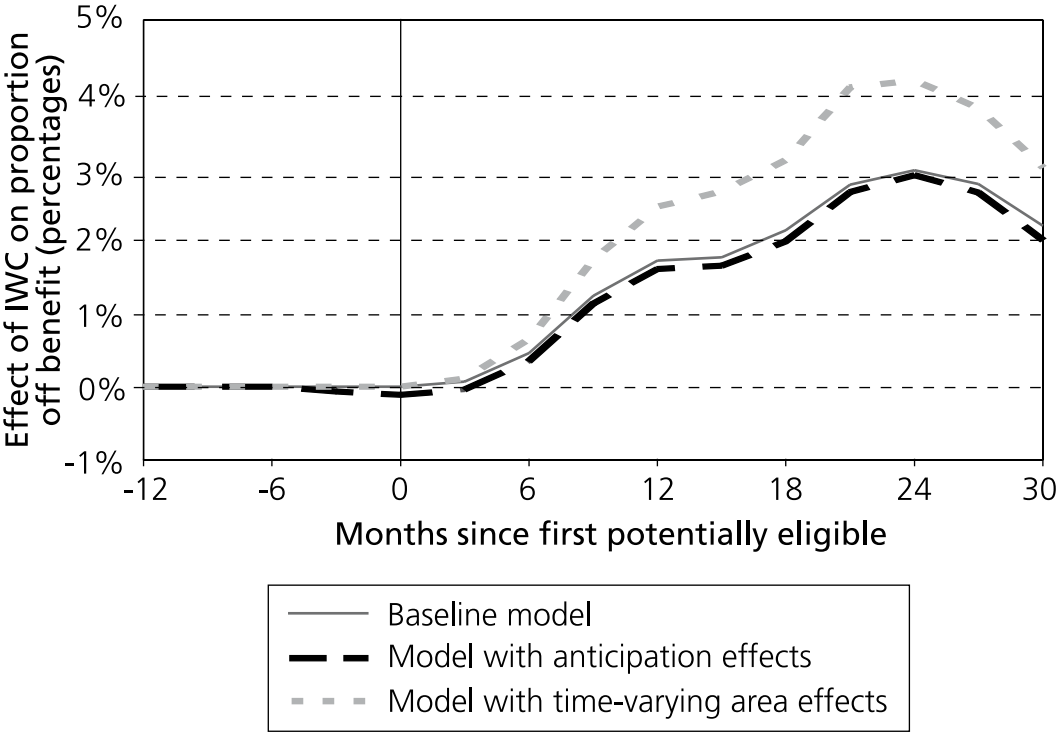
**Figure F.2 Simulated outcomes for IWC recipients in the absence of the LPPs**




Notes: Actual percentages off benefit 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 F.3 shows the result of a simulation for all those who start a benefit 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. We see that any anticipation effects are very small; however, the effect of IWC increases if we allow for time-varying area effects.

**Figure F.3 Impact of IWC on proportion of potentially eligible lone parents off benefit in different models**




Notes: Simulations using results of models described above without unobserved heterogeneity. Errors calibrated as described in this section.

Figure F.2 confirms analysis in Chapter 3 of this report that:

- around seven out of ten IWC recipients remain on IWC for the full 12 months;
- there is no evidence that substantial numbers of IWC recipients go on to claim IS when their IWC payments stop after 12 months.

What the duration model adds are the grey lines, which simulate what fraction of IWC recipients would have left IS anyway without IWC: the difference between this and the fraction who in reality left IS gives the net impact of IWC (expressed as a fraction of its recipients). Figure F.2 shows that:

- around 40 per cent of IWC recipients would not have left benefit when they did in the absence of the LPPs. This is, therefore, the initial impact of the LPPs, so the initial level of deadweight is around 60 per cent;
- the impact falls over time and two years later it is only half its initial magnitude. The decline is gradual, though, and there is no evidence that the impact of IWC ceases once payments of it stop after 12 months.

A comparison of the models with and without unobserved heterogeneity suggests that:

- models with no unobserved heterogeneity are clearly rejected in favour of models with correlated unobserved heterogeneity (the likelihood ratio test for the baseline model has a value of 778.8, which is highly statistically significant);
- the specification of the unobserved heterogeneity allowed there to be two types of lone parents, with different propensities to leave benefit for work of 16 or more hours, to leave benefit for work of less than 16 hours and to start a benefit 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 benefit 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). This means that failing to account for selection effects when comparing the length of time off benefit for lone parents leaving benefit in the pilot and control areas will bias the estimate of the effect of the LPPs upwards. This is because, according to the duration model, the LPPs induce more lone parents who are both less likely to leave benefit and less likely to leave work to leave benefit than would otherwise have done so. Despite this, however, comparing Figure F.3 and Table 4.1 shows that the duration model's estimates of the effect of the LPPs on the length of time spent off benefit are slightly larger than those from the DiD model, considerably so in the case of the duration model with time-varying area effects;
- allowing for correlated unobserved heterogeneity does change some of the important coefficients in the model. In the baseline model, although there are some changes to the duration dependence when unobserved heterogeneity is added, the simulation of the effect of the LPPs on the proportion of lone parents off benefit is virtually unaffected. However, the effect of the LPPs is slightly larger when unobserved heterogeneity is controlled for in the model with anticipation effects. In the model with time-varying area effects, the estimated impact of IWC is smaller when unobserved heterogeneity is controlled for.

Comparing the results from the baseline model with the models with anticipation effects and time-varying area effects (Figure F.3) 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. Indeed, in the model without unobserved heterogeneity, the results suggest that lone parents are more likely to leave benefit in the first 12 months after the introduction of IWC, which is contrary to what we would expect from economic theory;
- allowing for time-varying area effects increases the effect of IWC on the proportion of lone parents off benefit by up to 1 percentage point in the model where unobserved heterogeneity is not controlled for, although the coefficient is statistically insignificant. In the model with unobserved heterogeneity, the time-varying area effect is statistically significant but the estimated impact of IWC is smaller.

# Appendix G Supplementary analysis of IWC recipients

Table G.1 shows the number of starts of In-Work Credit (IWC) by phase and by month (up to 31 March 2007). This data is used in the estimates of take-up shown in Chapter 3. It shows that:

- there is considerable variation across the year in IWC starts, with September being the month with the highest number of IWC starts, and smaller peaks in January and May (disregarding the initial surges in Phases 2 and 4, which happen in November);
- in Phases 2 and 4, there is evidence of a surge of claims in the first full month that the IWC was operating (November 2004 and 2005 respectively). This suggests either that lone parents were delaying leaving Income Support (IS) and starting work until the IWC began or that some lone parents were making retrospective IWC claims as soon as the policy began for jobs that they had recently started;
- the administrative data suggests a very small number of IWC claims started before the policy became available.

## Table G.1 IWC starts, by phase and month

| *Month* | *Year* | *Not an IWC district* | *Phase 1* | *Phase 2* | *Phase 3* | *Phase 4* | *Unknown* | *Total* |
|---|---|---|---|---|---|---|---|---|
| 1 | 2004 | | 1 | | | | | 1 |
| 2 | 2004 | | 2 | | 1 | | | 3 |
| 3 | 2004 | | 19 | | | | | 19 |
| 4 | 2004 | | 94 | | 3 | 1 | | 98 |
| 5 | 2004 | | 103 | | 3 | 3 | 2 | 111 |
| 6 | 2004 | 1 | 122 | | 3 | | | 126 |
| 7 | 2004 | | 85 | | 5 | 2 | | 92 |
| 8 | 2004 | | 99 | 2 | 3 | 2 | | 106 |
| 9 | 2004 | 1 | 234 | 4 | 3 | | | 242 |
| 10 | 2004 | 1 | 191 | 181 | 3 | 3 | 1 | 380 |
| 11 | 2004 | 4 | 263 | 745 | 8 | | 2 | 1,022 |
| 12 | 2004 | 2 | 88 | 243 | 4 | | | 337 |
| 1 | 2005 | 1 | 170 | 450 | 6 | 3 | 2 | 632 |
| 2 | 2005 | 4 | 192 | 498 | 12 | 4 | 2 | 712 |
| 3 | 2005 | 2 | 171 | 549 | 37 | 3 | 1 | 763 |
| 4 | 2005 | 6 | 210 | 583 | 193 | 5 | 2 | 999 |
| 5 | 2005 | 2 | 178 | 669 | 228 | 2 | 4 | 1,083 |
| 6 | 2005 | 3 | 178 | 502 | 180 | 2 | 4 | 869 |
| 7 | 2005 | 4 | 147 | 462 | 177 | 2 | 1 | 793 |
| 8 | 2005 | 5 | 165 | 528 | 204 | 3 | 4 | 909 |
| 9 | 2005 | 2 | 295 | 833 | 386 | 7 | 6 | 1,529 |
| 10 | 2005 | 3 | 227 | 764 | 300 | 22 | 2 | 1,318 |
| 11 | 2005 | 11 | 303 | 904 | 359 | 1,054 | 5 | 2,636 |
| 12 | 2005 | 5 | 129 | 358 | 166 | 373 | 3 | 1,034 |
| 1 | 2006 | 3 | 243 | 568 | 350 | 791 | 4 | 1,959 |
| 2 | 2006 | 7 | 184 | 547 | 281 | 684 | 13 | 1,716 |
| 3 | 2006 | 7 | 195 | 550 | 245 | 663 | 7 | 1,667 |
| 4 | 2006 | 10 | 192 | 535 | 284 | 666 | 6 | 1,693 |
| 5 | 2006 | 10 | 195 | 618 | 275 | 836 | 13 | 1,947 |
| 6 | 2006 | 7 | 149 | 496 | 244 | 681 | 12 | 1,589 |
| 7 | 2006 | 8 | 146 | 454 | 210 | 592 | 8 | 1,418 |
| 8 | 2006 | 4 | 131 | 508 | 250 | 682 | 9 | 1,584 |
| 9 | 2006 | 10 | 263 | 826 | 435 | 1,262 | 18 | 2,814 |
| 10 | 2006 | 13 | 270 | 822 | 405 | 1,026 | 16 | 2,552 |
| 11 | 2006 | 10 | 209 | 642 | 375 | 822 | 12 | 2,070 |
| 12 | 2006 | 8 | 110 | 358 | 195 | 434 | 10 | 1,115 |

Continued

## Table G.1 Continued

| *Month* | *Year* | *Not an IWC district* | *Phase 1* | *Phase 2* | *Phase 3* | *Phase 4* | *Unknown* | *Total* |
|---|---|---|---|---|---|---|---|---|
| 1 | 2007 | 10 | 211 | 557 | 371 | 700 | 18 | 1,867 |
| 2 | 2007 | 6 | 193 | 494 | 314 | 650 | 10 | 1,667 |
| 3 | 2007 | 6 | 201 | 528 | 310 | 673 | 17 | 1,735 |
| All | | 176 | 6,558 | 16,778 | 6,828 | 12,653 | 214 | 43,207 |
| Monthly average | | 5 | 182 | 559 | 285 | 703 | 6 | 1,200 |

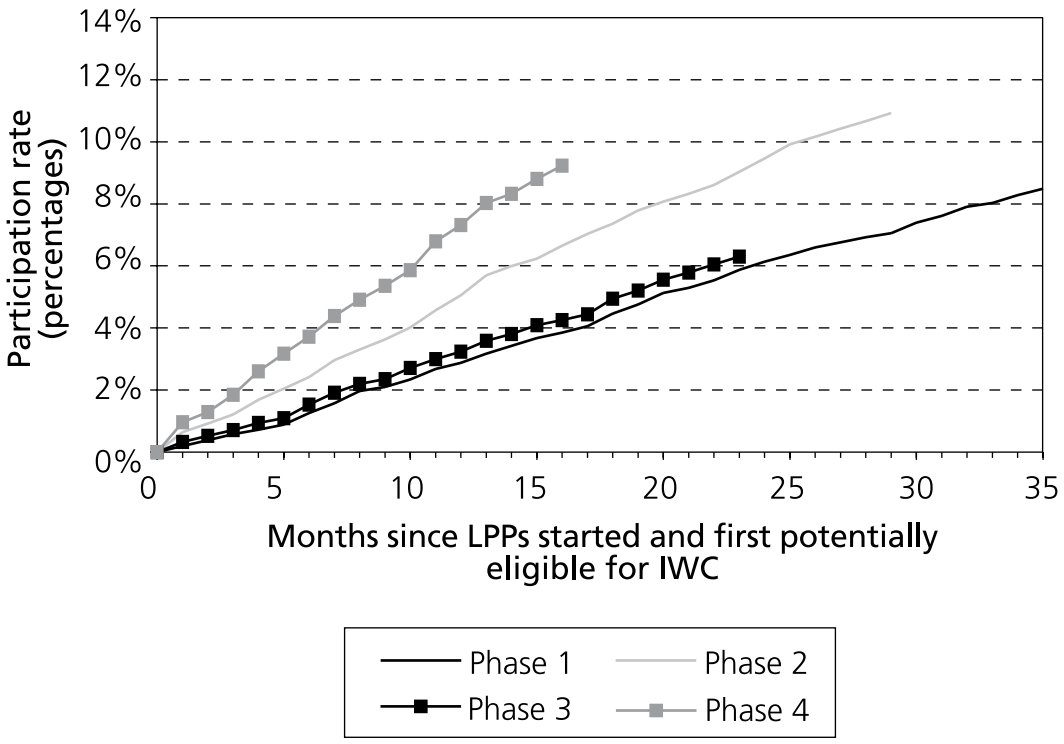
Base is all IWC claims that started on or before 31 March 2007.

Source: Individual-level data on IWC payment dates and amounts.

Notes: The relevant phase is imputed by merging in Jobcentre Plus district based on postcode (using encrypted National Insurance number (NINO)) from the IS History database. 'Unknown' represents IWC claims for which a relevant IS claim from a lone parent could not be found; these may therefore be IWC claims from eligible partners. 'Not an IWC district' indicates that the postcode held in the IS History database around the time that the IWC claim started is not in a lone parent pilot (LPP) district. 'Monthly average' is defined over 36 months for Phase 1, 30 months for Phase 2, 24 months for Phase 3, 18 months for Phase 4 and 36 months for the remaining averages.

Figures G.1 and G.2 split the sample of potentially eligible lone parents into the stock and flow respectively, and show the take-up rate of IWC. For both figures, the variations by district and over time are extremely similar to those in Figure 3.1. Note that for Figure G.2, the horizontal axis no longer measures time since the LPPs began but measures the time that the lone parents have been potentially eligible for IWC. This means that the denominator is not constant across the horizontal axis: almost all lone parents in the flow sample have been potentially eligible for a month and so contribute to the first data point but very few lone parents have been potentially eligible for over 30 months. The surge in month 1 reflects those lone parents in the flow sample who, according to the administrative data, first received IWC before becoming potentially eligible for it; this could reflect errors in the administrative data over the start dates of IWC, or errors in the IS History database from which the authors estimated the first date on which lone parents were potentially eligible for IWC. The downturn for Phase 3 towards the end of the series may reflect the very small sample or delays in IWC awards that genuinely began towards the end of the sample window appearing in the administrative data.

**Figure G.1 Take-up measure (i): recipients of IWC as percentage of all lone parents in stock sample, by phase and month since LPPs started (up to 31 March 2007)**

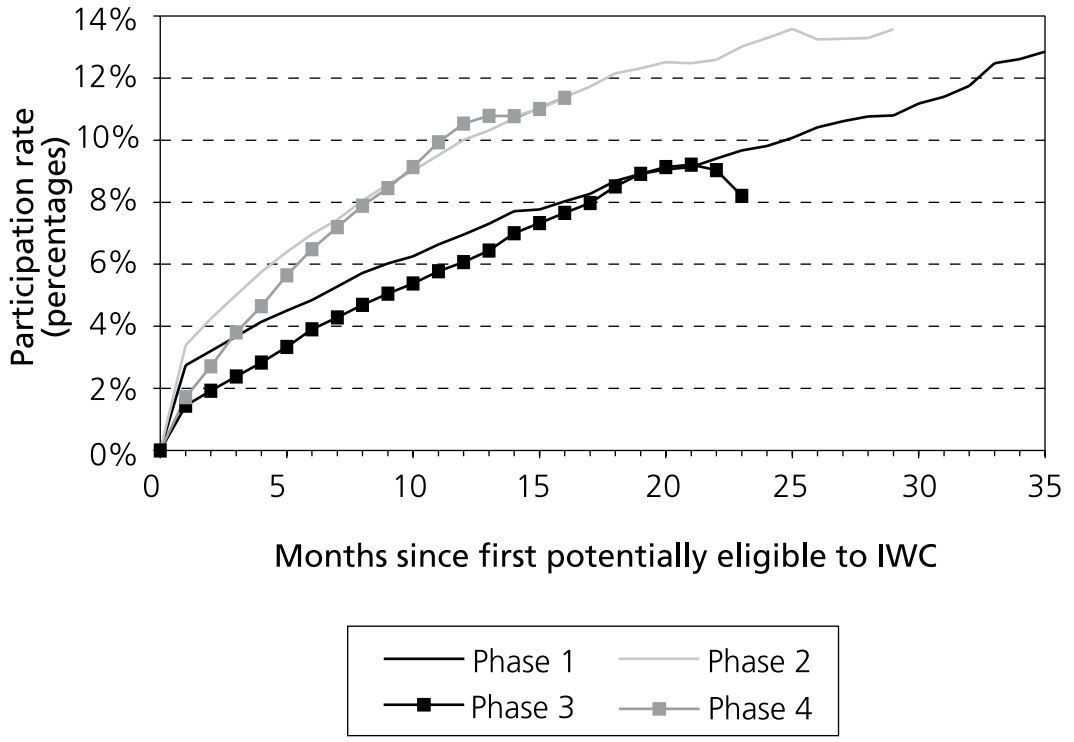



Note: Numerator is recipients of IWC to date and denominator is all potentially eligible lone parents in stock sample, both based on Department for Work and Pensions (DWP) administrative data described in Appendix B.

This analysis is based on individual-level data on IWC payment dates and amounts; the relevant phase is imputed by merging in (using encrypted NINO) a postcode variable (and hence, Jobcentre Plus district) from the IS History database. The data on payments of IWC included some partners who are also eligible for IWC. However, the overwhelming majority of IWC recipients are lone parents and those who are not lone parents will not have been matched to a district, and so will not have been used in the analysis in this appendix.

Table G.2 is designed to highlight the relationship between some of the sources of administrative data that are used for this project. Specifically, it is designed to show how many lone parents who leave IS (according to the IS History file) have an employment spell (recorded in the Work and Pensions Longitudinal Study (WPLS)) starting within a certain amount of time of their IS spell ending.

**Figure G.2 Take-up measure (i): recipients of IWC as a percentage of all lone parents in flow sample, by phase and month since first eligible for IWC (up to 31 March 2007)**




Note: Numerator is recipients of IWC to date and denominator is all potentially eligible lone parents in stock sample, both based on DWP administrative data described in Appendix B.

## Table G.2 Percentage of IS claims with an employment spell starting within some period of the end date

| *Percentage of IS claims with an employment spell starting within some period of the end date, where the period is:* | *All* | *Leave IS for IWC and claim IWC for at least 11 months* | *Leave IS for IWC and claim IWC for between 6 and 11 months* | *Leave IS for IWC and claim IWC for less than 6 months* | *Leave IS after 12 months in the pilot areas but not for IWC* | *Leave IS after less than 12 months in the pilot areas* | *Leave IS after 12 months in the comparison areas* |
|---|---|---|---|---|---|---|---|
| 2 weeks or less | 14.2 | 32.5 | 30.9 | 30.1 | 5.0 | 12.9 | 13.4 |
| 2 weeks to 1 month | 11.0 | 20.3 | 20.1 | 18.4 | 4.7 | 9.8 | 11.6 |
| 1 to 3 months | 9.3 | 6.9 | 8.4 | 9.7 | 7.8 | 11.2 | 8.5 |
| 3 to 6 months | 6.2 | 3.5 | 5.4 | 3.7 | 5.8 | 7.8 | 5.3 |
| 6 to 12 months | 8.8 | 5.4 | 6.7 | 5.3 | 8.1 | 10.4 | 7.6 |
| Over 12 months | 29.1 | 20.9 | 19.4 | 23.2 | 33.4 | 31.3 | 28.9 |
| No employment spell | 21.5 | 10.5 | 9.1 | 9.6 | 35.3 | 16.7 | 24.8 |
| All | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Sample size | 417,770 | 12,625 | 2,894 | 2,765 | 48,239 | 30,903 | 201,761 |

Notes: Based on DWP administrative data described in Appendix B.

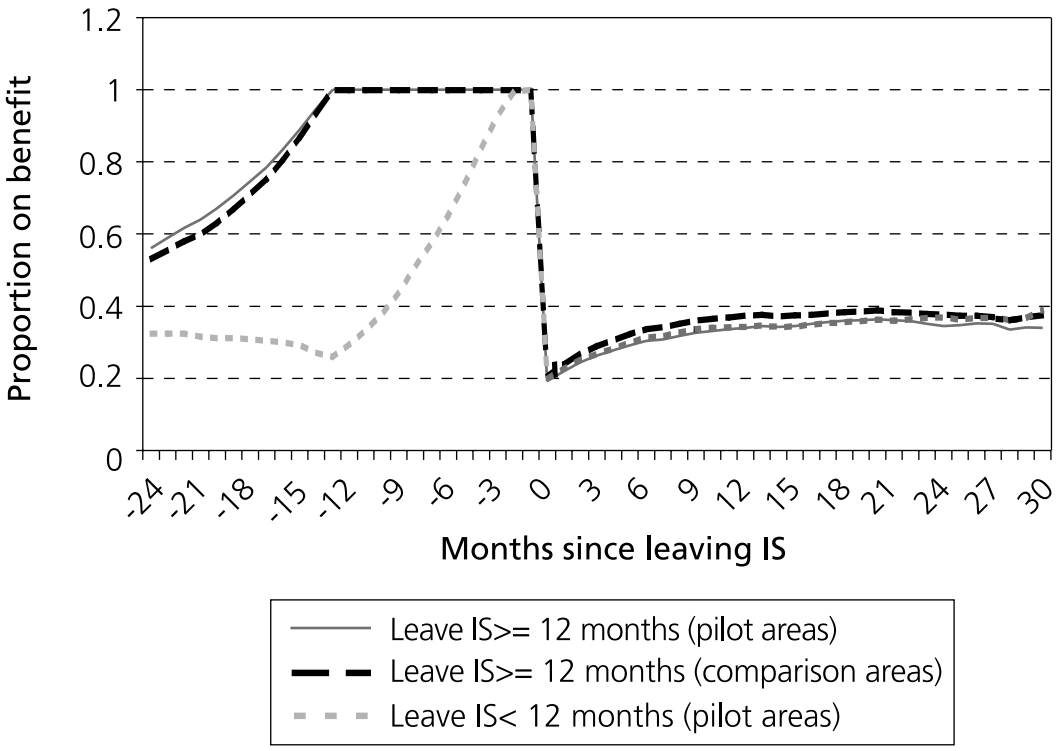
Sample is all lone parents in pilot districts who leave IS between the introduction of the pilots and 31 March 2006, and all lone parents in comparison districts who leave IS having claimed for at least 12 months between the introduction of the pilots and 31 March 2006. IWC claim length is defined using spell start and end dates.

As a condition of receipt, IWC recipients should have stopped claiming benefit and started working within a relatively short space of time. However, Table G.2 highlights the limitations of the employment data in the WPLS, as only around half of known IWC recipients are recorded as having an employment spell starting within a month of their IS spell ending.

Figures G.3 to G.8 compare the benefit and work outcomes of various groups of lone parent IS leavers whose IS claim was less than 12 months old when the pilots were introduced. This can be thought of as the 'flow' sample of IS leavers. These figures are equivalent to those in Section 3.2 except the latter document the benefit and work outcomes of **all** lone parent IS leavers (i.e. including those whose claim was already at least 12 months old when the pilots were introduced).

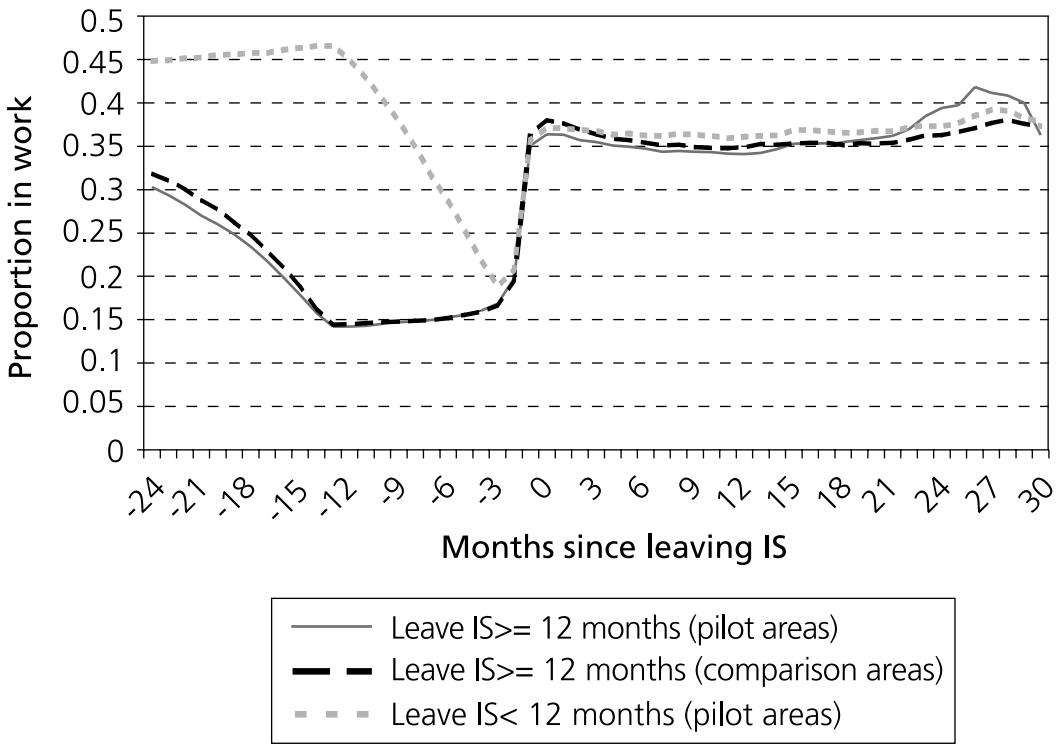
Figures G.3 and G.4 compare the benefit and work profiles of all lone parents in the flow sample who leave IS after claiming for at least 12 months in pilot districts (including IWC recipients), all lone parents in the flow sample who leave IS after claiming for at least 12 months in comparison districts and all lone parents in the flow sample who leave IS after claiming for less than 12 months in pilot districts.

**Figure G.3 Benefit outcomes for lone parent IS leavers whose IS claim was less than 12 months old on the day the pilots were introduced**




Notes: Sample is all lone parents who left IS in pilot districts (51,677) and all lone parents who left IS having claimed for at least 12 months in comparison districts (52,250) between when the pilots were introduced and 31 March 2006. All IS claims were less than 12 months old on the day the pilots were introduced.

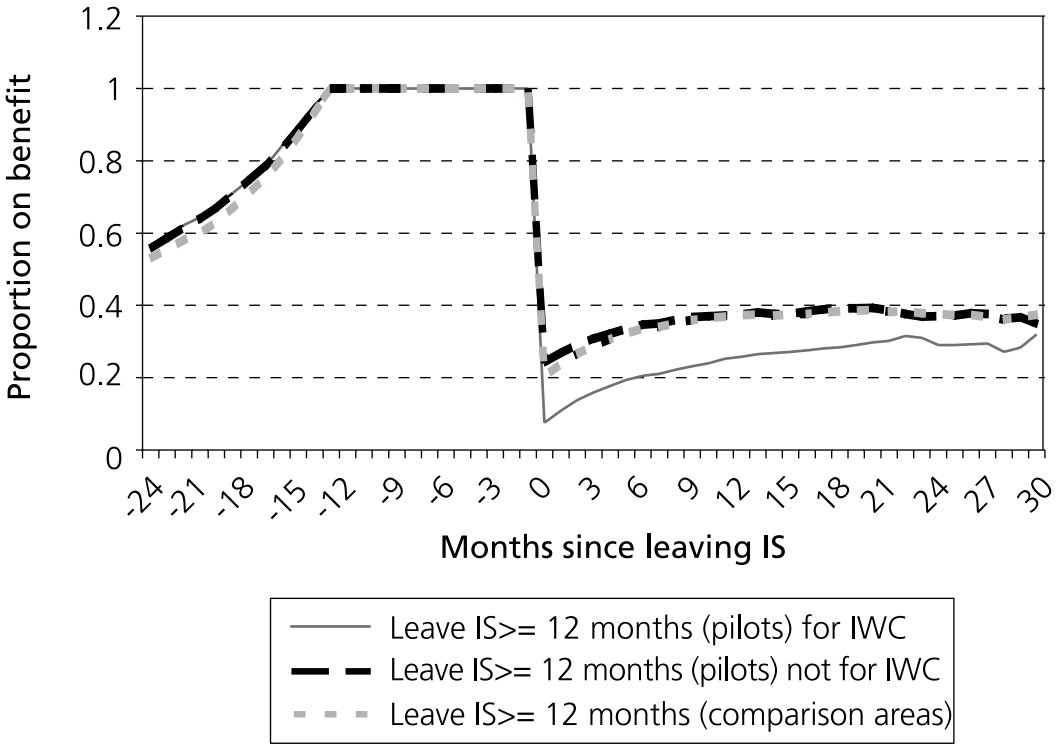
**Figure G.4 Work outcomes for lone parent IS leavers whose IS claim was less than 12 months old on the day the pilots were introduced**




Notes: Sample is all lone parents who left IS in pilot districts (51,677) and all lone parents who left IS having claimed for at least 12 months in comparison districts (52,250) between when the pilots were introduced and 31 March 2006. All IS claims were less than 12 months old on the day the pilots were introduced.

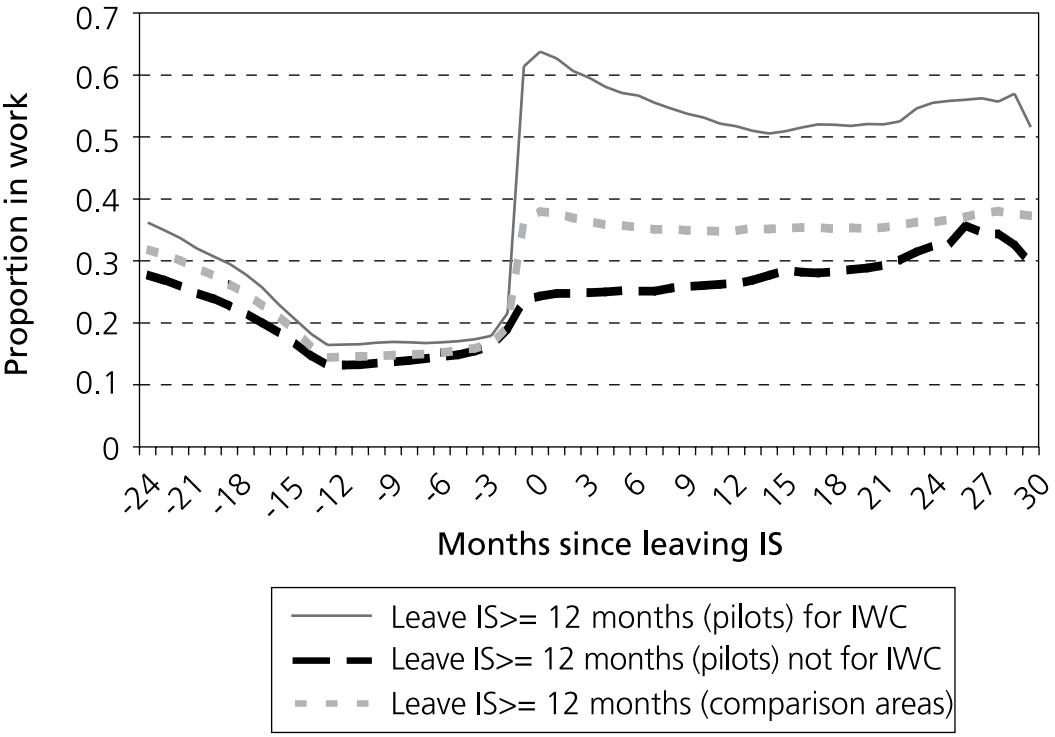
Figures G.5 and G.6 split the group of lone parents in the flow sample who have been claiming IS for at least 12 months in pilot districts into two groups: those who leave IS for IWC and those who do not. The work and benefit outcomes of these two groups are then compared with those of lone parents in the flow sample in comparison districts who have claimed IS for at least 12 months.

**Figure G.5 Benefit outcomes for lone parent IS leavers whose IS claim lasts at least 12 months, but was less than 12 months old on the day the pilots were introduced**




Notes: Sample is all lone parents who left IS after claiming for at least 12 months in pilot districts (20,774) and comparison districts (52,250) between when the pilots were introduced and 31 March 2006. All IS claims were less than 12 months old on the day the pilots were introduced.

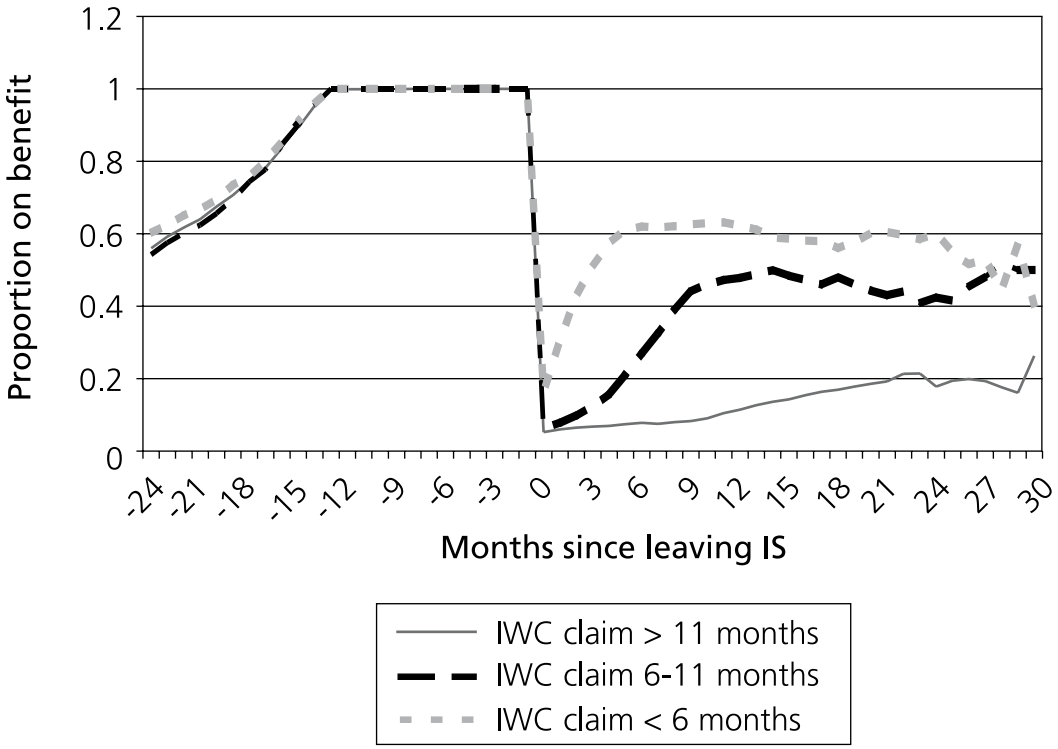
**Figure G.6 Work outcomes for lone parent IS leavers whose IS claim lasts at least 12 months, but was less than 12 months old on the day the pilots were introduced**




Notes: Sample is all lone parents who left IS after claiming for at least 12 months in pilot districts (20,774) and comparison districts (52,250) between when the pilots were introduced and 31 March 2006. All IS claims were less than 12 months old on the day the pilots were introduced.

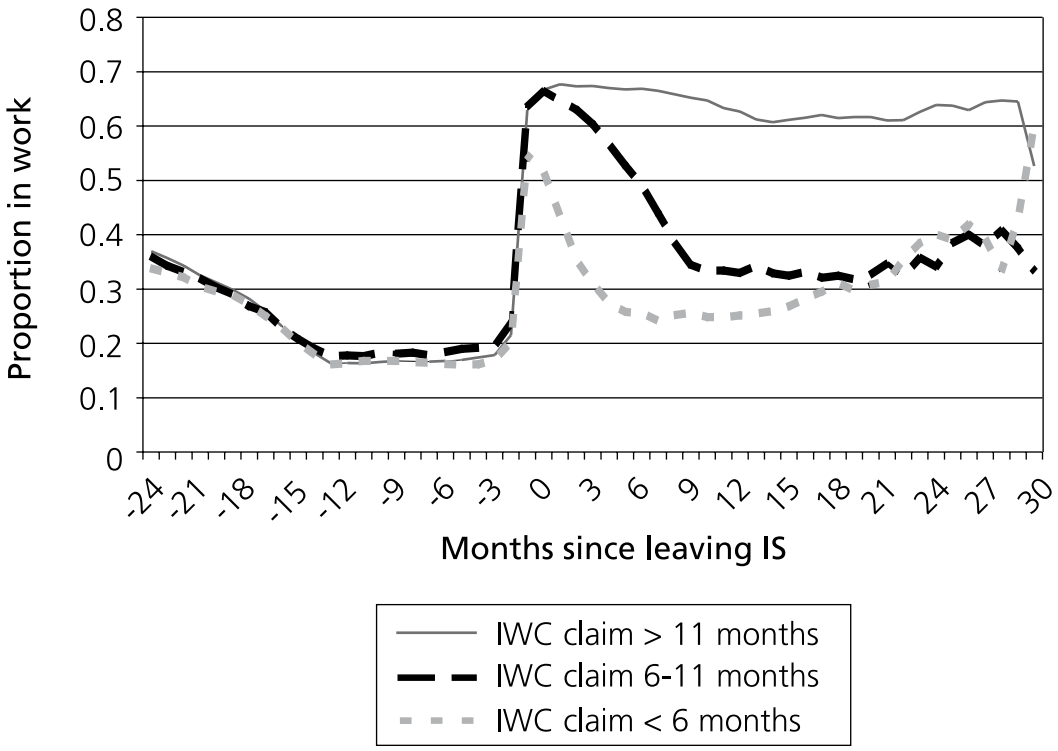
Figures G.7 and G.8 illustrate the benefit and work profiles for IWC recipients from the flow sample split according to length of IWC claim.

**Figure G.7 Benefit outcomes for IWC recipients whose IS claim was less than 12 months old on the day the pilots were introduced**




Note: Sample is all lone parents who have left IS for IWC between when the pilots were introduced and 31 March 2006 (5,983). All IS claims were less than 12 months old on the day the pilots were introduced.

**Figure G.8 Work outcomes for IWC recipients whose IS claim was less than 12 months old on the day the pilots were introduced**




Note: Sample is all lone parents who have left IS for IWC between when the pilots were introduced and 31 March 2006 (5,983). All IS claims were less than 12 months old on the day the pilots were introduced.

In all cases, the main difference between the patterns of work and benefit receipt for all lone parent IS leavers (shown in Chapter 3) and those of lone parent IS leavers in the flow sample (shown here) is that lone parent IS leavers in the flow sample are more likely to have been in work and less likely to have been on benefit between 12 and 24 months prior to leaving IS than all lone parent IS leavers. After leaving IS, the patterns are virtually identical for both groups of lone parents.

# Appendix H
# Average (mean) outcomes and sample sizes for difference-in-differences analysis

Tables H.1 to H.10 show mean work and benefit outcomes and sample sizes for the pilot and comparison groups by phase, before and after the introduction of the pilots, and for the stock and flow samples separately. These figures relate to the main difference-in-differences (DiD) analysis described in Chapter 4.

**Table H.1 Average level of benefit outcomes pre-policy: flow sample**

| Percentage off benefit after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 12.6 | 11.4 | 9.4 | 11.4 | 8.8 | 13.1 |
| 12 | 20.1 | 18.3 | 15.2 | 18.2 | 14.5 | 20.9 |
| 18 | 25.5 | 23.5 | 19.7 | 23.4 | 19.0 | 26.6 |
| 24 | 29.5 | 27.2 | 23.2 | 27.2 | 22.5 | 30.6 |
| 30 | 33.1 | 30.6 | 26.6 | 30.7 | 25.6 | 34.2 |
| 36 | 35.9 | 33.1 | 29.3 | 33.0 | 27.9 | 37.0 |

Base: All lone parents in flow sample (see Appendix B). Sample sizes given in Table H.5.

## Table H.2 Average level of benefit outcomes post-policy: flow sample

| Percentage off benefit after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 13.2 | 11.8 | 9.6 | 12.9 | 9.5 | 13.8 |
| 12 | 20.5 | 18.2 | 15.5 | 19.8 | 15.3 | 21.8 |
| 18 | 26.0 | 22.5 | 20.6 | 24.6 | 20.6 | N/A |
| 24 | 29.7 | 25.9 | 23.9 | 27.9 | N/A | N/A |
| 30 | 33.9 | 27.3 | 27.3 | N/A | N/A | N/A |
| 36 | 34.5 | 31.2 | 31.2 | N/A | N/A | N/A |

Base: All lone parents in flow sample (see Appendix B). Sample sizes given in Table H.6.

## Table H.3 Average level of work outcomes pre-policy: flow sample

| Percentage in work after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 18.5 | 17.8 | 16.4 | 17.6 | 16.7 | 18.7 |
| 12 | 20.8 | 19.6 | 17.6 | 19.7 | 18.0 | 20.7 |
| 18 | 22.6 | 20.8 | 18.9 | 21.2 | 18.5 | 22.0 |
| 24 | 24.0 | 21.8 | 19.9 | 21.9 | 19.2 | 23.6 |
| 30 | 25.2 | 23.1 | 21.0 | 23.1 | 20.4 | 25.1 |
| 36 | 25.9 | 24.1 | 21.4 | 24.4 | 21.5 | 26.2 |

Base: All lone parents in flow sample (see Appendix B). Sample sizes given in Table H.5.

## Table H.4 Average level of work outcomes post-policy: flow sample

| Percentage in work after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 14.3 | 12.0 | 11.9 | 12.8 | 10.8 | 11.6 |
| 12 | 17.0 | 14.3 | 14.3 | 15.3 | 12.5 | 14.3 |
| 18 | 18.5 | 15.6 | 15.4 | 16.1 | 14.6 | N/A |
| 24 | 19.3 | 16.7 | 15.7 | 17.6 | N/A | N/A |
| 30 | 21.1 | 16.6 | 16.6 | N/A | N/A | N/A |
| 36 | 22.3 | 22.0 | 22.0 | N/A | N/A | N/A |

Base: All lone parents in flow sample (see Appendix B). Sample sizes given in Table H.6.

## Table H.5 Sample sizes, flow sample (benefit and work outcomes), pre-policy

| | Comparison group | Pilot group (all phases) | Pilot group (Phase 1) | Pilot group (Phase 2) | Pilot group (Phase 3) | Pilot group (Phase 4) |
|---|---|---|---|---|---|---|
| 6 | 301,586 | 289,278 | 26,801 | 81,450 | 57,450 | 123,577 |
| 12 | 301,586 | 289,278 | 26,801 | 81,450 | 57,450 | 123,577 |
| 18 | 301,586 | 287,472 | 26,801 | 81,450 | 57,450 | 121,771 |
| 24 | 301,586 | 275,571 | 26,801 | 81,450 | 57,446 | 109,874 |
| 30 | 301,586 | 255,381 | 26,801 | 80,383 | 50,820 | 97,377 |
| 36 | 301,586 | 224,959 | 26,801 | 69,787 | 43,981 | 84,390 |

Base: All lone parents in flow sample (see Appendix B).

## Table H.6 Sample sizes, flow sample (benefit and work outcomes), post-policy

| | Comparison group | Pilot group (all phases) | Pilot group (Phase 1) | Pilot group (Phase 2) | Pilot group (Phase 3) | Pilot group (Phase 4) |
|---|---|---|---|---|---|---|
| 6 | 212,406 | 102,433 | 21,079 | 38,175 | 19,808 | 23,371 |
| 12 | 168,763 | 68,140 | 16,862 | 28,026 | 12,915 | 10,337 |
| 18 | 128,546 | 37,835 | 12,841 | 18,335 | 6,659 | N/A |
| 24 | 89,275 | 17,407 | 8,635 | 8,772 | N/A | N/A |
| 30 | 46,858 | 4,509 | 4,509 | N/A | N/A | N/A |
| 36 | 1,824 | 141 | 141 | N/A | N/A | N/A |

Base: All lone parents in flow sample (see Appendix B).

## Table H.7 Average level of benefit outcomes pre-policy: stock sample

| Percentage off benefit after X months | Control group, Phase 1 (%) | Control group, Phase 2 (%) | Control group, Phase 3 (%) | Control group, Phase 4 (%) | Pilot group, Phase 1 (%) | Pilot group, Phase 2 (%) | Pilot group, Phase 3 (%) | Pilot group, Phase 4 (%) |
|---|---|---|---|---|---|---|---|---|
| 6 | 8.0 | 8.0 | 8.0 | 8.0 | 6.0 | 7.1 | 5.7 | 9.2 |
| 12 | 14.4 | 14.4 | 14.4 | 14.4 | 11.5 | 13.0 | 10.6 | 16.6 |
| 18 | 18.5 | 18.5 | 18.5 | 18.5 | 14.7 | 16.8 | 13.9 | 21.1 |
| 24 | 23.2 | 23.2 | 23.2 | 23.2 | 18.6 | 21.1 | 17.6 | 25.9 |
| 30 | 25.8 | 25.8 | 25.8 | 25.8 | 21.2 | 23.7 | 20.0 | 28.9 |
| 36 | 29.2 | 29.2 | 29.2 | 29.2 | 24.3 | 26.7 | 22.9 | 32.3 |
| Sample size | 410,528 | 410,528 | 410,528 | 410,528 | 42,863 | 100,224 | 74,524 | 107,660 |

Base: All lone parents in stock sample (see Appendix B).

## Table H.8 Average level of benefit outcomes post-policy: stock sample

| Percentage off benefit after X months | Control group, Phase 1 (%) | Control group, Phase 2 (%) | Control group, Phase 3 (%) | Control group, Phase 4 (%) | Pilot group, Phase 1 (%) | Pilot group, Phase 2 (%) | Pilot group, Phase 3 (%) | Pilot group, Phase 4 (%) |
|---|---|---|---|---|---|---|---|---|
| 6 | 7.8 | 8.3 | 7.7 | 7.3 | 5.0 | 7.3 | 5.2 | 8.6 |
| 12 | 14.3 | 14.0 | 13.2 | 12.5 | 10.6 | 12.5 | 9.6 | 14.7 |
| 18 | 18.4 | 18.2 | 16.9 | 16.2 | 13.9 | 16.8 | 12.8 | 19.0 |
| 24 | 22.3 | 21.4 | 20.9 | N/A | 17.7 | 19.9 | 16.8 | N/A |
| 30 | 24.7 | 24.6 | N/A | N/A | 20.0 | 23.0 | N/A | N/A |
| 36 | 27.7 | N/A | N/A | N/A | 23.1 | N/A | N/A | N/A |
| Sample size | 383,423 | 372,180 | 361,484 | 348,069 | 43,204 | 95,613 | 72,910 | 99,883 |

Base: All lone parents in stock sample (see Appendix B).

## Table H.9 Average level of work outcomes pre-policy: stock sample

| Percentage in work after X months | Control group, Phase 1 (%) | Control group, Phase 2 (%) | Control group, Phase 3 (%) | Control group, Phase 4 (%) | Pilot group, Phase 1 (%) | Pilot group, Phase 2 (%) | Pilot group, Phase 3 (%) | Pilot group, Phase 4 (%) |
|---|---|---|---|---|---|---|---|---|
| 6 | 17.2 | 17.2 | 17.2 | 17.2 | 16.4 | 16.9 | 17.3 | 19.8 |
| 12 | 19.4 | 19.4 | 19.4 | 19.4 | 17.9 | 18.8 | 18.5 | 22.2 |
| 18 | 21.2 | 21.2 | 21.2 | 21.2 | 18.6 | 20.2 | 18.8 | 23.5 |
| 24 | 20.3 | 20.3 | 20.3 | 20.3 | 17.7 | 19.0 | 18.1 | 22.8 |
| 30 | 23.4 | 23.4 | 23.4 | 23.4 | 19.3 | 21.4 | 19.3 | 25.2 |
| 36 | 24.9 | 24.9 | 24.9 | 24.9 | 20.8 | 23.0 | 20.5 | 26.8 |
| Sample size | 410,528 | 410,528 | 410,528 | 410,528 | 42,863 | 100,224 | 74,524 | 107,660 |

Base: All lone parents in stock sample (see Appendix B).

## Table H.10 Average level of work outcomes post-policy: stock sample

| Percentage in work after X months | Control group, Phase 1 (%) | Control group, Phase 2 (%) | Control group, Phase 3 (%) | Control group, Phase 4 (%) | Pilot group, Phase 1 (%) | Pilot group, Phase 2 (%) | Pilot group, Phase 3 (%) | Pilot group, Phase 4 (%) |
|---|---|---|---|---|---|---|---|---|
| 6 | 13.7 | 13.4 | 12.8 | 10.8 | 11.6 | 12.6 | 11.6 | 12.3 |
| 12 | 16.1 | 15.8 | 13.9 | 12.7 | 13.7 | 14.8 | 12.6 | 14.4 |
| 18 | 18.3 | 15.9 | 14.8 | 13.3 | 15.1 | 15.1 | 13.2 | 15.3 |
| 24 | 18.6 | 17.1 | 15.6 | N/A | 15.7 | 16.1 | 14.0 | N/A |
| 30 | 19.1 | 17.5 | N/A | N/A | 15.7 | 16.6 | N/A | N/A |
| 36 | 19.6 | N/A | N/A | N/A | 16.4 | N/A | N/A | N/A |
| Sample size | 383,423 | 372,180 | 361,484 | 348,069 | 43,204 | 95,613 | 72,910 | 99,883 |

Base: All lone parents in stock sample (see Appendix B).

Tables H.11 to H.14 show mean work and benefit outcomes and sample sizes for the pilot and comparison groups by phase, before and after the introduction of the pilots. These figures relate to the Income Support (IS) leavers DiD analysis described in Chapter 8.

## Table H.11 Average level of benefit outcomes for IS leavers pre-policy: flow sample

| Percentage off benefit after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 76.3 | 78.6 | 79.3 | 76.7 | 79.3 | 79.7 |
| 12 | 72.1 | 73.5 | 73.4 | 72.3 | 73.8 | 74.4 |
| 18 | 70.9 | 71.9 | 72.2 | 71.1 | 71.4 | 72.6 |
| 24 | 70.4 | 71.3 | 72.2 | 70.4 | 71.2 | 71.8 |
| 30 | 70.3 | 70.4 | 71.1 | 69.8 | 69.7 | 71.0 |
| 36 | 70.3 | 70.0 | 70.6 | 69.4 | 68.6 | 70.7 |
| Sample size | 55,858 | 32,110 | 2,997 | 10,871 | 4,475 | 13,767 |

Base: All potentially eligible lone parents who left IS for work (see Box 8.1).

## Table H.12 Average level of work outcomes for IS leavers pre-policy: flow sample

| Percentage off benefit after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 71.7 | 73.9 | 76.1 | 72.6 | 77.0 | 73.5 |
| 12 | 67.4 | 68.9 | 71.2 | 68.3 | 71.0 | 68.1 |
| 18 | 64.8 | 65.9 | 68.1 | 65.7 | 67.5 | 65.0 |
| 24 | 64.1 | 64.6 | 66.7 | 64.6 | 65.6 | 63.8 |
| 30 | 61.1 | 61.9 | 62.9 | 61.8 | 62.9 | 61.5 |
| 36 | 58.9 | 59.7 | 61.1 | 59.8 | 60.1 | 59.2 |
| Sample size | 55,858 | 32,110 | 2,997 | 10,871 | 4,475 | 13,767 |

Base: All potentially eligible lone parents who left IS for work (see Box 8.1).

## Table H.13 Average level of benefit outcomes for IS leavers post-policy: flow sample

| Percentage off benefit after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 75.3 | 79.2 | 80.2 | 77.9 | 80.6 | 79.5 |
| 12 | 70.6 | 73.6 | 75.2 | 71.9 | 75.1 | 74.1 |
| 18 | 69.3 | 71.7 | 72.9 | 70.2 | 72.6 | 72.2 |
| 24 | 68.3 | 70.2 | 72.0 | 68.9 | 70.2 | 70.8 |
| 30 | 68.8 | 71.4 | 74.2 | 69.9 | 71.3 | 72.0 |
| 36 | 69.9 | 73.3 | 67.6 | 71.7 | 82.3 | 72.5 |
| Sample size | 61,554 | 39,632 | 4,017 | 13,477 | 6,175 | 15,963 |

Base: All potentially eligible lone parents who left IS for work (see Box 8.1).

## Table H.14 Average level of work outcomes for IS leavers post-policy: flow sample

| Percentage off benefit after *X* months | Level for comparison group (%) | Pilot group (all phases) (%) | Pilot group (Phase 1) (%) | Pilot group (Phase 2) (%) | Pilot group (Phase 3) (%) | Pilot group (Phase 4) (%) |
|---|---|---|---|---|---|---|
| 6 | 75.1 | 78.3 | 78.4 | 77.8 | 80.9 | 77.7 |
| 12 | 66.2 | 68.7 | 69.5 | 68.0 | 70.9 | 68.3 |
| 18 | 60.4 | 62.7 | 63.7 | 61.6 | 64.8 | 62.6 |
| 24 | 56.9 | 59.8 | 62.6 | 58.5 | 60.3 | 60.0 |
| 30 | 55.5 | 57.8 | 60.1 | 56.2 | 58.7 | 58.1 |
| 36 | 51.3 | 56.4 | 55.9 | 51.3 | 62.9 | 58.2 |
| Sample size | 61,554 | 39,632 | 4,017 | 13,477 | 6,175 | 15,963 |

Base: All potentially eligible lone parents who left IS for work (see Box 8.1).

# Appendix I
# Testing for pre-programme 'common trends'

As explained in Appendix E, the essence of the difference-in-differences (DiD) approach is to attribute any change over time in the difference in outcomes between the pilot districts and the comparison districts to the impact of the lone parent pilots (LPPs), having controlled for a range of explanatory factors that are changing over time. It is, therefore, very important to understand the underlying trends in outcomes in the pilot and comparison districts.

Of course, what one would ideally want to know is whether, in the absence of the LPPs, the trends in the pilot and comparison districts would have been identical – but this is unobservable. As a substitute, though, it is possible to test whether there were 'common trends' in the pilot and comparison districts in the period before the introduction of the LPPs – first over the whole period (from April 2001 onwards) and then over six-monthly periods immediately before the LPPs were introduced (from April 2003 onwards).

## Testing for constant differences between treatment and comparison districts

Figures I.1 to I.4 illustrate the underlying trend in outcomes in the set of comparison districts, and the trend in outcomes in the four pilot phases relative to that, having controlled for a set of explanatory variables (see Appendix D) over the whole pre-LPPs period (equivalently, they show estimates of the difference in outcomes between each of the four phases and the set of comparison districts, and how these differences change over time).

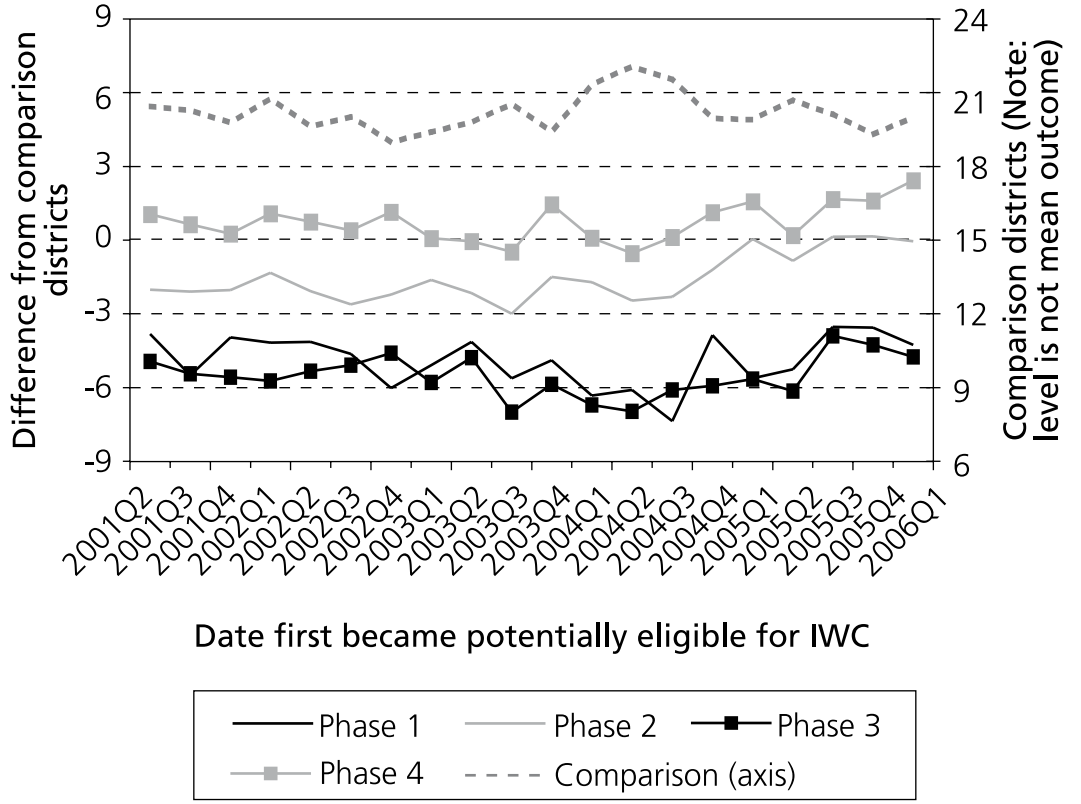
The figures do not plot the mean outcome in the set of comparison districts; they plot the mean outcome having controlled for other variables: each figure reports the coefficients from a regression that included a set of indicators for each

quarter interacted with a set of indicators for being in each of the four pilot areas and the set of comparison districts; this allows each pilot phase and the set of comparison districts to have their own (unrestricted) trend in outcomes. Because the other explanatory variables had non-zero mean, the coefficients plotted for the comparison districts are not identical to the mean outcome in the comparison districts.

Figures I.1 and I.2 suggest the following about the underlying trends in benefit outcomes at 12 and 24 months:

- There is no dramatic trend in benefit outcomes for the set of comparison districts, although there is a peak in outcomes in 2004Q2.
- Phases 1 and 3 (dominated by London districts) have a slight downward trend (relative to the set of comparison districts) until 2004, followed by an upward trend.
- Phase 2 has a slight upward trend in outcomes relative to the comparison districts, which accelerates at some point in 2004.
- There is no obvious trend in Phase 4, relative to the comparison districts, although there is an upturn at the very end of the period.

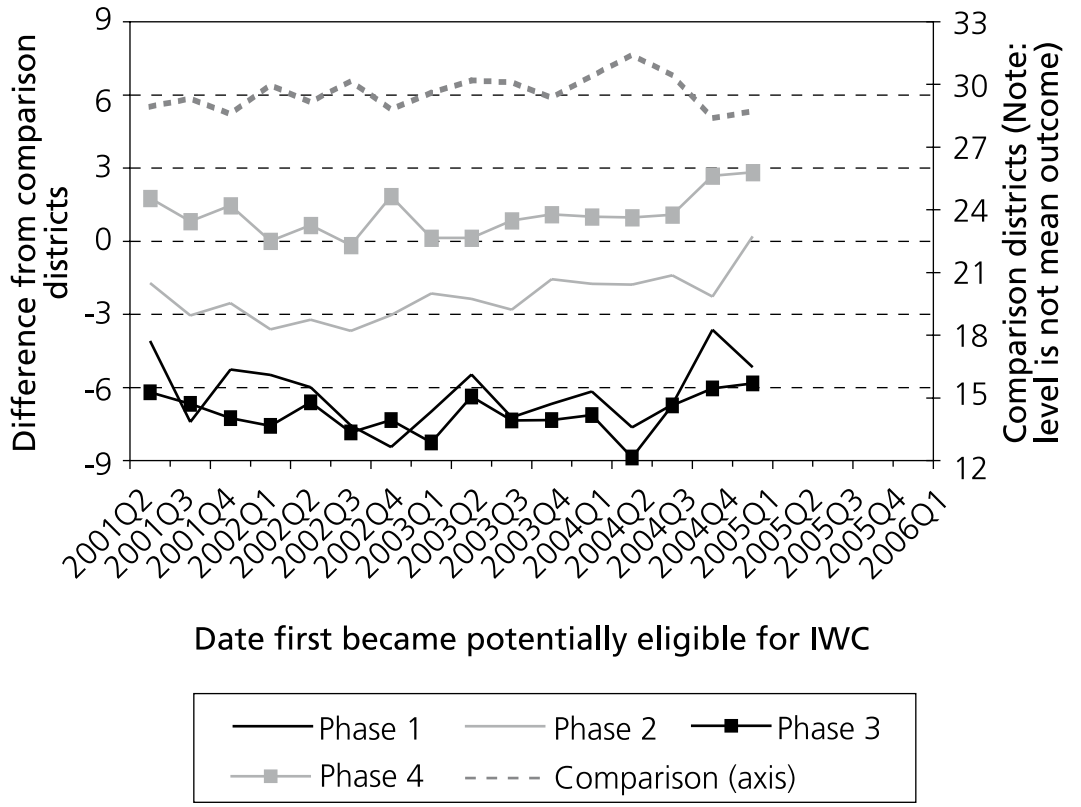
**Figure I.1 Trend in comparison districts, and differences between that and pilot phases: benefit outcomes 12 months after becoming potentially eligible**




Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

Note: Horizontal axis measures date when lone parent first became potentially eligible for IWC; outcomes are measured 12 months after that.

**Figure I.2 Trend in comparison districts, and differences between that and pilot phases: benefit outcomes 24 months after becoming potentially eligible**




Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

Note: Horizontal axis measures date when lone parent first became potentially eligible for IWC; outcomes are measured 24 months after that.

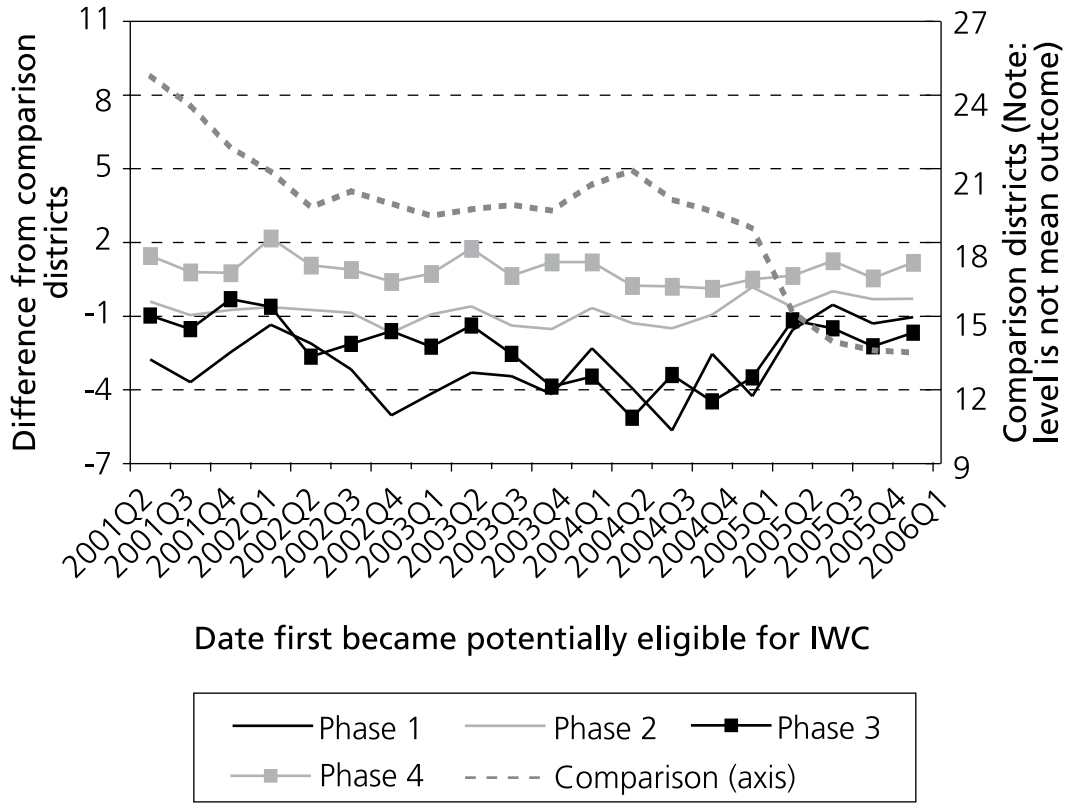
However, formal statistical tests – comparing outcomes between pilot and control districts across the entire pre-programme period – reveal two important points (what follows is true for benefit outcomes at 12 and 24 months and for outcomes at six and 18 months, but these are not shown). First, for each phase, the set of differences with the comparison districts are significantly different from zero. This means that even in the absence of the LPPs, outcomes were different in the pilot and comparison districts and this is why the estimates of the impact of the LPPs have to use a DiD estimator (rather than simply comparing outcomes after the LPPs were introduced).

Second, for each phase, the set of differences with the comparison districts before the LPPs start is not significantly different from a constant. Formally, therefore, the hypothesis of common pre-programme trends cannot be rejected for any phase and for any benefit outcome. (Note that it is not possible to carry out this test once the LPPs have started, because if the LPPs have an effect, it will have changed the trend in the pilot districts.)

Figures I.3 and I.4 suggest the following about the underlying trends in work outcomes:

- The trends for the set of comparison districts show a decline over time. Although it has been argued that the measure of work in the Work and Pensions Longitudinal Study (WPLS) contains errors in both directions (see Appendix B), it is not clear why there should be a downward trend nor why the trends are different for work and benefit outcomes observed at the same time nor why the trends are so different for outcomes after 12 and 24 months.
- Phases 1 and 3 (dominated by London districts) appear to have a downward trend (relative to the set of comparison districts) until around 2004 for outcomes at 12 months, and until 2003 for outcomes at 24 months, followed by an upward trend (the horizontal axis refers to the date when the lone parent became potentially eligible for In-Work Credit (IWC), so the same date on different figures refers to the same cohort of lone parents).

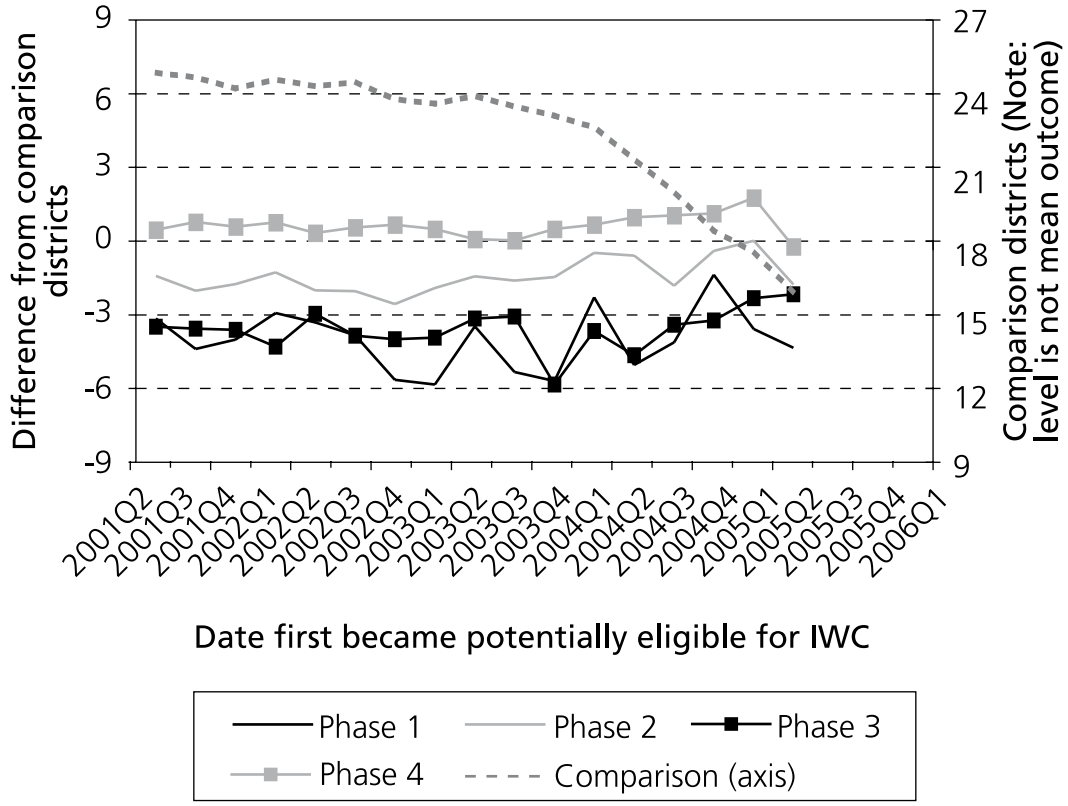
**Figure I.3 Trend in comparison districts, and differences between that and pilot phases: work outcomes 12 months after becoming potentially eligible**




Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

Note: Horizontal axis measures date when lone parent first became potentially eligible for IWC; outcomes are measured 24 months after that.

**Figure I.4 Trend in comparison districts, and differences between that and pilot phases: work outcomes 24 months after becoming potentially eligible**




Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

Note: Horizontal axis measures date when lone parent first became potentially eligible for IWC; outcomes are measured 24 months after that.

However, formal statistical tests reveal two important points (what follows is true for work outcomes at 12 and 24 months). First, for all phases, the set of differences with the comparison districts are significantly different from zero. This means that even in the absence of the LPPs, outcomes were different in the pilot and comparison districts, and this is why the estimates of the impact of the LPPs have to use a DiD estimator.

Second, for Phases 1, 2 and 4, the set of differences with the comparison districts before the LPPs start is not significantly different from a constant; for Phase 3, there is evidence of a diverging trend for outcomes at 12 months, but not at 24 months. Formally, therefore, the hypothesis of common pre-programme trends cannot be rejected for Phases 1, 2 and 4 for any work outcome and for Phase 3 for outcomes at 24 months.

## Testing for placebo effects

The tests carried out so far in this appendix have checked the validity of the 'common trends' assumption across the whole of the pre-LPPs period, i.e. between April 2001 and the date on which the LPPs were introduced in each of the pilot phases. The following tests check this assumption over six-monthly periods immediately before the introduction of the LPPs – that is, from April 2003 onwards – by testing for placebo 'treatment' effects amongst potentially eligible lone parents before the policy was introduced.

To give an example: lone parents living in Phase 2 districts who first became potentially eligible for IWC between April 2003 and October 2003 would have their 12-month labour market outcomes recorded between April 2004 and October 2004, before the LPPs were introduced in Phase 2. Thus, their 12-month outcome would be unaffected by the LPPs – assuming there are no anticipation effects – and can be used to test for unexplainable differences between pilot and control districts prior to the introduction of the LPPs (in Phase 1 districts, only the six-month labour market outcomes of a lone parent who became potentially eligible during the same period would be unaffected by IWC; being very short-term outcomes, they are not discussed here). This is also true for lone parents who first become potentially eligible for IWC between April 2003 and April 2004 in Phase 3 districts, and April 2003 and October 2004 in Phase 4 districts.

Clearly, the estimated treatment effects for cohorts of lone parents unaffected by the LPPs should ideally be close to zero and statistically insignificant. If they are not, they may be indicative of a violation of the 'common trends' assumption; equally, they may be indicative of anticipation effects (see Section 2.2 for more discussion of this issue) or the confounding effects of other labour market policies that may have been in place at the time.

Table I.1 presents the estimated placebo effects of the LPPs on the work and benefit outcomes of lone parents 12 months after they became potentially eligible. These estimates suggest that lone parents in Phase 2 districts who became potentially eligible between April 2003 and October 2003 are 0.5 percentage points (ppts) less likely to be off benefit and 0.048 ppts (0.0 ppts to 1 decimal place) more likely to be in work than otherwise identical lone parents in the control districts; reassuringly, however, neither coefficient is significantly different from zero.

## Table I.1 Impacts on unaffected lone parents, flow sample, by phase and cohort, 12 months after becoming potentially eligible, common unrestricted trend (ppts)

| Period in which lone parents became potentially eligible | Phase 2 | | Phase 3 | | Phase 4 | |
|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| Apr 2003–Oct 2003 | –0.5 | 0.0 | –0.4 | –0.2 | –0.9 | 0.3 |
| | (0.425) | (0.411) | (0.481) | (0.481) | (0.409)** | (0.391) |
| Oct 2003–Apr 2004 | | | –0.8 | –0.6 | 0.1 | 0.4 |
| | | | (0.499) | (0.481) | (0.431) | (0.401) |
| Apr 2004–Oct 2004 | | | | | –0.1 | –0.0 |
| | | | | | (0.407) | (0.376) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

In Phase 3 districts, the LPPs were not introduced until April 2005, so the first two cohorts of lone parents would have been unaffected by it up to 12 months after they became potentially eligible. Both cohorts of lone parents were less likely to be off benefit and in work than lone parents in the comparison group but again, the point estimates are not statistically significant.

The first three cohorts of lone parents in Phase 4 districts would have been unaffected by the LPPs up to 12 months after they became potentially eligible. Of these, the first cohort was 0.9 ppts less likely to be off benefit than lone parents in the comparison group and this coefficient is statistically significant at the 5 per cent level. This may call into question the 'common trends' assumption. However, for the remaining two cohorts, the impacts on benefit are small and significant; furthermore, none of the impacts on work for any of the first three cohorts is statistically significant.

Table I.2 repeats the exercise for 18-month labour market outcomes. Given the data cut-off at 31 March 2007, lone parents in the flow sample would have had to become potentially eligible before October 2005 in order to be followed in the data for 18 months thereafter. This restricts attention to lone parents who first became potentially eligible for IWC in Phase 3 districts between April 2003 and October 2003 or in Phase 4 districts between April 2003 and April 2004.

## Table I.2 Impacts on unaffected lone parents, flow sample, by phase and cohort, 18 months after becoming potentially eligible, common unrestricted trend (ppts)

| Period in which lone parents became potentially eligible | Phase 2 | | Phase 3 | | Phase 4 | |
|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| Apr 2003–Oct 2003 | | | 0.0 | 0.3 | –0.5 | –0.3 |
| | | | (0.539) | (0.512) | (0.446) | (0.412) |
| Oct 2003–Apr 2004 | | | | | 0.2 | –0.3 |
| | | | | | (0.464) | (0.423) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

The first cohort of lone parents in Phase 3 districts was slightly more likely to be off benefit and in work than lone parents in the comparison group but the point estimates are not statistically significant so there is no evidence against 'common trends' in this phase. In Phase 4 districts, the first cohort was 0.5 ppts less likely to be off benefit and 0.3 ppts less likely to be in work but neither of these effects is significant. The second cohort was more likely to be off benefit and less likely to be in work but again, neither of these estimates is significantly different from zero.

This analysis has shown three things:

- First, before the LPPs began, average outcomes controlling for a range of explanatory factors were significantly different between each of the four phases and the set of comparison districts and that justifies the use of DiD (rather than a straightforward comparison of outcomes after the LPPs started) to estimate the impact of the LPPs.
- Second, the underlying trend in outcomes before the LPPs is generally found to be common across the pilot and comparison districts (the only exceptions are for 12-month work outcomes in Phase 3 districts in the first test, and 12-month benefit outcomes for lone parents who became potentially eligible between April 2003 and October 2003 in Phase 4 districts in the second test). On the basis of this, the main results in Chapter 4 assume that the underlying difference between each phase and the comparison districts can be represented adequately by a constant and the underlying time trend is represented by a full set of quarterly indicators, common to all districts (these assumptions will be tested by carrying out robustness checks in Appendix K).
- Third, there is some visual evidence, especially for Phases 1 and 3, that outcomes improved relative to the comparison districts around the time that the LPPs were introduced (see Figures I.1 and I.3). This should give readers who feel that a DiD regression is a black box some reassurance that the estimated impacts are based on genuine changes in outcomes.

# Appendix J Difference-in-differences estimates of the impact of the lone parent pilots by phase and by cohort, flow sample

This report has examined different estimates of the impact effect of the lone parent pilots (LPPs) on the flow sample:

a the average impact across all lone parents and all phases (i.e. one estimated impact);

b the average impact across all lone parents but separately for all four phases (i.e. four estimated impacts);

c the average impact estimated separately for different cohorts of lone parents (defined) and separately for all four phases (i.e. ten estimated impacts).

In general, each successive variant gives more detail than its predecessor but at the cost of reduced precision; which of these variants should be preferred depends upon the use being made of the estimates. Chapters 4 and 6 presented results based on variant (a) and this appendix presents results based on variants (b) and (c).

## Impacts by phase

Table J.1 shows the estimated impacts separately for each phase (i.e. treatment effect variant (b)). The point estimates are almost all positive, and almost all significantly different from zero (none is negative and significantly different from zero). Apart from the last outcome measure in each phase, the point estimates tend to increase over time and this is a more reliable estimate of the time profile of the impact of the LPPs than that shown in Section 4.1. Except in Phase 3, the point estimates of the work outcomes are generally a little smaller than benefit outcomes at the same point in time.

It is possible to test whether the impacts in each phase are the same and it was not possible to reject this hypothesis for the following impacts: benefit outcomes at 15, 18, 21 and 24 months; work outcomes at six, 24 and 27 months. This could arise either because the impacts were genuinely the same or because the sample sizes are not large enough to detect differences sufficiently precisely. The inability to reject the hypothesis of the same impact in all phases suggests that the extra detail provided in Table J.1 compared with Table 4.1 may not be needed. However, a problem with Table 4.1 is that the importance of Phase 1 increases as more longer-term outcomes are examined.

## Table J.1 Estimated impact of the LPPs, flow sample, by phase, all cohorts, common unrestricted trend ppts

| Months since first potentially eligible for IWC | Phase 1 | | Phase 2 | | Phase 3 | | Phase 4 | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | –0.2 | 0.3 | 0.8 | 0.5 | 0.2 | 0.8 | 0.6 | –0.0 |
| | (0.216) | (0.263) | (0.164)*** | (0.188)** | (0.188) | (0.232)*** | (0.187)*** | (0.210) |
| 6 | 0.3 | 0.6 | 1.5 | 0.8 | 0.7 | 1.0 | 1.0 | 0.3 |
| | (0.293) | (0.300)* | (0.220)*** | (0.217)*** | (0.263)*** | (0.267)*** | (0.263)*** | (0.249) |
| 9 | 0.4 | 1.1 | 1.8 | 0.8 | 1.1 | 1.5 | 1.1 | 0.3 |
| | (0.346) | (0.334)*** | (0.261)*** | (0.243)*** | (0.322)*** | (0.304)*** | (0.337)*** | (0.302) |
| 12 | 0.8 | 1.4 | 2.0 | 0.9 | 1.2 | 1.5 | 1.8 | 0.2 |
| | (0.390)** | (0.363)*** | (0.298)*** | (0.270)*** | (0.382)*** | (0.346)*** | (0.444)*** | (0.383) |
| 15 | 1.4 | 1.5 | 2.1 | 1.1 | 1.4 | 1.6 | 0.9 | –0.6 |
| | (0.434)*** | (0.393)*** | (0.338)*** | (0.300)*** | (0.456)*** | (0.399)*** | (0.738) | (0.610) |
| 18 | 1.5 | 1.6 | 1.7 | 0.8 | 1.6 | 2.1 | | |
| | (0.474)*** | (0.422)*** | (0.379)*** | (0.332)** | (0.555)*** | (0.479)*** | | |
| 21 | 1.7 | 1.3 | 1.8 | 0.9 | 2.3 | 2.8 | | |
| | (0.520)*** | (0.457)*** | (0.439)*** | (0.383)** | (0.783)*** | (0.675)*** | | |
| 24 | 1.9 | 1.4 | 2.1 | 1.3 | | | | |
| | (0.572)*** | (0.496)*** | (0.529)*** | (0.460)*** | | | | |
| 27 | 2.2 | 1.9 | 0.1 | 1.1 | | | | |
| | (0.656)*** | (0.568)*** | (0.817) | (0.708) | | | | |
| 30 | 1.2 | 0.4 | | | | | | |
| | (0.758) | (0.650) | | | | | | |

Base: All lone parents in flow sample (see Appendix B for detail, and Appendix H for sample sizes and mean outcomes).

## Impact estimate by phase and cohort

This section investigates whether the estimated impact of the LPPs varies across cohorts of lone parents within a particular phase.

Tables J.2 and J.3 reveal how the impacts of the LPPs on outcomes measured 12 and 24 months after becoming potentially eligible for In-Work Credit (IWC) vary by period of eligibility (the impacts on outcomes measured six and 18 months after becoming potentially eligible for IWC are not shown).

The first two columns of Table J.2 show that, in Phase 1 districts, the impact of the LPPs 12 months after becoming potentially eligible was initially very small and statistically insignificant. Over time, however, the point estimates become more positive and more likely to be statistically significant. For example, lone parents in Phase 1 districts who became potentially eligible after the LPPs had been in operation for about a year (i.e. between April 2005 and October 2005) were 1.1 percentage points (ppts) more likely to be off benefit and 2.6 ppts more likely to be in work than otherwise identical lone parents in the comparison districts a year later; for lone parents who became potentially eligible after October 2005, the impacts on benefit and work outcomes were 2.0 ppts and 2.7 ppts respectively, both of which are highly statistically significant. Testing to see whether these effects are significantly different from one another, however, reveals that only the impact of the LPPs on work outcomes significantly changes over time; this is partly because the impacts on benefit outcomes in Phase 1 increase by a smaller amount than the work outcomes do and partly because the impacts on benefit outcomes are less precisely measured.

For Phase 2 districts, the first rows of the table are blank: the LPPs did not exist in these areas until October 2004, so no estimated impact is reported. Lone parents who became potentially eligible for the LPPs shortly after they were rolled out in these areas were 1.9 ppts more likely to be off benefit a year later and 0.9 ppts more likely to be in work. The impacts on benefit and work are similar for the lone parents who became potentially eligible during the next six-month period (slightly higher for benefit and slightly lower for work). As in Phase 1 districts, the impacts are highest among lone parents who became potentially eligible recently (after October 2005): these individuals were 2.4 ppts more likely to be off benefit and 1.1 ppts more likely to be in work a year later. As in the Phase 1 districts, however, there is only significant evidence that the work impacts change as additional cohorts of lone parents became potentially eligible.

The LPPs in Phase 3 districts increased the proportions off benefit and in work by 1.1 ppts and 1.7 ppts respectively among lone parents who became potentially eligible within the first six months of the pilots. Lone parents who became potentially eligible after this period experienced similar impacts a year later – higher for benefit and slightly lower for work but neither coefficient changes significantly over time.

## Table J.2 Estimated impact of the LPPs, flow sample, by phase and cohort, 12 months after becoming potentially eligible, common unrestricted trend (ppts)

| Period in which lone parents became potentially eligible | Phase 1 | | Phase 2 | | Phase 3 | | Phase 4 | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| April 2004–October 2004 | 0.1 | –0.3 | | | | | | |
| | (0.571) | (0.531) | | | | | | |
| October 2004–April 2005 | 0.5 | 1.1 | 1.9 | 0.9 | | | | |
| | (0.644) | (0.605)* | (0.461)*** | (0.428)** | | | | |
| April 2005–October 2005 | 1.1 | 2.6 | 2.0 | 0.8 | 1.1 | 1.7 | | |
| | (0.598)* | (0.542)*** | (0.427)*** | (0.373)** | (0.471)** | (0.425)*** | | |
| After October 2005 | 2.0 | 2.7 | 2.4 | 1.1 | 1.4 | 1.6 | 2.0 | 0.3 |
| | (0.694)*** | (0.631)*** | (0.490)*** | (0.429)*** | (0.547)*** | (0.487)*** | (0.452)*** | (0.390) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

The LPPs were not introduced in Phase 4 districts until October 2005, so there is only one post-policy period in the table that applies to these districts. Note that the coefficients for Phase 4 in Table J.2 will not necessarily be identical to those presented in Table J.1 for Phase 4 at 12 months, despite the fact that they apply to the same individuals. This is because the model used to produce the figures in Table J.2 specifies the impacts for Phases 1 to 3 in a more flexible manner; since all four phases are analysed jointly in the model, this can alter the estimated impact for Phase 4 districts.

Table J.3 repeats the exercise above for outcomes measured two years after lone parents first became potentially eligible for IWC. Given that this report uses data that tracks lone parents until 31 March 2007, only lone parents who became potentially eligible for IWC before 31 March 2005 would have such outcomes recorded, limiting the analysis to Phases 1 and 2.

## Table J.3 Estimated impact of the LPPs, flow sample, by phase and cohort, 24 months after becoming potentially eligible, common unrestricted trend (ppts)

| Period in which lone parents became potentially eligible | Phase 1 | | Phase 2 | |
|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work |
| April 2004–October 2004 | 1.4 | 0.6 | | |
| | (0.686)** | (0.591) | | |
| October 2004–April 2005 | 2.7 | 2.6 | 2.1 | 1.4 |
| | (0.784)*** | (0.669)*** | (0.530)*** | (0.461)*** |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

In Phase 1 districts, lone parents who became potentially eligible for IWC within six months of its introduction were 1.4 ppts more likely to be off benefit and 0.6 ppts more likely to be in work two years later – the latter impact, however, is not statistically different from zero. For the cohort of lone parents who became potentially eligible during the next six-month period, from October 2004 to April 2005, the impacts are considerably larger: these individuals were 2.7 ppts more likely to be off benefit and 2.6 ppts more likely to be in work two years after becoming potentially eligible for IWC. However, only the impact on work outcomes is significantly different for the second cohort from the first.

For Phase 2, only one point estimate is reported – for lone parents who became potentially eligible for IWC between October 2004 and April 2005. The table indicates that the LPPs made these lone parents 2.1 ppts more likely to be off benefit and 1.4 ppts more likely to be in work 24 months after first becoming potentially eligible. Both of these point estimates are significantly different from zero (the impacts for Phase 2 are similar but not identical to the corresponding estimates in Table J.1, for the same reasons outlined above for the Phase 4 impacts at 12 months).

This analysis provides some indication of how the impact of the LPPs has changed over time. The point estimates on both benefit and work outcomes appear to increase as additional cohorts became potentially eligible for IWC but only for work outcomes is the growth in the impacts statistically significant. The increasing impact of the LPPs may be consistent with the idea of information effects, whereby awareness of the policy among potentially eligible lone parents is low to begin with but gradually increases as the initial cohorts are exposed to it, leading to higher take-up rates. Alternatively, it could reflect an increase in the effectiveness of Jobcentre Plus advisers (and other practitioners) in the pilot districts as they gain experience of the policy. Finally, a third possible interpretation is that the more recent cohorts of potentially eligible lone parents are somehow different from previous cohorts in ways that are not captured by the data. If such differences also affect their chances of leaving benefit for work, they would lead to increases in the estimated impact of the LPPs.

## Impact of the LPPs on encouraging job retention in each phase

Table J.4 presents estimates of the impact of the LPPs on lone parents who leave Income Support (IS) for work separately for each phase.

In terms of benefit outcomes, the point estimates are all positive and, for Phases 1, 2 and 3, they are almost always significantly different from zero. The impact of the LPPs peaks between about nine and 18 months after potentially eligible lone parents leave IS for work, at 4 ppts in Phases 1 and 3 and 2.6 ppts in Phase 2.

The impact of the LPPs on work outcomes is more varied: the point estimates are greatest in Phase 3, with IWC recipients 4.6 ppts more likely to be in work than potentially eligible lone parents in the control districts 18 months after leaving IS for work, while receipt of IWC appears to have little effect on the work outcomes of potentially eligible lone parents who leave IS for work in Phase 1 or Phase 4.

Comparing these results with the findings reported in Table J.1 suggests that much of the impact of the LPPs in Phases 1 and 4 – on work outcomes in particular – arises because it encourages more potentially eligible lone parents to enter work. This is because the estimates that condition on having left IS and being in work (reported in this section) suggest that IWC recipients are not significantly more likely to be in work than potentially eligible lone parents in control districts. On the other hand, in Phases 2 and 3, the LPPs appear to have both initial and retention effects: that is to say, they encourage more potentially eligible lone parents to stop claiming benefits and start working and, conditional on having done so, also encourage more lone parents to stay off benefits and in work.

## Table J.4 Estimated impact of the LPPs on lone parents who leave IS for work, all cohorts, by phase, common unrestricted trend (ppts)

| Months since left IS | Phase 1 | | Phase 2 | | Phase 3 | | Phase 4 | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | 1.9 | 1.3 | 2.1 | 1.9 | 1.6 | 1.5 | 0.1 | 0.4 |
| | (0.764)** | (0.859) | (0.452)*** | (0.502)*** | (0.676)** | (0.736)** | (0.503) | (0.580) |
| 6 | 1.6 | –1.3 | 2.6 | 2.4 | 1.2 | 2.1 | 0.8 | 1.9 |
| | (0.969)* | (1.084) | (0.580)*** | (0.637)*** | (0.857) | (0.947)** | (0.654) | (0.741)** |
| 9 | 2.91 | –1.0 | 2.6 | 2.1 | 2.8 | 1.8 | 0.6 | 1.3 |
| | (1.076)*** | (1.172) | (0.646)*** | (0.704)*** | (0.983)*** | (1.100)* | (0.830) | (0.927) |
| 12 | 4.1 | –0.2 | 2.1 | 2.1 | 2.9 | 2.7 | 0.6 | 1.8 |
| | (1.156)*** | (1.260) | (0.707)*** | (0.770)*** | (1.106)*** | (1.245)** | (1.049) | (1.167) |
| 15 | 3.3 | 1.6 | 2.2 | 2.2 | 4.0 | 3.7 | 1.3 | 2.7 |
| | (1.209)*** | (1.329) | (0.760)*** | (0.833)*** | (1.239)*** | (1.404)*** | (1.562) | (1.740) |
| 18 | 2.9 | 0.3 | 2.0 | 0.8 | 4.1 | 4.6 | | |
| | (1.299)** | (1.430) | (0.837)** | (0.920) | (1.449)*** | (1.644)*** | | |
| 21 | 3.2 | 2.0 | 1.6 | 0.8 | 3.4 | 2.9 | | |
| | (1.396)** | (1.541) | (0.950)* | (1.038) | (2.144) | (2.402) | | |
| 24 | 3.3 | 3.9 | 1.6 | 2.0 | | | | |
| | (1.496)** | (1.649)** | (1.112) | (1.207)* | | | | |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

# Appendix K
# Robustness checks: trend variants

Section 4.2 investigated the underlying trend in outcomes in the comparison districts and how the difference between each of the phases and the comparison districts changed over time **before the introduction of the lone parent pilots (LPPs)**. It concluded that the underlying difference between each phase and the comparison districts could be represented adequately by a constant and that the underlying time trend should be represented by a full set of quarterly indicators, common to all districts.

To obtain an unbiased estimate of the impact of the LPPs, one must assume that these pre-programme trends continue after the introduction of the LPPs (an assumption which cannot be tested). However, the finding of negative 'treatment' effects amongst lone parents before they are potentially eligible for In-Work Credit (IWC), but **after the LPPs were introduced** (described in Section 4.2.3 and Appendix L), suggests that this may not be an adequate representation of the time trend after the LPPs were introduced.

This appendix considers three alternative estimates of the impact of the LPPs using different assumptions about the underlying trend in outcomes:

a no time trend, but seasonal indicators;

b separate quadratic and linear time trends for each of the four phases and the set of comparison districts, and seasonal indicators common to all districts;

c separate linear time trends for each of the four phases and the set of comparison districts, a common quadratic time trend, and seasonal indicators common to all districts.

In specifications b) and c), outcomes for lone parents observed before the LPPs began are used to estimate a time trend, which is then extrapolated into the period after the LPPs began; this is done separately for each of the four phases and the

combined set of comparison districts. The advantage of these specifications is that they allow the treatment and comparison districts to have different underlying trends in outcomes; the disadvantage is that the estimated treatment effect is then sensitive to the accuracy of the estimated underlying trend. In particular, in this case, the estimate of the underlying trend is based on data on outcomes of lone parents whose duration on Income Support (IS) reached 12 months between April 2001 and, at the latest, April 2004, and this trend is then extrapolated for at least three years. If that extrapolation is invalid, then the estimated treatment effect will be incorrect.

Table K.1 shows how the estimated treatment effects (averaged across all phases) vary as the assumptions about the underlying trend in outcomes is altered. Note that the first two columns – showing estimates using a common, unrestricted trend – replicate the headline results reported in Table 4.1. Compared with the headline set of results (which assumes that the underlying trend in outcomes is common to all phases but has an unrestricted form):

- Under the assumption of no trend in outcomes (columns 3 and 4), the point estimates for benefit outcomes are higher and for work outcomes are lower, particularly as time since becoming potentially eligible increases.
- Under the assumption of a differential quadratic trend in outcomes specific to each phase, the point estimates for benefit and work outcomes are lower (and the standard errors are substantially higher).
- Under the assumption of a differential linear trend in outcomes specific to each phase and a common quadratic trend, the point estimates for benefit and work outcomes are mostly higher except for outcomes at the longest durations (and the standard errors are substantially higher).

Tables K.2 to K.5 show how the estimated treatment effects for each phase vary as the assumptions about the underlying trend in outcomes are altered.

## Table K.1 Estimated impact of the LPPs, flow sample, all phases and all cohorts, trend variants (ppts)

| Months since potentially eligible for IWC | Common unrestricted trends | | No trend | | Differential quadratic and linear trends | | Differential linear and common quadratic trends | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | 0.5 | 0.3 | 0.5 | 0.3 | 0.4 | 0.1 | 0.4 | 0.4 |
| | (0.112)*** | (0.129)** | (0.112)*** | (0.129)** | (0.209)** | (0.245) | (0.171)** | (0.200)** |
| 6 | 1.0 | 0.7 | 1.0 | 0.6 | 0.6 | 0.4 | 0.7 | 0.7 |
| | (0.154)*** | (0.151)*** | (0.154)*** | (0.151)*** | (0.313)* | (0.314) | (0.246)*** | (0.245)*** |
| 9 | 1.3 | 0.9 | 1.4 | 0.8 | 0.7 | 1.4 | 1.3 | 1.3 |
| | (0.187)*** | (0.174)*** | (0.187)*** | (0.174)*** | (0.408)* | (0.385)*** | (0.310)*** | (0.293)*** |
| 12 | 1.6 | 1.0 | 1.7 | 0.9 | 1.4 | 0.8 | 2.1 | 1.2 |
| | (0.220)*** | (0.199)*** | (0.220)*** | (0.199)*** | (0.504)*** | (0.463)* | (0.378)*** | (0.349)*** |
| 15 | 1.7 | 1.1 | 1.9 | 1.1 | 1.1 | 0.5 | 2.5 | 1.5 |
| | (0.260)*** | (0.230)*** | (0.259)*** | (0.230)*** | (0.583)* | (0.524) | (0.456)*** | (0.414)*** |
| 18 | 1.7 | 1.3 | 2.0 | 0.9 | 1.0 | 0.7 | 2.1 | 1.7 |
| | (0.301)*** | (0.265)*** | (0.299)*** | (0.263)*** | (0.658) | (0.585) | (0.539)*** | (0.487)*** |
| 21 | 1.8 | 1.3 | 2.4 | 1.0 | 1.0 | 1.2 | 2.2 | 2.1 |
| | (0.348)*** | (0.306)*** | (0.345)*** | (0.301)*** | (0.669) | (0.590)** | (0.590)*** | (0.528)*** |
| 24 | 2.0 | 1.4 | 2.7 | 0.6 | 0.8 | 0.4 | 2.5 | 1.6 |
| | (0.419)*** | (0.366)*** | (0.414)*** | (0.360)* | (0.741) | (0.652) | (0.664)*** | (0.589)*** |
| 27 | 1.4 | 1.6 | 2.3 | 0.1 | –1.0 | –0.3 | 0.4 | 0.8 |
| | (0.539)** | (0.469)*** | (0.535)*** | (0.462) | (0.817) | (0.715) | (0.747) | (0.658) |
| 30 | 1.2 | 0.4 | 2.2 | –2.1 | 0.0 | –0.9 | 0.7 | 0.0 |
| | (0.758) | (0.650) | (0.748)*** | (0.639)*** | (1.281) | (1.121) | (0.985) | (0.857) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

## Table K.2 Estimated impact of the LPPs, flow sample, Phase 1, all cohorts, trend variants (ppts)

| Months since potentially eligible for IWC | Common unrestricted trends | | No trend | | Differential quadratic and linear trends | | Differential linear and common quadratic trends | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | –0.2 | 0.3 | –0.2 | 0.0 | –0.5 | –0.8 | –0.4 | –0.6 |
| | (0.216) | (0.263) | (0.216) | (0.263) | (0.403) | (0.499)* | (0.402) | (0.498) |
| 6 | 0.3 | 0.6 | 0.3 | 0.3 | 0.0 | –0.7 | 0.2 | –0.4 |
| | (0.293) | (0.300)* | (0.293) | (0.301) | (0.566) | (0.586) | (0.557) | (0.580) |
| 9 | 0.4 | 1.1 | 0.5 | 0.9 | 0.3 | 0.9 | 1.0 | 1.4 |
| | (0.346) | (0.334)*** | (0.346) | (0.333)*** | (0.692) | (0.672) | (0.668) | (0.653)** |
| 12 | 0.8 | 1.4 | 1.0 | 1.2 | 0.8 | –0.0 | 2.0 | 1.2 |
| | (0.390)** | (0.363)*** | (0.389)** | (0.363)*** | (0.817) | (0.763) | (0.764)** | (0.721)* |
| 15 | 1.4 | 1.5 | 1.6 | 1.3 | 1.3 | 0.1 | 3.1 | 2.2 |
| | (0.434)*** | (0.393)*** | (0.432)*** | (0.392)*** | (0.925) | (0.846) | (0.831)*** | (0.773)*** |
| 18 | 1.5 | 1.6 | 1.9 | 1.1 | 1.0 | 0.3 | 2.8 | 2.2 |
| | (0.474)*** | (0.422)*** | (0.471)*** | (0.419)*** | (1.031) | (0.925) | (0.891)*** | (0.815)*** |
| 21 | 1.7 | 1.3 | 2.3 | 0.8 | 1.6 | 0.8 | 2.9 | 2.7 |
| | (0.520)*** | (0.457)*** | (0.515)*** | (0.452)* | (1.121) | (0.993) | (0.918)*** | (0.828)*** |
| 24 | 1.9 | 1.4 | 2.7 | 0.6 | 1.6 | 0.6 | 3.4 | 2.5 |
| | (0.572)*** | (0.496)*** | (0.565)*** | (0.489) | (1.190) | (1.045) | (0.927)*** | (0.825)*** |
| 27 | 2.2 | 1.9 | 3.1 | 0.1 | 0.6 | –0.6 | 2.0 | 1.6 |
| | (0.656)*** | (0.568)*** | (0.647)*** | (0.559) | (1.252) | (1.098) | (0.941)** | (0.829)* |
| 30 | 1.2 | 0.4 | 2.2 | –2.1 | 0.0 | –0.9 | 0.7 | 0.0 |
| | (0.758) | (0.650) | (0.748)*** | (0.639)*** | (1.281) | (1.121) | (0.985) | (0.857) |
| 33 | 1.1 | 0.3 | 2.1 | –2.9 | –0.5 | –1.5 | –0.1 | –0.9 |
| | (1.014) | (0.856) | (1.004)** | (0.845)*** | (1.382) | (1.193) | (1.160) | (0.991) |
| 36 | 2.5 | 5.0 | 3.3 | 0.8 | 1.0 | 3.4 | 1.4 | 3.9 |
| | (3.985) | (3.655) | (3.982) | (3.653) | (4.075) | (3.731) | (4.015) | (3.680) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

## Table K.3 Estimated impact of the LPPs, flow sample, Phase 2, all cohorts, trend variants (ppts)

| Months since potentially eligible for IWC | Common unrestricted trends | | No trend | | Differential quadratic and linear trends | | Differential linear and common quadratic trends | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | 0.8 | 0.5 | 0.8 | 0.5 | 0.9 | 0.2 | 0.7 | 0.5 |
| | (0.164)*** | (0.188)** | (0.164)*** | (0.189)** | (0.353)** | (0.403) | (0.297)** | (0.346) |
| 6 | 1.5 | 0.8 | 1.5 | 0.8 | 1.7 | 0.7 | 1.5 | 0.9 |
| | (0.220)*** | (0.217)*** | (0.221)*** | (0.217)*** | (0.497)*** | (0.492) | (0.401)*** | (0.406)** |
| 9 | 1.8 | 0.8 | 1.9 | 0.7 | 2.0 | 1.5 | 2.0 | 1.2 |
| | (0.261)*** | (0.243)*** | (0.262)*** | (0.244)*** | (0.624)*** | (0.586)** | (0.479)*** | (0.459)*** |
| 12 | 2.0 | 0.9 | 2.2 | 0.8 | 2.3 | 1.0 | 2.7 | 1.2 |
| | (0.298)*** | (0.270)*** | (0.299)*** | (0.271)*** | (0.757)*** | (0.695) | (0.546)*** | (0.512)** |
| 15 | 2.1 | 1.1 | 2.3 | 1.1 | 1.5 | 0.6 | 3.0 | 1.3 |
| | (0.338)*** | (0.300)*** | (0.338)*** | (0.300)*** | (0.848)* | (0.764) | (0.596)*** | (0.547)** |
| 18 | 1.7 | 0.8 | 2.1 | 0.5 | 0.3 | 0.4 | 1.7 | 0.9 |
| | (0.379)*** | (0.332)** | (0.378)*** | (0.331) | (0.886) | (0.786) | (0.643)*** | (0.580) |
| 21 | 1.8 | 0.9 | 2.3 | 0.7 | 0.1 | 0.8 | 1.7 | 1.5 |
| | (0.439)*** | (0.383)** | (0.438)*** | (0.382)* | (0.884) | (0.779) | (0.686)** | (0.610)** |
| 24 | 2.1 | 1.3 | 2.7 | 0.7 | 0.4 | 0.4 | 2.0 | 1.1 |
| | (0.529)*** | (0.460)*** | (0.529)*** | (0.459) | (0.882) | (0.775) | (0.742)*** | (0.654)* |
| 27 | 0.1 | 1.1 | 1.0 | –0.0 | –2.0 | –0.2 | –1.3 | 0.1 |
| | (0.817) | (0.708) | (0.831) | (0.719) | (1.034)** | (0.902) | (0.968) | (0.846) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

## Table K.4 Estimated impact of the LPPs, flow sample, Phase 3, all cohorts, trend variants (ppts)

| Months since potentially eligible for IWC | Common unrestricted trends | | No trend | | Differential quadratic and linear trends | | Differential linear and common quadratic trends | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | 0.2 | 0.8 | 0.2 | 0.6 | 0.2 | 0.8 | 0.2 | 1.5 |
| | (0.188) | (0.232)*** | (0.188) | (0.232)*** | (0.407) | (0.502) | (0.297) | (0.372)*** |
| 6 | 0.7 | 1.0 | 0.7 | 0.9 | –0.4 | 0.6 | 0.4 | 1.4 |
| | (0.263)*** | (0.267)*** | (0.264)*** | (0.268)*** | (0.590) | (0.604) | (0.406) | (0.423)*** |
| 9 | 1.1 | 1.5 | 1.2 | 1.4 | 0.3 | 1.9 | 1.3 | 2.5 |
| | (0.322)*** | (0.304)*** | (0.322)*** | (0.304)*** | (0.729) | (0.699)*** | (0.481)*** | (0.466)*** |
| 12 | 1.2 | 1.5 | 1.3 | 1.5 | 1.8 | 2.2 | 2.1 | 2.4 |
| | (0.382)*** | (0.346)*** | (0.382)*** | (0.346)*** | (0.831)** | (0.772)*** | (0.549)*** | (0.512)*** |
| 15 | 1.4 | 1.6 | 1.6 | 1.6 | 1.9 | 2.0 | 2.6 | 2.3 |
| | (0.456)*** | (0.399)*** | (0.456)*** | (0.399)*** | (0.898)** | (0.806)** | (0.623)*** | (0.561)*** |
| 18 | 1.6 | 2.1 | 1.8 | 1.9 | 1.9 | 1.4 | 2.2 | 2.5 |
| | (0.555)*** | (0.479)*** | (0.555)*** | (0.479)*** | (0.940)** | (0.826)* | (0.713)*** | (0.629)*** |
| 21 | 2.3 | 2.8 | 2.7 | 2.5 | 2.0 | 2.2 | 2.9 | 3.1 |
| | (0.783)*** | (0.675)*** | (0.784)*** | (0.676)*** | (1.052)* | (0.914)** | (0.908)*** | (0.792)*** |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

## Table K.5 Estimated impact of the LPPs, flow sample, Phase 4, all cohorts, trend variants (ppts)

| Months since potentially eligible for IWC | Common unrestricted trends | | No trend | | Differential quadratic and linear trends | | Differential linear and common quadratic trends | |
|---|---|---|---|---|---|---|---|---|
| | Off benefit | In work | Off benefit | In work | Off benefit | In work | Off benefit | In work |
| 3 | 0.6 | –0.0 | 0.6 | 0.1 | 0.8 | 0.4 | 0.6 | 0.2 |
| | (0.187)*** | (0.210) | (0.188)*** | (0.211) | (0.396)* | (0.455) | (0.259)** | (0.296) |
| 6 | 1.0 | 0.3 | 1.0 | 0.4 | 0.2 | 0.6 | 0.6 | 0.5 |
| | (0.263)*** | (0.249) | (0.264)*** | (0.250)* | (0.530) | (0.519) | (0.350)* | (0.339) |
| 9 | 1.1 | 0.3 | 1.2 | 0.4 | 0.1 | 1.4 | 1.1 | 0.8 |
| | (0.337)*** | (0.302) | (0.340)*** | (0.304) | (0.626) | (0.577)** | (0.429)** | (0.391)* |
| 12 | 1.8 | 0.2 | 1.9 | 0.3 | 1.0 | 0.6 | 1.8 | 0.5 |
| | (0.444)*** | (0.383) | (0.450)*** | (0.388) | (0.718) | (0.641) | (0.534)*** | (0.471) |
| 15 | 0.9 | –0.6 | 1.3 | –0.2 | –0.2 | –0.3 | 1.2 | 0.3 |
| | (0.738) | (0.610) | (0.762)* | (0.631) | (0.949) | (0.810) | (0.823) | (0.693) |

Base: All lone parents in flow sample (see Appendix B for detail and Appendix H for sample sizes and mean outcomes).

To understand why changing the assumption about underlying trends affects the estimates of the impact of the LPPs, it is useful to refer back to Appendix I. For example, the trend in many of the outcomes in Phases 1 and 3 is U-shaped. Under the assumption that each phase has its own quadratic trend in outcomes, the quadratic trend fits the data well, so there is much less evidence of a treatment effect after the LPPs started. But under the assumption that each phase has its own linear trend, the model assumes that the (slight) downward trend in outcomes that occurred before the LPPs began would continue afterwards, and this leads to a larger estimated impact of the LPPs.

# Appendix L Robustness checks: anticipation effects

Chapters 4 and 6 presented the estimated impact of the lone parent pilots (LPPs) on lone parents in the flow sample who had been receiving out-of-work benefits for at least 12 months. One assumption underpinning the results was that the LPPs did not affect lone parents before this point in time. This assumption can be tested by estimating apparent treatment effects on lone parents who have been on Income Support (IS) for less than 12 months and who are, therefore, not yet eligible for In-Work Credit (IWC). This appendix reports such estimates.

However, interpreting such treatment effects is not simple: there are two main causes, with very different implications, and no reliable way of distinguishing between them:

- First, any estimated 'treatment effects' may genuinely be caused by the LPPs. There are at least three ways this could occur:
  - Chapter 2 discussed that one might expect that lone parents in pilot districts whose duration of IS is less than 12 months, and who are contemplating leaving IS for a job of 16 or more hours a week, might delay leaving IS until they become eligible for IWC. The benefits from doing this would be up to £2,080 in IWC payments; assuming it is costless to delay leaving IS for a job, the only cost would be the net earnings (i.e. net of taxes paid and benefits lost) forgone during the period of delay. These are known as anticipation effects and if present they would lead to an estimated negative 'treatment effect' on lone parents in pilot districts whose duration of IS is less than 12 months; the implication would be that estimates of the net impact of the LPPs that ignored these would be overstating the genuine impact of the LPPs.

  - There may be 'substitution effects'; in the case of the LPPs, this would refer to a situation where the higher number of lone parents whose duration on IS exceeds 12 months looking for work makes it harder for others – such as lone parents on IS for less than 12 months – to find work. Such effects would lead to a negative 'treatment effect' on lone parents in pilot districts whose duration of IS is less than 12 months and the implication would be that estimates of the net impact of the LPPs that ignored these would be overstating the genuine impact of the LPPs.
  - Some of the IWC districts were also operating other LPPs, such as New Deal Plus for Lone Parents (NDfLP). If these programmes had a positive (negative) impact on lone parents' outcomes, this could lead to estimated positive (negative) treatment effects on outcomes measured before the duration on IS reaches 12 months. The implication would be that estimates of the net impact of the LPPs that ignored these other programmes would correctly estimate the impact of the LPPs on potentially eligible lone parents but underestimate the impact of the LPPs as a whole.

- Second, any estimated treatment effects may be due to a failure of the 'common trends' assumption after the LPPs started. This would happen if there were a deterioration or improvement in the outcomes in the pilot districts that did not occur in the comparison districts and which could not be explained by the explanatory factors included in the regression. If such a deterioration (improvement) had occurred, then it would lead to estimated treatment effects on outcomes measured before duration on IS reaches 12 months that were negative (positive), and it would imply that the conventional difference-in-differences (DiD) estimates of the net impact of the LPPs were understating (overstating) the genuine impact of the LPPs.

Table L.1 estimates the impact of the LPPs on the 'variant flow sample' at various points during lone parents' IS claim. The variant flow sample comprises all claims of IS made by lone parents between 1 April 2001 and 31 March 2007. The advantage of this sample is that it follows lone parents who made an IS claim from the first day of their claim and so one can test whether there appear to be treatment effects on lone parents before they became potentially eligible for IWC. Lone parents were classified as being in the treatment group if they started a claim of IS no earlier than 12 months before IWC started in their district; in other words, the treatment group comprises those claims of IS that, if they had lasted for at least 12 months and there had been no changes in personal circumstances from the initial claim, would have been potentially eligible for IWC.

## Table L.1 Estimated impact of the LPPs on lone parents who are not yet potentially eligible, variant flow sample, all phases, all cohorts, common unrestricted trend (ppts)

| Months before/since potentially eligible for IWC | Months since claim of IS | Off benefit | In work |
|---|---|---|---|
| –9 | 3 | –0.6 | –0.3 |
| | | (0.094)*** | (0.134)** |
| –6 | 6 | –0.4 | –0.3 |
| | | (0.147)*** | (0.151)* |
| –3 | 9 | –0.7 | –0.6 |
| | | (0.178)*** | (0.168)*** |
| 0 | 12 | –0.6 | –0.7 |
| | | (0.199)*** | (0.184)*** |
| 3 | 15 | –0.2 | –0.6 |
| | | (0.221) | (0.203)*** |
| 6 | 18 | 0.3 | –0.4 |
| | | (0.244) | (0.222) |
| 9 | 21 | 0.2 | –0.0 |
| | | (0.274) | (0.249) |
| 12 | 24 | 0.9 | 0.6 |
| | | (0.310)*** | (0.285)** |
| 15 | 27 | 0.8 | 0.2 |
| | | (0.363)** | (0.334) |
| 18 | 30 | 1.2 | 0.8 |
| | | (0.429)*** | (0.398)** |
| 21 | 33 | 0.4 | 0.2 |
| | | (0.492) | (0.458) |
| 24 | 36 | 0.7 | 1.0 |
| | | (0.579) | (0.542)* |

Base: All lone parents in variant flow sample (see Appendix B for detail).

For both benefit and work outcomes, the point estimates are negative in months –9 to 3 (measured relative to when the claimant would have actually become potentially eligible for IWC) and then rise (until month 18).

The pattern of negative effects on benefit and work outcomes in months –9 to 3 is consistent with:

- negative anticipation effects, with lone parents delaying exits from IS in the first 12 months in order to benefit subsequently from the LPPs;
- negative substitution effects, with lone parents on IS for less than 12 months finding it harder to find jobs as a direct result of lone parents on IS for more than 12 months making more effort to leave benefit and start a job;

- a failure of the 'common trends' assumption after the LPPs were introduced, whereby the pilot districts saw outcomes deteriorate relative to the comparison districts.

It is not possible to distinguish empirically between these explanations and so there can be no direct conclusion. All that can be said is that if the:

- 'common trends' assumption is true, the negative impacts must be due to the policy, perhaps through anticipation or substitution effects. This would mean that estimates that assume these effects do not exist (such as those in Table 4.1) will overstate the genuine impact of the LPPs on the whole population of lone parents;
- policy has no impact on lone parents who are not directly eligible, the negative impacts must be due to a failure of the 'common trends' assumption. This would mean that estimates that ignore this (such as those in Table 4.1) would understate the genuine impact of the LPPs.

Of course, both factors could be present in reality.

Table L.2 shows how conclusions about the net impact of the LPPs are altered by the assumption that the negative apparent treatment effects in Table L.1 are due to the policy, perhaps through anticipation or substitution effects. Table L.2 translates the estimates in Table L.1 (which allowed for anticipation effects) and an equivalent set, shown in Table L.3 (which assumed no anticipation effects) into the additional number of lone parents moved off benefit at different times due to the LPPs (this is calculated by multiplying the estimated treatment impact by the population of potentially eligible lone parents).

## Table L.2 Estimated impact of the LPPs on number of lone parents off benefit or in work with and without anticipation effects, based on lone parents who are not yet potentially eligible, variant flow sample, all phases, all cohorts, common unrestricted trends

| Months before/ since became potentially eligible for IWC | Months since IS claim started | Numbers off benefit, allowing for anticipation effects | Numbers off benefit, assuming no anticipation effects | Difference | Numbers in work, allowing for anticipation effects | Numbers in work, assuming no anticipation effects | Difference |
|---|---|---|---|---|---|---|---|
| –9 | 3 | **–1,395** | | | **–614** | | |
| –6 | 6 | **–896** | | | –587 | | |
| –3 | 9 | **–1,175** | | | **–990** | | |
| 0 | 12 | **–949** | | | **–1,032** | | |
| 3 | 15 | –253 | **552** | N/A | **–784** | –187 | N/A |
| 6 | 18 | 398 | **950** | –58% | –421 | 29 | N/A |
| 9 | 21 | 228 | **977** | –77% | –8 | **363** | N/A |
| 12 | 24 | **705** | **1,092** | –35% | **447** | **553** | –19% |
| 15 | 27 | **435** | **708** | –39% | 113 | **381** | –70% |
| 18 | 30 | **522** | **530** | –2% | **353** | **392** | –10% |
| 21 | 33 | 126 | 199 | –37% | 53 | 140 | –62% |
| 24 | 36 | 130 | 171 | –24% | 191 | 163 | 17% |

Notes: Based on estimated impacts in Tables L.1 and L.3 multiplied by total number of lone parents actually potentially eligible for IWC. It is not possible to test whether the numbers are significantly different from each other but numbers in bold are based on coefficients that are themselves statistically significant from zero; it is highly likely that the difference between two numbers that are not in bold is not statistically significant.

As expected, allowing the LPPs to affect lone parents who are not directly eligible for IWC reduces the estimates of their overall impact, by around 19 per cent for work outcomes and 35 per cent for benefit outcomes after 12 months. The estimated impacts in Table L.1 are **not** comparable to those in Table 4.1; they are necessarily smaller, because around 30 per cent of the sample used for the estimates in Table L.1 were never eligible for IWC because the duration of their IS claim was less than 12 months. The estimated number of lone parents off benefit declines over time, **not** because the impact of IWC declines in percentage point terms but because fewer potentially eligible lone parents have been observed for these longer durations by 31 March 2007.

Table L.3 shows the estimated impact of the LPPs on those lone parents in the variant flow sample who remain on IS for at least 12 months. This is a similar, but not identical, sample to that used for the headline estimates in Table 4.1 (which is repeated in Table L.3). Both the main flow sample and that used in Table L.3 comprise individuals whose IS claims lasted at least 12 months. However, claims initially made by non-lone parents who later became lone parents will never appear in Table L.3 but will appear in Table 4.1; conversely, claims initially made by lone parents who were no longer lone parents after 12 months will appear in Table L.3 but will never appear in Table 4.1. Finally, Table 4.1 comprises lone parents who first became potentially eligible for IWC between 1 April 2001 and 31 March 2007 but Table L.3 comprises lone parents who first claimed IS between 1 April 2001 and 31 March 2007, and so the range of dates in which they will become potentially eligible for IWC, taking account of the cut-off point for the data used in this report, is 1 April 2002 to 31 March 2007. It is not possible to test whether the estimated impacts on the two different samples are equal for a given outcome, as they are based on samples that are not strict subsets of each other. The similarity between the results in Table L.3 and Table 4.1 provides some reassurance that the results in this appendix about the apparent treatment effects are unlikely to be driven by the use of the variant flow sample rather than the flow sample used in Chapter 4.

## Table L.3 Estimated impact of the LPPs, variant flow sample but conditional on being on IS for at least 12 months (with no changes in circumstances), all phases, all cohorts, common unrestricted trend (ppts)

| Months since potentially eligible for IWC | Off benefit | In work | Memo: benefit main results (from Table 4.1) | Memo: work main results (from Table 4.1) |
|---|---|---|---|---|
| 3 | 0.6 | –0.2 | 0.5 | 0.3 |
| | (0.163)*** | (0.208) | (0.112)*** | (0.129)** |
| 6 | 1.1 | 0.0 | 1.0 | 0.7 |
| | (0.221)*** | (0.234) | (0.154)*** | (0.151)*** |
| 9 | 1.4 | 0.5 | 1.3 | 0.9 |
| | (0.271)*** | (0.268)** | (0.187)*** | (0.174)*** |
| 12 | 2.0 | 1.0 | 1.6 | 1.0 |
| | (0.324)*** | (0.310)*** | (0.220)*** | (0.199)*** |
| 15 | 1.8 | 1.0 | 1.7 | 1.1 |
| | (0.391)*** | (0.368)*** | (0.260)*** | (0.230)*** |
| 18 | 1.8 | 1.3 | 1.7 | 1.3 |
| | (0.472)*** | (0.440)*** | (0.301)*** | (0.265)*** |
| 21 | 0.9 | 0.6 | 1.8 | 1.3 |
| | (0.552)* | (0.510) | (0.348)*** | (0.306)*** |
| 24 | 1.2 | 1.2 | 2.0 | 1.4 |
| | (0.660)* | (0.606)* | (0.419)*** | (0.366)*** |

Base: All lone parents in variant flow sample who are on IS after 12 months (see Appendix B for detail).

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