Institute for Fiscal Studies

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IFS Working Paper W16/11

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Can't work or won't work: quasi-experimental evidence on work search requirements for single parents[1]

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This Version June 2016

Abstract

Increasing the labour market participation of single parents, whether to boost incomes or reduce welfare spending, is a major policy objectives in a number of countries. This paper presents causal evidence on the impact of work search requirements on single parents' transitions into work and onto other benefits. We use rich administrative data on all single parent welfare recipients, and apply a difference-in-differences approach that exploits the staggered roll-out of a reform in the UK that gradually decreased the age of the youngest child at which single parents lose the right to an unconditional cash benefit. Consistent with the predictions of a simple search model, the work search requirements have heterogeneous impacts, leading some single parents to move into work (especially those with strong previous labour market attachments), but leading some (especially those with weak previous labour market attachments) to move onto disability benefits (with no search conditionalities) or non-claimant unemployment.

Keywords: single parents, active labour market policy, work search conditionalities

JEL codes. H53, I38, J64.

[1] Communication to: Andrea Salvatori (asalva@essex.ac.uk). This work was supported by the Economic and Social Research Council (ESRC) through the Research Centre on Micro-Social Change (MiSoC) at the University of Essex, grant number ES/L009153/1, by the NORFACE ERA-NET (New Opportunities for Research Funding Agency Co-operation in Europe Network) Welfare State Futures Programme, Grant Number 462-14-010, and by the UK Department for Work and Pensions.

1 Introduction

Over the past twenty years, several countries have extended to single parents various activation policies which are commonly directed at the unemployed at large (for reviews and discussion of active labour market policies, see OECD 2007; Bergemann and van den Berg 2008; Eichhorst and Konle-Seidl 2008; Immervoll and Scarpetta 2012; Card et al. 2015; Brown and Koetti 2015; Eichhorst and Konle-Seidl 2016). A central element of these policies is the imposition of work search requirements for single parents who claim benefits, with the aim of increasing the flow into employment. Previous work has shown that work search requirements might induce individuals with low level of labour market attachment to give up search entirely and join the ranks of those not in employment nor on benefits (Manning 2009; Petrongolo 2009). This casts doubt on the effectiveness of search conditionalities for single parents, a socio-demographic group that tends to have low levels of labour market participation.

In this paper, we present new causal evidence on the impact of the introduction of work search requirements on the probability of welfare-receiving single parents moving off welfare and into work. We exploit the staggered roll-out of a reform recently implemented in the UK, and known as "Lone Parents Obligations" (LPO). In a series of discrete jumps, the reform gradually lowered the age of the youngest child which triggers a move from a regime of unconditional income support to a regime with work search requirements. We use a difference-in-differences setting with rich administrative data on benefit receipt and spells of employment, using single parents with younger children as an unaffected group, and exploiting a long span of pre-reform data on single parents with similarly-aged children. The staggered nature of this roll-out – which effectively means we study a series of reforms affecting different groups at different times – provides reassurance that our results are not due to time-varying shocks affecting the treatment or comparison groups. Blundell et al. (2014) briefly consider the impact of this same reform on single parents' employment rates, but their analysis identifies the impact of LPO from deviations from a linear trend in employment rates, with no explicit comparison group to net out common labour market shocks, and does not consider the precise timing when single parents were affected.

Our research contributes to the literature examining the impact of passive or active labour market policies for single parents, and to the literature estimating the impact of work search requirements for the unemployed or those on social assistance. The literature on single

parents concludes that broad activation policies that have included work search requirements reduce the benefit count, increase employment and reduce poverty among single parents. [2] But there is also evidence that the effects of such reforms are heterogeneous and some single parents are made worse off. In the US, for example, welfare reforms are thought to have led to a substantial increase in the proportion of "disconnected" single mothers who are not in work nor on benefits (Blank 2007). But the comprehensive nature of the reforms evaluated in this literature makes it difficult to disentangle the effects of the individual provisions: the 1996 US reform, which has been the subject of a large number of studies, simultaneously introduced time limits, work search requirements and sanctions (Moffitt 2008), as well as giving states considerable discretion in designing the welfare system. An important feature of the UK's LPO reform is that it allows us to focus on effects of work search requirements alone, as no other major feature of the benefit system was altered by it. There is a much smaller literature on the impact of activating recipients of social assistance benefits, which in many European countries have traditionally (unlike unemployment insurance benefits) been "inactive" benefits. For example, Brodersen (2015) examines the impact of fortnightly meetings with case workers for social assistance recipients in Denmark, Dahlberg et al. (2009) examines the impact of activating welfare recipients in Stockholm, and Bolvig et al. (2003) estimate the impact of different sorts of activation policies for welfare recipients in Aarhus. Comparing the results of these studies to each other and to our own, though, is difficult, in part because there is considerable heterogeneity not just in what was involved by activation, but also by the composition of those receiving social assistance benefits.

The literature estimating the impact of work search requirements for the unemployed is too large for us to summarise, but two very relevant studies are Manning (2009) and Petrongolo (2009), which both estimate the impact of work search requirements for the unemployed in the UK (by studying the introduction of Jobseeker's Allowance (JSA) in 1996). Both studies find the JSA reform to have moved people off unemployment benefits, but not into work, with large flows into non-claimant unemployment and onto benefits for those with disabilities or poor health (we call these "health-related benefits" hereafter). These findings are

[2] See Moffitt (2008) for a review of the evidence for the US, but also Kok and McVicar (2013) and Gong and Breunig (2014), who study a reform similar to LPO in Australia, Mogstad and Pronzato (2012) who study a related reform from Norway,a nd Knoef and van Ours (2016) for 2 reforms in the Netherlands. Dolton and Smith (2011) examine an earlier UK reform (known as "New Deal for Lone Parents", or NDLP) in the UK that introduced a voluntary programme of work search counselling, and use the same administrative data on benefit receipt as we do, except that their data pre-dates the existence of tax credits, from which we draw our measure of employment.

consistent with a simple search model that predicts that some claimants might find the search requirements too burdensome and give up search entirely. As Manning (2009) shows, this is likely to be the case for individuals with initial low level of search, for whom the marginal cost of the extra search effort might exceed the expected benefit. And there are plausible reasons to think that single parents might be disproportionately found in this group. For example, single parents may have lower expected returns compared to the typical unemployed for given search effort, due to the longer average duration of their jobless spells (which might lower both the probability of an offer being made and the wage offered), or because, for a given job offer rate, they will accept only jobs with flexible arrangements or part-time hours that allow them to manage their childcare duties. If this is the case, the additional work search requirements could induce a significant flow towards benefits with no search conditionalities or towards non-claimant unemployment. Hence, both the literature on the impact of comprehensive activation policies on single parents and that on the impact of work search requirements on the unemployed at large suggest that introduction of search conditionalities for single parents might not achieve the intended aim of increasing labour market participation for this group.

We contribute to this issue by studying a reform that gradually reduced, from 16 to 7, the age of the youngest child at which a single parent loses her (or his, but we use female pronouns throughout) entitlement to the unconditional income support benefit (a further extension to age 5 took place in a period not covered by our data). The intention was that, once the youngest child had reached this age, single parents that wanted to receive welfare benefits would have to claim the unemployment benefit, although they could also claim health-related benefits if they met the medical conditions. The unemployment benefit, known as Jobseekers Allowance (JSA), can be claimed indefinitely (subject to a means-test on income and financial assets), but claimants are required to look for work actively, report to a welfare office at least fortnightly, and, like most "active" benefits, can be sanctioned for not making sufficient efforts to look for work, or for turning down job offers without good reason.[3]

[3] There is an extensive literature that seeks to estimate the causal impact of being sanctioned, or the causal impact of receiving unemployment benefits under a sanctioning regime (for example, see: Arni et al., 2015; Lalive et al, 2008; Rosholm and Svarer, 2008; Abbring et al, 2005). An important feature of the JSA regime in the UK is that claimants are required to undertake work search and related activities, and can be sanctioned if they do not comply with the terms of their "jobseeker's agreement", and so part of the impact of the LPO reform could be due to the act of being sanctioned, or the threat of being sanctioned. However, we lack data on who is sanctioned, and so we cannot contribute directly to this literature; instead, our results should seen as the overall

We show that the introduction of work search conditionalities did increase the flow of single parents into work, but also caused a large proportion of single mothers to move onto health-related benefits or into non-claimant unemployment (in the sense that they are not observed either in work or on benefits in our dataset). In fact, the flow towards the two states with no work search requirements is generally larger than that into work. For example, 9 months after the loss of entitlement to the unconditional income support, the reform has increased the probability that a previously welfare-receiving single parent is in work by about 10pp, but has also increased the probability of receiving either health-related benefits or being in non-claimant unemployment by about 18pp. The nature of this response is related to previous labour market experience: those with lower labour market attachment (proxied for by the fraction of time a single parent has spent on welfare benefits before being affected by the reform) are more likely to move into non-claimant unemployment and particularly onto health-related benefits, than those with stronger labour market attachment. That the impact of work search requirements might vary with the work-readiness of the single parents is consistent with the search model of Manning (2009) and Petrongolo (2009), and our empirical findings echo the one of an increase in the proportion of "detached" mothers found in the US (Blank 2007). Our findings also contribute to the literature that documents important interactions between (or substitutions between) programs to support those with poor health (such as the DI program in the US) and programs to support the unemployed: in addition to works already cited, see also, for example, Lammers et al. (2013), Brodersen (2015), and Lindner (2016) for recent empirical evidence, and Lawson (2015) for an assessment for how this affects the optimal design of UI.

The rest of the paper is arranged as follows. Section 2 explains the reform. Section 3 describes our empirical approach, while Section 4 described the data and gives a descriptive overview of the outcomes of the single parents affected by the reform. Section 5 presents our estimates of the impact of the reform, and Section 6 concludes.

2 The introduction of work search requirements on single parents in the UK: the LPO reform

The UK is the OECD country with the highest share of families headed by a sole parent (25.9% in 2004, (OECD 2011a)) as well as the highest proportion of children living in such

impact of moving single parents to a regime where they are required to attend fortnightly meetings and undertake work search activities, backed up by the threat of sanctions.

families (24.1% in 2004; OECD 2011a). In the mid-2000s, both the employment and the poverty rate of single parents in the UK were considerably lower than the OECD average, a fact OECD (2011a) attributes to the ability of the (pre-reform) income support system to alleviate poverty among non-working single parents. The employment rate of single parents in the mid 2000s was 56%, compared with 71% of mothers living with or married to a partner; the proportion of individuals from lone parent families with less than 60% of the median equivalised income was 50% in 2006-2008, compared with 23% for those in two-parent families with children.[4]

It was this context which led to the Lone Parent Obligations (LPO) reform, which effectively introduced work search requirements for single parents who claim welfare benefits. [5] It did this by gradually reducing from 16 to 5 the age of the youngest child at which a single parent loses her entitlement to the unconditional income support benefit (known as Income Support, or IS). To maintain the same level of income after IS runs out, single parents would then need to claim the benefit for the unemployed (known as Jobseeker's Allowance (JSA)), and be subject to the same work search requirements as any other unemployed claimant. Alternatively, single parents who satisfied the eligibility conditions could claim a benefit intended for those deemed unable to work through ill-health or disability (we call these "health-related benefits"; the main one in the period we study was called Employment and Support Allowance (ESA)). Single parents' entitlement to other welfare benefits or tax credits, such as the Child Tax Credit, Housing Benefit and Council Tax Benefit, was unaffected by LPO. Single parents who move into work of at least 16 hours a week were able to claim in-work tax credits; this was also unaffected by the LPO reform.

Hence, following the reform, as their youngest child reached a certain age, single parents who were not in work of at least 16 hours a week had a choice between claiming unemployment benefits subject to standard work search requirements, claiming health-related benefits if they were in sufficiently poor health or disabled, or accepting a significant reduction in their income (in 2009-10, a single parent with one (two) child(ren) that did not receive any of IS, JSA or ESA would be entitled to £3,820 (£6,741) a year from child benefit and child tax credit. IS or JSA would add a further £3,344. Foregoing IS or JSA therefore means a

[4] Employment rates from ONS analysis at http://tinyurl.com/j7k4nsu; poverty rates from http://www.poverty.org.uk/05/index.shtml.

[5] The LPO policy reform could be classified either as "work search assistance", or as "threat/sanctions" in Card et al's classification; and has elements of the "activation and workfare", "sanctions", "work search assistance" and "counselling and monitoring" categories in the Brown and Koetti classification.

reduction in income of 47% (33%) for a single parent with 1 (2) child(ren). [6] A small number of single parents were exempt from LPO, meaning that they could continue to claim the unconditional IS: these were single parents who were the designated full-time carer of a disabled adult, single parents who had a child who was severely disabled, and those who were fostering children (we observe only the first of these in our data, and exclude such single parents from our analysis sample).

The policy was phased in between November 2008 and late 2012. In this period, the age of the youngest child at which a single parent lost her entitlement to IS fell in a series of discrete jumps (Appendix A provides the precise information on the dates on which single parents lost entitlement to IS according to the date of birth of their youngest child). Officially, each of these discrete jumps was called a sub-phase, and these sub-phases were grouped into several Phases. The data available to us allows us to estimate the impact of LPO on single parents whose youngest child was between 16 and 7, covering Phases 1 to 3; we do not have data covering the period where single parents whose youngest child was aged 5 to 7 were affected by the reform.

3 Empirical strategy

3.1 Empirical strategy

Our aim is to estimate the impact of LPO on single parents who were existing claimants of the unconditional income support benefit (IS), and to estimate how LPO changed their subsequent employment and welfare receipt; data limitations mean we do not attempt to estimate how LPO affected welfare on-flows. We do this with a difference-in-differences design, where we observe outcomes for single parents with older children (the treatment group) and with younger children (the comparison group), and who are drawn from one of six cohorts spanning a 8 year period, the last of which is affected by LPO, and the first five of which are observed before LPO. We explain below precisely how these were constructed, and our approach to inference.

3.1.1 Constructing the treatment and comparison groups

For each sub-phase, the treated group is made up of the single parents whose youngest child's date of birth falls into various windows, as set out in Appendix A. We then assume that the

[6] Separate benefits are available to cover the cost of rental housing and local property taxes. Benefit rates are taken from http://www.ifs.org.uk/tools_and_resources/fiscal_facts/

LPO policy regime could have affected lone parent's behaviour beginning from 12 months before the loss of entitlement to IS, and so our treated group for each sub-phase is defined as single parents whose youngest child was born in a particular window, as set out in Appendix A, and who were receiving IS 12 months before the projected date on which they would lose entitlement to IS. Single parents were officially notified of their loss of entitlement to IS with 12 months' notice, and received more frequent counselling meetings with their Case Worker (although without any work search requirements) in the 12 months leading up to the loss of entitlement. Our approach therefore counts this period as part of the LPO treatment (we have no direct information on single parents' awareness of the reform as in, for example, van den Berg et al. (2009)). However, some single parents in our treated sample might not actually have been affected by LPO when the time came for them to lose entitlement to IS, either because their entitlement to IS had been extended (most usually because they had had another child), or because they had stopped receiving IS.

We then define an observation window that lasts 36 months from this date (i.e. the observation window begins 12 months before and ends 24 months after the date on which they were projected to lose entitlement to IS), or until 30 September 2011, when our data is right-censored. For example, a single parent with a youngest child born between 1 February 1999 and 26 October 1999 would be in sub-phase 2aF, and would have lost entitlement to IS between 25 October 2010 and 25 October 2011 (on a date that depended on the child's precise birth date).

For each sub-phase, the comparison group was defined as single parents whose youngest child turns 4 during the window of calendar time in which the treated single parents lost entitlement to IS. For example, the comparison group for sub-phase 2aF is made up of single parents whose youngest child turns 4 between 25 October 2010 and 25 October 2011. This is the oldest that we can make the comparison group's youngest children be while ensuring that they are not affected by LPO during the full observation window. [7] As with the treatment group, the observation period for the comparison group starts 12 months before this date, so it begins on the third birthday of the youngest child, and ends on the sixth birthday of their youngest child, or on 30 September 2011.

[7] We also checked the robustness of our results to using a control group with the youngest child aged 5 and reducing the observation period to 2 years. The results are not reported in here but in line with those included in this paper.

We then produce equivalent pre-reform cohorts of the treated and comparison groups by selecting single parents whose youngest children were the same age as the actual treated and comparison group and whose birthday fell in the same months of the year, but in earlier years. (This is equivalent to following the rules above for constructing the treatment and comparison groups, but pretending that LPO was introduced in earlier years). To ensure that all of our pre-reform cohorts are unaffected by LPO throughout their 36 month observation window, the latest pre-reform cohort is selected to be 4 years earlier than the actual treated group; additional pre-reform cohorts are drawn from earlier years. Because our data is available only from summer 1999 and in our regressions we control for the amount of time spent on benefits or work in the 36 months before the start of the observation period, then we can use at most 5 cohorts from the pre-reform period. For example, for the treated group that includes single parents whose youngest child turned 11 between 25 October 2010 and 25 October 2011, the latest pre-reform cohort includes single parents whose youngest child turned 11 between 25 October 2006 and 25 October 2007; the next pre-reform cohort between 25 October 2005 and 25 October 2006, and so forth, and we do the same for the comparison group. Finally, we drop all single parents who were receiving Carer's Allowance at the start of the observation window, as this group were exempt from the LPO reform, and those aged over 57 at the start of the window (as these women would become entitled to a state pension payment during the observation window).

3.1.2 Empirical specification and inference

We apply the two-step procedure suggested in Donald and Lang (2007) to produce coefficient estimates and p-values. If we think of a group as being defined by the interaction of cohort dummies with an indicator for being in the treatment group, then this addresses the twin problems that our variable of interest is constant within a group, and that we have relatively few groups (we have at most 12).

In the first step, we partial-out the individual-level covariates by running the following equation on the full micro-data:

$$y_{i(g)} = X_i\zeta + \sum_{g=1}^{12} \delta_g I_g + \epsilon_i \qquad 1$$

where I_g is an indicator variable for individual i belonging to group g, and X_i is a vector of individual-level controls.

In the second step, the dependent variable is the set of estimated group coefficients, $\hat{\delta}_g$, and these are regressed on cohort dummies, I_c, a treatment group dummy, and the interaction of the treatment group dummy with being in the final, post-reform, cohort (with β_2 being the coefficient of interest):

$$\hat{\delta}_g = \sum_{c=1}^{6} \gamma_c I_c + \beta_1 Treatment_g + \beta_2 Treatment_g * I(c = 6) + u_g. \qquad 2$$

Following Donald and Lang (2007), inference in this second step is carried out using the t-distribution with 4 degrees of freedom.[8] This approach should ensure that the true size of the tests is close to the nominal size if there is no dependence between the 12 clusters. The vector X_i includes the individual-level variables (age of gender of single parent, number of children, ethnicity of single parent, whether the single parent suffers from ill health or a disability, and summary measures of past employment and welfare receipt) and geographical variables which should control for time-invariant differences in local labour markets, as well as time-varying differences either due to changing labour markets or to any changes in the policy of local employment offices.[9]

As outcomes, we use "in employment" and receipt of various welfare benefits intended for non-working recipients, measured at 6 month intervals, beginning 9 months before the date of the predicted loss of entitlement to IS (or 3 months after the sample is drawn), and with a final outcome measured 24 months after the predicted loss of entitlement to IS (36 months after the sample is drawn). Equations (1) and (2) are estimated separately for each outcome, and for each sub-phase of LPO, by OLS. To help summarise the results, we also estimate a variant that pools all the sub-phase samples for each of the 3 main Phases, and we estimate a variant of (2) that allows for separate linear trends in the treatment and comparison groups.

[8] There are 12 data points and 8 coefficients. We do not make any allowance for estimation error in the first step; Table 1 shows the size of the post-reform treated groups in each sub-phase, the smallest of which has over 7,000 observations. Figure 2 to Figure 4 show a considerable degree of stability in the estimates of the pre-reform differences between outcomes for the treatment and comparison group, which suggests that sampling error in the set of $\hat{\delta}_g$ coefficents is negligible.

[9] We included: indicator variables for each travel-to-work area; a measure of the relative deprivation or affluence of the single parent's area of residence (this was the ward-level rank of the Index of Multiple Deprivation, measured separately for England and Wales, plus an indicator for being in Scotland); a set of indicator variables for each Jobcentre Plus district interacted with cohort.)

3.1.3 Threats to external validity

We rely on the three standard assumptions of the DiD approach for the coefficient β_2 to give unbiased estimates of the impact of LPO. First, we assume that single parents with younger and older children share a common trend in the absence of the treatment. This could be violated if other policy changes at the same time as LPO affected the two groups of single parents differentially. We provide details on potentially relevant policy changes (not necessarily specifically aimed at single parents) in Appendix B: we do not believe that other policy changes could have significantly altered the difference in outcomes between single parents with older and younger children. In Section 5.1, we provide evidence in support of the common trend assumption by showing that the difference between the treatment and comparison groups in the 5 pre-reform cohorts is remarkably stable over time. Additionally, the staggered roll-out of the reforms we exploit enables us to estimate the impact of the introduction of the work search requirements at different points in calendar time, hence providing reassurance that our results are not driven by a shock at a particular time differentially affecting the treatment or comparison groups. However, as a robustness check, we estimated a variant that allows outcomes in treatment and comparison groups to have their own linear trends.

The second assumption is that the composition of the treatment and comparison group does not change over time in a way that could confound the estimate of the effect of interest. Given the limited time span covered by our data, there are good reasons to believe the homogeneity of these groups over time. We show in Table 2 through Table 4 that the treatment and comparison groups appear very similar in terms of observed characteristics over time (and the inclusion of controls for employment and welfare receipt histories can be thought of as acting as a proxy for relevant unobservable, as in Card and Sullivan (1988) and Petrongolo (2009)).

A third assumption is that the comparison group are not themselves affected by the treatment. We defined the comparison group deliberately so that they would not be potentially affected by LPO throughout the three-year window (i.e. that the date on which they would lose eligibility to income support was at least a year after the end of the three year observation window). It is possible that the single parents in the comparison group could have been affected through substitution or displacement effects due to increased search effort by the

single parents in the treatment group. We cannot estimate these effects, but we consider that they are unlikely to be large.

4 Data and descriptive statistics

4.1 Overview

We use an administrative dataset provided by the UK's Department for Work and Pensions (DWP), and known as the Work and Pensions Longitudinal Study (WPLS). This combines information collected by DWP for administering benefit claims and welfare-to-work programmes with information about employment, earnings and tax credit claims collected by the tax authority (HM Revenue and Customs). This data is matched at the individual level, using a combination of name, date of birth, address and social security number. The advantage of this dataset is the very large sample, the ability to identify precisely when a single parent is due to lose entitlement to IS, and the ability to track accurately flows between different government programmes. The version of the dataset we used comprised a 100% sample of adults who had claimed IS as a single parent at any point since April 1999 in Great Britain. For these adults, we also observed the dates on which they were in receipt of any DWP benefit, and information on their claims of tax credits.

The outcome measures that relate to receipt of benefits come directly from this dataset (having cleaned the data to remove inconsistencies, as described in Appendix D). But our measure of work needs more discussion. We classified single parents as being "in work" if they had claimed tax credits and had reported that they were working 16 or more hours a week.[10] This will clearly underestimate the true employment rate amongst these single parents. First, the measure of employment clearly omits instances where single parents did paid work for fewer than 16 hours a week. But this is not common, partly because welfare benefits are withdrawn pound-for-pound for single parents who work fewer than 16 hours, but also because the in-work tax credit system provides a substantial financial incentive to work 16 or more hours a week (see, for example, Blundell and Shephard, 2011). Second, our measure will also not capture work of 16 hours a week or more by single parents who did not

[10] The information on a claimant's hours worked is needed only for determining entitlement to the Working Tax Credit, but typically the Working Tax Credit is claimed jointly with the Child Tax Credit, and so we refer to the two together as "tax credits" (for example, someone who wants to claim only the Child Tax Credit, knowing that they earn too much to be entitled to the Working Tax Credit will still be asked to report their weekly hours of work when making the claim even though that information is used only for determining entitlement to the Working Tax Credit).

claim tax credits when in work. Such non-claiming could be caused either by non-take-up amongst those who were eligible, or by having too high a family income to be eligible. In practice, we think both of these are likely to lead only to small biases: the take-up rate of tax credits amongst all single parents was estimated to be 95% during 2010-11[11], and a family with children would be entitled to tax credits with a combined gross income of up to £58,000 in the period covered by our data (the 90th centile of earnings across all employees was £46,293 in 2010-11).

Table 1 reports the number of single parents in our sample affected by the reform for each phase and sub-phase, and Table 2 through Table 4 report summary statistics. The treatment and the comparison groups are similar, but the former tend to be older (as expected, given they have older children), exhibit a higher incidence of ill-health or disability, and, has spent more time on IS in the six months before the observation period. The pre-reform cohorts appear very similar to their post-reform counterparts: the exception is the proportion of time spent in work in the 6 months prior to the start of the observation period, but this is because our measure of work does not capture time spent working before April 2003 (in our regressions, we deal with this by interacting this variable with a flexible control for year).

4.2 Outcomes for the affected single parents

Figure 1 shows, by Phase, how the main benefit and work outcomes evolved through the 36 month window for the single parents who were affected by LPO. It characterises single parents as being in one of the following mutually-exclusive states:

- Receiving Income Support (IS) with Carer's Allowance (CA)
- Receiving the unemployment benefit (JSA)
- Receiving the health-related benefit (ESA) and not receiving JSA
- Receiving IS and not receiving JSA or ESA
- In work and not receiving JSA, ESA, IS or CA
- Receiving CA and not receiving JSA, ESA or IS
- Not receiving JSA, ESA, IS or CA and not in work. [12]

[11] http://www.hmrc.gov.uk/statistics/fin-takeup-stats/cwtc-take-up.pdf. Take-up rates are, in general, lower for those entitlement to smaller amounts, but official statistics do not also break these down by family type.

[12] The outcomes shown for Phase 3 in Figure 1 are similar to results on destinations from a quantitative survey of single parents who lost entitlement to IS in early 2011 (Coleman and Riley. 2012). That report estimated that amongst those who left IS, 41 per cent were receiving JSA, 13 per cent ESA, 33 per cent were in work, and nine per cent not on benefit or in work , all measured 12 months after losing entitlement.

Because of the way the sample was constructed, all the single parents are receiving IS at the start of the window, 12 months before the projected date on which they lost IS entitlement. The fraction receiving IS falls considerably (by over 50 ppts) at the predicted time of losing entitlement (month 0), but some single parents continue to receive IS after that date: 6 months after the predicted loss of entitlement, about 10 per cent of potentially affected single parents are still receiving IS in Phases 1 and 2, and about 13 per cent in Phase 3. We show in Appendix E that, in just under two thirds of these cases, these single parents had experienced a change in circumstances which meant that they were no longer affected by the LPO reform; we are unable to tell whether the remaining cases reflect data inaccuracies or a failure of policy implementation.

The fraction of single parents receiving JSA or ESA rises sharply around the projected date on which the single parents lost IS entitlement; the fraction receiving JSA then declines steadily, and the fraction on ESA grows very slightly. The fraction recorded as being in work increases steadily from the beginning of the observation window beginning (i.e. 12 months before the projected loss of IS entitlement) and there is no discernible jump at the time that single parents are predicted to lose IS entitlement.

The difference between 1 and the shaded areas represents the fraction of the sample not receiving an out-of-work benefit and not recorded as being in work; this group corresponds to the "disconnected" single mothers identified by Blank 2007 that are not in work nor on benefits, and are likely to include many of those who were made financially worse off by the reform. The fraction of single parents in this group increases slowly from the beginning of the observation window, but then jumps up by some 2-3 pp at the time of the predicted loss of entitlement to IS; about 15% of single parents were not observed in work nor on any of the out-of-work benefits at the end of the observation window. It is not possible to tell, amongst those appearing to receive no state support, how many no longer have a dependent child (something that substantially reduces entitlements to benefits) or how many have re-partnered but without claiming tax credits. It is also not possible to tell whether any of these (former) single parents went on to be the partner of a claimant of an out-of-work benefit, but Appendix E shows that between 70% and 90% of this group are either not receiving any state support or receiving only child tax credits. Conservatively, and in line with evidence from an earlier survey, we assess that at least 8% of affected single parents lost a significant proportion of

their income from state welfare benefits when their entitlement to IS ended, as after that they received either child tax credit only, or no state support at all. [13]

In general, the pattern for the three phases is similar except there is a larger flow towards health-related benefits in Phase 1, and single parents in Phase 3 are slightly more likely to remain on IS than those in the earlier Phases. The differential pattern for Phase 1 is consistent with the incentives engendered by a unrelated benefit reform affecting health-related benefits: from autumn 2008, individuals wanting to claim an out-of-work benefit on the grounds of ill-health or disability had to claim a benefit known as Employment and Support Allowance (ESA) which had a more exacting medical assessment than its predecessor, Incapacity Benefit (IB), and this seems to have led to a larger-than-usual flow of single parents from IS to IB during late 2007 and early 2008. However, the pattern is also consistent with single parents in this Phase being older, on average, and having spent more time on benefit in the past, than those in Phases 2 and 3 (as can be seen by comparing Table 2 to Table 4). The higher fraction that remain on IS in Phase 3 could reflect that single parents affected by Phase 3 were more likely to have subsequent children than single parents in earlier Phases, who were older and had older children.

These descriptive results provide a first indication that, after the introduction of work search requirements, a fraction of single parents did move into work, but a significant proportion also moved onto health-related benefits or non-claimant unemployment.

5 The estimated impact of LPO on benefit and work outcomes

5.1 A graphical assessment of the difference-in-differences design

Figure 2 through Figure 4 provide a graphical assessment of the difference-in-differences design. Each graph plots the difference in the mean outcomes of the treatment and comparison groups, separately for each of the 6 cohorts, and with outcomes measured 15 months from the start of the observation period, and having stripped out the impact of individual-level covariates (equivalently, each point represents the difference between $\hat{\delta}_g$ and $\hat{\delta}_h$ from equation (1), where g and h are the two groups with different treatment statuses from

[13] In broad terms, these findings are consistent with those from a bespoke survey of single parents affected by Phase 3 of LPO. Of these single parents, whose entitlement to IS ended in early 2011, 11 per cent were not in work and not receiving any of IS, ESA or JSA when interviewed 12 months later, half of whom had re-partnered (Coleman and Riley (2012)).

a given cohort). Each Figure consists of one graph for each sub-phase, along with a summary graph for each Phase, and different Figures are for different outcomes; a vertical line separates the final, post-reform, cohort.

The way we implement the DiD design requires us to assume that the treatment-comparison group differences are identical in all 5 pre-reform cohorts, and that this difference would represent the unobserved, post-reform difference in untreated outcomes. The second part of this statement is untestable, but, in general, Figure 2 through Figure 4 show stable pre-reform differences in outcomes, lending support to the assumption of common trends between the two groups. It is for this reason that our preferred results use the basic DiD specification in equation (2). Estimates of the impact of LPO based on a variant of (2) that allow for group-specific linear time trends produced point estimates of the impact of LPO are always very similar to our standard specification; results are available on request.

5.2 The difference-in-difference estimates of the impact of LPO

In this section we report our estimated impacts of LPO, as given by the coefficient β_2 from equation (2), for the different outcomes.

Table 5 reports the DiD estimates of the impact of the introduction of work search requirements on the probability that a single parent is on the unconditional benefit, income support (IS), at different points in time. The estimates suggest that the reform began to induce some single parents to leave IS at least three months before the predicted date of their loss of IS entitlement (column 2); this response is larger for the earlier Phases. But the main impact occurs around the time of the predicted loss of entitlement: three months after this date, the reform has reduced the probability of being on IS by 46pp in Phase 1, and by over 55pp in Phases 2 and 3. These impacts are below 100 pp partly because some single parents remain on IS (as shown in Appendix E) and partly because some would have left IS in the absence of the LPO reform.

Table 6 reports the DiD estimates of the impact of the introduction of work search requirements on the probability that a single parent received any of the main three out-of-work benefits (IS, JSA, ESA). Three months after the predicted loss of entitlement to IS, LPO had reduced the fraction of single parents receiving an out-of-work benefit by 11 to 13 ppts (across Phases). This impact then rises over time, but relatively slowly, so that none of the

estimated impacts of LPO on the fraction of single parents receiving an out-of-work benefit exceed 20pp by the end of the observation window.

The number of single parents moved off all out-of-work benefits is therefore considerably smaller than the number of single parents moved off IS by the reform, and this is because the reform led single parents in many cases to switch benefits. Tables 7 and 8 report the DiD estimates of the impact of LPO on the fraction receiving the unemployment benefit with search conditionalities (JSA), and on the fraction receiving the health-related benefit (ESA). LPO had little impact on the fraction of single parents receiving unemployment benefits before the predicted loss of entitlement to IS (see the first two columns of Table 7), but LPO did cause substantial flows onto JSA after that: 3 months after the predicted loss of IS entitlement, LPO had increased the fraction receiving JSA by between 24 ppts and 36 ppts across all sub-phases except the first. This impact then falls over the observation period, especially for the single parents in Phase 1.

Table 8 shows that, 3 months after the predicted loss of entitlement to IS, LPO had increased the fraction of single parents receiving ESA by between 10 and 14 pp; this impact is fairly stable after this. There is evidence of considerable movement onto ESA in advance of the predicted loss of entitlement to IS amongst single parents in Phase 1: we attribute this to an unrelated reform to health-related benefits that made it less attractive to start a claim of health-related benefits after autumn 2008.

Table 9 reports the DiD estimates of the impact of LPO on the probability of being in work. Three months after the loss of entitlement to IS, the introduction of work search requirements is estimated to have increased the share in work by around 7 percentage points. This estimated impact then rises slowly with time since time since the predicted loss of entitlement to IS, falling (for example) just short of 12pp 15 months after the loss of entitlement to IS in Phase 2.

5.2.1 Overview and discussion

The results in Table 5 to Table 9 show a broadly consistent pattern across phases, Overall, LPO increases the probability of leaving the unconditional income support by over 50pp, but even at the end of our observation period the probability of being in work only increases by about 10pp. Most of this latter effect is already evident shortly after the loss of entitlement to IS. For example, in Phase 2 (Phase 3) over 60% (70%) of the impact on work outcomes

measured at the end of the observation period has already occurred after 3 months. The impact of the reform on the fraction of single parents claiming the unemployment benefit, JSA, is large from the beginning, but not sufficient to account for the entire difference between the fraction pushed off IS and that moved into work. Instead, the reform has induced non-negligible flows towards health-related benefits (which carry no search conditionalities), increasing the probability that a single parent claims the health-related benefits by around 10pp three months after the regime change, a larger impact than the impact on being in work, and towards non-claimant unemployment.

The impacts in Phases 2 and 3 were very similar to each other, but that those in Phase 1 were different, with the estimated impact of LPO on leaving out-of-work benefits or moving into work being smaller for single parents in Phase 1. This reflects several differences between the phases. First, the LPO reform represented a smaller policy change for single parents in Phase 1, since their children were already close to the age at which they would have lost entitlement to IS in the absence of the reform (for example, single parents in "Phase 1a Stock" lost their entitlement to IS at most 2 years and potentially as little as 1 day earlier than they would have done had LPO not been introduced, but single parents in "sub-phase 3b Flow" lost IS entitlement 7 years earlier than they would have done had LPO not been introduced). Second, as discussed earlier, the single parents in Phase 1 were also affected by a reform to health-related benefits that gave an incentive for individuals to claim a health-related benefit before autumn 2008 to avoid a tougher medical assessment. Third, single parents in Phase 1 have older children (by construction), and so tend to be older themselves, and so are less likely to have additional children. Finally, single parents in Phase 1 have tended to have spent longer out of work, and so are more disadvantaged than single parents in the later Phases.

To provide an overview of the results so far, Figure 5 plots the estimated impacts of the LPO reform on the probability of work (dashed line), the probability of claiming health-related benefits with no attached search conditionalities, and the probability of being in non-claimant unemployment (computed as the difference between the reduced probability that a single parent is on any benefit less the increased probability that she is in work). In Phases 2 and 3, the impact of LPO on the probability of being in non-claimant unemployment is at least 6pp by the end of the observation period, and always amounts to a considerable fraction of the impact on the probability of being work (plotted in Figure 5 as a dashed black line). For example, 9 months after the loss of entitlement to IS (which is the last observation point

available for all three phases), the implied impact on the probability of being in non-claimant unemployment is more than 60% of that on the probability of employment. The flow towards non-claimant unemployment could also be due to people who were previously making a fraudulent claim of IS who then decide not to claim another benefit when they lose entitlement to IS. In Appendix C, we show that the estimated incidence of fraudulent claims is small. Moreover, as we discuss in the next section, we find that the flow towards non-claimant unemployment is slightly larger for lone parents who have spent more time on IS. We do not see obvious reasons why the incidence of fraudulent claims should be higher in this group. Furthermore, the results show a sustained increase in the flow towards health related benefits as well for this group, which is again suggestive of mechanisms such as those discussed in Petrongolo (2009) rather than a disproportional rate of fraudulent claims.

The lighter area in Figure 5 shows the effect of LPO on the probability that a lone parent claims health-related benefits. It shows that the introduction of work search requirements caused more single parents to either claim health-related benefits with no search conditionalities or enter non-claimant unemployment than to enter employment (as the sum of the two grey areas is greater than the dashed line, except for the last observation period for phase 1).

Overall, these results are consistent with the predictions of a simple search model in which individuals with low level of initial search might give up searching and move to other benefits without search requirements (such as the health-related benefits) or enter non-claimant unemployment status (Manning 2009, Petrongolo 2009). [14] To further investigate the credibility of this interpretation we look at the impact of the introduction of the work search requirements on single parents with different degrees of initial labour market attachment, as proxied by the proportion of time spent on income support before the beginning of the observation period.

5.3 Heterogeneous effects by level of previous labour market attachment

Table 10 presents estimates of the impact of work search requirements on subsamples of single parents, defined by the proportion of time they had spent receiving the unconditional

[14] Manning (2009) finds no evidence of increased search intensity following the introduction of work search requirements for the unemployed in the UK in 1996, and Petrongolo (1996) finds a negative effect of the probability of employment and positive one on the probability of moving onto health-related benefits. Petrongolo looks at all unemployed (not just single parents) and her identification strategy compares claimants whose spell begins shortly before the introduction of JSA with claimants whose spell begins shortly after the introduction of JSA.

income support benefit in the 36 months before the observation period. We interpret this variable as measuring a lack of labour market attachment. We define three groups: those spending between 90% and 100% of the previous 36 months receiving IS (63% of all single parents in the sample); those spending between 50% and 90% of the previous 36 months receiving IS (17% of the sample); those spending less than 50% of the previous 36 months receiving IS (20% of the sample). Our interpretation of this variable as a lack of labour market attachment is confirmed by data from the pre-reform cohorts. This shows that (for example) 15 months into the observation window, 14% of the group with the highest proportion of time spent on IS are now in work across all phases; for the other two groups it the fraction in work after 15 months is above 22%.

The first three columns of Table 10 show that the introduction of work search requirements reduced the probability of being on any benefits by the largest magnitude for the group with the lowest level of labour market attachment. The following three columns indicate that the impact on work was also greatest for this group. However, the impact on receiving a health-related benefits (with no search conditionalities) is also the largest for this group. The final three columns consider the implied effect on the probability that a single parent is in non-claimant unemployment (again, computed as the difference between the impact on the probability of claiming any benefits and that of being in work). The differences across the three groups with different labour market attachments are not large, but there are larger flows towards non-claimant unemployment for the group with the weakest labour market attachment later in the observation window (as shown in the lower rows in the table). Overall, the reform appears to have generated stronger flows of single parents with low initial level of labour market attachment both towards work and towards states with no search conditionalities, namely health-related benefits and non-claimant unemployment.

To assess the relative size of these effects across the three groups, Figure 6 plots the difference between the impact of LPO on the probability of claiming health-related benefits or of being in non-claimant unemployment, and the probability of being in work (and so positive numbers indicate that LPO induced larger flows towards one of the states with no conditionalities than into work). It is very clear that the flow towards states with no conditionalities attached is larger for the groups with the lowest level of initial labour market attachment, and this is true across phases and observation periods.

Overall, these findings are consistent with the predictions of the search model in Petrongolo (2009): they indicate that work search requirements have tended to push individuals with low levels of labour market attachment more towards benefits with no search conditionalities attached or into non-claimant unemployment than into work.

6 Conclusions

This paper presents new causal evidence on the effects of work search requirements on transitions into and out of work and receipt of different welfare benefits for single parents, a growing group of great policy relevance with a historically low level of labour market participation.

We exploit the staggered roll-out of a reform recently implemented in the UK known as "Lone Parents Obligations" (LPO). In a series of discrete jumps, the reform gradually lowered the age of the youngest child which triggers a move from a regime of unconditional income support to a regime with work search requirements. We use a difference-in-difference setting with rich administrative data on benefit receipt and spells of employment, using single parents with younger children as an comparison group, and using a long span of pre-reform data on single parents with similarly-aged children. The staggered nature of this roll-out provides reassurance that our results are not due to time-varying shocks affecting the treatment or comparison groups.

We show that the introduction of work search conditionalities did increase the flow of single parents into work. As we discuss in Appendix F, the reform seems to have had larger effects than comparable interventions in the past. However, it also caused a large proportion of single mothers to move onto health-related benefits or into non-claimant unemployment (in the sense that they are not observed either in work or on benefits in our dataset). In fact, the flow towards either of the two states with no work search requirements attached is generally larger than that into work. For example, 9 months after the loss of entitlement to the unconditional income support, the reform has increased the probability that a previously welfare-receiving single parent is in work by about 10pp, but has also increased the probability of receiving either health-related benefits or being in non-claimant unemployment by about 18pp. The nature of this response is related to previous labour market experience: those with lower labour market attachment (proxied for by the fraction of time a single parent has spent on welfare benefits before being affected by the reform) are more likely to move

into non-claimant unemployment and particularly onto health-related benefits, than those with stronger labour market attachment.

These results echo the one of an increase in the proportion of "detached" mothers found in the US (Blank 2007) and are consistent with the predictions of a simple search model in which individuals with low level of initial search might give up searching and move to other benefits without search requirements (such as the health-related benefits) or enter non-claimant unemployment status (Manning 2009, Petrongolo 2009).

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Tables

Table 1 - Sample size of potentially affected single parents, by phase of the LPO reform.

Phase or sub-phase	Number of single parents in sample
Phase 1	152,847
Phase 2	101,515
Phases 3	194,844
By sub-phase:	
p1S	7,354
p1aF	21,370
p1aS	37,863
p1bF	13,310
p1bS	52,648
p1iS	20,302
p2aF	24,850
p2aS	40,827
p2bF	14,172
p2bS	21,666
p3aF	36,578
p3aS	36,931
p3bF	39,935
p3bS	53,059
p3cF	28,341

Source: authors' calculations based on IS History as described in the text.

Table 2 - Summary statistics by group for Phase 1

	Treatment, post reform cohorts		**Comparison, post reform cohorts**		**Treatment, pre-reform cohorts**		**Comparison, pre-reform cohorts**		**All**	
	mean	*sd*	*mean*	*sd*	*mean*	*sd*	*mean*	*sd*	*mean*	*sd*
Female	0.892	0.311	0.968	0.175	0.867	0.339	0.966	0.181	0.899	0.302
Age	41.999	6.390	29.333	6.903	41.820	7.112	29.409	6.673	38.233	8.936
White	0.755	0.430	0.740	0.439	0.670	0.470	0.701	0.458	0.690	0.463
Number of children	1.577	0.740	1.925	1.108	1.509	0.696	1.962	1.109	1.646	0.864
Disability	0.402	0.490	0.171	0.376	0.365	0.481	0.203	0.402	0.320	0.467
Proportion of last 6 months before observation on:										
IS	0.751	0.418	0.624	0.453	0.720	0.437	0.612	0.462	0.692	0.445
Work	0.122	0.317	0.153	0.343	0.001	0.019	0.000	0.011	0.020	0.136
JSA	0.010	0.086	0.009	0.077	0.010	0.091	0.008	0.077	0.010	0.087
ESA	0.127	0.327	0.091	0.274	0.104	0.300	0.069	0.243	0.097	0.289
Carer's Allowance	0.098	0.295	0.028	0.161	0.060	0.234	0.021	0.141	0.053	0.221
Deprivation (England)	0.754	0.237	0.761	0.234	0.759	0.236	0.765	0.232	0.760	0.235
Deprivation (Wales)	0.302	0.253	0.286	0.249	0.311	0.258	0.292	0.249	0.305	0.255

Notes and sources: treatment and comparison groups as defined in text. Deprivation is the within-country rank of the ward-level deprivation index.

Table 3 - Summary statistics by group for Phase 2

	Treatment, post reform cohorts		**Comparison, post reform cohorts**		**Treatment, pre-reform cohorts**		**Comparison, pre-reform cohorts**		**All**	
	mean	*sd*	*mean*	*sd*	*mean*	*sd*	*mean*	*sd*	*mean*	*sd*
Female	0.920	0.271	0.969	0.173	0.903	0.295	0.966	0.181	0.925	0.263
Age	39.069	6.664	29.212	6.837	38.568	6.604	29.440	6.743	35.682	7.934
White	0.748	0.434	0.743	0.437	0.726	0.446	0.709	0.454	0.725	0.447
Number of children	1.833	0.910	1.923	1.109	1.808	0.884	1.964	1.115	1.858	0.968
Disability	0.322	0.467	0.163	0.369	0.333	0.471	0.199	0.400	0.287	0.452
Proportion of last 6 months before observation on:										
IS	0.727	0.431	0.613	0.457	0.729	0.430	0.637	0.453	0.698	0.440
Work	0.146	0.341	0.178	0.365	0.007	0.072	0.005	0.057	0.029	0.159
JSA	0.008	0.079	0.009	0.079	0.009	0.085	0.010	0.084	0.009	0.084
ESA	0.099	0.293	0.086	0.266	0.087	0.277	0.080	0.259	0.086	0.273
Carer's Allowance	0.091	0.284	0.028	0.162	0.064	0.242	0.023	0.148	0.054	0.223
Deprivation (England)	0.747	0.241	0.756	0.237	0.755	0.237	0.765	0.232	0.757	0.236
Deprivation (Wales)	0.309	0.255	0.301	0.254	0.310	0.255	0.290	0.248	0.304	0.253

Notes and sources: treatment and comparison groups as defined in text. Deprivation is the within-country rank of the ward-level deprivation index.

Table 4 - Summary statistics by group for Phase 3

	Treatment, post reform cohorts		**Comparison, post reform cohorts**		**Treatment, pre-reform cohorts**		**Comparison, pre-reform cohorts**		**All**	
	mean	*sd*	*mean*	*sd*	*mean*	*sd*	*mean*	*sd*	*mean*	*sd*
Female	0.943	0.232	0.970	0.171	0.931	0.253	0.967	0.178	0.945	0.228
Age	35.472	7.119	29.310	6.867	35.441	6.778	29.432	6.820	33.333	7.411
White	0.727	0.445	0.742	0.437	0.738	0.440	0.718	0.450	0.731	0.443
Number of children	1.956	1.024	1.929	1.102	1.949	1.008	1.955	1.114	1.950	1.047
Disability	0.231	0.421	0.149	0.356	0.280	0.449	0.195	0.396	0.243	0.429
Proportion of last 6 months before observation on:										
IS	0.699	0.443	0.584	0.469	0.738	0.423	0.653	0.446	0.700	0.437
Work	0.169	0.363	0.191	0.383	0.026	0.151	0.028	0.156	0.051	0.211
JSA	0.008	0.074	0.008	0.071	0.009	0.084	0.011	0.087	0.009	0.083
ESA	0.079	0.264	0.085	0.263	0.079	0.264	0.089	0.270	0.082	0.266
Carer's Allowance	0.072	0.254	0.031	0.169	0.057	0.229	0.025	0.153	0.048	0.210
Deprivation (England)	0.745	0.243	0.748	0.241	0.756	0.236	0.766	0.231	0.758	0.235
Deprivation (Wales)	0.300	0.249	0.294	0.251	0.303	0.254	0.288	0.247	0.298	0.251

Notes and sources: treatment and comparison groups as defined in text. Deprivation is the within-country rank of the ward-level deprivation index.

Table 5 – DiD estimates of impact of LPO on the probability of receiving IS at different intervals relative to predicted loss of IS entitlement.

Months since predicted loss of IS entitlement	**(1) -9**	**(2) -6**	**(3) +3**	**(4) +9**	**(5) +12**	**(6) +15**	**(7) +24**
p1iS	-0.3	-8.0***	-18.1***	-19.6***	-20.1***	-19.2***	-21.1***
	(0.4)	(0.7)	(1.5)	(1.1)	(1.0)	(1.2)	(1.6)
p1aS	-0.8*	-10.4***	-48.0***	-47.1***	-36.6***	-22.9***	-21.3***
	(0.3)	(0.7)	(0.7)	(0.8)	(2.7)	(2.0)	(1.6)
p1aF	-2.3***	-8.4***	-51.4***	-48.8***	-47.5***	-45.6***	-31.5***
	(0.4)	(0.6)	(0.7)	(0.7)	(0.8)	(0.8)	(2.2)
p1bS	-1.7**	-11.9***	-51.0***	-50.3***	-49.1***	-47.6***	-43.1***
	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.5)	(0.8)
p1bF	-1.5**	-4.5***	-51.4***	-51.7***	-50.5***	-49.0***	-45.9***
	(0.3)	(0.5)	(0.9)	(1.2)	(1.1)	(0.8)	(0.5)
p2aS	-0.8*	-8.3***	-56.8***	-55.2***	-53.4***	-51.8***	.
	(0.3)	(0.6)	(0.6)	(0.6)	(0.8)	(0.6)	.
p2aF	-2.4***	-8.3***	-59.9***	-55.9***	-54.2***	-53.3***	.
	(0.3)	(0.7)	(0.8)	(0.9)	(1.0)	(0.9)	.
p2bS	-1.3***	-7.9***	-58.4***	-56.6***	-54.6***	-44.7***	.
	(0.2)	(0.6)	(0.3)	(0.7)	(0.8)	(0.9)	.
p2bF	-0.9*	-3.7***	-57.9***	-55.9***	-54.8***	-54.4***	.
	(0.3)	(0.5)	(0.5)	(0.8)	(0.7)	(1.0)	.
p3aS	-0.8**	-4.1***	-57.7***	-54.4***	.	.	.
	(0.2)	(0.8)	(0.8)	(1.5)	.	.	.
p3aF	-2.1***	-5.9***	-59.6***	-55.5***	.	.	.
	(0.4)	(0.5)	(0.6)	(0.4)	.	.	.
p3bS	-1.1*	-6.3***	-55.7***	.	.	.	.
	(0.5)	(0.9)	(0.9)	.	.	.	.
p3bF	-0.7	-3.3***	-57.6***	.	.	.	.
	(0.3)	(0.5)	(0.7)	.	.	.	.
p3cF	-1.0***	-3.3***	.	.	.	.	.
	(0.2)	(0.6)	.	.	.	.	.
all_phases1	-1.4***	-9.9***	-46.2***	-45.5***	-42.1***	-37.6***	-28.7***
	(0.2)	(0.4)	(0.5)	(0.5)	(1.1)	(1.0)	(1.3)

all_phases2	-1.3***	-7.4***	-58.0***	-55.6***	-53.9***	-51.3***	.
	(0.2)	(0.5)	(0.4)	(0.5)	(0.6)	(0.6)	.
all_phases3	-1.1**	-4.7***	-57.1***	-54.6***	.	.	.
	(0.3)	(0.5)	(0.6)	(0.8)	.	.	.

Notes: Sample construction and other covariates are described in the text.
* p<0.10 ** p<0.05 *** p<0.01
Standard errors are estimated following Donald and Lang (2007), treating a "group" as the interaction of "treatment/comparison" and "cohort".

Table 6 – DiD estimates of impact of LPO on the probability of receiving any out-of-work benefit at different intervals relative to predicted loss of IS entitlement.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Months since predicted loss of IS entitlement	**-9**	**-6**	**+3**	**+9**	**+12**	**+15**	**+24**
p1iS	-0.6	-4.9***	-1.6*	-2.0*	-3.1**	-3.5***	-5.6**
	(0.4)	(0.8)	(0.6)	(0.8)	(0.8)	(0.7)	(1.3)
p1aS	-1.0**	-7.3***	-11.8***	-13.4***	-11.6***	-7.9***	-7.8***
	(0.3)	(0.7)	(0.7)	(0.7)	(2.3)	(1.3)	(1.2)
p1aF	-2.0**	-5.1***	-11.6***	-13.4***	-14.7***	-14.4***	-11.7***
	(0.5)	(0.7)	(0.7)	(0.7)	(0.8)	(0.8)	(2.0)
p1bS	-1.9***	-7.2***	-13.7***	-15.7***	-16.5***	-17.2***	-17.0***
	(0.3)	(0.4)	(0.4)	(0.4)	(0.3)	(0.5)	(0.8)
p1bF	-1.3***	-2.7***	-10.5***	-13.5***	-15.2***	-15.6***	-16.8***
	(0.2)	(0.5)	(0.9)	(1.1)	(1.1)	(0.9)	(0.5)
p2aS	-0.4	-5.4***	-12.3***	-16.5***	-16.8***	-17.2***	.
	(0.4)	(0.5)	(0.6)	(0.5)	(0.7)	(0.5)	.
p2aF	-1.5***	-4.6***	-13.0***	-15.9***	-16.5***	-17.7***	.
	(0.3)	(0.6)	(0.7)	(0.7)	(0.8)	(0.8)	.
p2bS	-0.8**	-5.3***	-14.0***	-15.9***	-16.4***	-18.3***	.
	(0.2)	(0.5)	(0.2)	(0.7)	(0.7)	(0.7)	.
p2bF	-0.6	-2.8***	-11.0***	-13.5***	-14.7***	-16.2***	.
	(0.3)	(0.5)	(0.4)	(0.7)	(0.8)	(0.8)	.
p3aS	-0.6**	-3.3**	-12.5***	-15.9***	.	.	.
	(0.2)	(0.7)	(0.7)	(1.4)	.	.	.
p3aF	-1.5**	-3.7***	-11.2***	-14.7***	.	.	.
	(0.3)	(0.4)	(0.5)	(0.6)	.	.	.
p3bS	-0.7	-4.8***	-12.3***	.	.	.	.
	(0.5)	(0.8)	(0.9)	.	.	.	.
p3bF	-0.5	-2.6***	-10.6***	.	.	.	.
	(0.3)	(0.4)	(0.7)	.	.	.	.
p3cF	-0.7**	-2.5**	.	.	.	.	.
	(0.2)	(0.6)	.	.	.	.	.
all_phases1	-1.5***	-6.3***	-11.1***	-12.8***	-13.1***	-12.6***	-10.6***
	(0.2)	(0.5)	(0.5)	(0.4)	(0.8)	(0.6)	(1.1)
all_phases2	-0.7**	-4.7***	-12.6***	-15.7***	-16.3***	-17.5***	.
	(0.2)	(0.4)	(0.4)	(0.4)	(0.5)	(0.5)	.
all_phases3	-0.8**	-3.5***	-11.8***	-15.8***	.	.	.
	(0.2)	(0.4)	(0.5)	(0.9)	.	.	.

Notes: Sample construction and other covariates are described in the text.

* p<0.10 ** p<0.05 *** p<0.01
Standard errors are estimated following Donald and Lang (2007), treating a “group” as the interaction of “treatment/comparison” and “cohort”.

Table 7- DiD estimates of impact of LPO on the probability of receiving JSA at different intervals relative to predicted loss of IS entitlement.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Months since predicted loss of IS entitlement	**-9**	**-6**	**+3**	**+9**	**+12**	**+15**	**+24**
p1iS	-0.1	1.7***	5.0**	6.4***	6.2***	5.2**	5.1***
	(0.1)	(0.2)	(1.5)	(1.2)	(1.2)	(1.5)	(0.9)
p1aS	0.0	1.8***	24.1***	21.6***	13.4***	4.0**	2.7**
	(0.0)	(0.1)	(0.2)	(0.2)	(0.6)	(1.0)	(0.8)
p1aF	0.2**	1.7***	28.1***	23.8***	21.5***	19.9***	8.0***
	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)	(0.6)
p1bS	0.0	2.6***	27.5***	23.9***	21.9***	19.6***	14.9***
	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)
p1bF	0.0	0.2	31.3***	27.2***	24.5***	22.7***	16.7***
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
p2aS	0.0	1.1***	31.6***	25.7***	23.8***	21.9***	.
	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	.
p2aF	0.2***	2.0***	34.0***	27.6***	25.3***	23.2***	.
	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	.
p2bS	0.1	1.2***	32.4***	28.3***	26.0***	17.2***	.
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	.
p2bF	0.0	0.0	34.4***	29.3***	27.2***	24.7***	.
	(0.0)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	.
p3aS	0.0	0.0	34.1***	27.4***	.	.	.
	(0.0)	(0.1)	(0.2)	(0.2)	.	.	.
p3aF	0.2***	1.3***	35.6***	28.6***	.	.	.
	(0.0)	(0.1)	(0.0)	(0.1)	.	.	.
p3bS	0.1**	0.7***	33.0***	.	.	.	.
	(0.0)	(0.0)	(0.1)	.	.	.	.
p3bF	0.0	0.2*	36.2***	.	.	.	.
	(0.0)	(0.1)	(0.1)	.	.	.	.
p3cF	0.2**	0.0	.	.	.	.	.
	(0.0)	(0.0)	.	.	.	.	.

all_phases1	0.0	1.9***	24.2***	21.4***	18.0***	14.2***	7.3***
	(0.0)	(0.1)	(0.3)	(0.3)	(0.4)	(0.6)	(0.4)
all_phases2	0.1***	1.2***	32.8***	27.2***	25.0***	21.7***	.
	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	.
all_phases3	0.1***	0.5***	34.3***	27.5***	.	.	.
	(0.0)	(0.1)	(0.1)	(0.2)	.	.	.

Notes: Sample construction and other covariates are described in the text.

* p<0.10 ** p<0.05 *** p<0.01

Standard errors are estimated following Donald and Lang (2007), treating a "group" as the interaction of "treatment/comparison" and "cohort".

Table 8 – DiD estimates of impact of LPO on the probability of receiving a health-related benefit (ESA/IB/SDA) at different intervals relative to predicted loss of IS entitlement.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Months since predicted loss of IS entitlement	**-9**	**-6**	**+3**	**+9**	**+12**	**+15**	**+24**
p1iS	1.0**	4.3***	0.2	-1.9**	-3.1***	-3.4**	-5.1***
	(0.4)	(0.4)	(0.5)	(0.4)	(0.6)	(0.8)	(1.0)
p1aS	0.5	5.0***	13.6***	12.6***	5.8***	1.2***	-1.1
	(0.3)	(0.3)	(0.3)	(0.2)	(0.3)	(0.2)	(0.5)
p1aF	1.4***	4.2***	14.3***	13.8***	13.0***	12.7***	5.5***
	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.6)
p1bS	1.9***	4.2***	11.7***	12.4***	12.1***	11.9***	12.3***
	(0.1)	(0.2)	(0.2)	(0.0)	(0.1)	(0.2)	(0.4)
p1bF	1.1***	2.0***	10.8***	11.9***	11.5***	11.3***	12.4***
	(0.2)	(0.3)	(0.3)	(0.5)	(0.4)	(0.4)	(0.5)
p2aS	0.5**	2.1***	12.9***	12.8***	12.5***	12.1***	.
	(0.1)	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	.
p2aF	0.4	1.3***	12.3***	11.7***	11.6***	11.4***	.
	(0.2)	(0.3)	(0.3)	(0.2)	(0.3)	(0.2)	.
p2bS	-0.1	0.8***	11.4***	11.7***	11.5***	10.1***	.
	(0.2)	(0.2)	(0.3)	(0.4)	(0.4)	(0.3)	.
p2bF	0.0	0.4	11.8***	12.1***	12.0***	12.4***	.
	(0.2)	(0.4)	(0.4)	(0.4)	(0.3)	(0.9)	.
p3aS	0.0	0.4**	10.6***	10.8***	.	.	.
	(0.1)	(0.2)	(0.2)	(0.4)	.	.	.
p3aF	0.1*	0.6***	12.1***	11.6***	.	.	.
	(0.0)	(0.1)	(0.2)	(0.3)	.	.	.
p3bS	0.0	0.3	9.8***	.	.	.	.
	(0.1)	(0.2)	(0.3)	.	.	.	.
p3bF	0.0	0.1	10.2***	.	.	.	.
	(0.1)	(0.1)	(0.2)	.	.	.	.
p3cF	-0.1	0.4	.	.	.	.	.
	(0.1)	(0.3)	.	.	.	.	.

all_phases1	1.3***	4.2***	10.9***	10.7***	8.6***	7.2***	2.3***
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.3)
all_phases2	0.3	1.4***	12.2***	12.1***	12.0***	11.7***	.
	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)	(0.2)	.
all_phases3	0.0	0.4***	10.5***	10.9***	.	.	.
					.		

Notes: Sample construction and other covariates are described in the text.

* p<0.10 ** p<0.05 *** p<0.01

Standard errors are estimated following Donald and Lang (2007), treating a "group" as the interaction of "treatment/comparison" and "cohort".

Table 9 – DiD estimates of impact of LPO on the probability of being in work at different intervals relative to predicted loss of IS entitlement.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Months since predicted loss of IS entitlement	**-9**	**-6**	**+3**	**+9**	**+12**	**+15**	**+24**
p1iS	1.1	4.6**	3.5	4.9	5.4	5.7	9.6
	(0.2)	(0.7)	(1.3)	(2.6)	(3.1)	(3.0)	(5.8)
p1aS	1.0**	6.3*	7.4**	8.3***	7.2**	6.1*	7.6
	(0.0)	(1.7)	(1.2)	(1.3)	(2.0)	(2.1)	(4.3)
p1aF	1.5**	3.2**	6.1***	7.4***	8.2***	8.5***	7.3**
	(0.0)	(0.5)	(0.2)	(0.2)	(0.5)	(0.6)	(2.1)
p1bS	2.3	5.4*	7.9***	9.0***	10.0***	10.9***	11.0***
	(0.5)	(1.3)	(0.5)	(0.3)	(0.4)	(0.7)	(0.9)
p1bF	1.1	1.9**	5.3**	7.0***	8.2***	8.6***	10.0***
	(0.4)	(0.4)	(0.6)	(0.9)	(1.2)	(1.0)	(0.8)
p2aS	0.4**	2.6**	6.1***	10.0***	10.1***	11.0***	.
	(0.1)	(0.4)	(0.3)	(0.7)	(0.8)	(0.9)	.
p2aF	0.9*	2.8**	7.6***	10.3***	10.9***	12.0***	.
	(0.2)	(0.5)	(0.4)	(0.6)	(0.5)	(0.3)	.
p2bS	0.6	3.8	8.4***	10.5***	10.9***	11.6***	.
	(0.5)	(1.7)	(0.1)	(0.3)	(0.4)	(0.6)	.
p2bF	0.5	2.0**	6.7***	9.4***	10.0***	12.2***	.
	(0.3)	(0.4)	(0.2)	(0.7)	(0.6)	(0.8)	.
p3aS	0.5	2.5***	6.9***	9.9***	.	.	.
	(0.6)	(0.3)	(0.8)	(1.0)	.	.	.
p3aF	1.2**	3.1***	7.0***	8.7***	.	.	.
	(0.2)	(0.4)	(0.3)	(0.8)	.	.	.
p3bS	0.6	3.5***	6.8***	.	.	.	.
	(0.4)	(0.5)	(0.5)	.	.	.	.
p3bF	0.5	2.3***	6.4***	.	.	.	.
	(0.3)	(0.5)	(0.4)	.	.	.	.
p3cF	0.5	2.0**	.	.	.	.	.
	(0.3)	(0.6)	.	.	.	.	.

all_phases1	1.6***	4.8**	6.9***	7.8***	8.3***	8.9***	9.0**
	(0.1)	(0.5)	(0.6)	(0.4)	(0.8)	(1.5)	(3.1)
all_phases2	0.4	2.6***	6.8***	9.7***	10.3***	11.5***	.
	(0.2)	(0.3)	(0.2)	(0.6)	(0.4)	(0.4)	.
all_phases3	0.8	2.9***	7.0***	9.6***	.	.	.
	(0.2)	(0.4)	(0.4)	(0.7)	.	.	.

Notes: Sample construction and other covariates are described in the text.

* p<0.10 ** p<0.05 *** p<0.01

Standard errors are estimated following Donald and Lang (2007), treating a "group" as the interaction of "treatment/comparison" and "cohort".

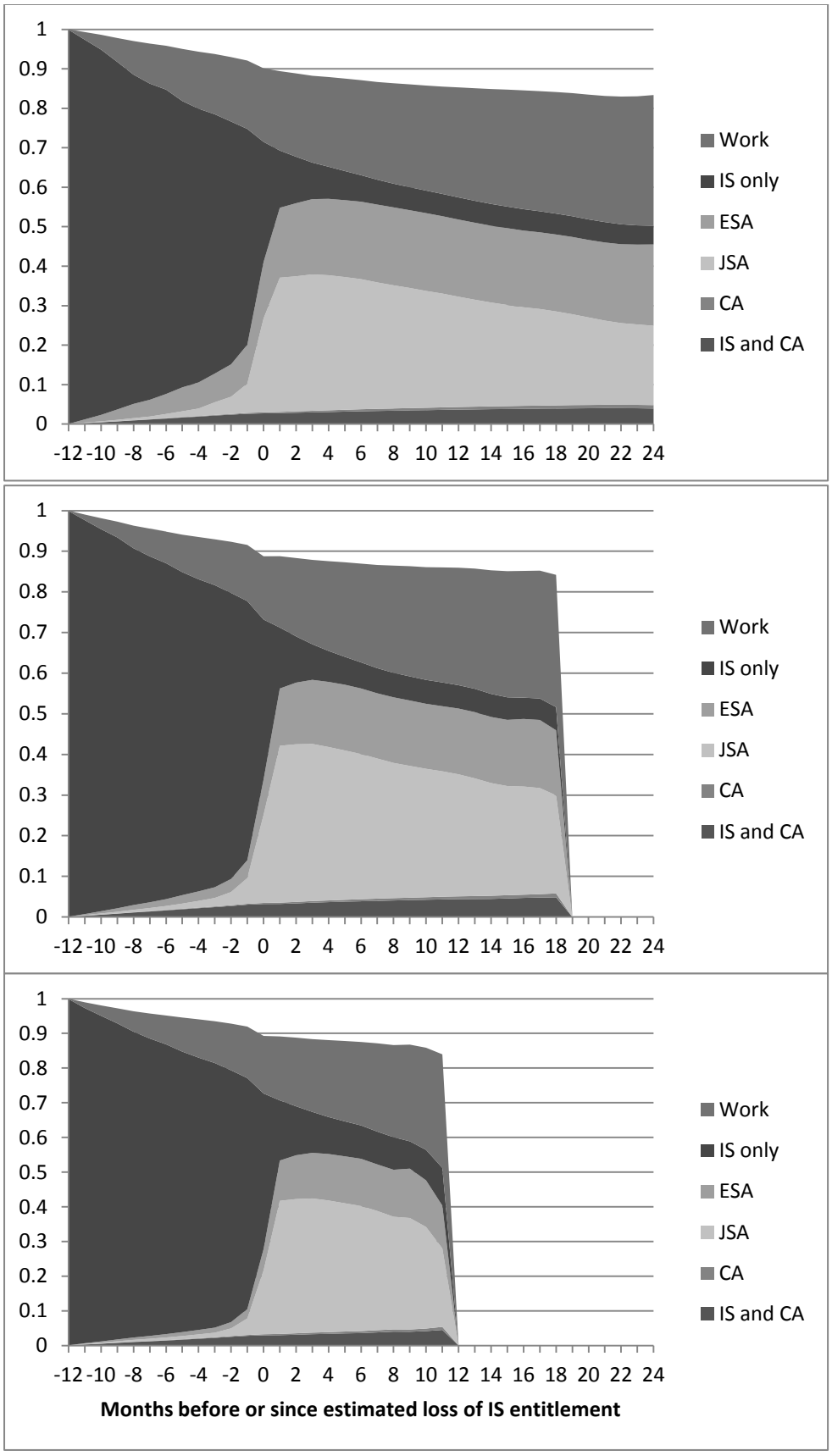
Table 10 – The effect of LPO on the probability of being in different states by proportion of time spent on Income Support in the 36 months prior to the observation period.

	Any out-of-work benefits			Work			ESA			Non-claimant Unemployment (a)		
	0-50	**50-90**	**90-100**	**0-50**	**50-90**	**90-100**	**0-50**	**50-90**	**90-100**	**0-50**	**50-90**	**90-100**
Interval: +3												
all_phases1	-0.088***	-0.086***	-0.116***	0.038*	0.051***	0.075***	0.066***	0.089***	0.124***	0.05	0.035	0.041
	(0.004)	(0.009)	(0.006)	(0.013)	(0.003)	(0.011)	(0.003)	(0.005)	(0.002)			
all_phases2	-0.111***	-0.114***	-0.123***	0.054**	0.058***	0.071***	0.075***	0.100***	0.141***	0.057	0.056	0.052
	(0.009)	(0.007)	(0.002)	(0.015)	(0.009)	(0.001)	(0.002)	(0.004)	(0.003)			
all_phases3	-0.123***	-0.111***	-0.111***	0.073***	0.068***	0.066***	0.070***	0.085***	0.121***	0.05	0.043	0.045
	(0.008)	(0.009)	(0.006)	(0.013)	(0.013)	(0.004)	(0.003)	(0.004)	(0.002)			
Inteval: +12												
all_phases1	-0.089***	-0.096***	-0.139***	0.058***	0.065**	0.086***	0.057***	0.077***	0.098***	0.031	0.031	0.053
	(0.007)	(0.014)	(0.009)	(0.005)	(0.012)	(0.008)	(0.003)	(0.003)	(0.002)			
all_phases2	-0.128***	-0.140***	-0.168***	0.076**	0.085***	0.111***	0.071***	0.097***	0.140***	0.052	0.055	0.057
	(0.012)	(0.006)	(0.006)	(0.021)	(0.009)	(0.003)	(0.004)	(0.004)	(0.002)			
Inteval: +15												
all_phases1	-0.086***	-0.095***	-0.136***	0.066***	0.076***	0.092***	0.045***	0.064***	0.079***	0.02	0.019	0.044
	(0.004)	(0.012)	(0.007)	(0.014)	(0.016)	(0.014)	(0.002)	(0.004)	(0.002)			
all_phases2	-0.148***	-0.142***	-0.180***	0.095***	0.094***	0.121***	0.068***	0.093***	0.137***	0.053	0.048	0.059
	(0.008)	(0.011)	(0.005)	(0.016)	(0.006)	(0.005)	(0.006)	(0.003)	(0.002)			
Inteval: +24												
all_phases1	-0.072***	-0.073**	-0.117***	0.068	0.081	0.094**	0.015	0.023*	0.024***	0.004	-0.008	0.023
	(0.010)	(0.019)	(0.010)	(0.033)	(0.038)	(0.029)	(0.008)	(0.010)	(0.003)			

a: computed as minus the impact on Pr(AnyBen) plus the effect on the probability of being in work.

Results from linear probability models. Standard errors are estimated following Donald and Lang (2007), treating a "group" as the interaction of "treatment/comparison" and "cohort". Column headings indicate the proportion of time spent on IS before the start of the observation period by the single parents included in each sample.

Figure 1- Fraction of single parents potentially affected by LPO in different labour market or benefit-receiving states, by Phase (top = Phase 1, bottom = Phase 3).



Notes: Sample construction and other covariates are described in the text. IS = Income Support; ESA = Employment and Support Allowance, or other health-related benefits; JSA = Jobseeker's Allowance; CA = Carer's Allowance.

Figure 2 – Differences in the probability of being on Income Support 15 months after treatment between the treated and the control group.

Figure 3 - Differences in the probability of being on any out-of-work benefits 15 months after treatment between the treated and the control group.

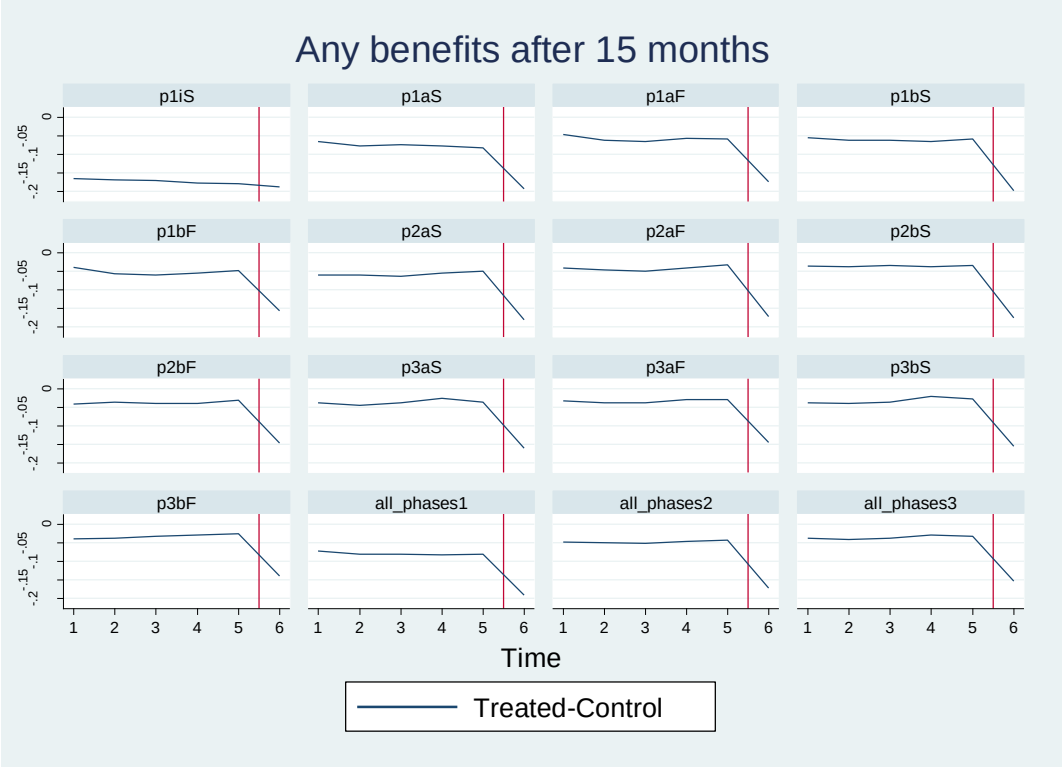
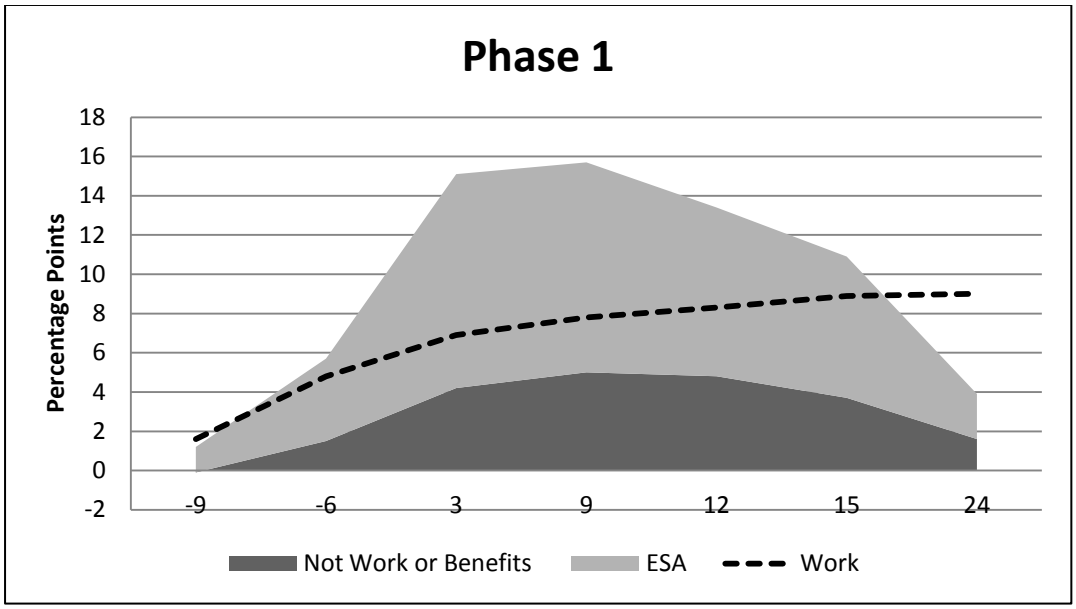
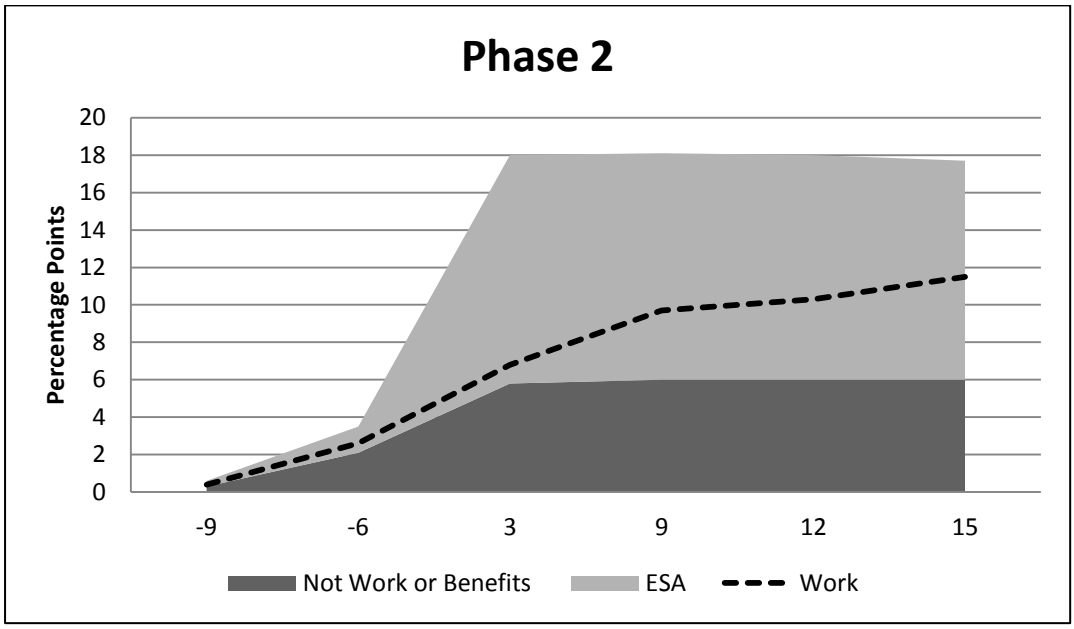
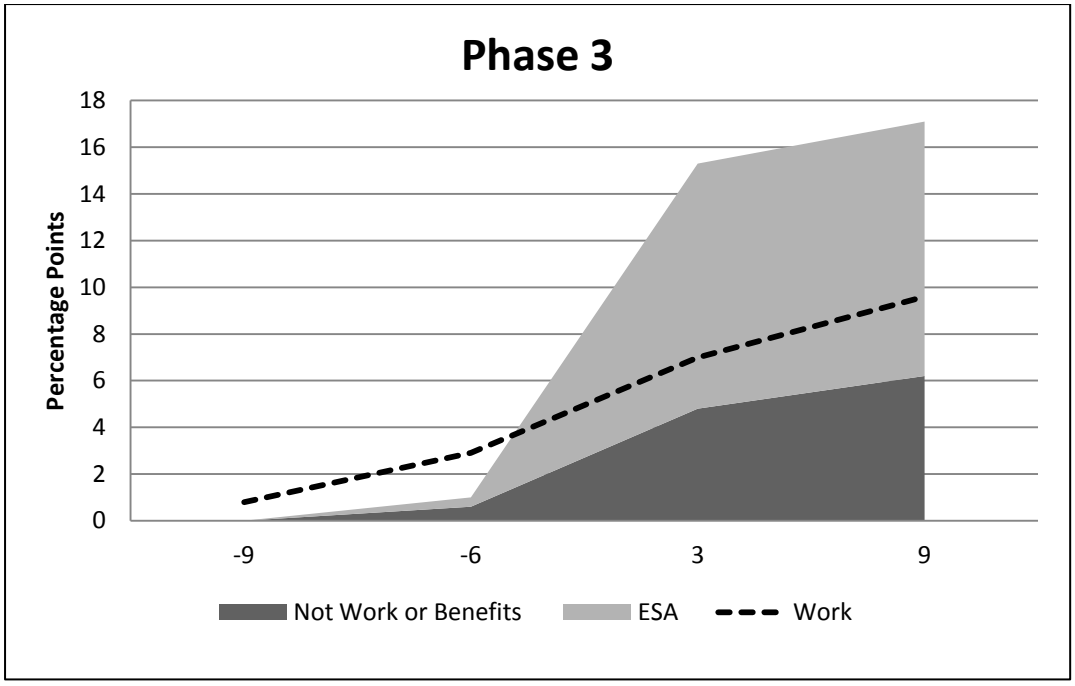


Figure 4 - Differences in the probability of being in work 15 months after treatment between the treated and the control group.

Figure 5 - The impact of LPO on the probability that a lone parent is in work, on health-related benefits or not in work nor on benefits.

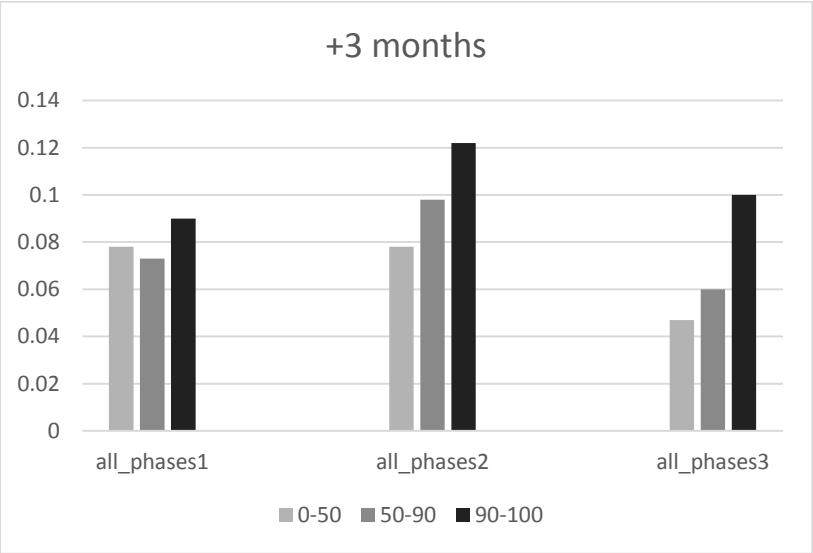


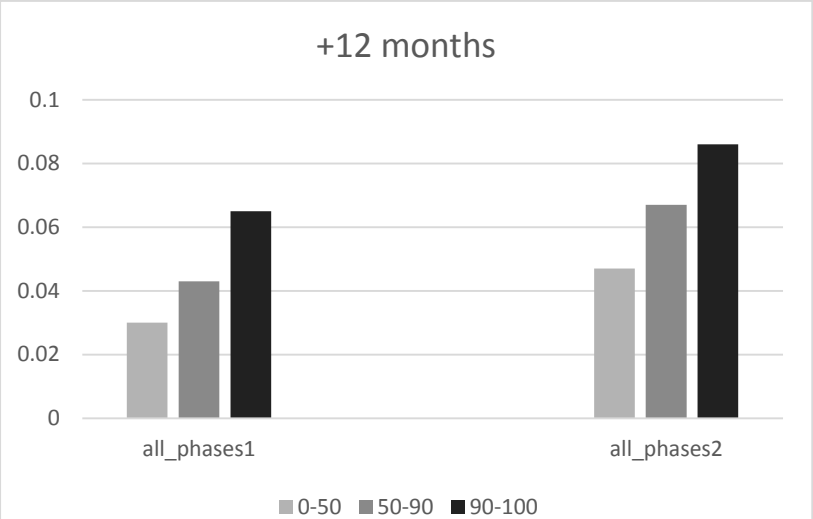


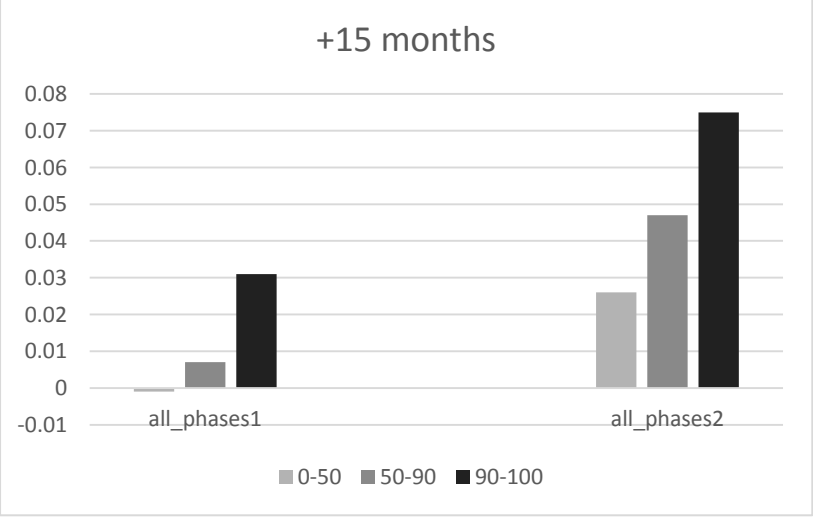


Note: DiD estimates of the impact of LPO on different outcomes. "Not in Work or on Benefits" is the differences between the effect on the probability of being on IS and the sum of the effects on the probability of being in work, on JSA and ESA.

Figure 6 – Difference between the effects of search requirements (i) on the probability of moving onto health-related benefits or non-claimant unemployment and (ii) on the probability of moving into work. Results by proportion of time spent on Income Support prior to the start of the observation period.







Appendix A Detail of Phases 1-3 of Lone Parent Obligations

Phase	DOB of youngest child	IS end date determined by	Memo: age of youngest child when lose IS entitlement
Phase 1 stock	25/11/1992 to 01/03/1993	Child's 16th birthday, from 25/11/2008 to 01/03/2009	Age 16 exactly
Phase 1i stock	02/03/1993 to 24/11/1993	On first of child's 16th birthday or date of first WFI between 02/03/2009 and 28/08/2009	Age 15-16
Phase 1a stock	25/11/1993 to 01/03/1995.	On date of first WFI between 02/03/2009 to 28/08/2009	Aged 14-16
Phase 1a flow	02/03/1995 to 24/11/1995.	Child's 14th birthday, from 02/03/2009 to 24/11/2009.	Age 14 exactly
Phase 1b stock	25/11/1995 to 05/07/1997.	On date of first WFI between 06/07/2009 to 06/01/2010	Aged 12-14
Phase 1b flow	6/07/1997 to 24/11/1997	On child's 12th birthday, from 06/07/2009 to 24/11/2009.	Age 12 exactly
Phase 2a stock	25/11/1997 to 31/01/1999	On date of first WFI between 01/02/2010 to 01/05/2010	Age 11-12
Phase 2a flow	01/02/1999 to 26/10/1999.	Child's 11th birthday, from 01/02/2010 to 26/10/2010.	Age 11 exactly
Phase 2b stock	27/10/1999 to 06/06/2000	On date of first WFI between 07/06/2010 to 07/09/2010	Age 10
Phase 2b flow	07/06/2000 to 26/10/2000	Child's 10th birthday between 07/06/2010 and 26/10/2010.	Age 10 exactly
Phase 3a stock	27/10/2000 to 24/10/2001	On date of first WFI between 25/10/2010 to 25/01/2011.	Age 9-10
Phase 3a flow	25/10/2001 to 25/10/2002.	Child's 9th birthday, from 25/10/2010 to 25/10/2011.	Age 9 exactly
Phase 3b stock	26/10/2002 to 02/01/2004.	On date of first WFI between 03/01/2011 to 03/04/2011.	Age 7-8
Phase 3b flow	03/01/2004 to 25/10/2004.	Child's 7th birthday, from 03/01/2011 to 25/10/2011.	Age 7 exactly

Note: WFI = "work focused interview", the name of the meeting between a welfare-receiving single parent and their Case Worker. At the time of LPO. WFIs took place every 3 months for those in Phase 2 and 3, and every 6 months for those in Phase 1.

Appendix B Further details on Lone Parent Obligations and other welfare policy changes

a. Further details on LPO

As part of the LPO changes, single parents are provided with a range of personalised support whilst out-of-work to help move closer to the labour market and into work, as well as post-employment support once they move into work. This includes:

- mandatory Final Year Quarterly Work Focused Interviews, in the year preceding loss of Income Support entitlement.

- a voluntary meeting with an adviser in the weeks before loss of Income Support entitlement, to assist with the changeover to another benefit, such as JSA or ESA[15].

- additional flexibilities for single parents claiming JSA in terms of the hours they are required to work, for example.

- post employment support from an adviser or to cover unexpected financial emergencies in the first months of moving into work.

b. Other welfare policy changes

Other policy changes will confound an impact evaluation if they affect the treatment and comparison groups differently. In such a case, the 'common trends' assumption underpinning the difference-in-differences methodology would not hold . In this appendix we discuss some relevant policies in more detail.

JSA and Flexible New Deal (FND): In April 2009, the JSA regime changed, with a policy known as Flexible New Deal (FND), which affected the support available to all JSA claimants. This initially applied in certain Jobcentre Plus districts, with the remaining districts affected from April 2010. The estimated impacts of LPO do not take explicit account of FND, but the DiD regressions do control for Jobcentre Plus district to allow for any differences at district level, and for these to change over time, as a way to account for the gradual roll-out of FND. This also means that the overall estimated impacts are effectively averaged over areas with and without FND.

[15] Jobcentre Plus districts also had to run 'Options and Choices' events in the year LPO was introduced, informing single parents about the changes and the support available to them, after which they had the discretion to run events if they considered there to be a need for them.

Incapacity Benefit (IB) and Employment and Support Allowance (ESA): ESA replaced Incapacity Benefit (IB) for new claimants from October 2008, just before LPO began. ESA claimants have to undergo a Work Capability Assessment to assess whether their health condition limits the work they are able to undertake. Single parents on IS before the introduction of ESA and who may have had a work-limiting health condition may have a strong incentive to claim IB before October 2008, after which date IB was closed to new claimants, rather than wait until the end of their IS entitlement and make an ESA claim. The estimated impacts of LPO do not separate out this impact from the impact of LPO. It is expected that the introduction of ESA would have mostly affected the early sub-phases of LPO, and might have resulted in greater than expected moves from IS to IB.

In Work Credit (IWC) roll-out: In Work Credit, a payment of £40 a week (£60 in London) for the first year of work (16 hours and over a week) for single parents who had been receiving IS or JSA for at least a year, was available nationally between April 2008 and October 2012 . It was previously available in certain Jobcentre Plus districts, covering around 45 per cent of single parents receiving IS. Therefore, the change in April 2008 affected only single parents in districts that did not previously have IWC, but in these areas, the national roll-out of IWC affected the treatment and comparison groups equally. The estimated impacts of LPO take no account of IWC, but the DiD regressions do control for Jobcentre Plus district to allow for any differences at district level, and for these to change over time, as a way to account for the gradual roll-out of IWC.

The Work Programme: The Work Programme began in summer 2011 and replaced Flexible New Deal and most other New Deal employment programmes. Therefore, up until 30 September 2011 (the end point for this analysis), it is possible that a small number of single parents may have entered the Work Programme during this time. However, it was not possible to determine this from the data used for this analysis. The estimated impacts of LPO, therefore, do not separate out any impact of LPO from the impact of the Work Programme; equivalently, the overall estimated impacts are effectively averaged over those few single parents who were affected by the Work Programme and the many who were not.

Appendix C Fraudulent claims of welfare benefits

The main means-tested welfare benefits and income-related tax credits in the UK are assessed on the joint income of a married couple, or of a cohabiting couple who are "living together as husband and wife" (this is the phrase used in legislation ; its meaning has been established through social security case law and practice). Many couples who are receiving means-tested welfare benefits and income-related tax credits would have a higher entitlement to welfare or tax credits if they were to claim (falsely) that only one adult was living in the household: this arises when any additional entitlement due through the presence of another adult is more than offset by the loss of entitlement through the means-test taking into account that other adult's own, private income. This phenomenon is sometimes referred to as the "couple penalty": see Adam and Brewer, 2010, for example (which we draw on here).

Based on random audits, the relevant government department estimates that, during the financial year 2008-9, it wrongly paid out £93 million in income support to working-age claimants fraudulently not reporting the presence of a co-resident partner. This represents around 2.9% of the total spending of Income Support for single parents (amount of fraud from Table 6.1 of DWP, 2009a; denominator derived from Table 9 of DWP, 2009b); the DWP estimates that all types of fraud increased its spending on Income Support for single parents by 4.7% (Table 9 of DWP, 2009b). The equivalent figures for those on income-related tax credits are considerably higher: HMRC estimates that 7.5% of the claims for tax credits by a single parent contained fraudulent or incorrect non-reporting of the presence of a partner, and these claims were worth £580m (see Table 8 of HMRC, 2010a, for the amount of fraud and Table 2.1 of HMRC, 2010b for the denominator).

Appendix D Further details on cleaning and using the WPLS data

a. Resolving inconsistencies between start and end dates of claims and spells in the IS history file

The IS History file contains information on IS claims, and the spells within them. Each row in the dataset records information relating to a specific "spell", where a spell within a claim should correspond to a period of time within which the claimant's circumstances were unchanged (and so a new spell should accompany a change in the claimant's circumstances).

The dataset presented a number of inconsistencies, both between and within claims. These included overlapping spells within a claim, or gaps between spells within a given claim. These inconsistencies were resolved following systematic rules, summarised in the remainder of this appendix. The rules were informed by two principles:

a) The start-of-claim dates were assumed reliable, meaning that only end-of-claim dates were adjusted to solve inconsistencies.
b) Within a claim, any pair of spells with consecutive dates (i.e. when the end date of spell n is one day earlier than the start date of spell n+1) were considered more reliable than other, possibly conflicting, spells.

These are the steps taken in cleaning the IS history file:

1) Spells that appear to be identical duplicates were dropped from the dataset.
2) End-of-claim date:
    a. Sort the spells within a claim by start date and end date.
    b. Consider the "Maximum Claim Date" associated with the last spell(s).
    c. Set the maximum value as the End of Claim date.
    d. If there is no "Maximum Claim Date", set the Claim as ongoing.
    e. Adjust the end-of-claim date to avoid an overlap with any following claim.
3) The end of each spell is constrained to be less or equal to the end of claim.
4) The start date of all first spells (within a claim) is constrained to be equal to the start of claim
5) When there are conflicting "last spells" (multiple spells with the same start date which appear at the end of the claim):
    a. Select the one for which end of spell is the same as end of claim.

b. If there are none, take the one with minimum difference between end of spell and end of claim.
c. If either of the two previous steps gives multiple candidates, the candidate last in order is kept as the "last spell of the claim".

6) Identify all the spells within a claim that appear consecutive (they are only one day apart) even if they do not appear adjacent in the dataset when the dataset is sorted by start of claim, start of spell and end of spell.
7) Within each claim, start from the first spell with at least one consecutive spell and apply the following rules:
    a. If the spell only has one successive consecutive spell, this latter is selected.
    b. If the spell has multiple consecutive spells, select the one which has a consecutive spell itself. If more than one has consecutive spells, select the first one. If none has a consecutive spell, select the first one as well.
    c. Now all spells which are in between two selected consecutive spells are dropped.
8) In case of gaps between spells, extend the end date of the earlier spell forwards in time.
9) In case of overlaps between spells, take back the end date of the earlier spell.
10) The few spells which end up with negative duration are dropped.

b. Measuring the date of birth of youngest child

A very important step of the analysis of this study is to select the single parents affected by LPO in different sub-phases. Whether and when a single parent is affected by LPO depends on the date of birth of their youngest child. The IS History file does provide information on the date of birth of youngest children, but there are often changes in the date of birth of youngest children which appear implausible (both in the pattern and in the number of changes) and which are very likely to be the result of reporting or recording errors. The following rules were followed to derive a consistent value for the date of birth of youngest child:

1) The (relatively few) claims which were associated with more than 3 changes in date of birth of youngest child were dropped. In the vast majority of cases these were self-evidently mistakes (for example, when four different date of births were recorded with the same day and month but varying years).

2) The two most recent date of births were selected (note: not necessarily the two most recently reported ones).
3) If the earlier of the two selected dates of birth implied that the single parent should be included in a given group, then that was selected as the relevant date of birth.
4) If a single parent was not eligible for inclusion in a given group based on the earlier date of birth, it was checked whether she would be eligible based on the more recent date of birth.

Using the tax credit data set to measure whether working 16 or more hours

The extract of data on tax credits contained information of spells of entitlement to the working tax credit (WTC), spells of entitlement to the child tax credit (CTC) and information on hours worked per week. Within the spells of entitlement to WTC and CTC, there were sub-spells corresponding to entitlement to the different elements of WTC and CTC. There were inconsistencies within and between all these pieces of information. For example

- within a spell of entitlement to WTC, it was possible to find people entitled to no elements of WTC (which should not happen) as well as people entitled to both the "single parent" and the "second adult" element (which is clearly not possible)
- spells of entitlement to CTC did not always match spells of entitlement to WTC
- information on hours worked was not always consistent with spells of entitlement to WTC.

In this report, the measure of work was taken from the spells of hours worked reported by single parents, and not from the spells of entitlement to WTC..

Appendix E Further analysis and descriptive evidence

a. Characteristics of those single parents remaining on IS

This sub-section analyses the characteristics of those single parents who remain on IS after the predicted date of loss of IS entitlement.

About 10 per cent of single parents in the sample were still receiving IS six months after the date on which they were predicted to lose IS entitlement. There are three reasons why this could occur:

- It could reflect that the single parent is exempt from LPO
- It could reflect inaccuracies in the data which mean that either the date on which they should have lost IS entitlement is wrongly predicted, or the data wrongly suggests that they have not left IS when in fact they have
- It could reflect a mistake in the operation of the LPO policy in practice indicating they should have lost entitlement to IS, but didn't.

Tables 1 and 2 provide breakdowns for the following mutually-exclusive categories:[16]

- Receiving Carer's Allowance along with IS.
- Receiving IS but not as a single parent, either because the claim is now from a couple, or because there are no dependent children.
- Receiving IS with a younger child
- Receiving Incapacity Benefit along with IS.[17]
- None of the above, ie there was no identifiable reason why the single parent was still receiving IS.

Overall though, there was no identifiable reason why the single parent was still receiving IS in around a third of cases (across phases). [18]

Amongst Phase 1 single parents, very few continue to receive IS because they have since had another child, but some continue to receive IS as single adults (this could happen if they claimed the pre-2008 disability benefit, known as Incapacity Benefit (IB)). In Phase 2, slightly more had started a claim for Carer's Allowance and slightly fewer were no longer single parents. Compared to Phase 1, more parents in Phase 2 were observed to be receiving IS and having a younger child. For single parents in Phase 3, there was no identifiable reason

[16] If more than one was applicable, single parents were placed in the first category.
[17] Single parents receiving IB when sampled were excluded from the sample, because they were exempt from LPO. The single parents in this category, then, must have started a claim of IB in the 12 months preceding the date when they would have lost IS entitlement, something which was possible only for single parents affected by Phase 1 of LPO.
[18] There are some categories of single parents that were exempt from LPO that cannot be identified in our data.

why the single parent was still receiving IS in around a third of cases, with roughly equal fractions of the remainder having started a claim of Carer's Allowance or having had a younger child.

Table 11: Reasons for remaining on IS after date when predicted to lose IS entitlement, Phase 1

	18 months after sampled (6 months after IS end date)	27 months after sampled (15 months after IS end date)	36 months after sampled (24 months after IS end date)
Receiving Carer's Allowance	23%	29%	31%
No longer a single parent	3%	4%	7%
With a younger child	9%	9%	8%
Receiving ESA/IB/SDA	28%	27%	27%
No apparent reason	37%	31%	27%
All cases	100%	100%	100%
(as fraction of all potentially eligible)	15,757 (14%)	14,756 (13%)	12,284 (11%)

Table 12: Reasons for remaining on IS after date when predicted to lose IS entitlement, Phase 2 and 3

	Phase 2		Phase 3
	18 months after sampled (6 months after IS end date)	27 months after sampled (15 months after IS end date)	18 months after sampled (6 months after IS end date)
Receiving Carer's Allowance	37%	44%	27%
No longer a single parent	1%	1%	1%
With a younger child	24%	21%	36%
Receiving ESA/IB/SDA	1%	1%	<1%
No apparent reason	36%	32%	36%
All cases	100%	100%	100%
(as fraction of all potentially eligible)	8,619 (10%)	5,364 (8%)	13,390 (8%))

b. Single parents who are not in work and not receiving any out-of-work benefits

Figure 7 shows what fraction of these (possibly former) single parents fall into one of the following mutually exclusive categories:[19]

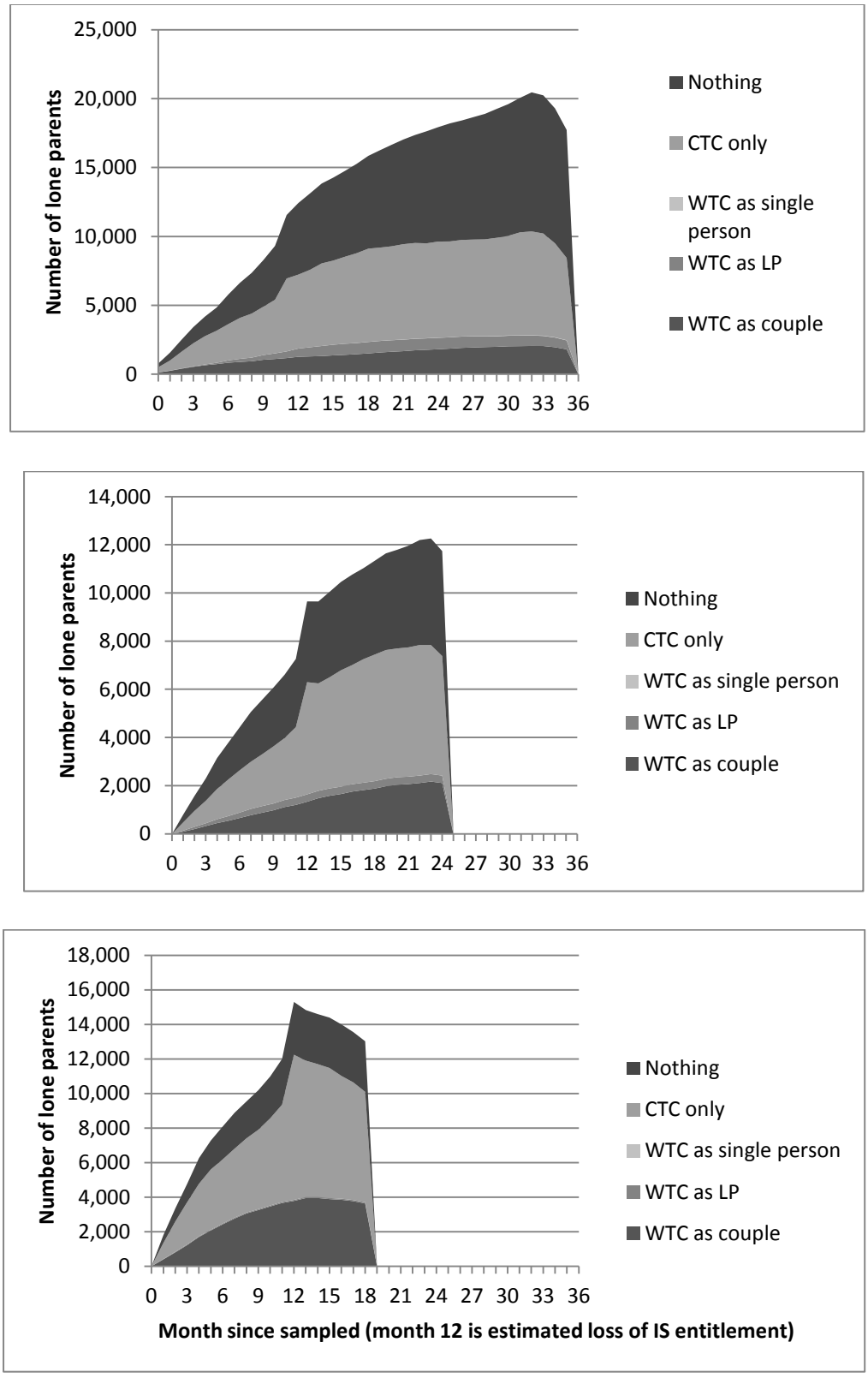
- working fewer than 16 hours/week themselves, but living as a couple that was entitled to WTC due to their partner working at least 16 hours/week
- recorded as entitled to WTC as a single adult but without reporting work of 16 or more hours (this would suggest an inconsistency between the data on "entitlements to WTC" and the data on hours worked recorded in the tax credit administrative data).
- receiving Child Tax Credit and working fewer than 16 hours/week.
- receiving no other working age benefits or tax credits in their own right

The figure shows that (across the 3 Phases) between 70% and 90% of this group are either not receiving any state support or receiving only child tax credits.[20] However, amongst those appearing to receive no state support it is not possible to tell, how many no longer have a dependent child (something that substantially reduces entitlements to benefits) or how many have re-partnered but without claiming tax credits. It is also not possible to tell whether any of these (former) single parents went on to be the partner of a claimant of an out-of-work benefit.

[19] Single parents were put into the first category that applied.

[20] It is not possible to tell, amongst those appearing to receive no state support, how many no longer have a dependent child (something that substantially reduces entitlements to benefits) or how many have re-partnered but without claiming tax credits. It is also not possible to tell whether any of these (former) single parents went on to be the partner of a claimant of an out-of-work benefit.

Figure 7 Outcomes for single parents not receiving any of ESA/IB/SDA, CA, IS, JSA and not reporting work of 16+ hours when claiming tax credits, by Phase (top = Phase 1, bottom = Phase 3)



Appendix F Comparison with other programmes for single parents in the UK

Comparison of our estimated effects with those of other programmes is complicated by the variation in outcome measures and population of interest. We therefore focus on just on evaluations of programs aimed at single parents in the UK, and we have also to focus on the impact on receipt of IS, as earlier studies could not look at the impact on employment, and did not systematically consider the impact on health-related benefits.

Our headline estimates are that LPO reduced the fraction of single parents receiving an out-of-work benefit by -12.8 at nine months (in Phase 1), and by -15.7 at nine months in Phase 2. These are considerably higher than the estimated impacts of three previous UK reforms affecting single parents receiving welfare benefits:

- the estimated impact of the Lone Parent Pilots (a set of reforms dominated by a back-to-work bonus of £40 a week for the first 52 weeks of work) amongst lone parents who had been on IS for 12 months was 1.6 ppts after 12 months, and 2.0 ppts after 24 months (Brewer et al, 2009).
- the estimated impact of a reform known as Work Focused Interviews (WFI), which required single parents on welfare to meet with a caseworker at 6 or 12 month intervals; after 12 months, was 0.8 per cent for single parents with youngest children aged over 13 and 2.0 per cent for single parents with youngest children aged 9–12 (Cebulla et al, 2008).
- The estimated impact of the New Deal for Lone Parents (NDLP), which offered a voluntary programme of work search counselling amongst all single parents (not just those who participated) on IS was 1.7 percentage points after nine months and 1.4 percentage points after 24 months (Cebulla et al, 2008).

Of these interventions, two are mandatory (WFIs and LPO) and two were voluntary programmes (NDLP and IWC). Of the mandatory interventions, LPO is clearly much more effective at moving single parents off out-of-work benefits and into work than are WFIs. This is fully in line with the considerable difference in intensity (and conditionality associated with different benefits) underpinning the two interventions. The two voluntary programmes have higher estimated impacts amongst their participants, but this is not the relevant way to measure their effectiveness when compared with a mandatory programme like LPO.